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ADDIS ABABA UNIVERSITY
COLLEGE OF VETERINARY MEDICINE AND AGRICULTURE
DEPARTMENT OF CLINICAL STUDIES

CASE REPORTS ON COMMON SURGICAL PROCEDURES, TECHNIQUES AND ITS OUTCOME ON DOMESTIC ANIMALS IN AND AROUND BISHOFTU TOWN, ADA'A DISTRICT, EAST SHOA ZONE, OROMIA, ETHIOPIA

MVSC THESIS

BY

JIREGNA DUGASSA KITESSA

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ADDIS ABABA UNIVERSITY

COLLEGE OF VETERINARY MEDICINE AND AGRICULTURE

CASE REPORTS ON COMMON SURGICAL PROCEDURES, TECHNIQUES AND ITS OUTCOME ON DOMESTIC ANIMALS IN AND AROUND BISHOFTU TOWN, ADA'A DISTRICT, EAST SHOA ZONE, ETHIOPIA

A Thesis Submitted To the College of Veterinary Medicine and Agriculture of Addis Ababa University in Partial Fulfillment of the Requirements for the Degree of Master of Veterinary Science in Veterinary Surgery

BY

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DEPARTMENT OF CLINICAL STUDIES

MVSc IN VETERINARY SURGERY

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APPROVAL SHEET

Addis Ababa University

College of Veterinary Medicine and Agriculture

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As MVSc research advisor, I hereby certify that I have read and evaluated this Thesis prepared under our guidance by Jiregna Dugassa entitled "**CASE REPORTS ON COMMON SURGICAL PROCEDURES, TECHNIQUES AND ITS OUTCOME ON DOMESTIC ANIMALS IN AND AROUND BISHOFTU TOWN, ADA'A DISTRICT, EAST SHOA ZONE, OROMIA, ETHIOPIA", We approved for submittal to dissertation assessment committee.**

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As member of the examining board of the final MVSc open defense, we certify that we have read and evaluated the thesis prepared by Jiregna Dugassa Kitessa entitled **"CASE REPORTS ON COMMON SURGICAL PROCEDURES, TECHNIQUES AND ITS OUTCOME ON DOMESTIC ANIMALS IN AND AROUND BISHOFTU TOWN, ADA'A DISTRICT, EAST SHOA ZONE, OROMIA, ETHIOPIA"** and recommended that it be accepted as fulfilling the thesis requirement for the degree of Masters of Veterinary science (MVSc) in Veterinary Surgery

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STATEMENT OF THE AUTHOUR

First, I declare that this thesis is my *bonafide* work and that all sources of materials used for this thesis have been duly acknowledged. This thesis has been submitted in partial fulfillment of the requirements for an advanced (MVSc) degree at Addis Ababa University, College of Agriculture and Veterinary Medicine is deposited at the university/College library to be made available to borrowers under rules of library. I solemnly declare that this thesis is not submitted to any other institution anywhere for the awards of any academic degree, diploma or certificate.

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LIST OF ABBREVIATIONS

AAU	Addis Ababa University
ACTH	Adrenocortictrophin Hormone
CRT	Capillary Refill Time
CVP	Cervix and Vaginal Prolapse
DSCVC	Donkey Sanctuary Veterinary Clinic
GIT	Gastro Intestinal Tract
LA	Local Anaesthetic
MOARD	Ministry of Agriculture and Rural Development
OVH	Ovariohysterectomy
PH	Perineal Hernia
SPANA	Society for Animal protection Abroad
VTH	Veterinary Teaching Hospital

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ABSTRACT

Livestock are the back bone of growth and development of a particular country of the world especially where majority of people rely on it as main source of income, daily livelihood and draught purpose. However this vast and valuable sector can be affected by multifaceted problems and constraints which can directly and/or indirectly hamper the production and productivity of the animals. Among these factors, poor and unsatisfactory coverage of veterinary services particularly veterinary surgical management of different deformities, injuries and ailment of various origins is one of the main problems in Ethiopia. So the surgical case reports presented in this study were compiled from surgical cases presented and performed to show the significance of surgical procedures and techniques on the outcomes related to recovery from abnormality. The procedures and techniques included in these case reports were performed on domestic animals brought to Veterinary Teaching Hospital, Donkey Sanctuary and Dire Veterinary Clinics with different ailments requiring surgical management during October, 2018 to June, 2019 G.C. On presentation, history, general physical examinations, clinical and laboratory findings were thoroughly assessed to determine the type of treatment and surgical intervention required. When the animal was found to require specific surgical treatment; each and every animal was well prepared for aseptic procedures and anesthetics preoperatively, before surgical procedure depending on animal species and type of surgical procedure to be conducted. The prescribed specific surgical procedure for each specific condition was performed using appropriate technique, suture material and patterns based on the requirement of the body site. After surgery, each and every animal patient was followed postoperatively and surgical complications and recovery outcomes were recorded. In this study a total of 27 animals including 33.33% (9/27) small animals and 66.67% (18/27) large animals were operated on different parts of their body at different places. Of all the operated animals, 96.30% (26/27) were recovered and cured whereas 3.70% (1/27) was died. This finding shows that surgical intervention performed by well trained veterinary surgeon under proper aseptic technique is crucial to save significant number of animals affected by life threatening conditions.

Key Words: *Case Report, Surgery, Surgical Management, Surgical Outcome*

1. INTRODUCTION

Livestock are essential assets for livelihoods of farmers that could serve for alleviating poverty, foreign exchange earnings, socio-economic development and insurance (Scoones and Wollmer, 2006). Animal production has been considered as the main component of agricultural development in most parts of sub-Saharan Africa because livestock plays a crucial role both for the national economy and the livelihood of rural communities (Gebrewold *et al.*, 2004). Ethiopia is known for its high livestock population, being the first in Africa and tenth in the world (CSA, 2013). The recent livestock population estimates that the country has about 52.1 million heads of cattle, 24.2 million sheep, 22.6 million goats and 44.9 million poultry. Despite the large number of livestock in the region, the sector is still characterized by low productivity and production due to various contributing factors such as low coverage of veterinary services (Gebreegziabher, 2009).

Among veterinary services, veterinary surgery plays crucial role in saving life of animals through surgical manipulation and treatments of various ailments and abnormalities or deformities (Byron, 2015). It is recommended that surgery be performed on animals by veterinarians (preferably by surgeon), whereby the procedures fall into three broad categories: orthopaedics (bones, joints, muscles), soft tissue (skin, body cavities, cardiovascular system, gastro intestinal, urogenital, respiratory tracts), and neurosurgery (Holt *et al.*, 2000). The procedure also involves advanced surgical procedures such as joint replacement (total hip, knee and elbow replacement), fracture repair, oncologic (cancer) surgery, complicated gastrointestinal or urogenital procedures, kidney transplant, skin grafts, complicated wound management and minimally invasive procedures are also in advancing (Andrews *et al.*, 2013; Millard *et al.*, 2014).

Truly incredible advances have been gained in the past few decades with regards to the clinical practice of veterinary surgery and anesthesiology (Forsberg and Eneroth, 2000). Novel investigational techniques and medical procedures have also greatly enhanced veterinarian abilities to diagnose and treat animals. Use of minimally invasive diagnostic and procedural techniques, improvements in medical equipment, and the advent of molecular biological

methods have advanced veterinary medical practice to a level well beyond what was possible just a few short years ago specially in developed countries (Byron, 2015).

Despite high livestock importance, the treatment of individual sick animal gets less attention until recent years as the policy and man power resource give more attention to preventive medicine in Ethiopia which in turn affects the veterinary practices such as veterinary surgery of domestic animals in addition to veterinary medical research (MOARD, 2010). However, recently there is an increased demand for better veterinary services due to the increasing awareness of the importance of treatment of individual animal by both the rural and urban community (Roman *et al.*, 2014). A growing trend of keeping pure or crossbred animals as companion pets (esp. dog) in urban areas also contributed to the increased demand in the veterinary care of individual animal (Angesom, 2015).

The origins of surgical and medical case reporting format have been traced to hundreds of years before records on Egyptian papyrus around 1600 BC (Nissen and Wynn, 2017). This format remains an important part of the array of methods for education and continuing education of professionals in all medical fields, including veterinary medicine. In addition it provides novel and innovative ideas on the methods, techniques and procedures of handling surgical cases of various natural and acquired ailments, abnormalities and deformities of animals (Burrow *et al*., 2006). In general few veterinary clinical case reports were compiled and published on different reputable scientific journals, but there is still inadequate description of major surgical procedures and techniques of small and large domestic animals in Ethiopia. Therefore, the objectives of these case reports are:

- To document and describe the various surgical procedures, techniques as well as its outcome in small and large domestic animals at VTH and Veterinary Clinics.
- To acquire knowledge and surgical skills on various aspects of common surgical treatments and managements in domestic animals in particular.

2. MATERIALS AND METHODS

2.1. Study Area

The study was conducted from October, 2018 to June, 2019 G.C in and around Bishoftu town of Veterinary Hospital and Clinical centers namely: Addis Ababa University veterinary Teaching Hospital, Donkey Sanctuary and Dire Veterinary Clinics of Ada'a district, Ethiopia on the case reports of common surgical procedures, techniques and its outcomes in domestic animals. The area is located in Oromia Regional State lying at a distance of 47.9 kilometers southeast of Addis Ababa (capital city of Ethiopia). Geographically it is stretched between 8 degrees 43' North 8 degrees 48' North latitude and 38 degrees 00' East 38 degrees 48' East longitude (Figure 1). According to spatial analysis in this study, the town currently covers the total area of about 14,878 hectares which was 4,520 hectares in the year 2005. Moreover, the town is suited in tepid to cool sub moist mid highland at an average altitude of about 1920 meters above mean sea level with moderate weather condition. The temperature of the area ranges from 16°c to 24°c (NMSA, 2003).

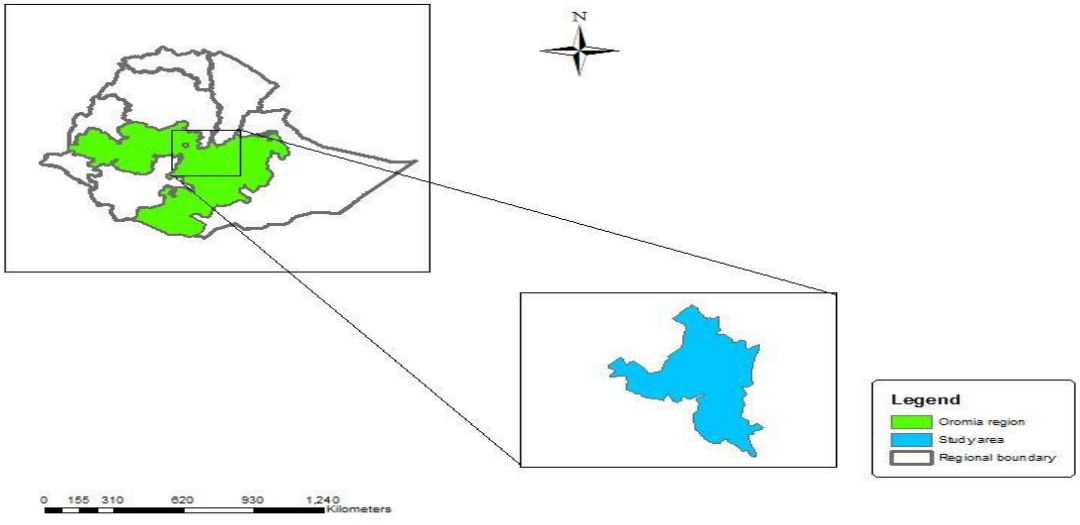


Figure 1: Geographical location of the study area

2.2. Study Population

The study animals were small and large animals of different breeds ages originated from different management systems and admitted to the VTH, Dire and Donkey Sanctuary Veterinary Clinic for various surgical treatments. Local breed cattle, donkeys, goats and sheep were kept under semi intensive husbandry condition. Small animals (dogs and cats) were kept as companion animals being fed with meats and other concentrate feeds. The report included case repots of surgical intervention performed on ailments of twenty seven domestic animals of different breeds, species, sex and ages where; four were donkeys, six were cattle, four, sheep, one was goat, two were pigs, eight were dogs, one was cat and one was mule of different surgical cases.

2.3. Study Design

The study design was descriptive clinical case report on the common surgical cases with regards to procedures, techniques and its outcomes in domestic animals.

2.4. Study Method

The different domestic animals brought to respective Veterinary Hospital and Clinics with various surgical cases requiring minor or major surgical manipulations either for elective or emergency treatment was subjected to thorough medical evaluation. Accordingly, each and every case was assessed, evaluated and findings pertaining to different clinical parameters such as patient signallment, history, physical examination and laboratory diagnosis were recorded. Inaddition the patient was pre evalaluated for anaesthesias and surgical risk. Depending on the examinations and clinical findings, specific surgical manipulations and management were prescribed and performed under aseptic condition and safe anesthetic protocol as per the presented cases' requirement. All animals undergone the surgical treatments were also followed through phone call communication and physical presence in addition to peri, intra and post operation for any discomfort and related complications. Later all the relevant data were compiled, the surgical case reports prepared and reported according to relative similarity of procedure and presentations same or/and different animal species with respective outcomes. Some of the record for case report includes the following.

2.4.1. Patient signalment recorded

The origin, sex, breed, age, species, clinical findings and general body conditions were recorded during presentations to the VTH.

2.4.2. Case history

All relevant past and immediate histories about the problem were systematically and chronologically inquired by using technical languages. Detailed and critical information about the patient such as: duration of ailment, progression of case, history of previous ailments and medication, route, regimen and its outcome, duration of pregnancy, management system, incidence of the case, recurrence, progression of ailment, duration and feeding system all are included. Also, assessment and recording of different clinical signs and systemic clinical findings were implemented.

2.4.3. Physical examination

Examination of accessible vital organs and systemic physiological parameters were visualized, examined and recorded before undergoing any surgical manipulations specially those involving the administration of general anesthetics. These vital parameters includes: Respiratory rate, Heart rate, Rectal temperature, Color of visible mucus membranes, hydration status of animals, rumen motility (Ruminants), and palpation of superficial lymph nodes were conducted. In addition, each case was closely inspected; visualized and examined to detect any structural and or functional disorders of the affected region/s. In addition, the affected parts and or region were manipulated to detect their nature, consistency, size, attachment and tenderness. Exploratory puncture was also performed whenever indicated to reveal the natural characteristics of the existed fluids or contents in the examined region/s. Finally all relevant information were assessed, concluded, decided and interpreted before undergoing particular surgical procedure.

2.4.4. Laboratory examinations

Whenever situations allowed depending on the availability of reagents, facilities and nature of the cases (elective vs. emergency), certain laboratory examinations such packed cell volume, bacterial culture and cytology were conducted.

2.5. Ethical Consideration

The Addis Ababa University college of Veterinary Medicine and Agriculture ethical review committee had critically reviewed the proposal in the context of research ethics and conclude that, there was no ethical problem on the objectives and methodology of the proposal and authorized to implement the research project in the field work. This research was done under the project of improving public health by controlling dog born zoonosis stray dog population through integrated preventive strategies in central Ethiopia as subtitle. The ethical clearance paper was attached (Annex 7).

3. INDIVIDUAL SURGICAL CASE REPORTS EMPLOYING COMMON SURGICAL PROCEDURES, TECHNQUES AND ITS OUTCOMES IN DOMESTIC ANIMALS

3.1. Caesarean Section in Queen and Cow

3.1.1. Queen

Abstract

Uterine inertia is lack of or decreased uterine wall contraction during labor and parturition due to various factors and forms. Of this primary uterine inertia is one of the common causes of dystocia in queen. A case of primary uterine inertia with dead fetus in uterus was presented to Addis Ababa University Veterinary Teaching Hospital with history of 15 hours duration of dystocia. Per-vaginal palpation of the fetus revealed the presence of emphysematous dead fetus. For having a dead emphysematous fetus that cannot be delivered normally, emergency caesarean section was decided as appropriate surgical intervention to be performed under general anesthesia. Thus, after aseptically preparing the caudal midline surgical site, an incision was made to exteriorize the fetus under general anesthesia. Abdomen was closed routinely. Finally the wound was healed without any postoperative complication.

Key words: Cat, Caesarean Section

Introduction

Dystocia is the inability of the queen to expel the fetus at parturition through the birth canal without assistance (Forsberg and Eneroth, 2000). The etiology of dystocia may be maternal factors (uterine inertia, inadequate size of birth canal) and/or fetal factors (oversized fetus, abnormal orientation as the fetus enters the birth canal). However, the maternal causes appear to be more common (Rajesh and Rajesh, 2002). In queen the condition occurs mostly due to uterine inertia that may be partial or complete. In partial uterine inertia labour ends prematurely while in complete uterine inertia, labor period is unable to start (Domoslawska *et al.,* 2011).
Among various factors, uterine inertia constitutes the biggest maternal cause of dystocia in cat (Deka *et al.,* 2003). The causes of inertias include; failure of uterus to respond to fetal signals

because of presence of one or two puppies and thus, there is insufficient stimulation to initiate labor (the single puppy syndrome) or because of overstretching of the myometrium by large litters, excessive fetal fluids, or oversized fetuses. Other causes of inertias may be an inherited predisposition, nutritional imbalance, fatty infiltration of the myometrium, age related changes and deficiency in neuro endocrine regulation (Linde-Forsberg and Eneroth, 2000).

The incidence of dystocia in companion animals like the bitch and queen are quite low but when it occurs it may constitute life threatening situations to both the dam and the young ones (Rothman, 2012). According to some studies in the cat, the incidence of dystocia is known to be highest in the Persian cat (Strom Holst and Frossling, 2009) followed by the Siamese type and Devon Rex cats (Linde Forsberg and Persson, 2007). An efficient diagnosis of dystocia is dependent upon taking an accurate history and performing a thorough physical examination in a timely manner. The clinician must quickly obtain a careful reproductive history detailing breeding dates, any ovulation timing performed, historical and recent labor, as well as a general medical history (Linde-Forsberg, 2005).

In case of queen, the gestation period is taken as 63 to 65 days on an average. The first stage of labor is characterized by clear vulvo-vaginal discharge, vocalization, tachypnea, pacing in circles, rearranging of bedding and washing itself constantly. The second stage, however, involves lying by side and as contractions become more vigorous, lowering of hind quarters in a semi-squatting position, standing on phalanges with the calcaneous bones pointed almost straight up and wide apart; the entry of foetus into the pelvic canal is signaled with groaning or crying of the queen (Sparkes *et al.,* 2006). First kitten should appear within 60 minutes of onset of second stage with time interval of up to 60 minutes between two successive births. Queening is usually completed in 2 to 6 hours but may take 10 to 12 hours in older females (Corbee, 2014). In the present surgical case report, diagnosis and surgical management of dystocia due to uterine inertia in local breed queen was described.

Case history and clinical examination: A four year old local breed queen weighing 14 kg was presented to Addis Ababa University Veterinary Teaching Hospital, College of Veterinary Medicine and Agriculture with clinical findings of anorexia, dull, depression, frequent licking of perineal area, putrid smelling black to greenish discharges from vagina (indicating placental

separation and fetal distress) and frequent granting. The owner informed as the animal had already given birth of two live kitten 15 hours before presented to VTH. On clinical examination the animal was found dehydrated and pyretic (104.5^0F).

On per vaginal examination, the birth canal was found moist with bad odour and discharges. Only posterior limb extremities could be palpated at deep pelvic inlet. The queen had been straining intermittently and very slowly to deliver the next kitten without any progress. Upon on external palpation of the abdomen, there was hard mass found in abdominal cavity. As there was clear symptom of toxemia with dead emphysematous fetus which could not be delivered normally; emergency surgery by caesarean section was decided to be performed under general anesthesia with adequate resuscitation measure taking utmost care not to spare the life of the mother.

Preoperative preparations: Before the queen undergone surgery, Penicillin (24mg/kg) and dihydrostreptomycin sulphate (30mg/kg) (Pen &Strep® Norbrook UK) was administered intramuscularly few hours before commencing surgery. The ventral abdomen was prepared by hair clipping, shaving and through scrubbing using sterile sponges and diluted antiseptics after sedation. Shaving of the hair was done gently, parallel to the skin, and then the skin was scrubbed with diluted chlorhexidine solution from the prep tray and rinsed with water containing diluted form until the gross debris had been removed. Finally the incision areas were scrubbed again with iodine solution and ready for draping (Figure 2A).

Anesthesia and animal control: Atropine sulphate @ 0.04 mg/ kg was administered intramuscularly as premedicant and general anesthesia was achieved by intravenous administration of mixture of Diazepam (manufactured by Intas pharmaceutical Ltd., India) @0.15mg/kg and ketamine (Ketamine Hydrochloride manufactured in Germany) @5mg/kg I.V respectively. Then the patient was kept in dorsal recumbence with the limbs tied on patient table to help stabilization. Lactated ringers solution was given IV at a rate of 1drop/sec., throughout the surgical procedure.

Surgical treatment and management: Caudal ventral midline incision was made and the skin, subcutaneous tissue and linealba were incised one by one caudal to the umbilicus and to exteriorize the uterus. The abdominal cavity was cautiously entered, the gravid uterus was

exteriorized and the remaining abdominal organs were packed of with sterile drape to prevent peritoneal contamination (Figure 2B). A stab incision was made on the uterus with scalpel blade on the ventral midline of uterine body on avascular area (Figure 2C) and the incision was extended with metzenbam scissors to sufficient length for easy removal of dead fetus.

Then the dead fetus was moved to incision site by gently pushing and squeezing the uterine horn. Then the placenta was removed by gently pulling from the endometrium. The dead neonate was removed from the surgical field. Before closing the incised uterus, the uterine content was checked to level of ovary for left fetus if any. Then the uterus was sutured with chromic cat gut 3-0 size using Cushing fashion in two layers of inversion.

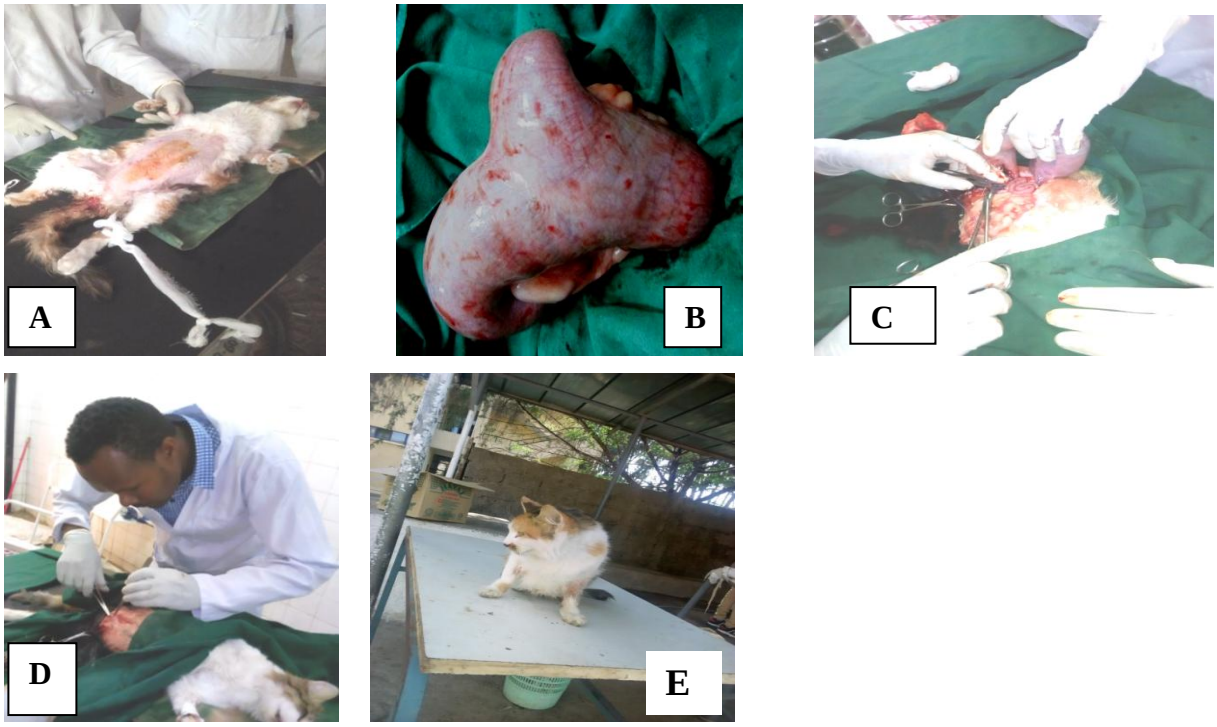


Figure 2: Caesarean section on progression in queen and its outcome

A) Preparation of surgical site B) Intra-operative image of exteriorized gravid uterine horn. C) Incising the gravid uterus at the ventral midline of uterine body on avascular area D) Closure of abdominal wall on progress E) Queen at third day post operation

The surgical area of uterus was checked for hemostasis and lavaged with warm sterile normal saline solution prior returning it to the abdominal cavity. The abdominal cavity was also

lavaged with sterile saline solution and aspirated to remove uterine contents. The laparotomy site was closed in three layers. As a first layer linealba and peritoneal fascia were sutured together with simple continuous pattern by using polyglycolic acid 910 (vicryl) 2-0 sizes. The subcutaneous tissue were sutured in simple continuous and skin was sutured using subcuticular (intradermal) manner by using polyglycolic acid 910 (vicryl) 2-0 size with buried knot to avoid licking of suture material (Figure 2D). After the closure was finished, the incision site was scrubed with diluted iodine solution.

Post operative care of queen and outcome: Post operatively, Penicillin (24mg/kg) and dihydrostreptomycin sulphate (30mg/kg) (Pen &Strep® Norbrook UK) IM was administered for three days and analgesic called tramadol hydrochloride (2% Tramadol hydrochloride Sakar Health care PVt.Ltd, Gujarat, India) @ 2mg/kg IM B.I.D was administered for two days post operation. The owner was also advised to keep Elizabethan collar and follow the animal for any complication as well as sign of discomfort. The owner reported mild decrement in appetite for two weeks but later restored. At the end case was recovered successfully without any additional complication and seen doing well at third day of post operation (Figure 2E).

Discussion

Although there is no standard surgical approach to the caesarean section of cats, the caudal midline approach predominates over flank approach as studied by (Stone, 2003). Because the flank approach has potential complications and might leads to difficulty in removing entire uterine body and cutting several layers. This assertion supports the current case management approach of caudal midline that enables in easily accessing the uterine body in addition to the advantage of decreased bleeding from linea alba. The caudal midline approach also needs less time to enter the peritoneal cavity as compared to flank approach because cutting the skin was longer for the flank approach, probably owing to the greater complexity of identifying the subcutaneous fat, external and internal oblique muscles and peritoneum, compared with identifying the linea alba (Burrow *et al*., 2006).

During the case management, queen was premedicated with atropine sulfate to reduce the bronchial secretion and GIT motility. This is also similar with the principle and anesthetic protocol, stated by (Kennedy and Miller, 2007) in which it is normally recommended to

decrease maternal stress and anxiety in addition to decreasing the doses of induction and maintenance of anesthetic agents. In the present case the dead fetus was expelled from uterus. The main reason for the lack of expulsion of dead fetus in present case may be due to primary uterine inertia which is common in canine and feline species (Romagnoly *et al.*, 2004).

The author, Lorenz *et al.*, (2009) also reported uterine inertia as main cause of dystocia in queens. The owner reported that the queen did not show any clinical manifestations of approaching whelping and expulsion of the left fetus from her genital tract without aid. In some younger and elderly female cats and dogs, due to poor abdominal muscle tone there is difficulty in producing uterine contraction in second stage of labor (Jackson, 2004b). This primary uterine atony may have been cause for the maternal dystocia (Vorwald *et al.*, 2012). It was also believed that fetuses fail to produce sufficient ACTH and cortisol to initiate the birth process (Johnston *et al.*, 2001a; Linde- Forsberg, 2010).

In conclusion, caesarean section on caudal midline was effective in this case of dystocia suspected to be due to uterine inertia.

3.1.2. Cow

Abstract

Caesarean section is a surgical procedure in which an incision is given through the abdominal wall and uterus of dam in order to deliver fetus when normal parturition in animal is too difficult or could endanger dam's life or calf. The case report is aimed to describe the surgical management of dystocia on a 4years old Holistein Fresean cow that was presented to Addis Ababa University Veterinary Teaching Hospital with dystocia due fetopelvic disproportion. Per vaginal examination revealed complete opening of the cervix with existence of large sized, emphysematous and partial expulsion of forelegs of dead fetus which was difficult to expel through birth canal due to fetopelvic disproportion and emphysematous fetus. Depending on the examinations the case was decided to be managed through emergency surgical manipulation by a cesarean section to deliver calf using lower left flank oblique laparotomy. After aseptically preparing the surgical site and anaesthetizing with the injection of lidocaine in to caudal epidural space the surgical procedure commenced. Finally after removing the dead

fetus from uterus the uterus and abdominal layers was properly sutured with appropriate suture patterns and suture materials.

Key words: Caesarean section, cow, dystocia

Introduction

A caesarean section, also called a C-section refers to a surgical procedure in which an incision is made through the abdominal wall and uterus in order to deliver fetus (Vermunt, 2008). It is necessary in adult dairy cattle when normal parturition in animal is too difficult or could endanger dam's life or calf. The first caesarean section in case of cattle had reported as early as 1930s to save a cow. Now a day, it has gained popularity due to high feto-maternal survival rate, less tiring, quicker, and more secured than fetotomy (Dhindsa *et al.,* 2010). A 90% of caesarean case is performed due to dystocia in all farm animals, which unless relieved, leads to death of the fetus and/or sometimes to the death of the dam (Loren *et al*., 2008). Among all domestic animals, cattle and buffalo are considered to be most suspicious species having highest incidence rate of dystocia (Purohit *et al*., 2011).

Dystocia is more of an emergency condition and may be of fetal or maternal in origin. Fetal causes of dystocia include mainly mal position and monsters. Maternal causes of dystocia include incomplete cervical dilatation (ring womb), narrow pelvis, and uterine inertia (Noakes *et al*., 2009). According to Lucky *et al*., (2016) the prevalence of dystocia was 21.18% in cattle and 12.5% in goats in syhlet district in Bangladesh. In cows the incidence of dystocia is higher in heifer than pluriparous (Zaborski *et al.,* 2009). Incidence of dystocia due to cervical cause was also seen to vary from 11.1 to 16.7 percent on cows (Wehrend *et al*., 2003). In large ruminants, dystocia or difficult birth contribute a significant economic loss in terms of loss of perinatal death of dams and fetus, uterine infections, more retained placentas, and longer calving and intervals (Brounts *et al*., 2004).

Any delay in correction or management of dystocia may seize the life of dam or calf. In certain situation, caesarean section may save life of both or either dam or calf (Wilson *et al.,* 2006). A number of surgical approaches are available for the bovine caesarean section including recumbent or standing left paralumbar laparotomy, recumbent or standing right paralumbar

laparotomy, recumbent ventral midline laparotomy; recumbent ventral paramedian laparotomy, ventrolateral laparotomy and the recumbant left oblique laparotomy. Each of this approach varies greatly and has its own advantages and disadvantages (Sood *et al*., 2011).

Selection of an approach for C-section mainly depends on species of animals, skill of the veterinarian and other factors such as the type of dystocia, the cow's condition, the environmental conditions and the availability of assistance during surgery (Dhindsa *et al.*, 2010). For this reason, it is worthwhile to select a suitable site for operation in a laying cow and most often the left paralumbar fossa approach is favored by most veterinarians (Vermunt, 2008). The objective of this case report is to describe caesarean section and its management in the exotic breed cow performed under clinical conditions and with recumbent position using caudal epidural anesthesia and lower left flank oblique laparotomy.

Case history and clinical examination: A 4years old age exotic breed cow was presented with dystocia due to failure of giving birth due since 15hrs from onset of parturition. The history stipulated that the cow was tried to give birth with normal presentation of fetus 16hours before owner informed for assistance. After few hours later she laid to ground and continuously straining for parturition but failed to expel the fetus and recumbent soon later for few hours without any close monitoring of veterinarian except the owner. The cow also failed to rise since then. When closely observed there is partial expulsion of both for legs and dried indicating as it is stayed for long time. The patient history revealed that she hadn't given any birth before. At first general physical examination was done by using vital physiological parameters.

On clinical examination the cow's respiration, heart rate and pulse rate was within physiological limits. Clinical examination of the cow also revealed as there was dull and anorexic with distended abdomen. However rectal temperature was 38.9^{o}c, but no sign of parturition was observed and the cow slightly depressed. Per vaginal examination revealed complete opening of the cervix with existence of large sized, emphysematous and partial expulsion fore legs of dead fetus which was difficult to expel though birth canal due to feto-pelvic disproportion. Depending on the diagnosis and clinical examinations the case was decided to be performed as an emergency surgical manipulation by a cesarean section to deliver calf using lower left flank oblique laparotomy.

***Preoperative preparations*:** Before conducting the operation, the cow was administered with Procaine penicillin (24mg/kg) and dihydrostreptomycin sulphate (30mg/kg) (Pen &Strep® Norbrook UK) intramuscularly one hour before the operation. The proposed site of incision was aseptically prepared by shaving hair with sterile surgical instruments and scrubbed with povidone iodine solution (Figure 3A). Finally sterile drape was fixed to the proposed site of incision by using towl clamps.

Anesthesia and animal control: Since the animal was recumbent prior caudal epidural anesthesia was used with 2% lidocaine hydrochloride (jeil pharma. co. Ltd. Korea) @0.22mg/kg in to sacrococcygeal space. The animal was kept in right lateral recumbent position during surgical procedure.

Surgical correction and treatment: After aseptically preparing the surgical site and stablising, left oblique lower flank laparotomy approach was used for caesarean section with recumbent position. After that sharp incision was performed on skin and subcutaneous layer through the same opening. The incision was given 2 to 3 cm ventral and cranial to the tuber coxae, extended cranioventral at 45 degree angle to the ground. The external abdominal oblique muscle was incised in the same direction as the skin (Figure 3B). The internal abdominal oblique muscle and transverse abdominis muscles were guided parallel to the incision using a combination of sharp and blunt dissection and ligating all the blood vessels and cutting by taking care to avoid major blood vessels.

Following separation of the muscles by blunt dissection, the peritoneum was incised and then guiding a cut by a finger placed underneath the peritoneum. After identifying the uterus, the portion of the uterus containing a head was pulled up into the abdominal incision by grasping the calf's head. Then incision was given along the greater curvature of the uterus avoiding major blood vessels. Huge amount of amniotic fluid came out and large, emphysematous dead calf was pulled out. Then the detached placenta was removed gently. Before closing the abdominal cavity, the inner surface of uterus and peritoneal cavity were given a good flush with normal saline to reduce contamination. The uterus was closed with Cushing over Lambert suture pattern with a synthetic absorbable monofilament chromc cat gut (2-0). An atraumatic needle was used starting well above the incision and using Cushing pattern without penetration

of the wall. (Figure 3D). Finaly the wound spray was applied over the sutured line. The animal was then monitored for a period of certain days to observe any complication but died after two days post operation.

Figure 3: Surgical progression of caesarean section in exotic breed dairy cow

A) Preparation of surgical site B) Incision of skin and abdominal muscles C) Abdominal wall closure on progress D) After closure of incision site

Then peritoneum and muscle layers were closed by using by simple continuous suture using polyglycolic acid 910 (vicryl) 2-0 sizes (Figure 3C). The abdominal wall was closed in three separate but intimate layers with preferable suture material and suture patterns in ascending order. During these procedures individual layer was sutured separately and antibiotic Procaine penicillin powder was scattered over the suture line to reduce bacterial contamination and promote healing in early condition. As a first layer the peritoneum and transversus abdominis

muscle was sutured with simple interrupted pattern by using polyglycolic acid 910 (vicryl) 2-0 sizes. Then as second layer the subcutaneous fascia and two oblique muscles was sutured together by using former suture material but continuous ford interlocking suture for better apposition of muscles. Then horizontal mattress sutures were used in the skin using non-absorbable suture material silk 2-0 size.

Post operative care of dam and outcome: After surgery, sufficient fluid replacements, antibiotics and anti-inflammatory drugs were given up to 2 days to combat toxemia. Oxytocin injection (Inj. Oxin® Vet (Techno pharmaceuticals) 20 IU single dose I.M was administered to prevent uterine bleeding and to increase uterine contraction to expel out fluid and fetal remnant for two days. In addition, 5% dextrose saline 1 litre IV), fluid therapy was given. For topical application at incision line of skin 5% Povidone iodine solution was recommended. The incision site was sprayed with wound spray (Figure 3D). The cow wasn't stood up post operation for two hours but later stood and recumbent where she was died due to extreme myopathy and other complications such as surgical stress combined with failure of ingestion of feed.

Discussion

Caesarean section is widely used and emergency operative technique for surgical delivery of cattle calves in dystocia of affected cows. Following caesarean section the survival rate of dam has been recorded 36-100% (Phogat *et al.*, 1992; Dhindsa *et al.*, 2010). The survival rate may reach 64.7-100% if the operation is done within 24-26 hours of dystocia (Newman and Anderson, 2005). So if the fetus is live and all other efforts relieving dystocia fail, caesarean section is recommended. In the present case, a left paralumbar laparotomy approach was used for caesarean section in a recumbent exotic breed cow to deliver a calf under caudal epidural analgesia by using lidocaine hydrochloride which is similar to (Loren *et al.*, 2008) though they did the surgical procedure in standing condition.

Caesarean section of a cow in recumbent condition is somewhat different from standing condition. Closure of the abdominal wall is straightforward and relatively easy, less assistance is necessary and exteriorization of gravid uterus is easier in case of standing condition as compared to recumbent position (Schultz *et al.*, 2008). Sometimes sedation is required and

xylazine hydrochloride is commonly used in this purpose (Newman, 2008). Both physical as well as chemical restraining provided to control the cow. Some authors also reported the use of light sedation as mentioned by Sathya *et al.* (2006); Singh *et al.* (2013). But in this case management sedation was not used due to the anesthetic risk of the patient but local anesthetic in to epidural space at appropriate site and dose.

In uterus inverting suture pattern by using Czerny lembert, in muscles apposition suture pattern e.g. simple continuous and in skin everted pattern e.g. horizontal mattress suture was applied which agrees with the case report of Schultz *et al.* (2008). The success of an operation depends on well provision of post operative care such with antibiotic and fluid therapy as post operative medication (Zaborski *et al.,* 2009) which is similar with this study described. The calf was found dead following caesarean section. This might be due to failure of expulsion within normal time, suffocation and damage to the calf during manual pulling by the animal attendant before requesting for vet assistance. It is important to remember that caesarean section is a major abdominal operation and complications are common both during and after the operation. Common complications include metritis, adhesions, peritonitis, hemorrhage, wound dehiscence, poor fertility, disgalactia etc which is also reported by Sood *et al.,* (2011) which is similar with the reported case and the cow was fully cured up to 2 days observation and died on third days.

In conclusion, caesarean section is normally an emergency surgical procedure so it should have to be performed as early as possible for the saving life of dam and or calf under aseptic condition through preferable incision approach.

3.2. Hernia Repair in Small Ruminants and Dog

3.2.1. Ventrolateral hernias in sheep

Abstract

Hernia is one of the common ailments in domestic animals and occurred due to various factors on different body parts. The present case report is aimed to describe the surgical management of ventrolateral abdominal hernia on two local breed sheep that were brought to the Addis

Ababa University Veterinary Teaching Hospital (VTH), College of Veterinary Medicine and Agriculture, Ethiopia with the case of different forms of ventrolateral abdominal hernia. The patients had undergone physical examination. Since the hernias were reducible within the hernial ring, henial repair was performed after aseptic preparation of the surgical site and sedating the animal. Elliptic skin incision was performed on the periphery of the hernia before entering in to the contents. After exposing the henial contents it was detected for adhesion and manually retracted to abdominal cavity before closing the ring and abdominal wall by appropriate suture patterns and techniques. Finally the sheep were successfully recovered from the problem without recurrence.

Key Words: Herniorrhaphy, Ewe, Ventral Hernia

Introduction

Hernias are passage of an organ or tissue through natural or acquired opening (Jettennavar *et al.*, 2010; Das *et al.*, 2012). The anatomical structures of hernia include: hernia sac, ring and content(s). It can affect both small and large animals through interfering with the reproduction, production and productivity of the animals. Hernia can be divided according to the site/location/ into abdominal, umbilical, scrotal, inguinal, femoral, perinial and diaphragmatic or according to the etiology into congenital and acquired or clinically into reducible or irreducible (Fahd and Ahmed, 2007).

Complications of the hernia include strangulation, incarceration of the contents, adhesions, infection in addition to the effect of the general appearance of the animal (AlSobayil and Ahmed, 2007). Ventral abdominal hernia in sheep can pass through part of the abdominal wall ventral to the skin fold of stifle other than natural orifice due to muscle weakness. But the sites can be anywhere from the lateral site of the thoracic cavity to the iliac cresting (Yasin, 2004). It is commonly acquired due to a defect in the abdominal wall musculature and can be caused by injury (kick, horn thrust or blunt trauma, abscess in the abdominal cavity, abdominal distention or straining during pregnancy and parturition, or occur without trauma due to weakness of the pre pubic tendon) (Gahlot, 2000).

Herniorrhaphy is among the most commonly performed operations in animal and human surgical practices (Bellavance *et al.,* 2010). Most hernias enlarge over time and, if not repaired surgically, they may cause pain, anorexia, weight loss, or it may cause dystocia when a gravid horn is found in the hernial sac. Incarceration and strangulation of the bowel are the most dangerous life threatening sequela of herniation. The repair of hernia should be managed early before the hernia ring becomes wide and hernia contents become increased in number from the nearby structure and organs (Radišić *et al.,* 2010). The case report aimed to describe the surgical management of ventrolateral hernia in two sheep.

Case 1

Case history and clinical examination: A three years old local breed ram was brought to the Addis Ababa University Veterinary Teaching Hospital (VTH), College of Veterinary Medicine and Agriculture with a clinical presentation of large swelling on the right ventrolateral part of abdomen on the caudal to umbilicus and slightly cranial to inguinal unilaterally (Figure 4A). The anamnesis suggested that the ram had horn thrust on the site before three weeks and the swelling started growing in size since then and losing his appetite then after. The hernia was also palpated to detect pain, heat, presence of hernial rings and its width, reducibility of the contents, and the presence of infection. In addition hernia was documented by photographs. Accordingly, the clinical examination revealed that hernial content is slightly firm, non painful and reducible within the hernial ring. The ring was approximately about 5cm in width. Similarly the parameters like heart rate, respiratory rate and rectal temperature were within the normal physiological limits. The other history of the case and information concerning the species, age, and gender of the animal, and the location of the hernia was recorded on medical card. A thorough body examination was also carried out to identify the physical status of the animals and detect any defect in other parts of the body. Finally based on examinations and clinical findings the case was diagnosed as ventrolateral abdominal hernia and suggested for surgical hernia repair.

Case 2

Case history and clinical examination: A four year local breed ewe was brought to the Addis Ababa University Veterinary Teaching Hospital (VTH), College of Veterinary Medicine and

Agriculture with a clinical presentation of large swelling on the ventral abdomen on the right just caudal to umbilicus and slightly cranial to udder on right side unilaterally. The anamnesis suggested that the ewe had undergone herniorraphy before two months in the same hospital and recurred in addition to growing in size and losing her appetite then after. The other history of the cases and information concerning the species, age, and gender of the animal, and the location of the hernia was recorded on medical card. A thorough body examination was also carried out to identify the physical status of the animals and detect any defect in other parts of the body.

The hernia was also palpated to detect pain, heat, presence of hernial rings, reducibility of the contents, and the presence of infection. In addition hernia was documented by photographs. Accordingly, the clinical examination revealed that hernial content is slightly firm, non painful and reducible within the hernial ring. The ring was approximately about 7cm in width. Similarly the parameters like heart rate, respiratory rate and rectal temperature were within the normal physiological limits. The presented case was diagnosed as ventrolateral abdominal hernia and suggested for surgery to correct the condition.

Preoperative preparations: Before coming for operation, both sheep were withheld from feed and water for 24 hours and 12 hours respectively and for case 2 procaine penicillin (24mg/kg) and dihydrostreptomycin sulphate (30mg/kg) (Pen &Strep® Norbrook UK) was given intramuscularly three before the operation and repeated for 3 days thereafter for both cases. Before hernia repairs were commenced, the incision site and its surrounding areas were aseptically prepared by (clipping, shaving the skin (Figure 4B for case 1) scrubbing with povidone iodine and ethyl alcohol and using sterile surgical instruments and drapes.

Animal control and anesthesia: Field block anesthesia was performed by making circular infiltration of 2% lidocaine hydrochloride 20mg/ml (manufactured by jeil pharma. co.Ltd. Korea) enclosing the ventrolateral abdominal hernial borders @ 10mg/kg for case 2 but not in case 1. In addition to the local anesthesia (case 2), the ewe was sedated with diazepam (manufactured by Intas pharmaceutical Ltd., India) @ 0.1mg/kg I.V in both case 1&2. in addition case 1 was also administered with xylazine @0.1mg/Kg I.M. before both positioned in slightly dorso-lateral recumbence for operation.

Surgical correction and treatment: Fortunately, the location of hernia was almost the same except difference in physiological stage, sex and age of the patients. After the animals positioned to dorso-ventral recumbence with slightly tilted to lateral direction, in both cases, two elliptical incisions for both cases and lateral to previous skin incision was made through the center of the hernial sac, starting two centimeter beyond the anterior border of the hernia and extended for two centimeter posterior to it and one centimeter far from the margin of previous sutured incision site (case 2). The small skin flap in between the incision was removed and the bleeding was held with artery forceps and transfixed accordingly. After skin and subcutaneous tissue dissection and excision, the underlying tissues were bluntly dissected to expose and open the hernial sacs. Thence, the condition of the hernial sac and ring was examined carefully to confirm the presence or absence of adhesions of the abdominal organs and the identified adhesions were excluded by blunt dissections. Especially in case 1, major intestinal parts are adhered to abdominal wall and bluntly detached and few hemorrhage were encountered but ligated soon.

Thence, the herniated visceras were repositioned in the abdominal cavity by manual taxis (Figure 4B for case 1). In both cases herniorrhaphy was achieved by using sterilized silk (2-0) as horizontal mattress pattern between the hernia ring and abdominal wall. During these single stitches were preset and held with artery forceps as shown in figure 3C for case 1 but also similar in case. Once all of the single sutures were positioned, then they were tied. Excess part of the sac was removed and the muscles and subcutaneous tissue were routinely sutured with catgut (size 2-0) with simple continuous suture pattern. During subcutaneous suturing, proper care was taken to avoid the formation of dead space and the skin was close apposed with interrupted cruciate mattress suture using silk (Figure 4D) for case 1 and in simple interrupted for case 2.

Figure 4: Ventrolateral abdominal hernia and its repair in ram
(A) Clinical presentation (B) Ventral hernia repair in progression (C) preplaced stay sutures (D) Post herniorrphy.

Post operative care and outcome: In the post-operative period, an antibiotic named procaine penicillin (24mg/kg) and dihydrostreptomycin sulphate (30mg/kg) (Pen &Strep® Norbrook UK) was administered intramuscularly for three days in both cases. In addition the suture line was dressed after two days interval. The healing process was also clinically evaluated and the surgical wound was almost healed after 15 days of operation in case 2 and 10 days in case 1 but the skin stitches was removed after 20 and 17 days to be sure for complete healing in case1 and case 2 respectively. Postoperative complications and follow up information were obtained from the owners through phone calls and after three months the hernia was slightly swelled due to progression of pregnancy in case 2 and finally given birth of two live lambs. After parturition the condition was regressed to non life threatening. In case 1, it was completely healed without recurrence and the ram even increased in body weight since then and seen on twenty days

(Figure 5A and B).The incision site was completely healed adequate enough to remove suture material.

Figure 5: Outcome of the ventrolateral herniorrhaphy in local breed Ram

A) Observation at glance B) Incision site closely visualized before removing suture

Discussion

Ventral abdominal hernia is common in sheep (Yasin, 2004; Alsobayil and Ahmed, 2007; Hassan, 2008). The case was mainly occurred due to horn thrust in the flock and is acquired in nature which also agreed with study of (Das *et al*., 2012) in that the case can be acquired in nature such as mechanical injuries. Reducible ventral hernia are commonly presented than irreducible one which is in agreement with (Hassan, 2008) because the animals with reducible hernias have a good general health than those with irreducible hernias that appear more risky making the owners to sell or slaughter them to avoid the cost and risk of the operation.

Several techniques of herniorrhaphy were applied in veterinary medicine (Alsobayil, and Ahmed, 2007; Jose, 2011). One of them and most common in treatment of hernia in sheep is overlapping horizontal interrupted mattress of the hernial ring and nearby structural layer by layer. The other method which used in this study was interrupted horizontal mattress to suture

the hernia ring this was due to less holding capacity of muscles and fascias wich will contribute for recurrence and complications. In the study the ewe had recurrent hernia on same area and prior incision site which may be manifested by the persistence of the weakness in the body wall so they should avoid being pregnant in the future which can in turn agrees with study of (Noakes *et al.,* 2009).

Abdominal hernia was successfully reduced in the presented cases. The exact cause of the present case study could not be revealed, it might be due to weakening of the abdominal muscles or violent trauma with blunt object such as horns. These findings were supported by the findings of (Vebclauskas *et al.,* 2008; Vijayanand *et al.,* 2009; Villar *et al.,* 2011). In the presented case, the hernia ring was <8 cm in width and that type of hernia was corrected by using interrupted horizontal mattress pattern and non-absorbable sutures. This similar finding was described by (Vebclauskas *et al.,* 2008) where hernial ring size was measuring >3cm and special precaution was taken at the time of suturing. In the presented case, there were no complications except mild adhesions especially in case 1 which was corrected manually and by using blunt dissections. But in the study of (Villar *et al.,* 2011) complications like adhesions and hydrocele of hernial sac, incarcerations and torsions were found and in the study of (Jettennavar *et al.,* 2010) abscess was found.

Herniorrhaphy was commonly used in case of medium to large sized hernia ring and incase of very large hernia ring hernioplasty was more effective. These were described by the study of (Jahromi *et al.,* 2010). In presented cases, sterilized silk was used to suture hernial ring and abdominal wall and the excess part was removed to avoid further complication and proper healing. Herniorrhaphy attempted in these cases proved to be successful and the animals recovered uneventfully without any complications at different periods of time.

3.2.2. Inguinal Hernia In kid

Abstract

A hernia is the protrusion organ/s through a defect in the body wall or natural opening due to various factors causing physiological derangements in affected animal/s. The present case report is aimed to describe the surgical repair and management of inguinal hernia repair in kid

on two months-old that was brought to the Veterinary Teaching Hospital, College of Veterinary Medicine and Agriculture, Addis Ababa University, Ethiopia. The kid was presented with a large swelling in ventral abdomen just caudal to umbilicus and near to the inguinal region. Thorough clinical examination by palpation revealed; the doughy hernial content, non painful and reducible within the hernial ring. After aseptically preparing the surgical site and stabilizing the kid with chemical and physical restraining, sharp and linear incision was performed on skin and subcutaneous tissues proximal to the inguinal hernia slightly lateral to the udder. The content was identified and repositioned to abdominal cavity. Then the ring was freshened and sutured with appropriate suture materials and patterns. Similarly the adjacent muscle layers and skin were sutured. Finally the case was successfully healed from the case since then.

Key Words: Inguinal Hernia, Kid, Herniorrhaphy

Introduction

A hernia is the protrusion of the content of body cavity through a defect in the body wall or natural opening (Venugopalan, 2000). This may be from accidental or normal anatomical opining, which does not completely fulfill its physiological function. The majority of hernia involves the protrusion of the abdominal contents through the part of the abdominal wall, diaphragm, canal or perineum and may occur elsewhere in the body (Slatter, 2002). There are three parts of hernia including the ring, the sac and the contents. The ring is the actual defect in the limiting wall, and it may be a small as a few millimeters or up to several centimeters (Al-Sobayil and Ahmed, 2007).

Sheep and goats are frequently affected by different kinds of hernias similar to other domestic animals. Abdominal hernias may occur on high or low flank due severe trauma on the abdominal wall along the costal arch or between the last few ribs (Gilbert and Fubini, 2004). It is usually caused by violent force, such as from the impact of blunt objects, which results in protrusion of abdominal contents into over lying subcutis (Radišić *et al.,* 2010). Umbilical hernias may be congenital or acquired, and they are seen in foals, calves, pups and pigs (Bellavance *et al.,* 2010; Jettennavar *et al.,* 2010). Inguinal hernia is relatively common in bulls, rams and boars. Scrotal hernia is merely an extension of an inguinal hernia. Congenital

inguinal hernia is rare in bulls, but it may result in evisceration at castration. Acquired inguinal hernias occur in mature bulls and rams (Dyce *et al.,* 2002).

During inguinal hernia, abdominal content in direct contact with skin stimulate formation of adhesions that can interfere with normal digestion unless corrected and managed at appropriate time preferably early (Dey *et al*., 2018). The size of hernia varies depending on the extent of the hernia defect and the amount of abdominal contents contained within it. Inguinal hernia is less frequent than other hernias in goat (Das *et al.,* 2012). The only effective treatment for inguinal hernia is surgery to restore integrity of the abdominal wall, prevent incarceration and strangulation of herniated contents (Jahromi *et al.,* 2009).

Application of bandage, clamps, or ligatures may be helpful in a few cases where the hernial ring is small in abdominal hernias and inguinal hernias. Herniorrhaphy may be implemented by using strong suture materials to strengthen the suture and avoid in case of large hernial opening but in extensive ventral abdominal and inguinal hernia may require hernioplasty (Villar *et al.,* 2011; Kumar *et al.,* 2014). Inguinal hernia surgery is an operation to repair a weakness in the abdominal wall that abnormally allows abdominal contents to slip into a narrow tube called the inguinal canal in the groin region (Larson and Farley, 2004). Surgery remains the ultimate treatment for all types of hernias as they will not get better on their own, however not all require immediate repair (Monsang *et al.,* 2014).

Case history and clinical examination: Two months-old local female goat (kid) was brought to the Veterinary Teaching Hospital, College of Veterinary Medicine and Agriculture, Addis Ababa University, Ethiopia with a large swelling in ventral abdomen just caudal to umbilicus and near to the inguinal region (Figure 6A). Anamnesis suggested that the kid lost its appetite and showed swelling at the inguinal region which was increasing with its age since one month. Clinical examination by palpation revealed; the doughy hernial content, non painful and reducible within the hernial ring. The ring was approximately <3cm in diameter. Clinical parameters like heart rate, respiratory rate and rectal temperature were also performed and found within the normal physiological limits. The presented case was diagnosed as inguinal hernia and suggested for surgery in the form of inguinal hernia repair.

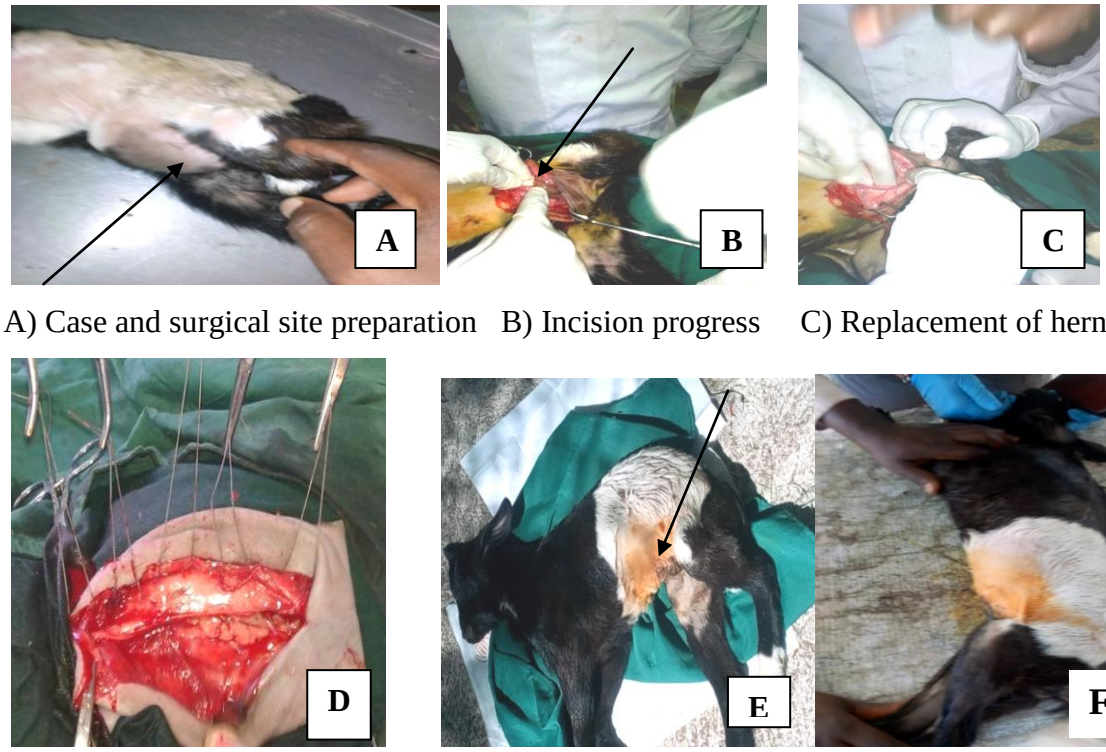
***Preoperative preparations*:** Before coming for operation, the kid was withheld from feed and water for 4 hours and 2 hour respectively but only milk. Procaine penicillin (24mg/kg) and dihydrostreptomycin sulphate (30mg/kg) (Pen &Strep® Norbrook, UK) was given intramuscularly one hour before the operation and repeated for 3 days thereafter. The area intended for incision was aseptically prepared by clipping, shaving after washing with soap and water thoroughly. Thence the skin was scrubbed with povidone iodine and ethyl alcohol (Figure 6A).

Anesthesia and animal control: Field block anesthesia was performed by making circular infiltration of 2% lidocaine hydrochloride (2% lidocaine hydrochloride 20mg/ml which is manufactured by jeil pharma. co.Ltd. Korea) enclosing the in the inguinal hernial borders at dose rate of 10mg/kg was used approximately 1ml/cm area infiltration. In addition to the local anesthesia, the kid was sedated with diazepam (manufactured by Intas pharmaceutical Ltd., India) @ 0.1mg/kg I.V and positioned slightly dorso-lateral recumbence for operation with upward elevation of the hind limb and the affected side uppermost).

Surgical correction and treatment: After aseptically preparing the surgical site and fixing the drape with towel clamps, sharp and linear incision was performed on skin and subcutaneous tissues proximal to the inguinal hernia slightly lateral to the udder (Figure 6B) after palpating the unilateral/bilateral status of the inguinal rings. After retracting the skin to aside, the subcutaneous tissues were bluntly and sharply dissected away from the external abdominal fascia. In addition it was reflected away from the external rectus sheath and hernial sac by using Metzenbaum scissors to avoid damage to the underlying and nearby tissues. Thence, the hernial sac, content and ring was visualized and examined carefully to confirm the presence or absence of adhesions of the abdominal organs and entrapment of organ/s. The major herniated organs were parts of intestinal segments and its omentum. Unfortunately there were few adhesions and excluded by blunt dissections before retraction.

The herniated viscera were repositioned in the abdominal cavity by gentle manual taxis (Figure 6C). Then herniorrhaphy was achieved by using sterilized silk 2-0 size as horizontal mattress pattern between the hernia ring and abdominal wall. Single stitches were preset and held with artery forceps in the form of modified Mayo closure (vest-over-pants) technique until all rings

are bitted and approximated (Figure 6D). Once all of the single sutures were positioned, then they were tied together after freshening and denuding the ring. Excess part of the sac was removed and the muscles and subcutaneous tissue were routinely sutured with catgut (size 2-0) in ford interlocking suture pattern. During subcutaneous suturing, proper care was taken to avoid the formation of dead space and the skin was closed with cross mattress suture using silk (Figure 6 E and F). The kid was completely healed and recovered from the case after operation without recurrence and complication.



A) Case and surgical site preparation B) Incision progress C) Replacement of herniation

Figure 6: Inguinal Hernia and its progress of surical repair

D) Preplacing modified Mayo sutures before tying the knots E) After correction of inguinal hernia F) After removal of suture material on 16 days

Post operative care and outcome: In the post-operative period, an antibiotic named penicillin (24mg/kg) and dihydrostreptomycin sulphate (30mg/kg) (Pen &Strep® Norbrook UK) was administered intramuscularly for three days and analgesic Tramadol (Tramadol hydrochloride 50mg (Sakar Health care Pvt.Ltd, Gujarat, India) @10mg/Kg B.I.D intramuscularly was administered for three days. The incision site was dressed with Diluted chlorhexidine solution

every two days for three days. The healing process was clinically evaluated and the surgical wound was completely healed after 18 days of operation. The suture material was removed on twenty days post operation. The ewe was completely healed from the problem and increased in body condtion.

Discussion

Inguinal hernia is the abnormal protrusion of an organ or tissue through a normal opening in the inguinal canal or adjacent wall of abdominal muscles (Mendoza, *et al*., 2010). In this case report the inguinal hernia was occurred in female kid which agrees with the study of (Abdin-Bey *et al.,* 2001) in which many of the female are affected than male (18/41). It is interesting that the majority of hernias appeared at the site of natural orifices such as the umbilical and inguinal canal of immature animals exacerbated by different factors (Hendrickson *et al.,* 2005). In this particular case, the size of the hernial swelling was greater in left ventral abdominal adjacent to inguinal canal. This may be attributed to rupture of the peritoneum and escape of the content to the subcutaneous tissues.

Surgical intervention and management of inguinal hernia involves different approaches and variable degrees of success (Ravikumar and Ranganath, 2014). But in this surgical intervention, it was met with reasonable success without any recurrence and complication. This may be due aseptic surgical procedures and early management of the case in addition to the smallness of the diameter of the ring (<3cm). In case if hernia ring (the ring of which is about 40 cm long), should be better performed using prosthetic meshes (Youssef *et al.,* 1994; Shoukry *et al.* 1997). The repair of large hernial defect without prosthetic meshes might result in failure due to excessive tension on the suture line in addition to the presence of weakened tissue around the hernial ring (Abdin-Bey *et al.,* 2001).

In the present study, absorbable suture material was not used to close hernia ring because it may lose its tensile strength or become absorbed before the healing process is completed, causing re-herniation. This technique was also agreed with the idea and procedure of (Yasin, 2017) in surgical management of external hernia in small ruminants. Modified Mayo closure (vest-over-pants) pattern was used on closure of rings because it is a suitable suture pattern for

small to medium hernias to support and reinforce the thin and weak parts of the abdominal wall particularly the ventrolateral region (Al-Sobayil, and Ahmed, 2007).

In inguinal hernias of immature females, simple interrupted pattern was used to close the external inguinal rings to preserve the blood vessels and nerves passing through the ring and prevent their compression and blockage by the suture materials which may occur if a continuous pattern is used (Baxter, 2004; Sutradhar *et al.,* 2009) which disagrees with this particular case. Following ring closure, the muscles and subcutaneous tissue were routinely sutured with catgut (size 2-0) in ford interlocking suture pattern. This technique was similar with hernia management in farm animals by (Misk *et al*., 2008). In the presented case, there were no complications except mild adhesions which was corrected manually and by using blunt dissections. But in the study of (Villar *et al.,* 2011), complications like adhesions, incarcerations and torsions were found and in the study of (Jettennavar *et al.,* 2010).

In conclusion inguinal hernia is more common small ruminants and needs immediate surgical repair. In this particular case report description the case was handled before organs are incarcerated or extremely formed adhesion through standard surgical repair under aseptic condition and the case was successfully recovered. Therefore emergency surgical repair strongly recommended.

3.2.3. Perineal hernia in dog

Abstract

Perineal hernia may be unilateral or bilateral and results from weakening as well as separation of the pelvic diaphragm muscles, favoring herniation of the abdominal viscera into the perineal subcutaneous area. Once occurred, it requires surgical reconstruction of the pelvic diaphragm. The objective of this case handling was to repair unilateral perineal herniorrhapy by using internal obturator muscle transposition techniques. After aseptically preparing the surgical site, elliptical skin incision over the hernia swelling was performed. After detecting the sac, content and for presence of adhesion, the content was replaced to pelvic viscera and closed layer by layer. Clinical outcome including postoperative complications and recurrence rate was

assessed. PH did not recur on the dog until it was dead finally due to unrelated causes few weeks later.

Key words: Dog, Pelvic Diaphragmatic Muscles, Perineal Hernia

Introduction

Perineal hernia is characterized by disruption of pelvic diaphragm and herniation of the abdominal or pelvic organs into the ischiorectal fossa especially in middle-aged or aged intact male dogs (Gilley *et al.,* 2003). Approximately 59% of the perineal hernias are unilateral while 41% bilateral and the condition may be associated with sacculation, dilatation, deviation and diverticulation of rectum, retroflexion of urinary bladder or uretral obstruction (Vnuck *et al.,* 2006). Large rectal sacculation and rectal diverticulum may cause straining to expel feces and may lead to disruption of the perineal hernia repair. Therefore, surgical correction of rectal diverticulum or large sacculation should be carried out to prevent recurrence of perineal hernia (Head and Francis, 2002).

The other factors such as hormonal imbalance, prostatic enlargement, straining, and congenital or acquired muscle weakness or atrophy are also associated with the condition (Aronson, 2012). During perineal hernia repair castration is recommended due to the effects of testosterone or relaxin on the prostate gland and perianal musculature (Brissot *et al*., 2004; Bongartz *et al.,* 2005). In severe conditions the perineal hernia repair also requires surgical reconstruction of the pelvic diaphragm. So far several surgeries have been used successfully in dogs, including a simple appositional technique, vascularized muscle flap transposition (internal obturator muscle, superficial gluteal muscle, semitendinosus muscle), and the use of implants or graft techniques (Shaughnessy and Monnet, 2015).

A laparotomy for colopexy and/or cystopexy may be required in complicated PH, in combination with any technique of perineal herniorrhaphy (Brissot *et al.,* 2004). Orchiectomy is also recommended at the time of PH repair in intact dogs (Snell *et al.,* 2015). Complications after PH repair are common and may include recurrence of PH, surgical wound dehiscence and infection, tenesmus, fecal incontinence, and rectal prolapse (Morello *et al.,* 2015). There may

be also gastric upset and dehydration in addition difficulty to defecation for the first few weeks (Gilley *et al.*, 2003).

Case history and clinical examination*:* A 25kg, six year-old exotic breed intact male dog was presented to Addis Ababa University Veterinary Teaching Hospital with unilateral swelling on the right side of the perineal region (Figure 7A). The owner reported a four day long aquesia, emesis, decreased feed intake, frequent constipation and intermittent fecal impaction for 6 months. Physical examination revealed a mild dehydration (4%), apathy, fecal bulge and asymmetric swelling on perinium, obstipation, tenesmus and dyschezia, tachycardia, pain in the abdominal palpation, replaceable firm and voluminous intestinal loops. During the rectal palpation, and dried fecal content was present. The exams showed perineal hernia with bowel content and pelvic viscera so it was decided to undergo surgical opening for correction of perinium henia.

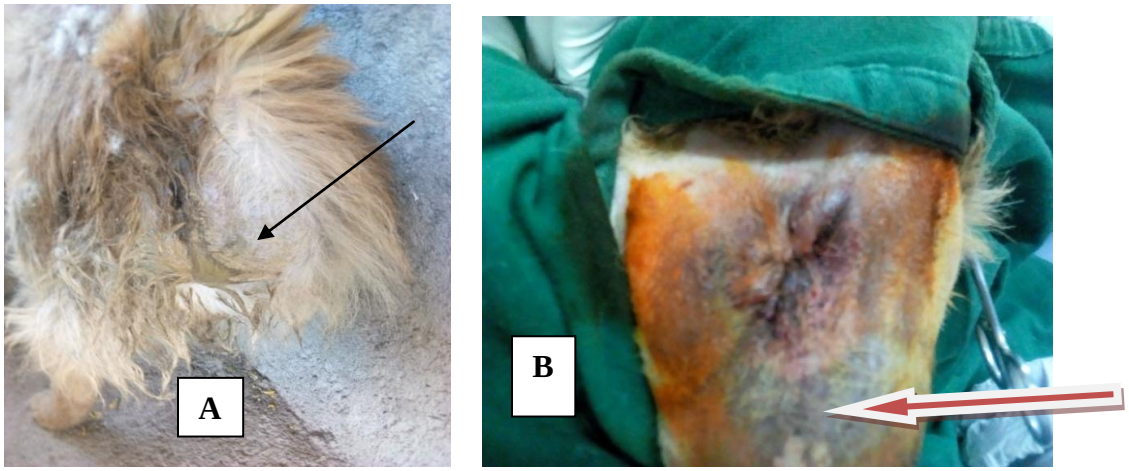
Preoperative preparations: As there may be infection due to normal physiological derangement of GIT, the antibiotic; penicillin (24mg/kg) and dihydrostreptomycin sulphate (30mg/kg) (Pen &Strep® Norbrook UK) I.M was administered first day before undergoing surgical procedure and sent back home for withholding of feed and water for 24hrs after removing fecal impaction and performing rectal enema to reduce the possibility of surgical site contamination during surgery. On the second day, patient was admitted to the Addis Ababa Veterinary Teaching Hospital for surgery in order to correct the perineal hernia. Before undergoing a surgical repair, the hair on perineal swelling and its surrounding was aseptically prepared by clipping the hair, and scrubbing with water and antiseptics after deep sedation (Figure 7B). Penstrip of the same dose was also administered through IM one hr before surgery and lactated ringers solution given I.V using at surgical rate of 10 ml/kg/hr with a calculated rate of 1drop/sec to restore and to maintain the blood volume.

Anesthesia and animal control**:** The animal was premedicated with diazepam (manufactured by Intas pharmaceutical Ltd., India) at the dose rate of 0.3mg/kg I.V to provide adequate muscle relaxation. Later the dog was induced by the combination of Diazepam (manufactured by Intas pharmaceutical Ltd., India) 0.15mg/kg and ketamine (Ketamine Hydrochloride manufactured by Germany) 5mg/kg I.M and maintained by propofol Propofol (Aulife health

care Pvt.ltd, Gujarat, India) at dose rate of 4.5mg/kg IV and finally the dog was kept in sternal recumbence for surgical procedure.

Surgical correction and treatment: After preparation of the surgical field, a purse string suture was applied around the anal opening using non absorbable suture material to protect the contamination of surgical field. Then sterile drape was placed over the surgical area followed by attachment of it to the animal body using towel clumps. A curved skin incision was placed over the perineal mass starting from the tail base to a point midway between the pubis and ischial tuberosity then returned to the midline proximal to the scrotum.

Thence blunt dissection was continued though the same opening and subcutaneous tissue was folded for further identification and inspection of the hernia sac in order to relocate the herniated structures into the abdominal cavity. Then the hernial content was assessed for adhesion, content and strangulation. Few adhesions of the hernia and omentum was loosened and detached gently before hernial content was gently reduced, replaced and maintained with the aid of sterile gauze (Figure 7C). After proper orientation, location and replacement of the main anatomical structures, the caudal lateral aspect of the internal obturator muscle was incised and elevated from the ischium with periosteal elevator to the caudal aspect of the obturator foramen and reflected dorsally.



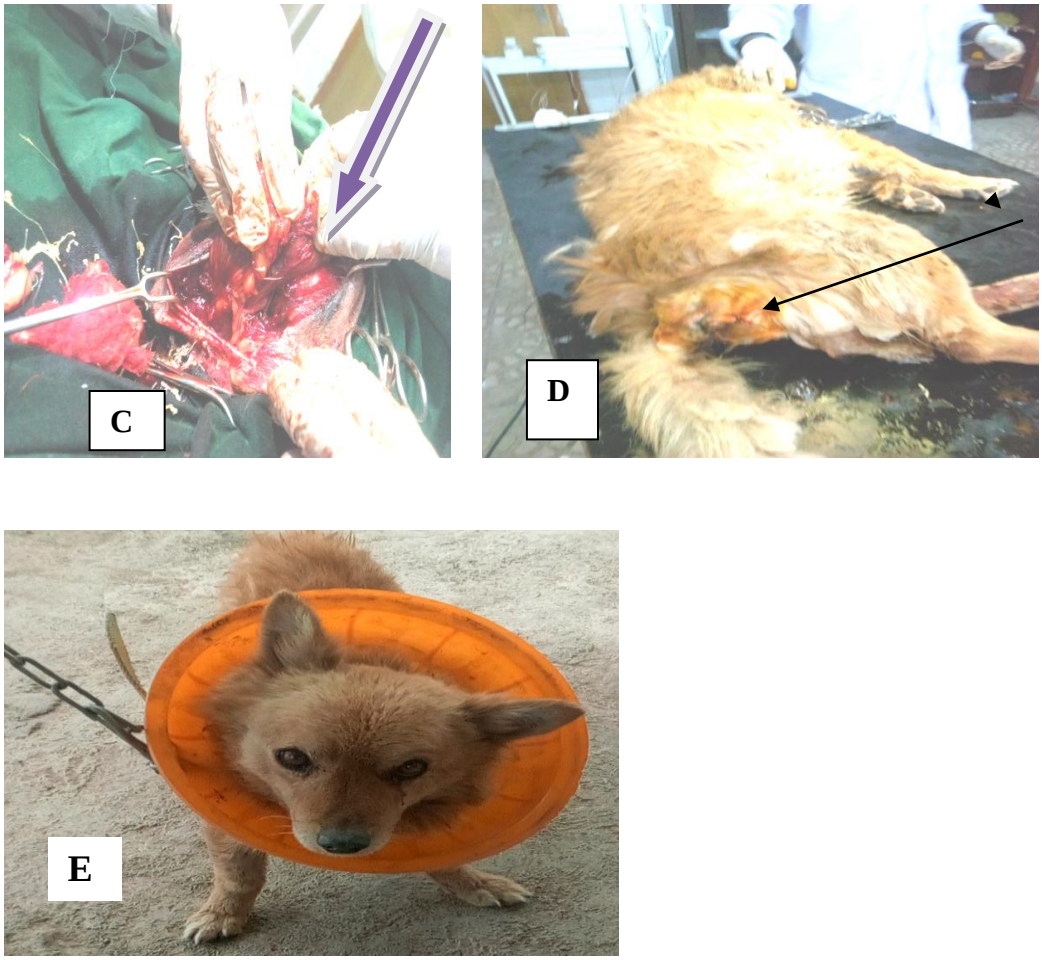


Figure 7: Perineal Herni, its surgical repair and outcome in dog

(A) Unilateral perineal hernia (B) surgical site preparation (C) replacement of herniated organs (D) Animal in drowsy after surgical correction (E) Outcome at seveth day

Then interrupted sutures were preplaced using Polyglycolic acid 910 (vicryl) 2-0 beginning from dorsal aspects and progressing to ventral aspect suturing the caudomedial border of the internal obturator muscle to the external anal sphincter muscle and the caudolateral border of the internal obturator muscle to the sactrotuberous ligament. After all these sutures on the ligament and the muscle were properly placed, subcutaneous tissue was sutured contineously by using the chromic cat gut of number 2-0 and skin was closed by using the Polyglycolic acid 910 (vicryl) 2-0 in subcuticular manner (Figure 7D).

Post operative care and outcome: After surgery was successfully finished, systemic antibiotics by using penicillin (24mg/kg) and dihydrostreptomycin sulphate (30mg/kg) (Pen &Strep®

Norbrook UK) for five days, low residue diet, application of an Elizabethan collar, lavage of the wound once daily with saline solution was given. Tramadol (Tramadol hydrochloride, Sakar Health care Pvt.Ltd, Gujarat, India) @2 mg/kg I.M q 12 hr for pain management was also prescribed. The owners were also advised to subjectively assess for pain, discomfort and inflammation at the surgical site, and defecation and urination behaviors. One week of post operation was come to VTH (Figure 7E) with bright eye and without any sign of recurrence. Ten days following the surgery, skin sutures were removed. The owner informed as there was mild decrement in appetite. Four months of postoperative the patient died sudden ingestion of poison.

Discussion

There are several treatment methods used for the repair of perineal hernia in dogs including the standard herniorraphy (Özak *et al.,* 2001), transposition of the internal obturator muscle (Alkan *et al*., 2001); semitendinosus muscle apposition techniques (Vnuck *et al.,* 2006). In this particular hernia repair transposition of the internal obturator muscle is used. This is recomended surgical protocol by (Shaughnessy and Monnet, 2015) although recurrence rate of 17.4% was reported in six intact male dogs in their study out of 34 cases. In cases of lateral PH, the defect can be partially repaired by suturing the two edges of internal obturator muscles at the midline, while ventral rectal support has been effectively provided by muscle transposition techniques (Morello *et al.,* 2015).Sometimes, colopexy, cystopexy, and vas deferens pexy have been recommended prior to PH repair to reduce the risk of recurrence, to resolve rectal deviation, and to facilitate herniorrhaphy (Brissot *et al.,* 2004; Al-Akraa, 2015). But in the present surgical case management, these techniques were not performed. Dogs with this type of perineal hernia can be successfully treated solely by perineal surgery by providing consistent ventrolateral support.

Anatomical positioning of hernia contents was easily obtained during this surgery and recurrence was not observed. However, some authors observed and reported partial wound dehiscence in 3%-21% of the cases after perineal hernia repair (Brissot *et al.,* 2004; Szabo *et al.,* 2007). Although this case recovered from this surgical intervention without significant postoperative complication except for few signs of inflammation in the early phase, ,other

studies have reported 11 to 45% wound infection (Coit *et al.*, 2008; Kirpensteijn and Ter Haar, 2013) and 7% perineal fistula (Kirpensteijn and Ter Haar, 2013). Wound infection, associated with fecal contamination, extensive surgical dissection, and previous local infection were also incriminated as the main causes of postoperative wound dehiscence from this type of surgical procedure (Lee *et al*., 2012; Snell *et al.,* 2015). The absence of wound infection in this case may be attributed to the application of prophylactic as well as postoperative antimicrobial therapy.

3.3. Surgical excision of Lipoma in Dogs

Abstract

Lipomas are common benign tumors. In most cases, surgical excision is curative and simple to perform; however, such a procedure requires general anesthesia. This case report describes surgical management of lipomas in two dogs: an eight and seven years old female exotic and local breed male dogs, respectively. Both were presented with history of large sized and pendulous swelling on their ventral abdomen in between left and right parts of the mammary gland directly on the midline in one case but medium sized swelling and tumurous growth above elbow in the other one. In both cases the surgical sites were aseptically prepared before the tumour mass was excised surgically and subjected to histopathological examination for confirmation. Finally the dogs were successfully treated and recovered from the problem without recurrence for the duration of the follow up.

Key Words: Adipose tissue, Bitch, Lipoma

Introduction

Lipomas are benign tumors arising from mature adipocytes. Adipose tissue tumors are common mesenchymal skin tumors of dogs with higher incidence in old female dogs (Julie *et al.,* 2013). Lipomas can be found between skin and muscle or in the muscle by itself. The lipomas located between skin and muscle layers are soft and freely movable while those located between muscles have a more firm consistency and are not mobile. In benign tumors, surgical excision is the right choice of treatment (Veena *et al*., 2013). Even though, these neoplasms are

commonly encountered in dogs, but can occasionally also occurred in cats, horses, and rarely observed in other domestic species (Song *et al.,* 2011).

Lipomas are common subcutaneous tumors in small animals in any location on the body. It usually occurs as solitary masses, but multiple lipomas can also occur in dogs. These tumors are frequently localized (non infiltrative) in the subcutaneous tissues but may extend intramuscularly or along deep fascial planes (infiltrative) (Case *et al.,* 2012). Among this the less common ones are infiltrative or intermuscular lipomas. Intermuscular lipomas are also variants of subcutaneous lipomas situated between muscle planes with no local invasion (Withrow *et al.,* 2013). Generally, both types of lipoma are mostly found in the pelvic limbs of dogs and can be difficult to differentiate without surgical evaluation (McEntee *et al.,* 2001).

Lipomas are normally benign fatty tumours composed of mature fat cells. So the recommended treatment is complete surgical excision of the intermuscular lipoma, because it offers effective removal of adipocytes, low rates of recurrence and has good prognosis (Case *et al.,* 2012). In addition postoperative complications are rare and limited to the formation of seroma and hematomas, wound infection and nerve injury, depending on lipoma location (Lamagna *et al.,* 2012). In all cases the treatment requires good surgical planning as it is crucial to therapeutic success unless, the local recurrence of tumor masses are associated with incomplete excision techniques (Nishida *et al.,* 2007; Kaeser *et al.,* 2010). This report describes a case of surgical excision techniques of non infiltrative lipoma from the female dog.

3.3.1. Case history and clinical examination

Case 1

An eight years old bitch was brought to the Addis Ababa University Veterinary Teaching Hospital with clinical presentations of large sized and pendulous mass swelling on her ventral abdomen in between left and right parts of mammary gland directly on the midline (Figure 8A). The history stipulated that the size of the swelling had grown progressively starting in the form of lumps with lack of pain, limping and licking of site before nine months. Clinical examination through palpation revealed a soft, painless and well circumscribed tumor mass on lower abdomen. On palpation, mass was semisolid in consistency, located subcutaneously and

was moving freely indicating absence of attachment to structures beneath it. The clinical parameters like heart rate, respiration rate and temperature were within physiological limits. The cut surface of the tumor was oily and yellowish in color. The skin biopsy was taken for histopathological examination of the lesions. Fine needle aspiration cytology (FNAC) was also performed for cytological examination and showed adipose tissue cells. Histopathological examination after incision biopsy of the tumors showed malignancy-free tissue, composed of adipocytes without atypia, interspersed with fibrovascular stroma. Surgically, excised tumour growth was also subjected to histopathological examination which revealed polyhedral closely packed cells with several vacuoles and nucleus was pushed to one side (Annex 6).

Case 2

A Seven years old dog was also presented to the Addis Ababa University Veterinary Teaching Hospital with clinical manifestation of medium sized and pendulous mass swelling on his forearm above the elbow. The history stipulated that the size of the swelling had grown progressively starting in the form of lumps with lack of pain, limping and licking of site before four months. Clinical examination through palpation revealed a soft, painless and well circumscribed tumor mass below the subcuit. Up on palpation, mass was also semisolid in consistency, located subcutaneously and was moving freely indicating absence of attachment to structures beneath it. The clinical parameters like heart rate, respiration rate and temperature were within physiological limits. The cut surface of the tumour after excising by surgery was slightly oily and yellowish in color. Finally depending on the examinations and clinical findings both cases was diagnosed as a skin tumor mainly lipoma, and was decided to be undergone surgical excision of the mass**.**

3.3.2. Preoperative preparations

Both dogs were withheld from feed and water for 24hrs before coming to the clinic based on appointment. As there may be infection due to abrasion on the superficial skin of the swelling, the antibiotic; penicillin (24mg/kg) and dihydrostreptomycin sulphate (30mg/kg) (Pen &Strep® Norbrook UK) I.M was administered three hours before undergoing surgical procedure in case 1 but not in case 2 as the case was in early stage no visible external trauma which predispose the animal to infection. Before undergoing a surgery, the area proposed for surgery were

washed with water and soap thoroughly after deep sedation. Thence the hair surrounding of the swelling were aseptically prepared by clipping, shaving, scrubbing, washing with water and chlorhexidine solution (savlon) (Figure 8B for case 1). After inducing the dogs with anesthetic drugs, I.V infusion using lactated ringers solution were set at a surgical rate of 10 ml/kg/hr and calculated rate 1 drop/sec in both cases.

3.3.3. Anesthesia and animal control

The dogs were premedicated with diazepam at the dose rate of 0.3mg/kg I.V. Later, the dog was induced by the combination of Diazepam (Intas pharmaceutical Ltd., India) @0.15mg/kg and ketamine (Ketamine Hydrochloride, Germany) @5mg/kg I.M and maintained by propofol (Aulife health care Pvt.ltd, Gujarat India) at dose rate of 4.5mg/kg IV and finally the dogs were restrained in dorsal recumbence on patient table where all legs were loosely secured for ease of surgical procedure for case 1 and laterally recumbent with affected limb uppermost in case 2.

3.3.4. Surgical correction and treatment

After aseptically preparing each surgical sites and keeping the dogs in appropriate position on patient table, an elliptical skin incision was given on the base of the swelling and advanced gently with blunt dissection by using metzenbum scissor. After careful handling and divulsion of adjacent tissues, the tumorous growth were surgically excised and removed en bloc (Figure 8C for case 1), weighed one Kilogram and sent for histopathological examination. But the size of the case 2 tumurous growth was much smaller than case 1. Then the removed areas were moped up and well cleaned before closure for both cases. During closure, subcutaneous tissue was apposed with continuous sutures to obliterate dead space and accumulation of serosanguinous fluid using polyglycolic acid 910 (vicryl) no. 0 for both cases. Finally the skin was sutured with subcuticular sutures using polyglycolic acid 910 (vicryl) no. 2 (Figure 8D for case 1). Finally the suture lines were scrubed by diluted iodine solution and sent home from the hospital.

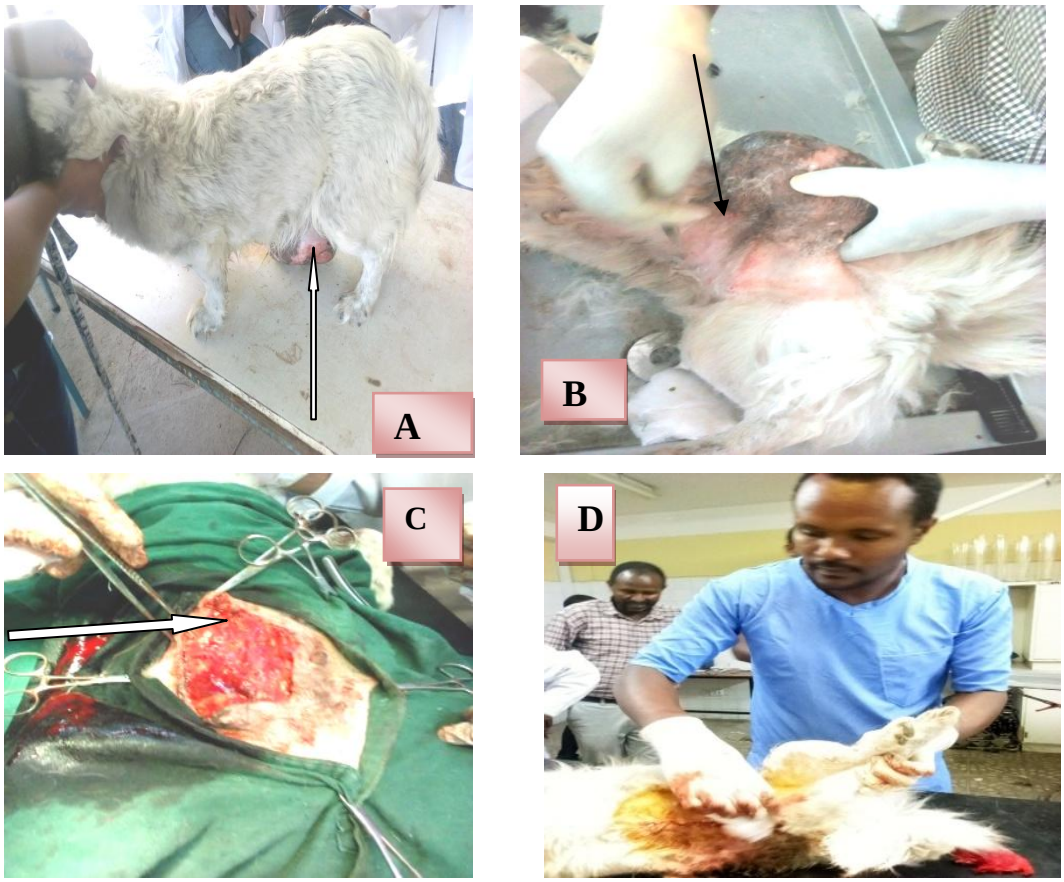


Figure 8: Surgical progression of Lipoma in bitch

A) Pendulaous, hard swelling lipoma on ventral abdomen

B) surgical site preparation C) Surgical excision of lipama D) Scrubbing the surgical area

3.3.5. Post operative care of dogs and outcome

After surgery was successfully accomplished in both cases, systemic antibiotics by using Penicillin (24mg/kg) and dihydrostreptomycin sulphate (30mg/kg) (Pen &Strep® Norbrook UK) I.M was administered consecutively for three days, application of an Elizabethan collar, lavage of the wound once daily with saline solution were applied. Tramadol (Tramadol hydrochloride 50mg/ml manufactured by Sakar Health care Pvt.Ltd, Gujarat, India) at dose rate of 2mg/kg I.M q 12 hr for pain management was also prescribed. The owners were also advised to subjectively assess for discomfort, unpleasant discharges, pain, and inflammation at the surgical site. No signs of recurrence were present during this period. The postoperative evaluations showed good healing progress of the surgical wound and good general condition of

the patients, as well. At few days the site of incision was dried and on the way of healing (Figure 9A&B).

Figure 9: Outcome of surgical excission of lipoma in dog

A) At day 4 B) visualization of incision site at day four

3.3.6. Discussion

Lipomas are benign (noncancerous), freely movable, relatively slow-growing, fat-filled tumors that are quite common in dogs, especially older ones and can develop anywhere but most commonly found on dog's undercarriage, in the chest or abdomen (Tallini and Tan, 2006). The proximal extremity of limb and trunk are the most common site for lipomas (Goldschmidt and Hendrick, 2002). This agrees with the case two in which the lipoma was grown on fore arm above elbow. The tumor of adipose tissue can be divided into benign (lipomas) and malignant neoplasms (liposarcomas). Although they may resemble one another macroscopically, they are histopathologically distinct (Baez *et al.,* 2004). Among these tumors, lipomas are much more common than liposarcomas (Vegad, 2012).

Although lipomas are relatively common in older dogs, especially in the subcutaneous tissue, intermuscular subtype is rare in veterinary patients (Liptak and Forrest, 2007). The intermuscular septum is considered as the origin of intermuscular lipoma, with subsequent development of the adipose tissue between adjacent muscle bundles thus resulting usually in well circumscribed mass of easy surgical divulsion (Liu *et al.,* 2013). This also agreed with the surgical approaches conducted by Lahrach *et al.,* (2013) in which the therapy chosen to treat

the intermuscular lipomas in dogs were performed through complete surgical resection of the tumor mass, through the blunt dissection of the muscle fascia adjacent to the neoplasia (Case *et al.,* 2012). Both surgical managements are concurrent with the current surgical case management through surgical excision in both cases.

In the present cases the lipoma were well circumscribed, pedunculated and hanging on the ventral abdomen in case 1 and above elbow in case 2. This similar case was reported by some authors such as (Nishida *et al.*, 2007) in which all patients of the intermuscular lipomatous tumors were well circumscribed, easily isolated from the surrounding tissues promoting easy implementation of the surgical technique. Macroscopically, lipomas are described as well circumscribed yellow or orange masses of greasy consistency, surrounded by a thin capsule. Microscopically, adipocytes are the same size or slightly bigger compared to normal cells (Kaeser *et al.*, 2010). The present case was followed after surgery and there was no recurrence of tumor up to nine months. The reason for non recurrence in present case might be due to its complete excision and early diagnosis as opined by (Rao *et al*., 2011).

Intermuscular lipomas are rare tumors in veterinary patients. Accurate diagnosis and meticulous surgical planning are essential to the success of therapy in order to prevent recurrence and restore function. Thus, complete tumor resection was the treatment due to its effectiveness.

3.4. Surgical Management of Hematomas

3.4.1. Aural hematoma in dog

Abstract

Aural hematoma is the most common injury to the pinna that needs surgical intervention in addition to removing the predisposing cause. The present case report describes the surgical management and its outcome on a five years old dog presented to Addis Ababa University Veterinary Teaching Hospital with history of scratching of left ear since two weeks filled with abnormal blood in a space under the skin of the ear flap and swollen. There was no history of external trauma, but intense head-shaking and abrupt increase in the size of the ear flap was

noticed. On physical examination oral and conjunctival mucosa was normal, rectal temperature: 101^0F, heart rate: 90 beats/min, respiratory rate: 21 /min, capillary refill time about <2 s. The swollen right ear was warm to touch and pet was feeling pain on palpation. The examinations revealed the dog having aural hematoma. The animal was, managed surgically and recovered completely from the problem.

Key Words: Aural Hematoma, Dog, Surgical Management

Introduction

An aural hematoma is a collection of blood in the form of either fresh or clotted, within the pinna (ear flap) resulting in very thick and spongy appearance over entire pinna or localized area (Paterson and Tobias, 2013). The pinnae (ear flap) are composed of a layer of skin on each side of a layer of cartilage which gives shape of ear flap. Blood vessels go from one side to the other by passing through the cartilage (Harari, 2004). Aural hematoma or othematoma in dogs is a traumatic condition located at ear pinna, clinically exhibitted by the presence of fluctuating hematogenous collections, disposed on the external(convex) face, that occurs following tear or cut off the blood vessels located between the cartilage and cutis ear (Fossum *et al.*, 2002).

Most of the time it occurs when pets vigorously shake their heads or scratch their ears which may result trauma to the small blood vessels of ears followed by rupture of the blood vessels and capillaries in the pinna (Slatter, 2003). In addition to traumas due to scratch and shaking the heads of dogs with long, floppy ears are also at greater risk for developing ear hematomas. Also pets with clotting or bleeding disorders may develop hematomas, with or without a history of trauma which finally causes pools of blood collected in the space between the skin and cartilage, creating a hematoma. This condition is usually unilateral, but it can also be bilateral (Joyce, 2000). Hematoma can pose health problem to affected dogs in addition to interfering with hearing (Blattler *et al.*, 2007).

Hematomas should be drained as soon as possible. If they are left untreated, fibrin formation can occur, leading to fibrosis, contraction and thickening, potentially leaving the ear with a deformed cauliflower-like appearance (Medleau and Hnilica, 2006). If treatment is delayed,

surgical intervention may be more difficult and scars will be more likely to form. There are various methods of treatment for the aural hematoma which includes simple aspiration as the most conservative treatment that relieves acute pain, but recurrence is common with this technique. The best method is surgical drainage as it may reduce recurrence unlike the former method in addition to, preserving cosmetics and aesthetic aspects of the ear if done in time and properly (Ahirwar, *et al.,* 2007). This case report describes the surgical procedure and technique with its outcome on single case of aural hematoma treated surgically.

Case history and clinical examination*:* A five years old dog was presented to Addis Ababa University Veterinary Teaching Hospital with history of scratching of left ear since two weeks, filled with abnormal blood in a space under the skin of the ear flap and swollen (Figure 10A). There was no history of external trauma, but intense head-shaking and abrupt increase in the size of the ear flap was noticed by owner of the dog. On physical examination oral and conjunctival mucosa was normal. Recorded rectal temperature was 101^0F heart rate was 90 beats/min respiratory rate was 21 /min and capillary refill time was about <2 sec. The swollen right ear was warm to touch and the pet was feeling pain on palpation. Based on above parameters the pet was diagnosed with aural hematoma of left ear pinna without other health concern and decided to treat the case by surgical intervention.

Pre operative preparation of the dog*:* The dog was withheld from feed and water for 18hrs and 6hrs respectively before coming for surgical treatment. Pinnae of affected ear was aseptically prepared, by clipping both sides (convex and concave) the ear and shaving hair after moisturizing the region well with antiseptic soap and sedating the patient. The inner surface of the pinna was prepared for surgery by standard aseptic method and an aperture drape was applied exposing only the surface of the inner pinna. Sterilized gauze was pulugged in the entrance to the external ear canal to prevent hematoma fluid from draining into the external ear. A tincture of iodine solution was applied, on the pinna and wiped with sterile swab to dry the surgical site, remove excess solution and foreign materials.

Anesthesia and animal control: The animal was premedicated with diazepam (Intas pharmaceutical Ltd., India) at 0.3mg/kg I.V to provide adequate muscle relaxation. Later the dog was induced by the combination of Diazepam (Intas pharmaceutical Ltd., India) at

0.15mg/kg and ketamine (Ketamine Hydrochloride, Germany) 5mg/kg I.V and maintained by propofol (Aulife Health Care Pvt.ltd, India) at @4.5mg/kg IV. Finally the dog was kept in lateral recumbence with affected ear uppermost.

Surgical treatment: There are a lot of surgical techniques used to resolve ear hematomas depending on the preference of the veterinarians in addition to the trend of the problem. These include conservative and radical surgical interventions.

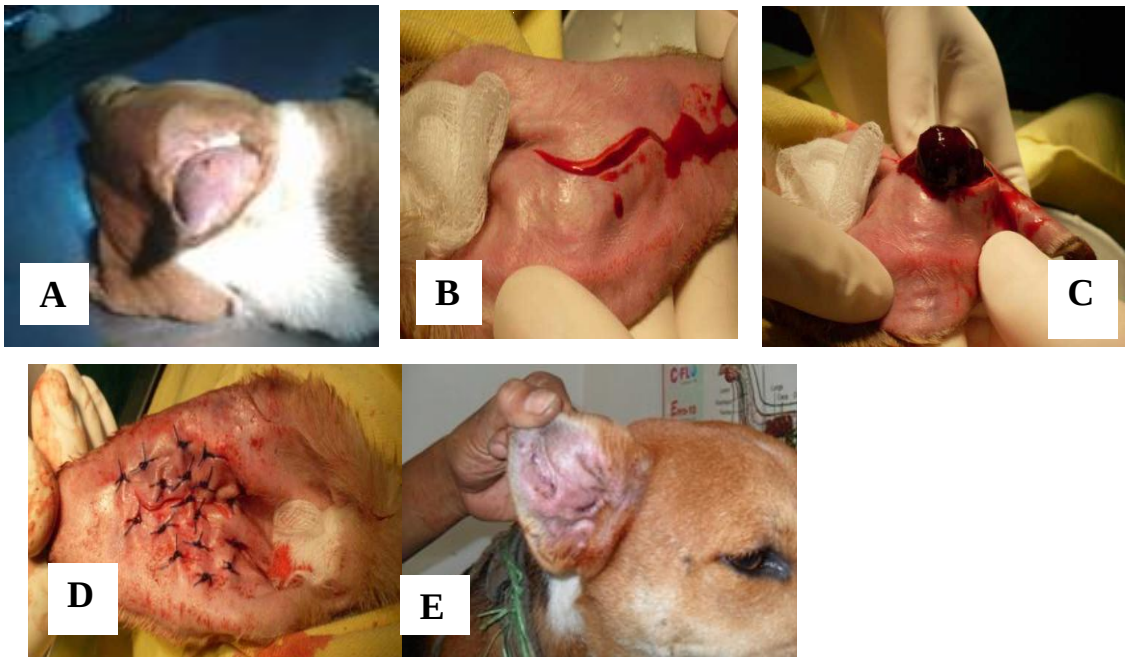


Figure 10: Aural hematoma in dog and its surgical management in progress

A) Case presentation (Red arrow) B) Surgical incision pattern C) Removing blood clot by compression D) Putting stitches after evacuation E) After two months with complete recovery

Aural hematoma was manged differently by various authors including by placement of teat canula in the dependent portion, providing indwelling drain, making punch holes and by surgical incisions of different kinds. The current case was managed surgically. After aseptically preparing the surgical site and stabilizing the animal, an "S" shaped incision was made on the concave (internal) surface of the skin along the length of the auricular hematoma (Figure 10B). Incision was made over haematoma with the scalpel blade. Drainage of the auricular hematoma was performed after opening the incision. Adequate length of incision was made followed by

digital compression from exterior for complete drainage of the content (Figure 10B&C). After removal of the auricular hematoma all debris, clots and tissue fluids were stripped off the cavity wall and the cavity was lavaged with saline and diluted iodine solution.

Then vertical mattress suture penetrating all layers from concave to convex surface of the ear was applied to decrease the dead space and preserve the normal appearance of the the ear using the polygycolic acid 910 (vicryl) 2-0 (Figure 10D). Suture lines were applied parallel to the axis of the pinna and major vessels. Adequate horizontal mattress sutures with approximate distance of 1cm between two adjacent points were applied to avoid pocket formation and fluid accumulation. At the completion of surgery, pressure bandage was applied over the pinna to minimize accumulation of exudate as well as recurrence of haematoma to promote healing. In addition to surgical management, the animal was administered with anti inflammatory and antibiotics as described under post operative care to treat the underlying cause, which in many cases is an infection or allergy.

***Post operative care and outcome*:** The animal was administered with antibiotics Procaine penicillin (24mg/kg) and dihydrostreptomycin sulphate (30mg/kg) (PenStrep® Norbrook UK) I.M for three days post operation. After successful completion of the surgical procedure, the affected ear was bandaged. The bandage was checked periodically to ensure it was not too tight. A collar was used to prevent the patient from damaging the surgical site or bandage. In addition the owner was advised to check the bandage at home at least twice daily to ensure that it remains loose and is not soiled and also to return the animal to the hospital to change the bandage every three days or when it gets soiled. Bandaging was continued until granulation tissue is present at the surgical sites. Accordingly, drainage was minimal and the patient was no longer shaking his head for few days. The owner also informed about how to keep the incision clean and free of clots and debris. Tramadol (Tramadol hydrochloride (Sakar Health Care Pvt. Ltd, India) was also given @ 4mg/kg I.M q 12 hrs for two days. Finally the dog was completely recovered after one months of operation and seen after two months (Figure 10E) of follow up.

Discussion

Aural haematoma is accumulation of blood in the ear especially between the cartilage and the skin (Joyce, 2000). The aim of surgical treatment of hematoma is to remove blood and fibrin debris, prevent infection, eliminate dead space at the cavity of the haematoma and inhibit recurrence (Lanz and Wood, 2004; Brown, 2010). Aural haematoma can be managed by conservative or surgical methods and/or its combination with a squeezing sponge (Dávid *et al.*, 2000). Among all management approaches surgical treatment of ear hematoma was mostly preferred due to its effectiveness in restoring normal anatomical structure and appearance as early as possible. The same surgical protocol and techniques was applied for surgical management aural haematoma in some studies (Joyce, 2000; Karim *et al.,* 2017) that reported healing within two weeks without recurrence unlike untreated cases.

Even though surgical management is best option it requires longer period of time to heal completely in large aural hematomas (Harari, 2004). There was no postoperative surgical infection or other complications regarding wound dehiscence. However with this procedure of surgery the prognosis was excellent and swift this finding concurs with (Blättler *et al*., 2007; Paterson and Tobias, 2013) opined that healing after surgical treatment of aural hematoma was rapid and usually require 2-3 weeks. During the surgical management of aural hematoma, the suture material was removed on 14 days post operation with bandages left for few days since then to reduce mutilation. This is what was recommended in a case report (Mohsin, 2010) that opined sutures could be removed 9-10 days postoperatively while bandaging should continue for one more week for positive outcome.

Most operative techniques use non absorbable sutures such as nylon, which have to be removed 9–12 days after the operation (Lanz and Wood, 2004; Cynthia, 2005; Mohsin, 2010). But in this case study, synthetic absorbable suture material, polygycolic acid 910 (vicryl), was used with anticipated advantage for no need to return the patient to hospital for removal of the stitches. As polygycolic acid 910 (vicryl) absorption sutures take about 50 days for absorption, the animal is not expected to feel any discomfort from the stitches. This means less stress for the dogs. All the auricle layers were penetrated and vertical mattress sutures were tied in a way that prevents deformity of the ear. The multiple parallel rows of several lines of stitches, placed

and fixed on the auricle are important to limit the probability of recurrence. A frequent complication of aural haematoma without adequate treatment is the cauliflower-like shrinkage of the auricle (Harvey *et al.*, 2001). In the current case, complication was avoided by careful placement and knotting of suture lines with an operative technique that avoided wrinkling.

The surgical technique is a viable and better option for the surgical treatment of aural haematoma in dogs. The surgical technique used for the treatment of aural hematoma in the current case was well described in several texts and the success practicing surgeons are advised to apply it. The utilization of absorbable multifilament suture may provide an advantage over other suture materials such as nylon that was used as established standard. Thus use of polygycolic acid 910 (vicryl) requires further evaluation in a larger number of patients for a potentially lesser amount of postoperative complication and wrinkling of ear pina.

3.4.2. Mandibular hematoma in ox

Abstract

An eight years old local breed ox was presented to AAU Veterinary Teaching Hospital with mandibular swelling on the left side, decreased appetite, and loss of body condition. Thorough physical examination and palpation of the swelling were conducted and revealed fluctuated fluid and soft in content. Aspiration with the sterile needle with 16.0 gauges was poked into the area on dependent part. As a result a cascade of serous fluid tinged with water was found. After removing the fluid the cavity was flushed with gauze soaked with antiseptics. Finally the ox was successfully recovered from the case after two weeks without recurrence.
Keywords: Drainage, Mandibular hematoma, Ox

Introduction

Hematoma is the accumulation of blood perivascularly in the subcutaneous, subserosal, intermuscular or intramuscular connective tissue due to a lesion in a blood vessel (Blattler *et al.*, 2007). It is a pocket or localized collection of blood usually in liquid form within the tissue. This distinguishes it from an ecchymosis, which is the spread of blood under the skin in a thin layer, commonly called a bruise (Hoffmann *et al.,* 2011). Hematoma can occur in different

animals with variable degree on various locations. Even though uncommon in adult cattle, occasionally calves can be affected by hematoma. Mandibular hematoma in adult cattle is also rare but can occur (Hur *et al.*, 2011).

Most of the time hematoma can be confused with haemangioma which is an abnormal build up of blood vessels in the skin or internal organs. Hematoma occurs because of the damage in the wall of a blood vessel (artery, vein or capillary), and leakage of blood into tissues where it does not belong (Fubini and Ducharme, 2004). Before diagnosing and searching treatment for mandibular haematoma, it also should have to be ruled out from disease conditions such as: abscesses and seroma which can be characterized by presence of pus and clear fluid respectively but hematoma can be identified from them by presence of bloody fluid (Iwanaga *et al.*, 2017).

Case history and clinical examinations: An eight years old local breed ox was presented to AAU Veterinary teaching hospital with mandibular swelling on the left side (Figure 11A), decreased appetite, and loss of body condition. Due to inaccessibility, radiographs and ultrasound were declined for diagnosis. The rigorous physical examination and palpation of the swelling area revealed fluctuated fluid and soft in consistency. The other physical parameters were in normal range except the finding of pale mucus membrane and sunken eye lids. To check the contents of swelling and aspirate, the sterile needle with 16.0 gauges was poked into the area on dependent part (Figure 11B). As a result, slightly serous fluid tinged with blood was oozed like water cascade and diagnosed as it is mandibular haematoma. The blood of the ox from ear vein was also taken to examine PCV. Accordingly the result was read 24%. In addition the aspiration fluid sample was cultured on blood agar and revealed no growth of microorganism (Annex 5) revealing the hematoma as there was no growth. Depending on laboratory findings and clinical examinations the case was diagnosed as mandibular hematoma and subjected for surgical drainage.

Preoperative preparations and animal control: After the animal was physically controlled and restrained with head extended, the swelled area and hair surrounding swelling was aseptically prepared by cleaning, clipping, shaving, and scrubbed with diluted chlorhexidine solution thoroughly.

Surgical correction and treatment: Normally haematomas should not be incised as far as possible. Time should be given (2-3wks) for resorption. If there is no resolution, then only incision is indicated (Shah, 2010). But in this case the hematoma was matured enough for drainage. After the area was aseptically prepared, small stab incision was done on dependent part and the hematoma was drained as well as flushed thoroughly with antiseptic (weak iodine solution) after soaking it with gauze held with forceps in the form of iodine-soaked cling (Figure 11B). Thence the wound was left open for drainage of fluids and limit accumulations.

Post operative care and outcome*:* The opening was managed as open wound by dressing and flushing for three consecutive days. In addition the animal was administered with penicillin (24mg/kg) and dihydrostreptomycin sulphate (30mg/kg) (Pen &Strep® Norbrook UK) for three days to avoid secondary bacterial complications. Following surgical drainage the condition was restored normal after two weeks without post operative complications and seen after two months (Figure 11C).

Figure 11: Mandibular Hematoma in local breed Ox

A) Large and fluctuate swelling on mandible B) Drainage of hematoma on progress

C) After two months with complete healing

Discussion

A hematoma is a collection of blood under the skin, similar in mechanism to a bruise, but the blood generally pools deeper in the tissues and is confined to one area, causing the swelling. The skin itself is not damaged, but the tissues and blood vessels underlying the skin are

damaged, causing minor internal bleeding. Since the blood is confined to one area, it causes that area to swell out of proportion (Poulsen *et al.,* 2008). Although most hematomas in bovine will reabsorb back into the system, some require draining. Bovines, by virtue of their loose skin and vascularized epidermal layers, are prone to forming hematomas like other animals such as horses (Johns *et al.,* 2005).

Subcutaneous mandibular haematoma occurs most of the time due to trauma or injuries to the superficial blood vessels under the skin of mandibular area leading to the formation of hematomas in the subcutaneous layer (Schultheiss *et al.,* 2004). The symptoms related to a hematoma are variable, depending both on the placement of the hematoma and its size. The most noticeable symptom is usually a presence of a soft lump which may grow in size somewhere on the bovine body and can become quite large (Goldschmidt and Hendrick, 2002).

In conclusion bovine hematoma is rare as compared to other domestic animals such as pet animals. In any hematoma the conservative therapy by using aspiration of fluid and administering anti inflammatory drugs can be practiced before conducting surgical opening but in this particular case the surgical management through opening the swelling and flushing with antiseptics was conducted and found effective. So I strongly recommend this technique particularly in matured case and should have to be managed as early as possible for positive outcome and early recovery.

3.5. Ovariohysterectomy in Bitches

Abstract

Two intact local breed bitches were presented to Addis Ababa University Veterinary Teaching Hospital for surgical sterilization through ovariohysterectomy. The owners requested to permanently sterilize the bitches since they didn’t want any more puppies. Before surgery thorough physical examination of the bitches were conducted. Thence the bitches were prepared for spaying with aseptic preparation of surgical site. Caudal midline incision was performed to exteriorize the parts of reproductive tracts to be removed. Finally after gonadoectomy and hysterectomy, the abdominal wall was closed layer by layer by using appropriate suture materials and suture patterns in each bitches.

Key words: Bitch, Caudal Midline, Ovariohysterectomy

Introduction

Elective surgical sterilization of female dogs and cats is one of the most common and routine procedure performed in veterinary surgical practice but requires skills, experience and safe anesthetic drugs (Bedoor *et al.,* 2014). Spaying pet entails surgical removal of the reproductive organs. In females, there are two ovaries and a uterus that has to be removed and the procedure is called an ovariohysterectomy, or spay. For routine spaying, the best age for dogs and cats is before puberty (Bender, 2012). Spayed animals do not go through heat cycles or produce unwanted puppies or kittens. Cats and dogs have their first heat at 5 to 12 months of age (White, 2012).

Sterilization of female dogs and cats can be accomplished by removing both the ovaries and uterus (ovariohysterectomy) or by removing the ovaries alone (ovariectomy) (AVMA, 2010). Despite the apparent preference for ovariohysterectomy in the United States and Canada, ovariectomy appears to have become the standard of care in many European countries (Reichler, 2009). Ovariohysterectomy and ovariectomy involve similar surgical techniques, except that the skin and fascia incisions are considerably smaller and located more cranially with ovariectomy, compared with ovariohysterectomy (Peeters and Kirpensteijn 2011).

Surgical complication rates associated with ovariohysterectomy in healthy dogs and cats have been reported to range from 6.2% to 20.6%, depending on surgeons' experience (Pollari *et al.,* 1996; Burrow *et al.,* 2005). Most complications are mild and generally consist of incision line inflammation or gastrointestinal tract upset. Incision complications are more common in larger animals and animals with longer surgery and anesthesia times (Burrow *et al.,* 2005). Even though it has few complications and requires some in puts, surgical sterilization remains the most widely used technique as it produces a permanent solution especially in reproductive and disease control and is available for both sexes (Yoak, *et al*., 2016). So the present surgical case report is aimed to perform ovariohysterectomy and report the outcome of this elective surgical sterilization of female dogs under our condition.

3.5.1. Case history and clinical examinations

Two 15kg, five (case 1) and 20Kg, four (case 2) years-old intact local breed bitch respectively were presented to Addis Ababa University Veterinary Teaching Hospital for surgical sterilization of reproductive tract to prevent breeding. The owners wanted no more puppies from the bitches and decided to permanently sterilize. Before commencing surgery the bitchs underwent thorough general physical examination. Accordingly, all physical parameters such as respiratory rate, heart rate and pulse rate were within normal physiological limits. In addition the body temperature and mucous membrane examined; were normal and the dog was found apparently healthy enough to undergo ovariohysterectomy.

3.5.2. Pre operative preparation of the bitches

Before coming for operation, the dogs were withheld from feed for 12hrs and from water for 4hrs. The bitch was administered penicillin (24mg/kg) and dihydrostreptomycin sulphate (30mg/kg) (Pen &Strep® Norbrook UK) 3hrs before commencing surgery in case one but not in case 2 due to the presence serous fluidly discharge in the former. After sedating and inducing, the bitches were prepared for surgery by clipping, shaving the hair from the surgical site and cleaning the surgical field with a chlorhexidine surgical scrub solution for 5 min (Figure 12A) in both cases. The preparation of the surgical field was completed with a final spray of diluted iodine solution. Thence, sterile drapes were put and surgical instruments were used during surgery. Sterile surgical gloves were worn and standard aseptic principle was followed in all surgical steps, including surgical scrubbing of hands with iodine-based scrub solution and aseptic handling of instruments.

3.5.3. Anesthesia and animal control

Before commencing the surgical procedure both bitches were administered premedication and induction agents with selected anesthetic drugs. As a premedication, ketamine (Ketamine Hydrochloride manufactured by Germany) @10mg/kg IM and Tramadol (Tramadol hydrochloride manufactured by Sakar Health care Pvt. Ltd, Gujarat, India) @ 2 mg/kg IV) were administered based on an estimated weight in both cases. Once sedated, an intravenous catheter was placed. Intravenous fluids (0.9% lactated ringers solution) was administered @10 ml/ kg/hr throughout the surgery. Thence the bitches were induced with combination of ketamine @5mg/kg and diazepam @ 0.15 mg/kg IV. Thence, the bitches were taken on to patient table

and kept in dorsal recumbence by stabilizing and tying each limbs on to. Maintenance of the anesthesia throughout the procedure was achieved with a propofol (Aulife health care Pvt.ltd, Gujarat India) bolus @4mg/kg IV every 6–10 min to effect.

3.5.4. Surgical correction and treatment

Sterile drape with central fenestration was put and fixed to each bitch's body by towel claps after positioning, stabilizing and aseptically preparing the incision sites and all surgical procedure was almost the same in both cases. The midline incision was made in the cranial third of the caudal midline, for easy exteriorization of the ovaries. Then incision was made through the three layers (skin, linealba and peritoneum) using surgical blade to expose the abdominal contents. After incising skin and fascia, the subcutaneous fat was removed to visualize the liea alba on ventral midline and to put the incision over it. After picking up the loose fascia and fat that covers the external rectus sheath with brown adison forceps and extending by snip off this tissue with Metzenbaum scissor, the bright white fibers of the external rectus sheath were exposed. The linealba was grasped with rat toothed forceps and tented up and a stab incision was put on the linea alba using number 10 scalpel blade with the sharp edge facing up to avoid any possibility of causing injury to the underlying abdominal organs. Then the incision was lengthened using mayo scissors with the jaws of a curved haemostatic forceps inserted through the stab incision to keep the linea alba tented up and the stab incision remain open to facilitate lengthening of the incision.

After around 6-8 cm long incision is made on the caudal ventral abdominal midline was made, the uterine horn was located by means of an ovariohysterectomy hook from the left part frist. After exteriorizing the left uterine horn, on haemostatic clamp was applied on the proper ligament and the ovary was held between the fingers to retract it while the suspensor ligament is stretched with an index finger or broken held between the index finger and the thumb. After the ovary was sufficiently exteriorized to the abdominal incision, a window was made in the mesovarium caudal to the ovarian vessels and three haemostatic clamps were applied on the ovarian pedicle (Figure 12B). Then circumferential ligature was applied distal to the third haemostat farthest away from the ovary and the jaws of the middle haeamostatic forceps was opened and a second trans-fixation ligature was placed in the place where the hemostat crushed

the pedicle and the jaws of middle clamp closed again. Then the pedicle was severed between the clamp closest to the ovary and the middle clamp. The clamp applied distally from the ovary, and removed as to place the ligature on the groove of pedicle. The pedicle was ligated by vicryl 2-0.

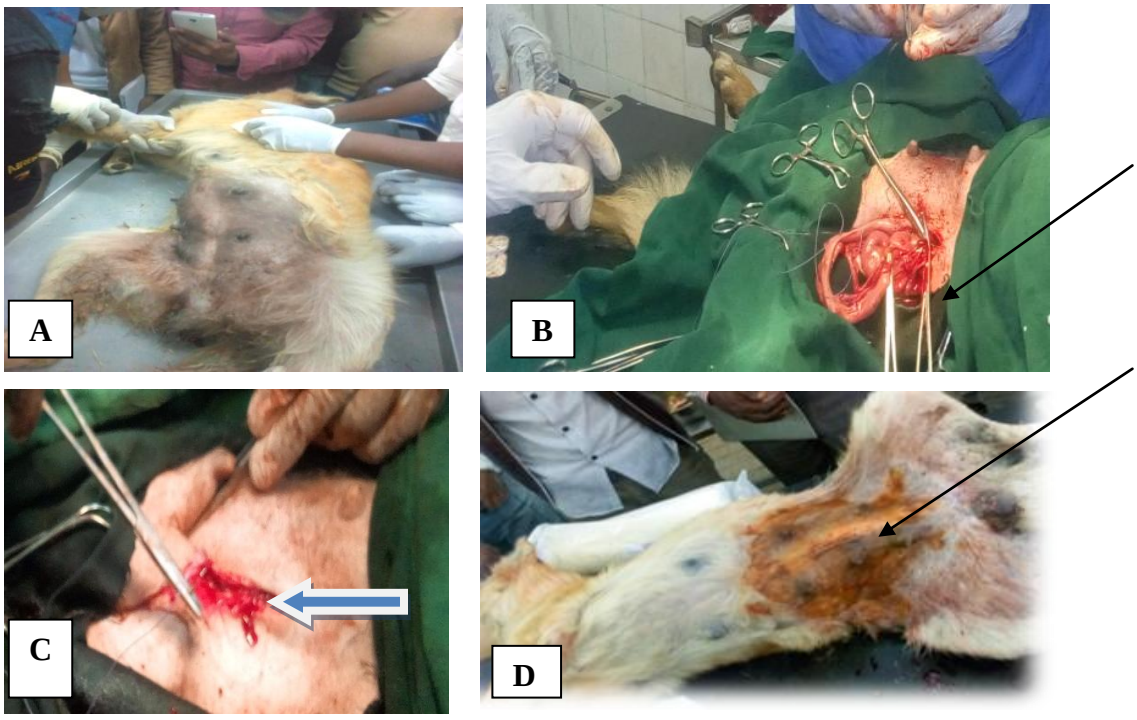


Figure 12: Surgical preparation and its progression in ovariohysterectomy of bitch

A) Preparation of incision site B) Exteriorization of ovarian bursa and putting clamps
C) Closure f subcutaneous in progress D) Scrubbing of the incision site after closure

The pedicle was inspected for bleeding and gently replaced back into the abdomen. Same procedure is repeated on the opposite ovarian pedicle. After both ovarian pedicles are ligated, the broad ligament was torn to allow uterine exteriorization. Similarly, three clamps were placed on the uterine body just cranial to the cervix before ligation. The uterine arteries located in each side of the uterine body were individually ligated caudal to the most caudal clamp before severing the uterine body. Thence, the middle clamp was removed and the uterus was ligated in the groove that remains. The uterine body was severed between the proximal and middle clamps. Then pedicle was inspected for bleeding and gently replaced into the abdomen.

During closure at the end of both surgeries the abdominal incision was stitched up routinely in three layers (Figure 12C).

Peritoneum and body wall was sutured as first layer from the bottom with simple interrupted pattern by using the Vicryl 1-0. In the second layer the subcutaneous tissues was sutured with simple continuous by using the vicryl 2-0. Finally the skin was sutured with subcuticular suture pattern by using vicryl 2.0 and finally the area was scrubbed with diluted iodine solution before the patient was raised from surgical table (Figure 12D).

3.5.5. Post operative care of bitchs and outcome

After surgery was successfully finished, systemic antibiotic was given using penicillin (24mg/kg) and dihydrostreptomycin sulphate (30mg/kg) (Pen &Strep® Norbrook UK) and was continued for two more days. The owner was advised to apply an Elizabethan collar and lavaging of the wound once daily with saline solution and mild antiseptics. The owners were also advised to subjectively assess pain, inflammation at the surgical site, defecation and urination behaviors and to restrict exercise.

Figure 13: Surgical outcome of both cases after few days

Tramadol (2% Tramadol Hydrochloride Sakar Health care Pvt.Ltd, Gujarat, India) was given at dose @4mg/kg I.M q 12 hrs for two days was also prescribed. Fourteen days following the

surgery, wound was completely healed without any additional complications for both cases and seen on figure 13.

3.5.6. Discussion

Ovariohysterectomy in the bitches is a common procedure for birth control, prevention of oestrus and pseudopregnancy (Bradley *et al.,* 2000). Ovariohysterectomy, or spaying is considered as a routine abdominal operation and the best age for bitch is before puberty (Bedoor *et al.,* 2014). The current surgical case was performed after puberty but during anoestrus period. This surgical procedure was performed using injectable anaesthetic protocol with premedication, induction and maintenance for general anesthesia similar with surgical procedures done in small animals under general anesthesia (Spain, *et al.,* 2004).

Even though some animal hospital holds and beds for 2-3days post operation for healing of incision sites (Klein, 2007), some hospitals and most spay clinics will release the bitch on the same day as surgery so that she may be observed at home in case of problems but skin stitches necessitate a return visit for a recheck, which is always a good idea after an abdominal surgery (Ortega-Pacheco *et al.,* 2007; Reichler *et al.,* 2009). The current case management was done the same in which the bitches were sent home as the same day they have finished the operation after monitoring for complete recovery from anesthesia and any potential complication such as bleeding from surgical site as there were no well designed boarding for pets in the VTH. The present procedure shows the importance of sterilization of the bitch performed under application of aseptic principles with clean surgical instruments to avoid any risk to complications to the bitch related to contamination and associated surgical failure. This result agreed with those of (Greenfield *et al.,* 2004; Brooks, 2014).

Two approaches used for ovariohysterectomy were mentioned in the literature including the flank and caudal midline approaches. The caudal midline approach was the main route selected for ovariohysterectomy over flank approach by some authors and supported and used as best techniques in certain surgical texts (Hedlund 2002; Stone, 2003; Devitt *et al.,* 2005; Fontbonne, *et al.,* 2007; Djemil *et al.,* 2010). The flank approach is less preferred because of several challenges encountered including the difficulty to exteriorize the entire uterine body, a dropped ovarian pedicle that may pose difficulty to recover, and that it may be difficult to expose the

opposite ovary and uterine bifurcation. However, this complications and difficulties may be dependent on the experience of the surgeon have on the procedure. Although, this procedure cannot provide sufficient evidence to prefer caudal midline approach as better technique over the flank technique, it is logically sound to assert that caudal midline approach is better to get better access to both ovaries for ease of removal. Thus, caudal midline approach is recommended first choice especially for surgeons with less experience. A pair of scissors was used to bluntly dissect the subcutaneous connective tissue, to visualize the linea alba. This gain also agreed with the surgical protocol of (Djemil *et al.,* 2010).

While entering to the abdominal cavity, rat-tooth forceps was used to grasp the linealba in the middle and tented up before being incised with a pair of scissors. The peritoneum was then punctured using a cannula that is slid towards the umbilicus to enable incision of the linealba without damaging the abdominal contents, with the cutting edge of the blade turned uppermost. The same procedure is then performed in the opposite direction towards the pubis. To locate the genital apparatus with ease, the bladder was retracted laterally so that cranial to the bladder, the body of the uterus and bifurcations of the horns were easily accessed. One of the horns is then followed cranially up to the ovary, which is hidden in the fat-filled ovarian bursa. These surgical techniques were again used by many authors such as (Devitt *et al.,* 2005; Fontbonne, *et al.,* 2007). In conclusion this surgical case report strongly recommends the caudal midline incision under general anesthesia and aseptic procedure for well recovery and positive outcome of the surgical activity.

3.6. Castration of Male Domestic Animals

3.6.1. Dog

Abstract

Dog castration is a routine surgical sterilization procedure performed by veterinarians. This case report describes closed castration on a four years old local breed dog that was brought to Addis Ababa University Veterinary Teaching Hospital for surgical sterilization. After sedating and aseptically preparing the surgical site, small incision of about 2-3 cm was made in front of the testicle, through which both testicles were exteriorized. The spermatic cords were double

ligated using 2-0 absorbable suture material and cutout. Finally the surgical opening was closed in two layers of subcutaneous tissue and skin. The surgical wound was completely healed without postoperative complications.

Key words: dog, prescrotal, semi closed castration

Introduction

Surgical sterilization of dogs and cats is one of the most commonly performed routine procedures in veterinary practice (Spain *et al.,* 2004). It is done as a method of contraception to aid in the control of pet overpopulation, as well as to prevent diseases associated with the reproductive system, such as mammary neoplasia or benign prostatic hyperplasia (Olson *et al.,* 2006). Castration in male animals has also various importance. Among these: to make the animal docile, for easy management in the presence of female animals, to prevent unwanted animals from breeding, malignant disease or irreparable injury of the testes, to promote weight gain in meat animals and correction of scrotal hernia (Hancock *et al.,* 2005).

Neutering or castration involves the surgical removal of ovary and uterus (ovariohysterectomy) in case of female and surgical removal of testicle (orchoectmy) in case of male (Van Goethem *et al.,* 2003). Neutering in male dog can be approached either in scrotal or pre scrotal ways. The prescrotal technique, by displacing the testis cranially and exposing is used a midline pre scrotal skin incision (Stone, 2003), is used more frequently in larger dogs. However, scrotal approach for castrating small dogs and cats has also been used safely castrate dogs of any age (Howe *et al.,* 2000). The pre scrotal approach offers many advantages in that it improves cosmesis and decreases in anesthetic and surgical times, incision length and subsequent surgical trauma, postoperative discomfort, self-trauma, and scrotal hematoma formation (Boothe, 2003).

Castration in the dog, can be performed either in an open or closed technique. During the procedure, the scrotum itself should not be clipped or prepped so that it should be draped out of the surgical field to avoid self-mutilation postoperatively. The open technique is preferred in larger dogs since ligatures may be placed directly around the vascular pedicle, resulting in more secure ligations (Boothe, 2003). The advantages of the closed technique are that the technique

is simpler to perform, and the parietal vaginal tunic need not be opened, thereby minimizing risk of peritoneal contamination via the communication between the abdomen and the parietal vaginal tunic. But its disadvantage involves less secure ligatures because the vessels are ligated while being surrounded by the tunic and the attached cremaster muscle, rather than being ligated directly (Davidson *et al.,* 2004).

Complications of castration include scrotal swelling, hemorrhage, bruising, and infection. In the dog, swelling and bruising of the scrotum are more commonly seen after open castration. Severe hemorrhage after castration may be serious, and may result in scrotal hematoma or intra abdominal hemorrhage (New *et al.,* 2003). Serious hemorrhage may require intensive supportive care and an abdominal approach to locate and ligate the spermatic cord. Scrotal hematoma, if severe, may necessitate scrotal ablation (Spain *et al.,* 2004). This case report aimed to describe elective surgical sterilization of local breed dog.

Case history and clinical examination: A four year old local breed dog was brought to Addis Ababa University Veterinary Teaching Hospital for surgical sterilization. The dog was presented for the owner wanted to sterilize the dog to prevent breeding and improve its behavior. Before undergoing the surgical procedure the dog was examined for any abnormalities or physiological derangements. The dog was found apparently healthy in all respects and decision was made to perform closed castration under general anesthesia.

Pre operative preparation of the dog: As this was an elective surgery, the dog was brought to VTH on the day of the appointment made for the castration withheld from feed and water overnight. . After sedation, the dog was put on surgical table in dorsal recumbence, and the area between the base of the scrotum and os-penis was shaved, washed with water and soap (Figure 14A). Long scrotal hairs were also cut short, and the scrotum is sprayed with antiseptic solution during surgical preparation using diluted chlorhexidnie solution (savlone). Finally the surgical area was scrubbed with diluted iodine solution before surgery.

Anesthesia and animal control: Before starting the surgical procedure the dog was pre medicated and induced with appropriate anesthetic drugs. First, the dog was sedated with ketamine (Ketamine Hydrochloride, Germany) at 10mg/kg IM. After few minutes the dog was induced with combination of diazepam (Intas pharmaceutical Ltd., India) at the 0.15mg/kg and

ketamine (Ketamine Hydrochloride, Germany) @5mg/kg IV. Finally the dog was kept in dorsal recumbence and secured on surgical table. The same anesthetic agents used for induction were used for maintenance of general anesthesia.

Surgical treatment: After securing the patient in appropriate position, a 2-3 cm long incision was made at the prescrotal area on the skin and subcutaneous tissues and one testicle was pushed cranially to the incision, to exterorize the testicle (Figure 14B). Using both hands, the cranial pole of the testicle was pushed up to the incision by squeezing below the testicle while making a cut on incompletely incised subcutaneous tissue and fascia let the testicle come out through the incision line.

Figure 14: Progression of closed castration through prescrotal approach in dog
A) Incision site preparation B) Prescrotal incised and testis exteriorized for ligation and excision C) Closure of incision site D) Dog after one month

Then the testicle that popped out through the incision was grabbed and pulled with the right hand using a gauze sponge while the left hand was used to hold at the scrotum stabilize and break the scrotal ligament which attaches the scrotum to the caudal pole of the testicle. The cord was first clamped using three haemostats; double ligated using polyglycolic acid 910 (vicryl) 2-0 where one circumferential ligation was applied below the distal haemostat from the

testicle and one transfixation ligature placed at the place where the middle haemastat made. The spermatic cord was then cut between the middle haemostat and the haemostat near the testis and removed. After the cut stump was checked for bleeding, the haemostats on the cord were released. The same procedure was followed for the second testis and removed.

Once both testes were removed and effective hemostasis is confirmed, the incision was closed in two layers of skin and subcutaneous tissue using the absorbable suture material polyglycolic acid 910 (vcryl) 1-0. The subcutaneous layer was sutured with simple interrupted suture pattern by thoroughly obliterating the dead space The skin was closed with a buried continuous horizontal subcuticular pattern, using absorbable suture material 2-0 polyglycolic acid 910 (vicryl). Finally the incision is inspected for gaps, oozing or any other problems (Figure 14C).

Post operative care of dog and outcome: The owner was advised to restrict exercise for few days, and use Elizabethan collars postoperatively to avoid self mutilation. In addition the owner was advised to follow the dog for any sign of discomfort during urination. The dog was treated medically with Procaine penicillin (24mg/kg) and dihydrostreptomycin sulphate (30mg/kg) (Pen &Strep® Norbrook UK) I.M for two days post operation. Finally the dog was completely recovered from operation without any complication and upon on follow up of one month (Figure 14D), he improved his body condition and seen alert.

Discussion

For many years, the prescrotal technique has been taught as best acceptable method of canine castration (Hamilton *et al.,* 2014). However, scrotal castration has also gained popularity in recent years as a safe alternative to the prescrotal technique (McKenzie, 2010). In this current case the prescrotal approach was used. Before incising surgical site, the incision site should have to be aseptically prepared by clipping an area around and including the scrotum; scrub with an appropriate antiseptic solution (Kustritz *et al.,* 2017). This also supports the current case preoperative preparation of the surgical site. Once the scrotum was aseptically draped, one of testicle was gently grasped and directed caudo ventrally away from the body to pull the scrotal skin taut over the testicle. Then incised the ventral-most surface of the testicle just lateral to the median raphae by take care to avoid incising the epididymis but adequate enough to

exteriorize the testicle. This was similar with case management conducted by (Woodruff *et al.*, 2015).

During the surgical procedure the initial incision was made over testicle after pushing cranially, the spermatic fascia was bluntly (manually) or and scrotal ligament until the spermatic cord is isolated from all visible connective tissues after exteriorizing testicle. In a closed castration, the tunic is not incised, and the vessels, vas deferens, and associated structures are ligated together, usually with two or three separate knots to prevent bleeding. In this particular case management, closed castration techniques, was performed. This same surgical protocol was used by some authors (Karen *et al.*, 2010; Okwee-Acai *et al.*, 2013). During castration of dogs there is always some danger that the vessels may slip out of a knot. Transfixing ligatures help to ensure things stay where they should and no bleeding occurs in which needle is used to thread the suture gently between the cremaster muscle and vessels (Baba *et al.*, 2013). This surgical protocol was followed in the current case report.

During the surgical procedure the initial incision was made over testicle after pushing cranially, the spermatic fascia was bluntly (manually) or and scrotal ligament until the spermatic cord is isolated from all visible connective tissues after exteriorizing testicle. In a closed castration, the tunic is not incised, and the vessels, vas deferens, and associated structures are ligated at once, usually with two or three separate knots to prevent bleeding. In this particular case management the closed castration techniques was used and followed by ligation of the spermatic cord and the replacement of the cord deep within the scrotum after confirmation of hemostasis. This surgical protocol was similar with authors (Karen *et al.*, 2010; Okwee-Acai *et al.*, 2013). However in an open castration technique, the tunic, the tough membranous covering of the testicle, associated structures, is incised and each structure is ligated (tied off) separately (Howe, 2006).

Sucessful closed castration for surgical sterilization of a male dog through prescrotal midline incision and general anaesthesia was described in this case report.

3.6.2. Mule

Abstract

Open castration in male equine is one of the routine surgical sterilization procedures. This case report was aimed to describe the open castration procedures and techniques conducted on the four aged male un castrated mule brought to the Dire Veterinary Clinic. Before undergoing the procedure the mule was evaluated and assessed by various vital physiological parameters like Heart rate, Respiration rate, Pulse rate, Mucous membrane color. In addition, palpation of both testicles was conducted for concurrent scrotal herniation or cryptorchidism, asymmetric size and descending status of both testes. After the mule passed the surgical judgment, the mule was stabilized, recumbent, adequate dose of lidoaine was injected to each spermatic chord and site of incision was aseptically prepared. Finally, both testes were exteriorized and entered in to tunica vaginalis to isolate in to avascular as well as vascular part for ligation after gentle detachment from the mesoorchium before excision. Finally the scrotum was left open for free drainage and healing through second intention of healing.

Key words: Castration, Mule, Testes

Introduction

Castration is one the most common surgical sterilization procedure of male animals performed by experienced and qualified veterinarians in the field. It can be achieved in either open or closed castration (Schumacher *et al.,* 2012). The choice is dependent on the age, size, and temperament of the mule/horse in addition to surgeon's preference. However most of the time, open castration is the most popular method of this procedure. Depending on the size and temperament of the horse, the procedure may be carried out under heavy sedation, a local or general anesthetic (Riemersma, 2005). In some cases, it is possible to castrate a horse while they are stood, but this is only undertaken in extremely laid-back and well-managed equines. During open castration, one incision is made over each testicle, but rather than being closed with sutures, they are left open so that they can drain and heal freely (Kummer *et al.*, 2009).

Castration prevents unwanted breeding and improves the behavior as well as management of the horse. Equine castration usually takes place in either the spring or autumn months in order to avoid bacteria carrying flies in the summer and the mud of winter (Price *et al.,* 2005). Traditionally, castration is carried out in a horse's yearling year, but there is no reason why the procedure cannot be undertaken at other times (Reilly and Cimetti, 2005). However, both testicles must have descended into the scrotum before the castration takes place. If one testicle is un descended, then waiting to castrate is usually the most viable option. It is also possible to carry out a full castration via laparoscopy to find the retained testicle, although this requires much more sophisticated surgical intervention in addition to longer recovery period (Owens *et al*., 2015).

Although the surgery is technically easy to perform, the complication rate associated with it is relatively high with 20–38% of horses experiencing a complication (Mason *et al.,* 2005). Pre-operative identification of risk factors for the development of complications can ensure that proper measures are taken to reduce these risks (Schroeder *et al.,* 2014). This can help eliminate some complications, but even with appropriate pre-operative evaluation and proper surgical technique, complications can still occur. Therefore, prompt recognition of complications and quick application of appropriate therapy are essential for the treatment of post-operative complications (Voermans *et al.,* 2006).

During the recovery period, most veterinarians will recommend as the equine should get some light exercise every day. This will encourage the wound to drain and minimize any swelling. But if there is paddock, had better horse/mule be left to moving around as when normal. However, horse/mule is stabled then he should be walked out 3 or 4 times a day for at least ten minutes each time. All horses are given post-operative antibiotics and pain relief for the procedure (Pyati and Gan, 2007). Therefore the presnt case report aimed to describe the procedures and techniques of open castration of male mule under field conditions.

Case history and clinical examination*:* The six years aged male mule was brought to the Dire Veterinary Clinic for castration with history of difficulty in management and frequent searching for mares for mating purpose. Pre surgically the mule was evaluated and assessed by various vital physiological parameters like Heart rate, Respiration rate, Pulse rate, Mucous membrane

color and was found apparently normal. Palpation of both testicles to assess the presence of concurrent scrotal herniation or cryptorchidism, asymmetric size and descending status of both testes was also performed and found normal. Finally depending on the examinations and findings the mule was fit for surgery and decided to undergo open castration.

Preoperative preparations*:* The Mule was kept an overnight from water and feed to undergo the procedure on early morning and to prevent him from covering themselves in mud overnight. The site of incision was aseptically prepared by washing with sterile water and scrubbing the testicle with diluted chlorhexidine solution and scrubbed with iodine solution after the animal was physically restrained.

Anesthesia and animal control: The mule was physically restrained with the aid of rope and recumbent to the side line with adequate visualization of both testicles by extending and tying his upper hind limb with corresponding forelimb (Figure 15A). The spermatic cords were desensitized by directly injecting 2% lidocaine hydrochloride 20mg/ml (manufactured by jeil pharma. co.Ltd. Korea) was performed to block the spermatic nerve. A 20cc syringe filled with block (Lidocaine) and 18 gauge needles was prepared. Thence, a 10ml of lidocaine was injected in to each spermatic cord after isolating and grasping spermatic cord firmly. The needle was inserted where the cord roles over index finger and thumb thence, aspirated to insure the inadvertent injection of blood vessel. Finally, 10ml lidocaine was injected.

Surgical procedure and management: After aseptically preparing the testes and controlling the animal the testicle was pushed to the tip by gently handling fingers to estimate the site and provide sharp incision. One circular incision approximately 4cm above tip of the testicle was made through the scrotal skin, tunica dartos and scrotal fascia. The testis, still encapsulated by the parietal tunic, is grasped, and the scrotal fascia is ‘stripped’ (separated using a sterile gauze) from the parietal tunic until the cremaster muscle and tunic were fully exposed. First the upper part of testes was removed followed by the lower. During the procedure, the parietal tunic of the testis was incised to undergo open castration procedure. After that, the ligament of the tail of the epididymis (caudal ligament of the epididymis), which attaches the parietal tunic to the epididymis, was bluntly transected. The testis, epididymis and distal portion of the spermatic cord were completely freed from the parietal tunic by transecting the fold of mesorchium and

mesofuniculum (Figure 15B). Ligature around the vasculature of the spermatic cord was used in order to reduce the incidence of post operative haemorrhage and to prevent inguinal eventration. After isolating the vascular and avascular part of testicular chord, the vascular part was ligated after transfixing with vicryl 2-0 size suture material on separate and corresponding testes. Then was cut distal to the ligature and removed.

Figure 15: Surgical procedure of castration in mule and its outcome

A) Preparation of incision site B) Interring in to tunica vaginalis of testis C) After six days of castration D) After four weeks of operation

Before releasing in to the scrotal sac it was held with forceps and checked for active bleeding. Thence the same procedure was conducted on the left testes through same opening. Finally, the site of incision was cleaned, scrubbed with Iodine solution and left open for secondary intention healing.

Post operative care of mule and outcome: Daily antiseptic dressing was carried out by using 5% povidone iodine solution until healing at two days interval, penicillin (24mg/kg) and dihydrostreptomycin sulphate (30mg/kg) (Pen &Strep® Norbrook UK) was injected I.M daily

for 2days. Simple exercise was also recommended daily for the mule. Few swelling and depression was observed in the first few days for six days and seen slightly with depression (Figure 15C) and later regressed as the day went on with regular open wound management. Up on consecutive week follow up on four weeks (Figure 15D) the wound was completely healed without any additional complications, increased its body weight and improved its desired demeanor since then according to the owner reports.

Discussion

In the present case report the mule was aseptically undergone open castration and the site of incision was left open for discharge of testicular sac contents such as blood clots. After the testes were exteriorized the spermatic chord was also isolated in to avascular and vascular part for ligation by gentle detachment from the mesorchium. This is similar with previous studies in which all equines have ligatures with absorbable suture placed as part of the procedure to prevent hemorrhage from blood vessels of the spermatic cord (Sprayson and Thielmann 2007).

Some authors of a previous study (Carmalt *et al*., 2008) also found that placement of ligatures during castration of draught colts under field conditions helped prevent omental herniation, intestinal eventration and significantly reduced the incidence of post operative haemorrhage (2.3%), compared with a reported rate of 2.44% without ligatures (Moll *et al*., 1995). Similarly the infection rate in a study by author (Carmalt *et al*., 2008) on draught horse colts that underwent castration under field conditions with ligatures placed was low (0.76%). This study showed that the use of absorbable ligatures can reduce the chance of hemorrhage and post operative complication. In the case study the scrotal incision was also left open for secondary intentional healing. This surgical procedure and protocol agrees with some authors such as (Mason *et al*., 2005) in which scrotal incisions were generally allowed to heal by second intention and left un sutured. Primary closure may also be performed, but this is not typically performed in the field.

Complications that results most of the time from castration includes; scrotal swelling, oedema, haemorrhage, omental herniation, eventration, penile trauma, bacterial infection of the spermatic cord (scirrhous cord formation), incisional infections, hydrocele formation, and peritonitis have been reported (Shoemaker *et al*., 2004). But in this case the predominant

complication observed was swelling of scrotum in the first two days and later regressed as day progress. A recent study (Kilcoyne *et al*., 2013) reported the overall complication rate of routine castrations in 324 equids to be 10.2% with only a 0.3% mortality rate but in recent study the animal was completely recovered and healed a few days after surgery except few swelling on the scrotum.

In conclusion castration of male equine is one of the routine and common surgical procedures in veterinary clinical practice. In this particular case report the mule was assessed for health status, restrained and aseptically prepared before incision. Finally the circular incision at the tip of testes was performed in through which both testes were removed after adequate ligation and was completely healed without threatening post operative complication. I strongly recommend that the procedure should have to be undertaken under aseptic procedure at best age and early morning.

3.6.3. Boar

Abstract

In most pig-producing countries in Africa, male piglets are castrated at a younger age not only to prevent boar's taint, but also aggressive behavior and difficulties in animal management. The present case report is aimed to describe castration of two boars of two months and four months-old york shire breed that were brought to Addis Ababa University Veterinary Teaching Hospital. The owner complained that boars have shown aggressive behavior in the farm and reluctant to be managed with continuously searching for mating saw. In addition the owner also wanted to sterilize and keep it for fattening for economic purpose. Before undergoing the procedure the boars underwent general physical examination. In addition the nature and status of both testicles were also examined and found apparently normal. Before commencing the castration the animals were physically restrained and adequate dose of 2% lidocaine (2% lidocaine hydrochloride 20mg/ml which is manufactured by jeil pharma. co.Ltd. Korea) was injected to both testes. The testis was also aseptically prepared for both cases and two sharp vertical incisions parallel to median raphae and single adequate incision were performed to exteriorize testicle for case 1 and case 2 respectively. The both testis was excised after ligating spermatic chord. Finally the incision site was left open for drainage and managed as open

wound management for both cases. The Barrows were completely healed after 10 days and increased its body condition gradually in addition to decreasing their aggressive behaviors.

Key Words: Boar, Open Castration, Testes

Introduction

Castration of animals has been under debate for many years (Henke and Ehrhardt, 2004). In animal breeding castration has been performed on animals intended for fattening with the purpose of removal of boar's taint caused by compounds such as androsterone and skatole which are produced in Leydig's cell of testis and large intestinal bacteria respectively to give the meat an offensive odour (Migdał *et al*., 2009). However, castration is one of the most controversial management practices in swine production, because it is usually performed without the use of preoperative anesthetics and/or analgesics (Kluivers-Poodt *et al*., 2012), and therefore causes intense suffering and stress to animals. Castration induces behavioral (Lavand'Homme, 2006; Hansson *et al.,* 2011), biochemical and endocrine changes (Sutherland *et al.,* 2012). Although these changes may be minimized by LA and analgesia, this is not yet a common practice worldwide (Hansson *et al.*, 2011).

Although intratesticular administration of local anesthesia may cause a painful additional stimulus to castration, Haga and Ranheim (2005) have shown that administration of lidocaine intra testicularly or in the spermatic cord in piglets was effective in reducing the nociceptive effects caused by orchiectomy. Over the years, many studies have been developed to reduce or prevent the stressful effects of surgical castration in pigs. However, the major obstacles to implementation of developed techniques in the industry are usually related to the economic impact or need of specialized technicians, which are not available in pig farms (Katz and McCartney, 2002).

In most pig producing countries in Africa, male piglets are castrated at a younger age not only to prevent boar's taint, but also aggressive behavior and difficulties in animal management (Carroll, 2006). There are strong indications that castration causes pain in piglets, not only during the procedure itself, but also for several days afterwards (Henke and Ehrhardt, 2004; Taylor *et al.,* 2001). Pain responses are produced when an incision is made in the skin, when

the testicles and spermatic cords are manipulated, and when the spermatic cords are cut. Piglet castration may be performed without any form of anesthesia or analgesia within the first seven days of life (Hay *et al.*, 2003. After that, it must be performed under anesthetic by a veterinarian and with additional prolonged analgesia. The case at hand describes the procedures and techniques implemented during boar castration at field level.

Case history and clinical examination: A Four (case 1) and two months (case 2) old York shire breed boars were brought to Addis Ababa University Teaching Veterinary Hospital for castration. The owner complained that boars have shown aggressive behavior in the farm and reluctant to be managed with continuously searching for mating saws. It also shoves and jumps over other pigs (case 1). In addition the owner also wants to sterilize and keep them for fattening and economic purposes. Before undergoing the procedure the boars underwent general physical examination. Accordingly, all vital physiological parameter were found within the physiological limit. In addition the nature and status of both testicles were also examined and found apparently normal. Finally, the boars were admitted for closed castration (case 2) and open castration (case 1) through opening of scrotum by surgical incision.

Pre operative preparation of the boars: After managing the animals the testicles were washed with saline water and soap thoroughly. Then the hair surrounding testis was shaved and was again washed with diluted chlorhexidine solution and the tail was held to one direction to minimize the contamination. Finally the area was scrubbed with iodine before incision in both cases.

Anesthesia and animal control: The local anesthesia was injected 5ml intra testicularly to each testis by using lidocaine hydrochloride (2% lidocaine hydrochloride 20mg/ml which is manufactured by jeil pharma. Co. Ltd., Korea) @10mg/kg in case 1 but not in case 2 due to the age difference, duration of procedure and manageability. Then the animal was kept in sterna recumbence by catching his hind limbs with animal attendants in both cases.

Surgical correction and treatment: After preparing the testicle aseptically and well restraining, adequate vertical skin incision was done parallel to median raphae onto each testicle by using sterile scalpel after pushing the testicles forward through the scrotum (Figure 16A for case 1) and only single vertical incision on the median raphae was performed in case 2. Thence the

testicular chords were gently pulled caudally as long as possible. Then testicular chord were severed after ligating with modified millers knot and severed caudal to the ligature in case 2 but not in case 1 in that the incision was extended to parital tunic and finally vascular and avascular parts are separately ligated. The opposite testicle was operated in same way in corresponding case in same manner. The incision site was checked for active bleeding before replacing, cleaned and left opens without suturing /closing/ to allow discharges. Finally the incision site was scrubbed with iodine solution and barrow was released.

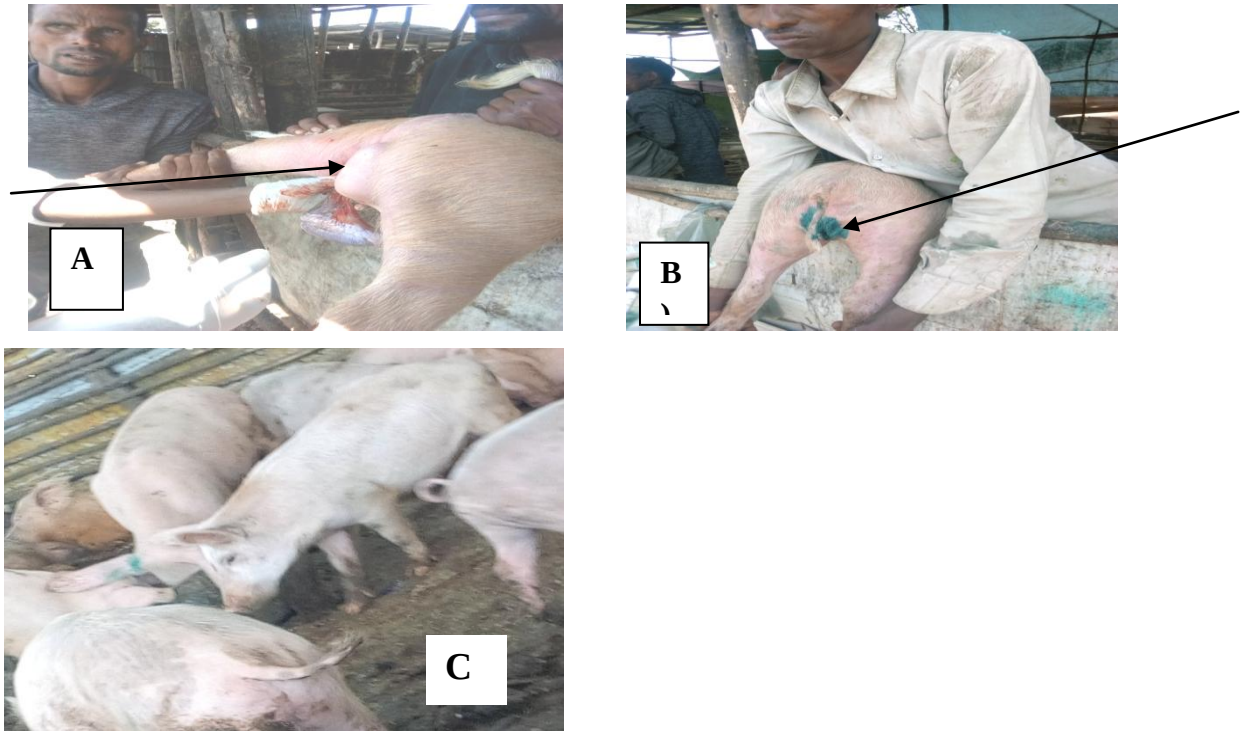


Figure 16: Open castration in boar and its surgical management

A) Exteriorizing left testes and progressive activity B) after castration and disinfection of around incision sites C) After fourty five days

Post operative care of boar and outcome: Post operatively the barrows were administered penicillin (24mg/kg) and dihydrostreptomycin sulphate (30mg/kg) (Pen &Strep® Norbrook UK) for two days. In addition the surgical site was regularly dressed and sprayed with suspension of wound spray (Figure 16B) for both cases. Not only these but also the regular monitoring of the barrows were advised to the client for any complication such as active and

prolonged hemorrhage. After 15 days of operation, the barrows were on good stage of incised wound healing without complications days and according to the report of owners barrows minimized their aggressive behaviors. Finally upon the follow up at 45 days (Figure 16C) later both and the rest barrows improved the body condition and in addition to improving their temperament.

Discussion

The boar was surgically sterilized in the form of open castration (case 1) under injection of local anesthesia to alleviate pain and distress to the animal by injecting adequate dose in to both testicles prior commencing surgery. This agrees with surgical protocol of Telles *et al*., (2016) in which the local anesthetic (LA) was used prior to castration and appears to have positive effects on long term weight gain of pigs, indicating that technique has both welfare for pigs and economic benefits for producers according to his findings. This scientific evidence also supported by (Prunier *et al.,* 2006) in that the pain induced by castration might elicit long-term neurophysiological changes, such as allodynia, hyperesthesia, hyperalgesia, paresthesia, and possibly peripheral and/or central sensitization, which would have negative effects on weight gain and these effects can be reduced by local anesthetics.

A 2% Lidocaine hydrochloride (2% lidocaine hydrochloride manufactured by jeil pharma. co. Ltd. Korea) can be used with either with or without adrenaline/epinephrine, (5-36 μg/ml)**.** The advantage of using adrenaline/epinephrine in addition to lidocaine is that the bleedings are reduced, and that the duration of the anesthesia is extended during boar castration. However, the risk of infections might be increased because of reduced blood flow in the tissue (Vanhonacker and Verbeke, 2011). These do not agree with the current case at hand in that even though adequate dose of lidocain was injected intra testicular it is without adrenaline. This was due to the short duration of the procedure and well controlling of hemorrhage by ligation of blood vessels during the procedure.

Surgical castration of piglets is carried out prior to weaning, most commonly within the first three days of life. Piglets may be restrained for castration in a variety of ways including suspension by the hind legs using a castration stand or another stockperson, placement in a V-trough, or being held with a hand or between an individual's legs (Rault *et al.,* 2011). After the

piglet is secured, either two vertical cuts or one horizontal cut is made to the skin of the scrotum, and the testes are removed by cutting the spermatic cord with a scalpel or pulling until the cord tears (Hewson *et al.,* 2007). This in turn also similar with the conducted castration procedure in that to adequate, vertical incision was done on each testicle after pulling foreward between thumb and index finger and then severed after ligating the spermatic chord.

Even though castration of piglet is less practiced in some countries such as UK, it is a common practice in many countries because it is performed to avoid boar taint in the meat of sexually mature male pigs and to reduce aggression toward other pigs and caretakers. In addition it can reduce boar taint which can cause an unpleasant smell and taste that is released when pork is heated (Quiniou *et al.,* 2012). Potential complications associated with surgical castration of boar include hemorrhage, excessive swelling or edema, infection, poor wound healing, and failure to remove both testicles. It has been suggested that surgically castrated barrows suffer from suppressed immunity, and exhibit higher incidences of inflammation, pneumonia and other diseases (Giersing *et al.,* 2006). In the present case there was no significant complication except little swelling at incision site in the first few days which was completely regressed after four days post operation.

In general castration of pigs can be conducted in closed and open method. It mainly performed to reduce boars' tent and improving the behavior in addition to sterilizing the reproductive tract. In this particular case report the boar was castrated at fourth month by closed castration under field condition and recovered without much surgical stress and post operative complications. Since then the barrow increased its body weight and improved its behavior. So I strongly forward that the pig should have to be castrated within first week, the best age and conducted under aseptic condition with adoption of post appropriate post operative care.

3.7. Exploratory Rumenotomy in Ewes

Abstract

Environmental pollution due to plastic materials is one of the growing problems for grazing animals due to absence of recycling industries and environmental cleaning cultures in addition to posing great problem to human health. The present case report is aimed to describe on two

ewes that were brought to Addis Ababa University Veterinary Teaching Hospital with the history of complete anorexia, wasting body condition especially post parturition, let loose for free grazing in the city area during entire day's hours routinely. External palpation of abdomen revealed a hard mass on the left side of the abdomen and low ruminal motility especially in the first case. Clinical examination of ewes also revealed pale mucus membrane, and hard impacted mass up on palpation of external left paralumbar fossa. Based on the history and clinical examinations, ewe was diagnosed as ruminal foreign body and decided to undergo rumenotomy through left upper flank approach after sedation with diazepam and infiltration of lidocaine on in inverted "L" fashion. Accordingly, the foreign material was removed from both ewes and then after the animals regained normalcy.

Key Words: Ewe, Foreign Body, Rumenotomy

Introduction

Environmental pollution is one of the growing problems for grazing animals due to absence of recycling industries and environmental cleaning cultures. The improper disposal of plastic bags in turn leads to ingestion of plastic bags by free grazing animals especially in towns and villages (Ramprapbhu *et al.,* 2002). These plastic bags are indigestible and their accumulation in the rumen of grazing animals and lead to adverse effect on health (Ghurashi *et al*., 2009). Plastic bags also resist biodegradation which consequently pollute environment for decades and even for centuries in addition to posing great risk to human health (Ramaswamy and Sharma, 2011).

Ruminants are notorious for ingestion of foreign bodies related to nutritional deficiencies and feeding management of the animals. They are the root causes for various problems in different organs of the animals (Kahn *et al*., 2005). The entry and migration of foreign bodies through the body tissues lead to many complications based on nature of the foreign body entrance into the tissues (Calfee and Manning, 2002). Reports from cattle and sheep reared in urban and sub-urban environments indicates that impaction of rumen from the accumulation of foreign bodies, such as plastic bags causes interference with the flow of ingesta leading to distention of rumen and absence of defecation (Igbokwe *et al*., 2003; Remi-Adewunmi *et al*., 2004; Radostits *et al*., 2007).

In Ethiopia, small ruminants that are kept under an extensive type of management are likely to be exposed to the ingestion of indigestible garbage from various sources due to a wide spread environmental contamination with plastic bags, absence of policy to protect environment and frequent occurrence of drought that predispose animals to nutritional deficiency and pica (Abebe and Nuru, 2011). Sheep with nutritional deficiencies may also ingest various types of foreign bodies deliberately. The indiscriminate feeding habits and mineral deficiency also makes them susceptible to inadvertent ingestion of foreign materials. Rumen impaction due to plastics, ropes and leather in the rumen leads to anorexia, decreased production and progressive loss of body condition (Semieka, 2010).

Clinical rumen indigestible foreign body impaction is characterized by pale mucous membrane, reduction of milk yield, complete cessation of rumination, impacted rumen, atony, reduced rumen motility, feces become scant and inappetance (Vanitha *et al*., 2010). The most common symptoms observed in animals with plastic bags were bloat and were exhibited by the abnormal bulging of the paralumbar fossa on the left side of the abdominal wall (Ramaswamy and Sharma, 2011). The objective this case report is to describe exploratory laparatomy through rumenotomy in two ewes due to foreign body impaction.

3.7.1. Case history and Clinical Examination

Case 1

A five years old ewe was brought to Addis Ababa University Veterinary Teaching Hospital after giving birth one month before. The ewe was presented with the history of complete anorexia, wasting body condition especially post parturition, let loose for free grazing in the city area during entire day's hours routinely. External palpation of abdomen revealed a hard mass on the left side of the abdomen and low ruminal motility of one cycle in 3 and 1/2 minutes. There was bruxism (teeth grinding). Clinical examination also revealed pale mucus membrane, and hard impacted mass up on palpation of external left paralumbar fossa, body temperature, heart and respiratory rate was within normal range. On the basis of history and clinical examination ewe was tentatively diagnosed as rumenal foreign body and confirmatory diagnosis was conducted by exploratory rumenotomy.

Case 2

A three years old ewe was brought to Addis Ababa University Veterinary Teaching Hospital with the history of complete anorexia, wasting body condition especially post parturition, let loose for free grazing in the city area during entire day's hours routinely. The owner also informed as the ewe ate and swallowed large plastic material with salt in the home and sown different clinical sign since then. External palpation of abdomen revealed a hard mass on the left side of the abdomen and low ruminal motility of one cycle in 3 minutes. There was bruxism (teeth grinding). Clinical examination also revealed pale mucus membrane, and hard impacted mass up on palpation of external left paralumbar fossa, body temperature, heart and respiratory rate was within normal range. On the basis of history and clinical examination ewe was tentatively diagnosed as rumenal foreign body and confirmatory diagnosis was conducted by exploratory rumenotomy.

3.7.2. Preoperative preparations

The ewes were with held from feed and water for 24 hours before coming for exploratory laparatomy. In both cases the patients were prepared aseptically for rumenotomy procedure. After the each patient was placed on right lateral position; the hair around the upper left paralumbar area was clipped in each case. Then the clipped area was shaved and finally scrubbed using diluted chlorhexidine solution as shown (Figure 17A). At the end sterile drape was placed and fixed by towel clamps on the proposed surgical site before final preparation of the surgeon in both cases.

3.7.3. Anesthesia and animal control

Both ewes were sedated with diazepam (manufactured by Intas pharmaceutical Ltd., India) @ 0.1mg/kg I.V and placed on right lateral position (Figure 17A case 1). Intravenous fluid line was set for Ringer's Lactate (Unique Pharmaceuticals Ltd., UK) at the rate of 1 drops/sec using the jugular vein. Local anesthesia was achieved with inverted "L" block technique using 2% lidocaine hydrochloride (2% lidocaine hydrochloride jeil pharma. co.Ltd., Korea) with dosage rate of 10mg/Kg approximately 1ml/1cm distance.

3.7.4. Surgical procedure

After aseptically preparing the surgical sites, routine laparotomy and rumenotomy procedures were performed on ewes by using chemical and physical method of restraining in both cases. In both case upper flank approach approximately a distance of 3-5cm from last rib and ventral to the transverse process of lumbar vertebrae were used for incision sites. Then the skin and the three muscular layers of the abdominal wall (external oblique, internal oblique and the transverse abdominal) and peritoneum were incised (Figure 17B) and the rumen fixed by stay sutures using a thick nylon line; maintained by two assistants and pulled over the flank incision (figure 17D).

Rumen wall was incised in about 15cm longitudinally in the vertical direction on the dorsal compartment away from blood vessels area; so that rumen was explored and large sized foreign bodies (plastic material) was removed (Figure 17C for case 1) majorly from rumen which weighing about 3.5Kg and 1kg in case one and case 2 respectively. Then rumen and reticulum was further explored for foreign bodies if there was any and in addition some impacted feeds were removed with in both cases.

Figure 17: Surgical progression of exploratory laparatomy in ewe and its Outcome

A) Surgical site preparation and animal management B) Entering in to abdominal cavity on progress C) leathery plastic materials removed from rumen D) Closure of rumen on progress E) after closure of abdominal wall F) After 20 days of operation

Thence, the ruminal incision site was cleaned from ingesta and sutured with chromic cut gut 2-0 size in lambert followed by Cushing with the same suture material on both cases. After closing the rumen wall, the hand was gloved with other surgical glove after removing the former one. After that the peritoneum and transverse muscle was sutured with simple interrupted suture pattern using vicryl 2-0 size. Then two oblique muscles and subcutaneous tissues were sutured with vicryl 1-0 in ford interlocking fashion in both cases. Finally, the site of skin incision was closed with simple interrupted pattern by using silk 2-0 size (Figure 17E for case 1) and cross mattress for case 2 with same suture material.

3.7.5. Post operative care of ewes and outcome

The ewes were administered antibiotics by using oxytetracycline 10% at dosage rate of 10mg/kg (oxytetracycline 10% Chongking Bull animal pharmaceutical Co. Ltd., China) I.M for three days post operation. The surgical sites were scrubbed with antiseptics genital violet. The surgical wounds were dressed daily for 3 days. In addition the owners were advised to decrease feed supplementation in quantity for first weeks and gradually increased. Not only these but also advised to report always cases promptly, clear off polythene materials and iron sheets by burying in to the ground and supplement the diet of the flock with salt lick as a source of mineral supplement. Skin sutures were removed and scrubbed with diluted iodine solution on 12^{nd} postoperative day in case 2 and 20 days in case 1(Figure 17F). The animals were recovered successfully and gained back normalcy.

Discussion

Presence of foreign body such as plastic bags and other indigestible materials found in ruminants could pose serious health problem among free grazing animals (Abebe and Nuru, 2011). These findings agree with the present cases in that there were emaciation and debilitation due to the presence of plastic materials found in the rumen of ewes. The most commonly observed clinical sign during the case presentation includes emaciation, pale mucus

membrane, scanty feces, anorexia, rough hair coat and distended abdomen among animals affected by foreign bodies. These results were in agreement with the studies conducted by (Bakhiet, 2008) in which animals with indigestible foreign body cannot able to digest feeds normally so that prone to feed deficiency which can be manifested by different clinical signs.

In this study, a major part of the foreign body was in the rumen while the small part was removed from the reticulum especially in case 1. This finding was in general agreement with the findings of (Roman and Hiwot, 2010; Abebe and Nuru, 2011; Tesfaye *et al.,* 2012) which may be attributed to the larger rumen volume and the cumulative size/s. Surgical removal of foreign body from ewes improved the body condition, feed intake and well being. This finding agreed with experimental study conducted by Ghurashi *et al., (*2009) who concluded that, surgical removal of the foreign body did improve the health of the animals under investigation in addition to increasing feed intake and weight gain during the following weeks.

Initially, due to ruminal contractions, polythene bags/plastics accumulated in rumen will get entangled with each other leading to the formation of hard mass. Later on, this hard plastic mass obstructs the orifice between reticulum and omasum thereby causing hindrance to the ruminal movements. Over a period of time, this hard plastic mass leads to decrease in rumen motility and thereby cause ruminal atony and ruminal impaction (Singh, 2005; Vanitha *et al.,* 2010). There was no major post operative complication on ewes. This finding disagree with the findings conducted by Sileshi *et al.,* (2013) in which the postoperative surgical complications were occurred due to poor health status of animals used, broken asepsis during surgery, wrong use of instrument, poor surgical techniques and dirty pens which they were kept after surgeries.

In conclusion, ruminal foreign body is one of the GIT problems in ruminants due to their feeding behaviors in both urban and rural areas especially where waste disposal is regulated at grass root level. In these both case reports the ewes were undergone rumenotomy and found with variable sizes of plastic materials. After removing rumenal and abdominal wall was sutured with appropriate suture patterns and techniques and the ewes were recovered from the problem and increased in body conditions. So recommend that once the case occurred it should have tobe managed early before the animals are emaciated and immunologically compromised.

3.8. Second Degree Perineal Laceration Repir in Jennys

Abstract

Perineal lacerations in domestic animals typically occur following parturition and involve the structures within the perineum mainly due to dystocia. The present case report is aimed to describe second degree perineal laceration management on two local breed jennys that were brought to Donkey Sanctuary Veterinary and Dire Clinic with dystocia. The clinical examination for status, live and presentation of the fetus through vagina, revealed complete opening of the cervical canal in which the some parts of dead fetus were trapped and visualized externally. Finally the case managed by relaxing the flexed neck and gently pulled through the birth canal and fortunately the perineum was lacerated in the form of second degree perineal laceration in both cases. After aseptically preparing and trimming of the mucosa of the right side of vagina were realigned and sutured using vicryl (Ethicon) of appropriate size. Vulval lips were reconstructed in two layers, first layer involving the musculature by using vicryl 2.0 size in the form of simple continuous suture pattern starting from cranial to caudal on lacerated part and followed by vulvar skin suture using 1.0 sized vicryl (Ethilon) subcuticularly. Finally the area was cleaned with water and scrubbed with iodine solution on suture site and sent home the same day as operation. Finally the Jennies were recovered successfully after a month.

Key Words: Jenny, Parturition, Perineal Laceration

Introduction

Perineal lacerations in domestic animals typically occur following parturition and involve the structures within the perineum. The perineum is defined as the region between the tail and the ischiatic arch; especially the region between the anus and genital organs, which is bounded ventrally by the pelvic symphysis, laterally by the ischial tuberosities, and dorsally by the coccygeal vertebrae (Blood *et al.,* 2007). Perineal lacerations typically occur during unassisted foaling, and primiparous mares, jenny and cows are particularly susceptible to injury during parturition (Kazemi *et al.,* 2010). The prominence of the vestibule-vaginal sphincter and remnants of the hymen in mares and Jennies foaling for the first time are responsible for most of these injuries because the foal's hooves catch on the dorsal transverse fold of the vestibule-

vaginal junction, and the mare's abdominal press during parturition forces the foal's foot into the roof of the vestibule (Brinsko *et al.*, 2011).

Perineal injuries are classified into first-, second-, and third-degree lacerations, according to the location, extent and severity of tissue damage (Woodie, 2006; Hospes and Bleul, 2007). First-degree perineal lacerations involve only the skin and mucosa of the vagina or vestibula. Second-degree perineal lacerations involve vestibular mucosa and submucosa, skin of the dorsal commisure of the vulva, and perineal body musculature, including the constrictor vulva, but there is no damage to rectal mucosa (Adams and Fessler, 2000). Third-degree perineal lacerations occur when there is tearing through the rectovestibular septum, musculature of the rectum and vestibule, in addition to the perineal body (Hendrickson, 2007).

Perineal lacerations occur recurrently in mares due to foaling strain. The timing of the operation and the severity of the lesion can determine the surgical managements. First degree perineal lacerations usually involve only the mucosa of the vulva and vagina and they are often unnoticed without close examination after parturition (Schonfelder and Sobiraj, 2004). Meanwhile, second degree perineal lacerations extend into the submucosa and muscularis layer of the vulva and vagina, the anal sphincter and the perineal body which compromise the ability of the muscles to constrict the vestibule and can predispose the animal to pneumovagina and urine pooling (Mohamad *et al*., 2013).

Lastly, third degree perineal lacerations will include the rectovaginal septum, the muscles of the vagina and rectum, and the perineal body. They usually create a common rectal and vestibular vault, permitting direct faecal contamination that result in bacterial infection of the vagina, cervix, and uterus (Ghamsari *et al.,* 2008). Dystocia is one of the problems that could lead to the occurrence of perineal lacerations. Fetal mal presentation is one of the causes of dystocia whereby the fetus is not in the normal presentation, position and posture which is in an anterior longitudinal presentation, with dorso-sacral position and extended head and extremities or neck flexion (Purohit *et al.,* 2012). This case report is aimed to describe the surgical managements of second degree perineal lacerations in two Jennies with dystocia.

3.8.1. Case history and clinical examination

Case 1 and Case2

Five and seven years old, local breed Jennies were brought to Addis Ababa University, Donkey Sanctuary Veterinary Clinic and Dire Veterinary Clinic due to dystocia respectively. The problem was stayed for more than fifteen hrs and ten hrs before they reached the clinic and were manually tried to pull fetus forcibly at home. When undergone examination for status, live and presentation of the fetus through vagina, there were complete opening of the cervical canal in which the flexed neck of the dead fetus was trapped in the former unlike the later. Upon additional physical examination, Jennys were dull and depressed. Their vital parameters were within normal range but temperature was 39.7 ^{o}c and 39.90 respectively. Apart from that, their mucous membrane was pink with prolonged capillary refill time (CRT).

Finally the cases were managed by relaxing the flexed neck (former) and gently pulled through the birth canal leading to the expulsion of the dead fetus from each jenny as shown in (figure 18D for former).and fortunately the perineum was lacerated extending from ventral aspect of anus to the dorsum of the vulva and vagina (Figure 18A) in each case but did not extended to involve the anus or the rectal wall. Based on the condition both lacerations were diagnosed as the second degree perineal laceration and decided to be managed through surgical repair.

3.8.2. Pre operative preparation of the Jenny

In both cases the area was trimmed for the alignment and washed with saline water and soap thoroughly after administering epidural analgesia. Thence, the area was washed with mild antiseptics (chlorhexidine solution) and ready for surgical correction. The needle placement for epidural injection was also shaved and disinfected with savlone or chlorhexidine solution. The tail of animal was also held away from the median tied to minimize contamination and tail twitching during surgical procedure after raping with gauze.

3.8.3. Anesthesia and animal control

After preparing the lacerated vaginal wall in aseptic manner, the Jennies were administered with 2% lidocaine hydrochloride (2% lidocaine hydrochloride by jeil pharma. co.Ltd. Korea) at dosage rate of 1ml/100kg by using the 16G needle between first and second intercoccygeal

space (Brinsko *et al.*, 2011). Both animals were kept in standing position throughout the procedure in appropriate direction (Figure 18B for case 1) thought out the surgical procedure.

5.8.4. Surgical correction and treatment

Once the area was prepared aseptically and trimmed, the mucosa of the right side of vagina was realligned and sutured using vicryl (Ethicon) of appropriate size in both case with two and three layers of closure in case 1 and case 2 respectively. Vulval lips were reconstructed in two layers (for case 1), first layer involving the musculature by using vicryl 2.0 size in the form of simple continuous suture pattern starting from cranial to caudal on lacerated part and followed by vulvar skin suture using 1.0 sized vicryl (Ethilon) subcuticularly as shown on (figure 18C for case 1).

Figure 18: Second degree perineal laceration and its surgical management
A) Perineal laceration before closure B) Adminstration of lidocain into 1st inercoccygeal space C) After closure of perineal laceration E) Large sized expelled dead fetus

But in case two the skin skin layer is additionaly sutured with simple interrupted manner to prevent the wound dehiscence that was observed in case 1. Finally the area was cleaned with

water and scrubbed with iodine solution on suture site and sent home the same day as operation.

3.8.5. Post operative care of Jenny and outcome

After the operation has been accomplished the jenny was administered flunixin meglumin (Banamine®) dose rate of 2.2mg/kg intramuscularly for 2 days for case 1 in addition to antibiotic and fluid therapy by using one liter of Lactated ringer solution IV @10ml/kg/hr. Broad spectrum antibiotics penicillin (24mg/kg) and dihydrostreptomycin sulphate (30mg/kg) (Pen &Strep® Norbrook UK) were injected for two and five successive days for case 1 and 2 respectively. In both cases the owners were also advised to inspect and monitor the urination status and any discomfort felt on Jennies in addition to following the general condition of the wound. Post operatively the superficial layer of suture was sloughed with surrounding skin on second day but not in case 2. Finally the Jennies were recovered successfully after one month.

Discussion

Surgery of the perineum and vagina should be done to restore the fertility of the animal rather than to achieve cosmetic effect. Injuries due to parturition and breeding, and the resultant complications constitute the majority of indications for surgical management of problems of the perineum and vagina (Baipoledi, 2001; Larson, 2012). Reconstruction of second degree perineal laceration (vulvo-vaginal) was performed in a standing position under the effect of caudal epidural anesthesia. This finding agrees with that report of (Farag *et al*., 2000; Mosbah, 2012). However, some studies (Saleh *et al*., 1988; Saini *et al*., 2013) used dorsal recumbence under effect of general anesthesia. Adams and Fessler, (2000) mentioned that dorsal positioning of the cases completely distorted the anatomical relations, and thus is not recommended.

A first degree laceration typically does not require any surgical intervention as the mucosa can heal very fast. However, caslick procedure may be opted if the skin of the dorsal aspect of the vestibule is involved (Ghamsari *et al.,* 2008). But in a second degree perineal laceration, large blood vessels that are located at the dorsolateral vessels or region of the vaginal birth canal may be affected (Larson 2012). Thus, the hemorrhage should be controlled by either ligating the blood vessels or clamping using hemostat for 24 hours. Then, vestibuloplasty can be done to

reconstruct the perineal body before proceeding to caslick procedure on the vulva in order to prevent the occurrence of pneumovagina (Brinsko *et al.*, 2011). However, in the present case report only simple continuous suture pattern followed by vulvar skin suture using 1.0 size Ethilon in subcuticular suture pattern was performed.

Lacerations of perineum can be noticed during parturition of heifers and during faulty obstetrical techniques (Farhoodi *et al.*, 2000). This also agrees with the current case report in which the laceration was occurred during parturition. For the success of this surgery, proper selection of the suture material is fundamental. Vicryl (polyglactin 910) is a strong, delayed absorbable and synthetic suture with excellent tissue compatibility. Various suture materials have been used for repair of second degree vulvo-vaginal lacerations by different authors such as monofilament nylon (Dabas *et al*., 2011), chromic cat gut (Woodie, 2006), polyglycolic acid (Kazemi, *et al*., 2010), polydioxanone (Karrouf and Zaghloul, 2003; Mosbah, 2012) and polyglactin 910 (Farag *et al*., 2000; Mehrjerdi *et al*., 2010).

In the present case management the problem was surgically corrected soon after the laceration due to forceful expulsion of the dead fetus through the vaginal canal without delay for for formation of granulation tissue and epitelilization of the wound. This did not agree with some surgical treatment protocol (Abdullah *et al.*, 2014) in which reconstruction was executed once the inflammation was subsided and granulation tissue appeared at the injury. But the reconstruction of wound in the present case yielded good apposition of wound edges without causing any unpleasant appearance.

In conclusion various degrees of perineal laceration is reltively common in femle equines than other cloven hooved animals and the situation is occurred consequent to dystocia. The present cases are occurred in the form of second degree perineal laceration due to dystocia. The cases were successfully managed and restored the anatomical distortion. So I strongly recommend as the cases of such problem should have to be managed early by using absorbable suture materials in three layers of closure. Inaddition, if there was a dead fetus it should have to be assisted with fetotomy wire rather than merely pulling the fetus for expulsion and assisting dam.

3.9. Wound Management Due To Hyena Bite in jenny

Abstract

Wounds of different forms are amongst one of the common health concerns to afflict working donkeys in many countries. The case at hand briefly describes the open wound management of hyena bite in donkey on five years old local breed jenny that was presented to the Addis Ababa University, Donkey Sanctuary Veterinary Clinic, Bishoftu, Ethiopia following a hyena bite over posterior body part which was traumatized in the form of avulsion of the skin including the dermis and fascia of the upper quarter of left part of hind leg unilaterally. The wound edges were irregular and wide to estimate (close) but almost. Depending rigorous and thorough clinical examination the cause was diagnosed as avulsion type of open wound and was managed as open wound management. After preparing the surgical site, the wound was thoroughly irrigated with normal saline to remove all dirt, loose and unviable flesh was trimmed. Since there was loss of part of tissue and wide to close, it left as open wound and will heal through second intention of wound healing. Finally, the peripheral area of the wound was pasted with Zinc oxide followed by regular debridement; lavage and dressing with antiseptics until nearly healed leaving the wide scar of connective tissue at the affected part.

Keywords: Hyena Bite, Jenny, Open Wound

Introduction

Donkeys are economically very important animals in Ethiopia. The low level development of the road transport network and the rough terrain of the country makes the donkey the most valuable, appropriate and affordable pack animal under the smallholder farming systems of Ethiopia (Gebrewold *et al*., 2004). There are an estimated 1.8 million horses, 377,000 mules and 4.3 million donkeys working in Ethiopia harboring the largest population of donkeys in Africa and the second largest donkey population in the world after china (Anon, 2007). However, due to apparent lack of awareness by the owners, donkeys in Ethiopia suffer from a multitude of health, management and welfare problems (DFID, 2006).

A wound is a breakdown in the protective function of the skin or loss of continuity of epithelium, with or without loss of underlying connective tissues, muscles, nerves, bones following injury to the skin, surgery, a blow, cut, chemicals, heat, cold, friction, shear force, pressure or diseases such as leg ulcers or carcinomas (Velnar *et al.,* 2009; Fernandez and Griffiths, 2015).Wounds of different forms are amongst one of the common health concerns to afflict working donkeys in many countries (Pritchard, *et al.,* 2005). Similarly, the study on donkey in Ethiopia has demonstrated that back sores and other wound forms are the most commonly observed health problem and potential cause of equine wounds are almost endless: punctures from sharp object like metal and glass; shear wounds from barbed wire sticks; collusion injuries from falling or running in to the object, horn thrust and hyena bites (Tesfaye *et al.,* 2005; Curran *et al.,* 2005).

Due to the donkey's nature and the environment in which it lives, wounds frequently involve a significant amount of tissue trauma (Samantha *et al.,* 2010). In addition to mechanical injuries due to inanimate objects such as car accidents, kicks, hyena bite are also common resulting from minor laceration to deep avulsion on exposed body parts especially in developing countries where management is poor especially at night (Theoret, 2008). As a result, equine ambulatory practitioners typically see a relatively large number of cases presenting for wound care. Enormous variation exists in treatments, medications, bandages, and bandaging techniques applied to wounds in horses and donkeys (Gomez, 2008). The case at hand briefly describes the open wound management of hyena bite in donkey.

3.9.1. Case history and clinical examination

Five years old local breed female donkey was presented to the veterinary Teaching Hospital, Addis Ababa University, Donkey sanctuary veterinary clinic, following a Hyena bite over posterior body part (Figure 19A) nine hours before. The donkey was traumatized in the form of avulsion of the skin including the dermis and fascia of the upper quarter of left part of hind leg and few parts of perineum characterized by deep lacerations and few contusions to the lateral thigh. The wound edges were irregular and wide to estimate (close) but almost fresh (Figure 19A). Fortunately the wound was unilateral and the donkey able to walk. The physical examination parameters were examined. Accordingly, the temperature, respiratory rate, heart

rate and pulse rate were 38.5º C, 72 breaths/min. 50beats/min and 52/min respectively. All were within physiological limit. The mucous membrane was pink. Its weight was estimated as 200kg. Depending clinical examination the cause was diagnosed as avulsion type of open wound and was managed as open wound management as follows (Figure 19B).

Figure 19: Open wound management in jenny due to hyena bite
A) Wound presented to the Donkey Sanctuary Veterinary Clinic
B) After cleaning, washing, shaving and pasting with zink oxide at wound edges

3.9.2. Pre operative preparation

After physical restraining and stabilizing of the animal with the hair surrounding the periphery of the wound was shaved and washed with water and soap.

3.9.3. Anesthesia and animal control

Animal was physically restrained with lifting one of his forelimb and keeping in hanged position by his owner. In addition the animal was sedated with detomidine hydrochloride at dosage rate of 40mcg/kg I.V in to juguilar vein. The operation was conducted in standing position.

3.9.4. Surgical correction and treatment

After preparing the surgical site, the wound was thoroughly irrigated with normal saline to remove all dirt, loose and unviable flesh was trimmed. Since there was loss of part of tissue and wide to close, it left as open wound and will heal through second intention of wound healing.

Finally, the peripheral area of the wound was pasted with Zinc oxide (Figure 18B). After finishing the procedure the jenny was sent home.

3.9.5. Post operative care and outcome

The wound was regularly debrided, lavaged and dressed frequently with antiseptics until nearly healed leaving the narrow scar of connective tissue at the affected part after two months. The donkey was administered penicillin (24mg/kg) and dihydrostreptomycin sulphate (30mg/kg) (Pen &Strep® Norbrook UK) I.M for three days. The wound was applied fly repellant by using sterile Vaseline at the wound periphery. The owner was also advised to maintain the cleanliness of the surgical site from contamination. In addition the owner was advised to inspect the overall discomfort and status of the wound in addition to providing well built shelter for his animal which is wild animal proof. Finally depending on the phone communication the donkey was successfully healed and given birth after three months of hyena bite and management. The phone calling was preferred due to the location of the owner and every wound management was conducted at nearby veterinary clinic by veterinarians.

Discussion

The current case at hand is characterized by wide area and avulsion type of wound in which the wound was difficult to close and only intended to be managed as open wound for second intention wound healing. This does not agree with wound management of the horse by (Hansen, 2008) Hassen K (2000) in which primary repair of the wound is the preferred treatment for wounds that involve detachment of skin with maintenance of an intact blood supply rather than secondary healing. Because, tissue integrity and perfusion, wound repair processes, and bacterial challenge and host responses heavily influence infection if left open. Excessive tension of sutured skin often also lead to complications of healing because of local ischemia with pressure necrosis of the surrounding skin and the pull through of sutures at the skin edge with subsequent wound disruption (Singer *et al*., 2003). But this supports the current case management in which the wound was left open without suturing.

The current case was mechanical injury due to hyena bite. Similarly the study conducted by Addis and Tesfaye (2017) had found that hyena bite in working donkeys were very common

and sever in the same locality. Hyenas seem to consume domestic prey species in the Ada'a district indicating the virtual absence of wild prey species. Hyena bite may cause loss of tissues and or even death of the donkeys depending on the severity of the wound. However, the survived donkey from hyena bite was extremely painful, stressful and undoubtedly the most critical welfare issue facing donkeys with varies degree wound encountered at different anatomical site (Singh *et al.*, 2005).

The common anatomical site of bite was thigh and perianal muscle areas this might be due to quantity and quality of muscle. Whereas, limbs was unlikely to be bitten by hyena which might be due to low quality of muscle and during kicking the limbs was upward to kick hyena posing less susceptible to be bite (Addis and Tesfaye, 2017). This ideas and suggestion also agreed with the case in which the donkey was bitten at the upper thigh and perineum area which may be due to presence of different muscles. Both surgical and traumatic wounds can fail to heal and become chronic but traumatic wounds are more commonly affected by healing difficulties. In addition, large number of horse ad donkey trauma wounds progress to chronicity making wound healing management plans more complex (Collins *et al*., 2000). These facts agree with the current wound in which the wound was healed leaving large scar of connective tissues after few months.

To some up mechanical injury to integumntaries of donkey; particularly hyena bite of kin and associated structure is one of the clinical conditions encountered in veterinary practice. However hyena bite can be managed by different methods; either in open or closed method of wound management. In the present particular case, hyena bite in the form of avulsion was brought to clinic managed in the form of open wound management and finally healed leaving scar tissue.

3.10. Horn Amputation in Cattle

Abstract

Dehorning or disbudding is the process of removing or stopping the growth of the horns and horn producing tissues after the horns have formed from the bud by different methods which can match to the size of the horn and the age of the animal for optimum effectiveness. The

present case report is aimed to describe surgical procedures, techniques of horn amputation and its management on six years old local breed cow that was referred to the Veterinary Teaching Hospital (VTH), Addis Ababa University from nearby Hidi Veterinary Clinic. History stipulated as the cow was treated several times but didn't respond as the condition was getting worse. Finally based on the history and clinical observation, the case was diagnosed as suppurative frontal sinusitis. After aseptic preparation of the surgical site, stabilizing the animal and locally desensitizing the incision area an elliptical skin incisions with a distance of approximately (~1cm wide) around the base of right horn was done for successful removal of corium. Finally Skin edges were partially apposed to assist the skin contraction by using the silk 2-0 size in horizontal interrupted mattress. The area was properly bandaged with elastic bandages and properly secured to the normal horn and admitted home. With successive dressing, bandaging and lavaging of the dehorned site, the cow was successfully recovered after two months.

Key Words: Cow, Dehorning, Horn Injury

Introduction

Horns are the pairs of hard, bonelike, permanent growth projecting from the heads of cattle. They grow from a unique area of skin cells at the base of the horn. At about two months of age, horns become attached to the frontal bone of the skull (Gottardo *et al.,* 2011). A sinus lies within the skull beneath the horn bud. As the horn grows and attaches to the skull, this frontal sinus joins into the adjacent portion of the horn (Braun *et al*., 2010)**.** Dehorning or disbudding is the process of removing or stopping the growth of the horns and horn producing tissues after the horns have formed from the bud by different methods which can match to the size of the horn and the age of the animal for optimum effectiveness (Anderson, 2009). The principal reason for dehorning is to remove the risk of injury to other animals in the herd or to people working with the cattle. Introducing a horned animal in a polled herd is poor judgment and cows with horns often sell at reduced prices (Vickers *et al.,* 2005).

The horns of cattle are the unique adaptations of the skin. The horn generating cells are located between the junction of horns and skin known as the corium, which is the site for horn

production (Ward and Rebhun, 1992). Horns begin as buds within the skin of the poll. At approximately 2 months of age, the horn buds become attached to the periosteum of the frontal bone overlying the frontal sinus. As the horns grow, the cornual diverticulum of the caudal portion of the frontal sinus extends into the most proximal portion of the horn (FAW, 2006). The cornual nerve, a branch of the Trigeminal nerve (cranial nerve V), provides sensation to the skin of the horn/horn bud region. Injection of a local anesthetic around the cornual nerve as it traverses the frontal crest and desensitizes the area (Godinho and Getty, 1975; Hoffsis, 1995).

If dehorning is not properly done with removal of the whole corium, then horns can start regrowing (Jesse *et al.,* 2016). Similarly, improper dehorning especially at an older age predisposes to frontal sinusitis in the calves (Drake and Phillips, 2006). Infection is a possible complication arising from dehorning, but this occurs mostly following invasive procedures that expose the sinus cavity to the external contaminated environment. Furthermore, the use of surgical and non-surgical instrument, including knives, Barnes (gouge) dehorners, obstetrical wires, Keystone (guillotine) dehorners, and saws may increase the risk of infection during dehorning (Faulkner and Weary, 2000).

Normally, the wounds heal well without treatment after dehorning. However, the dehorning procedure may cause several post operative complications including bleeding, bacterial infections and fly contamination. Operative animal requires 30-60 minutes for bleeding observation after dehorning and tourquents, clamps or electric cauterizing help to reduce blood loss. For prevention of fly contamination, fly repellent is advisable for 10-14 days (Cattle, 2012). Besides that, sinusitis is a complication of dehorning and an exclusive risk in older calves (Anderson, 2009). Sinusitis in cattle typically involves the frontal or maxillary sinus. Frontal sinusitis is generally associated with dehorning and maxillary sinusitis with infected teeth. This case report is aimed to describe the surgical management of horn in cow due to frontal sinusitis as sequela to trial of dehorning by sharp material is described.

3.10.1. Case history and clinical examination

Six years old healthy local breed cow with a medium body condition was presented to Hidi Veterinary clinic one month before and referred to the Veterinary Teaching Hospital (VTH),

Addis Ababa University, Ethiopia. In the former veterinary clinic, the cow was treated with oxytetracycline injection (20mg/kg) intramuscularly for three days at one day interval but after one month, pus was still oozing out of the wound without regressing. After two weeks, the owner understood that the wound did not heal properly and the dehorned site was septic and finally referred to VTH. The owner also complained of discharging of pus around the right horn following trauma around base of the horn by sharp instrument (knife) for dehorning purpose at their home. When clinically examined, the right horn was partially sawed (cut) but the majority of the horn structure is uncut and there was oozing of unpleasant discharge (serous to purulent) in content through the opening as shown on (Figure 20A).

The cow tries to mutilate her horn to inanimate object frequently there was no cauterization of the horn since as a major for wound healing. The depth of the affected horn would measure approximately (3cm in diameter x 6cm in depth) and was observed near base of right horn. There was swelling and pain with signs of vocalization on palpation of the wound area. Further close examination of vital organ parameters such as heart rate, respiratory rate, pulse rate and mucous membrane revealed within physiological limits. Finally based on the history and clinical observation, the case was diagnosed as suppurative frontal sinusitis and decided to be managed surgically by unilateral horn amputation.

3.10.2. Pre operative preparation of the cow

The cow was restrained adequately and the circumfrancial skin surface of the base of right horn was prepared aseptically by washing with soap and water. Thence the hair was shaved with blade and cleansed thoroughly with diluted Chlorhexidine solution. Finally the area was scrubbed with iodine solution and dried before readying for dehorning.

3.10.3. Anesthesia and animal control

The cow was properly immobilized with the combination of physical and chemical method. Physically, the cow was handled with bull handle by personnel and kept in well built crush which adequately restrains the cow. Chemically, the cow was regionally anaesthetized with two per cent lidocaine (2% lidocaine hydrochloride 20mg/ml which is manufactured by jeil pharma. co.Ltd. Korea), loaded in a syringe with 18 gauges, 1-1.5 inch needle, 6ml/side is injected half

way between the lateral canthus of the orbit on upper third and base of the horn just under the shaft of frontal crest to block the cornual nerve (Figure 20B) and waited for 5minutes. In addition the cow was sedated with diazepam (manufactured by Intas pharmaceutical Ltd., India) @ 0.1mg/kg I.M.

3.10.4. Surgical correction and treatment

After well securing, managing and keeping the cow on appropriate direction, elliptical skin incisions with a distance of approximately(~1cm wide) around the base of right horn was done for successful removal of corium (Figure 20C). Then active bleeding was occluded by tamponade and ligation of major vessels in addition to splashing with adrenaline on bleeding site. Further the skin was bluntly and gently detached from the bone by scissor and retracted rostrally to get the skin flap and make it easy for sawing the horn. Thence after adequately exposing the proximal part of the bone and horn base, the base of the horn below the corium was cut with dehorning saw and the subcutaneous tissues hanging the detached horn were cut by surgical blood and removed with the corium.

After that the frontal sinus was exposed and detected for any gross pathological findings (Figure 20C). Up on holding and lowering of the dehorned horn part to one side and an intact one to upper there was a little cascade of clear to serous discharge from the cavity. Then the cavity was washed with sterilized water and cleaned with gauze. Skin edges were partially apposed to assist the skin contraction by using the silk 2-0 size in horizontal interrupted mattress. The area was properly bandaged with elastic bandages as a second layer after well padding the opening with cotton sandwiched in between large gauze and soaking with weak iodine solution as primary layer. The area was properly secured to the normal horn and admitted home (Figure 20D).

Figure 20: Dehorning and its surgical procedure in local breed cow

A) Presentation of case B) Administration of lidocaine to block corneal nerve

C) Cutting the injured horn D) Putting bandage on dehorned horn base E) After four months

3.10.5. Post operative care and outcome

Few bleeding was noticed following the horn amputation but it is normal and helps to clean the wound unless continued for long period. As there was a difficulty to appose the skin flap completely on the base of the horn after dehorning it was properly bandaged with elastic bandages and dressed regularly on some day's interval. The dressing of the wound was done at three, fifth, seventh days up to fourteen days until healed. Penicillin (24mg/kg) and dihydrostreptomycin sulphate (30mg/kg) (Pen &Strep® Norbrook UK) was also administered I.M for four days post operation at Hidi veterinary clinic due to nearby veterinary clinic to the patient. Fly repellant was also done around the wound by using sterile Vaseline. The owner was also advised avoid leaving cow in the yard after dehorning but need to put onto good nutrition to facilitate wound healing. After two moths the cow was healed completely and at four months of follow up the cow improved in body weight as observed on (Figure 20E).

Discussion

Dehorning is a delicate procedure that requires professional skill and expertise because; poor technique and management of wounds may result in ample complications that will lead to septicemia and may be death of the animal in addition to delayed healing (Jesse *et al.,* 2016). Several dehorning methods such as using chemical agents, including sodium hydroxide and calcium hydroxide are commonly used for the purpose of burning the corium (Vickers *et al.,* 2005). Similarly, electric hot-iron device is also used on calves up to twelve weeks of age. However, this method has certain drawbacks as it is also considered to be relatively painful. But in adult ones it is not advisable rather using other methods such as dehorning wire and saw after administering appropriate local anesthesia and sedation (Doherty *et al.,* 2007). This agrees with the current case management in terms of age and surgical management.

During dehorning the removal of the skin corium by cutting with detached horn is crucial unless it will regrow again and promote infection in unhealed wound (Faulkner and Weary). This idea also agrees with the performed dehorning in which the corium was properly removed but healed after few months. Some research also reported that the use of Barnes dehorners, knives, Burners, tubes, guillotine dehorners, saws and obstetrical wire all may increase the risk of infection after dehorning (Hoard and Allenstein 1993; Drake and Phillips 2006). In this case,

the farmer used a saw to dehorn the cow and complications arose from the improper procedure, resulting in the development of frontal sinusitis.

Furthermore, the infected wound was not properly treated and managed except administration of systemic antibiotics. During dehorning, some behavioral signs observed include: head movement, tail wagging, tripping and rearing (Faulkner and Weary, 2000). However, head rubbing, head shaking, extension of the neck; ear and tail flicking, and reduced rumination are postoperative signs and similar signs also reported by (Sutherland *et al.,* 2002). In this case report, due to the infection of the wound, there was unpleasant discharges and pain with signs of reaction and reluctance to touch the as a result of the discomfort without prior administration of analgesic drugs. This disagrees with similar case management by systemic analgesic (Flunixine meglumin) adminstration to reduce the pain and inflammation as reported previously (Fish and Danneman 2011).

The post-operative management of dehorning is very important in preventing bacterial contamination of the wound. Dehorning has been shown to increase the incidence of developing the Bovine papilloma virus, Bovine leucosis virus and Tetanus. Pre or post use of non-steroidal analgesics has proven effective in reducing pain and swelling in the dehorned site (Cattle, 2012). In this case, no analgesic or suitable antibiotic medications were instituted by the owner, resulting in suppurative infection of the frontal sinus. However, proper wound management and medication was able to resolve the infection and ensured the healing process.

To sum up surgical method of amputating horn is removal of the horn especially in adult animals at the base mainly below the corium. The procedure highly complicated due to high bleeding and delayed time of healing; predisposing the the animal to infection of brain and myiasis. In this particular case report the horn was surgically excised under aseptic condition and alleviation of pain through cornual nerve block. Finally after removing the horn, the incision site was regularly dressed and bandaged and recovered after few months. So for early recovery and positive outcome of the procedure, it should have to be managed early and regularly monitored for progression of healing.

3.11. Tenotomy in Calf

Abstract

Knuckling in new born animals is one of the common congenital abnormalities found in farm animals. The present case report is aimed to describe the surgical management of one month old calf that was brought to Dire Veterinary Clinic due to knuckling of the both forelimbs at distal extremities. After aseptic preparation and stabilizing the calf, tenotomy was carried out on both forelimbs and finally the calf was successfully recovered from the ailment.

Key words: Calf, Felexural deformity, Tenotomy

Introduction

Congenital deformity of locomotory system is mostly observed in new born animals such as calves, lambs and foals and affects flexor and extensor tendon of fetlock and pastern joints (Sangwan *et al.,* 2009). This condition may also affect the flexor tendon of one or both fore limbs and hind limbs but forelimbs affection is more common. In severe cases there may be some bony involvement. The condition is mainly manifested with affection of tendon; as result animal unable to achieve or maintain the normal extension of the limbs (Anderson *et al.*, 2008).Tendon injuries causing loss of a production animal or a decreased level of production result in significant economic loss to the cattle producer (Simon *et al.,* 2010).

Tendon disorders may be congenital or acquired. Congenital abnormalities include lax tendons, contracted tendons, and displaced tendons. Acquired tendon disorders include lax tendons, contracted tendons, luxated tendons, tendinitis, lacerated tendons, avulsed tendons, ruptured tendons, and tenosynovitis (Weaver *et al.,* 2005). Congenital contracted tendon is common defect in cattle and there is no breed predilection (Adams and Santschi, 2000). The other contraction of tendon may arise due to mal positioning in uterus and overcrowding caused by size of the fetus relative to the dam even though some authors as it may be originated from autosomal recessive gene (Tyagi and Singh, 2010). At birth, calves were not able bear weight on affected limbs due to shortening of superficial and deep digital flexor tendon and associated

muscles at fetlock and pastern region (Talamillo *et al.*, 2005). The present report describes the successful surgical management of contracted flexor tendon deformity in calf on forelimb.

3.11.1. Case history and clinical examination

A calf aged about one month was brought to Dire Veterinary Clinic with bilateral forelimbs' flexural deformity and difficulty in movement due to knuckling (Figure 20A). The history stipulated as the calf was bornt through AI from the cross bred dam and Jersey bull and the condition was immediately after birth. Clinically the calf was reluctant in moving and its forelimbs being unable to bear weight. When manually tried to extend the limbs it wasn't successful. The physical parameters were all within physiological limit. Clinical examinations also revealed that of the fore limbs was symmetrical and knuckling of both fore limbs in calf with flexed carpal joint and inability to keep the limb flat on the ground (Figure 21A). The forelimb had excessive angulations at the carpal joints with the convexity directed anteriorly and the calf moves forward in the knuckling of his forelimbs. Except these, musculo skeletal abnormalities of the calf appeared normal and it could suckle its dam with assistance. Based on history and clinical signs the cases were diagnosed as contracted flexor tendon deformity and decided for surgical correction through tenotomy.

3.11.2. Pre operative preparation

The calf's forelimb was aseptically prepared through shaving, washing and scrubbing. In addition the limb was wrapped and tourniquet with gauze distal to the site of incision (Figure 21B). Finally the area was ready by stabilization of the calf.

3.11.3. Anesthesia and animal control

The calf was stabilized both physically and chemically. First the calf was sedated with diazepam (manufactured by Intas pharmaceutical Ltd., India) @0.1mg/Kg I.V. Then intravenous analgesia was carried out at the medial side of the metacarpophalangeal joint as shown on (Figure 21C) by using 5ml of 2% lidocaine hydrochloride (2% lidocaine hydrochloride, jeil pharma. co.Ltd. Korea) and syringe after applying tourniquet. Before surgery commenced, the calf restrained in lateral recumbence, handled by assistants and animal owners.

3.11.4. Surgical correction and treatment

After aseptically preparing and stabilization of the calf, about 10 cm stab incision from proximal to fetlock distally into heel horn was started and performed first on the medial side of the limb along the line of superficial digital flexor tendon (Figure 21D). Thence the skin incision was retracted with Allis forceps and the tendons were visualized and inspected. Fortunately few bleeding and were crushed and ligated. After that, partial tenotomy was done on both the medial and lateral side of the limb at different level after forcibly extending the fetlock joint (Figure 21E).

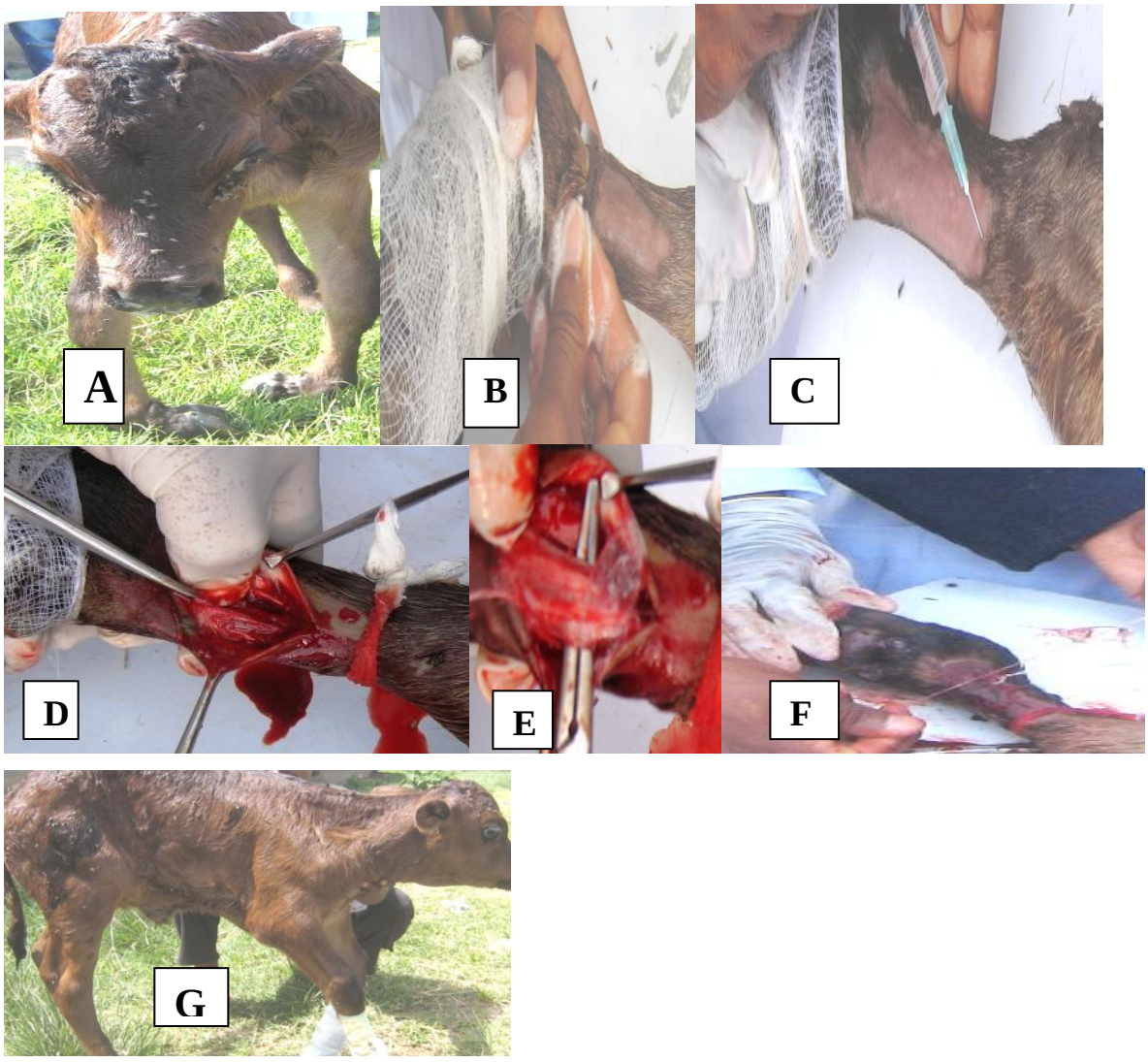


Figure 21: Surgical management and progression of tenotomy in calf

A) Knuckling case in bilateral forelimbs of calf B) Site preparation C) Administering local anesthetic with 2% lidocaine hydrochloride D) skin incision on progress E) Rising the tendon F) Skin closure on progress G) Calf movement after one week

Then superficial tenotomy and manual pressure was applied to extend the limb and wasn't successful leading to requirement for the deep digital flexor tenotomy. The same procedure and technique was applied on the right foreleg. Finally the skin was sutured with simple interrupted suture pattern by using silk 1-0 size (Figure 21F). After that, both of the calf limbs were stabilized with bamboo splint and soft bandage from elbow to hoof in forelimbs (Figure 21G) and kept for a few days.

3.11.5. Post operative care and outcome

After surgery was finished the calf administered antibiotic by using oxytetracycline 10mg/kg I.M for four consecutive days. In addition the calf was regularly inspected for any discomfort and progress of the operation. Not only these but owner was advised to give rest in first weeks but little exercise in the compound, well feed and managements. Finally the bandage and suture material was removed after 20 days and the calf's normal locomotion is gradually restored and seen at one week (Figure 21G)**.**

Discussion

Fore limbs flexural deformity affected calf started to bear weight immediately after the surgical correction with supportive bandage and gradually restored to near normalcy. In new born calves, contracture or shortening of flexor tendon can result knuckling of fetlock joints frequently and rarely carpal joints. The degree of knuckling may vary from mild flections of knee to severe flections of fetlock and pastern joints (Tyagi and Singh, 2010). This was concurrent with present case report where the calf showed sign of knuckling at the both the forelimbs. Malformations of distal limbs are more frequent congenital anomaly found in human and animals (Talamillo *et al.*, 2005). The majority of the contracted flexural deformity in calves observed within the first few days of birth. Similar results were found in a study of (Shivaprakash *et al*., 2009) where the young cow claves were mostly affected with contracted tendon flexural deformity.

Flexural deformity may vary from mild to severe. In mild case, calf may walk on the toe but heels do not touch the ground. In moderate cases, calf may walk on the dorsal side of the toe instead of heel. Severe cases affected animals are forced to walk on the pastern, fetlock or carpal joints (Weaver *et al.,* 2005). In the present case affected animals were not recumbent and able to bear weight and moderately affected. This study is not concurrent with studies of (Rashmi *et al.,* 2018) in which the animal is severely affected, recumbent and cannot bear its weight. A complete physical examination should be warranted to rule out other diseases before initiated surgical treatment for contracted tendon because contracted tendon always occurs with other abnormalities like cleft palate, arthrogryposis and dwarfisim (Fazili *et al.,* 2014). But in the present case the calf was not affected with other congenital abnormalities.

According to the Anderson *et al.* (2008) treatment of flexural deformity should be initiated immediately after recognition of the problem when calf get older contracted tissue become less responsive for treatment. This is similar with current management in which the case was managed at early age. Most flexural deformity of limbs could be corrected with non surgical treatment but surgical method is routinely used for correction of more severe deformity of limbs or when failure of other method of treatment (Fubini and Ducharme, 2004). But in this case choice of non surgical treatment was not possible due to severity of the condition and failure of manual extension of limbs so surgical interference was assumed to be plausible solution to relief the condition. Bandaging and splinting of limb should be done until animal getting normal walk postoperatively (Sangwan *et al.,* 2009).

In present study, the calf hadn't showed any post operative complications except reluctance of movement in the first days of operation. Postoperatively non steroidal anti inflammatory drugs provide analgesia for calves and are useful for decreasing post operative pain related to surgery and extension of soft tissues caused by weight bearing (Simon *et al.,* 2010). But in this case only antibiotic was administered and found effective but recommended if incorporated. After removal of bandage the calf walked normally without knuckling of limbs. In conclusion, early presentations of contracted tendon cases were surgically managed along with proper application of splint. Tenotomy is a relatively very simple surgical procedure but post operative care is uttermost of importance in the outcome.

3.12. Surgical Correction and Managements on Prolapse of Urogenital Organs

3.12.1. Parapimosis in Dog

Abstract

Prapimosis is not uncommon in canines specially following mating. The present case report is aimed to describe surgical management of parapimosis on four years old dog that was presented to Veterinary Teaching Hospital. The history stipulated; protrusion and intermittent licking of the penis and restlessness which was noticed immediately following the mounting of adult bitch on heat in the same compound. On clinical examination there was swelling and oedema of the protruded penis with banding effect especially caudal part of prolapsed penis created by the preputial orifice as a result of a small, restrictive preputial orifice relative to penile engorgement. Then based on examinations the prolapsed penis was diagnosed as parapimosis. After stabilizing the animal and aseptically preparing the exposed penis, the penis was repositioned in to preputial cavity and purse string was performed at preputial orifice to prevent the recurrence. Finally the suture material was removed on fifth day and successfully recovered on follow up.

Key words: Dog, Parapimosi, trauma

Introduction

Parapimosis is a condition that results from the inability of the penis to retract into the preputial cavity and may be caused by a small preputial orifice, ineffective preputial muscles, preputial hypoplasia, trauma, infection, neoplasia, persistent erection, sexual excitement and coitus (Boothe, 2003). A constriction preventing the penis from being retracting back into the prepuce, can be congenital or acquired common condition in the dog leads to requirement of emergency veterinary service due to its predisposing for the occurrence of gangrene (Michael, 2005). The prepuce is a tubular sheath of skin (Parietal layer) lined with mucosa (Inner visceral layer) that covers a portion of the penile shaft (Pars longa glandis, bulbus glandis). The mucosa reflects off the bulbus glandis forming a fornix as the mucosa reflects onto the external penile surface to the urethra orifice (Hassan and Hassan, 2003).

The skin is firmly attached to and continuous with the ventral abdominal skin, creating a sling effect to support and protect the penis from trauma while providing reasonable mobility. The cranial 1 to 3 cm of the prepuce protrudes forward from the skin reflecting off the abdominal wall. The preputial orifice normally permits unimpeded extrusion and retraction of the penile shaft (Boothe, 2003). The band-like preputial muscle, draw the prepuce forward to cover the glans penis after erection. The primary sources of circulation to the parietal and visceral layers are the external pudendal artery and dorsal artery of the penis (Aronson, 2012). The visceral layer is also supplied by the artery of the bulb of the penis, albeit to a lesser degree. A small preputial orifice relative to the size of the penis can result in phimosis (Inability to extrude the penis from the preputial orifice) or paraphimosis (Inability of the penis to retract completely into the prepuce) (Bongartz *et al.*, 2005).

The most serious condition is paraphimosis with entrapment and strangulation of the penile shaft. Paraphimosis can present as persistent or episodic exposure of the penis; the most serious scenario is acute penile entrapment and circulatory compromise (Fossum, 2002). Determination of the cause of parapimosis is required for effective treatment and in dog it can be managed in different forms depending on the severity and duration of the prolapsed penile segment (Papazoglou, 2001). If retraction is impossible, the surgical enlargement of the preputial orifice is necessary, while paraphimosis accompanied by penile necrosis is best managed with amputation (Kirsch *et al.,* 2002). Preputial advancement technique works better when the length of the exposed penis is 1.5 cm or less. Recurrences or very long penile protrusions require partial penile amputation or staged reconstructive techniques by using phallopexy technique, by creating a permanent adhesion between the penile shaft and the adjacent preputial mucosa is also an effective and rapid surgical management of recurrent paraphimosis (Fossum and Willard, 2007).

***Case history and clinical examination*:** A four years old dog was presented to Veterinary Teaching Hospital, with complaint of protrusion and intermittent licking of the penis and restlessness which was noticed immediately following the mounting of adult bitch on heat in the same compound. On clinical examination there was swelling and oedema of the protruded penis with banding effect especially caudal part of prolapsed penis created by the preputial orifice as a result of a small, restrictive preputial orifice relative to penile engorgement (Figure

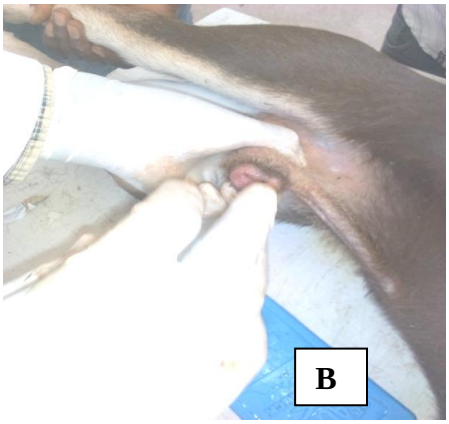
22A), the penis was also examined for venous and lymphatic compromise which may result to penile necrosis. The dog was also assessed for pain by gentle palpation of exposed penis. Finally based on clinical examination the prolapsed pennies was diagnosed as parapimosis and recommended to be retracted by surgical manipulation after stabilizing the patient.

Preoperative preparations: After sedating and administering epidural analgesia to the hair surrounding the preputial orifice and site assumed for injection of epidural analgesia was shaved and disinfected with diluted chlorhexidine solution followed by washing protrude penis adequately with soap and water to remove the debris and moisten the penis. The exposed penis was also washed with dextrose solution but didn't able to reduce the edema. Then exposed penis was undergone chryotherapy by using ice to reduce the pain, swelling and edema. In addition the exposed penis was lubricated with tetracycline ointment before retraction.

***Anesthesia and animal control*:** The dog was restrained physically before every operation. To alleviate pain and frequent erection during repositioning 2% lidocain hydrochloride was injected in to epidural space at the level of lumbosacral space @0.22mg/kg. In addition the dog was sedated with diazepam @0.3mg/kg I.v and set in dorsal recumbence on patient table by holding with forelimbs with owners.

Surgical correction and treatment: After aseptically preparing the protruded penis, reducing the swelling, edema and applying topical ointment on penile shaft to prevent desiccation of the exposed penile mucosa and the prepuce, it was gently retracted in to preputial cavity in gradual manner. After replacing in to the cavity (Figure 22 B), circumfrancial stay suture was performed in the form of purse string suture pattern by using non absorbable suture material with silk 2-0 size to prevent recurrence (Figure 22C). Finally the condition was completely replaced in to preputial cavity.

A) Its clinical presentation



B) After repositioning of exposed penis

C) Purse string suture in progress

D) Outcome fter one months of treatment

Figure 22: Parapimosis in dog and its surgical management

Post operative care and outcome: After completing the procedure, the dog was administered penistrip for three consecutive days. The suture area was scrubbed with diluted chlorhexidine solution. The dog was prescribed to wear collar to prevent mutilation of suture site. The owner was also advised to isolate and keep the dog from female dogs in the compound. Finally the purse string suture was removed on fifth day and completely recovered from the problem and seen at one month (Figure 22D) with improved body condition and absence of sign of recurrence during follow up period.

Discussion

The occurrence of paraphimosis commonly occurs in dog of less than one year of age and diagnosis is most of the time based on the physical examination of protrusion of penis through preputial cavity (Boothe, 2003;). The entrapment is associated with restriction around the penis

from a small preputial orifice relative to the diameter of the penile shaft, which results in dramatic swelling of the exposed penis and this also agrees with (Michael, 2005). The immediate attempts to correct this condition and the surgical technique are indicated by (Papazoglou, 2001) further delay may results to prolonged entrapment and strangulation which causes venous and lymphatic compromise that leads to penile necrosis (Babalola, and Henshaw, 2016).

Paraphimosis can be occurred by tightening of the foreskin resulting failure of penis to be retracted over the glans penis or into the preputial cavity. It generally occurs mainly following sexual excitement as the penis becomes engorged with blood, and retraction of the penis into the prepuce becomes difficult (Asif and Tripathi, 2011). Failure of bulbar engorgement to regress, accompanied by trauma during coitus, may also prohibit withdrawal of penis. The retracted prepuce then becomes lodged caudal to the bulbus glandis, creating a constricting band. On the other hand prolonged paraphimosis can result in necrosis of the glans penis and obstruction of urethra. Although usually associated with coitus or sexual excitement, paraphimosis can also precipitated by fractures of the penis balanoposthitis, inefficient preputial muscle and pseudo-hermaphroditism (Rao and Bharathi, 2004).

In summary, the dog was sedated with sedatives and managed by administering epidural anesthesia by using the 2% lidocain hydrochloride in to lumbosacral space. After that prolapsed penis was aseptically washed and gently replaced to preputial cavity. Finally retention suture was placed at orifice to prevent recurrence and this method was found effective.

3.12.2. Cervico Vagianal Prolapse

Abstract

Cervix and Vaginal prolapsed is commonly a disorder of ruminants normally in late gestation and possibly after parturition. The present case report is aimed to describe surgical management of cervico vaginal prolapse on six years old local breed cow having parturition prior to twelve hours which was presented to the Dire Veterinary Clinic, Ada'a District, East Showa zone, Ethiopia. As the owner claimed, the condition occurred following parturition after the calf was manually and gently pulled by the owner. Care full and rigorous examination of the cow

revealed prolapsed vagina and cervix hanging with some dead tissues. After stabilizing and managing the animal on standing position, the prolapsed mass was washed with cold water and antiseptic solutions before replaced in to normal position. Finally after replacing with manual taxis, suture was placed on vulvar lips by using silk 2.0 size and sterile rectangular plastic material to prevent recurrence on the bilateral aspects vulvar lips for few four days and removed after complete absence of reprolapse.

Key words: Cervicovaginal Prolapsed, Cow, Parturition

Introduction

Uterine prolapse is a fairly common condition in dairy farms. It involves the complete prolapse of the uterus, vagina and cervix (Divers and Peek, 2007). Cervix and Vaginal Prolapse (CVP) is commonly a disorder of ruminants normally in late gestation (Raidurg, 2014). Occasionally, it is observed after parturition and rarely does it occur unconnected with pregnancy and parturition (Noakes, 2009). Cervico-vaginal prolapse is most commonly observed in small and large ruminants like cows, buffaloes and sheep. The incidence and symptoms have been extensively elaborated in cows (Yimer *et al.,* 2016). According to some authors, the incidence of reproductive tract prolapse in cattle ranges between 1-2% (Yotov *et al.,* 2013). Protrusion of all or part of the everted vagina through the vulva is a common condition in certain pluriparous cows (Tyagi and Singh, 2002).

The exact cause of cervico-vagianal disorder in cattle has not been well ascertained (Noakes *et al.,* 2001). Although there are differences among different cattle to the predisposing factors associated with cervico-vaginal prolapse; uterine atony, dystocia and hypocalcemia are some of the most common causes (Andrews *et al*., 2008). An uncomplicated case of cervico-vaginal prolapse usually has a good prognosis if corrected in time; hence it should always be treated as a veterinary emergency (Yadav *et al*., 2014). Early intervention and correction of cases of prolapsed uterine tissue is very vital in ensuring a good case prognosis and survival of the cow. It is also vital for early restoration of reproductive tract physiology. Poor or delayed intervention may result in bleeding and contamination resulting in infection, shock, gangrene formation and may be death (Andrews *et al*., 2008).

The correction of a prolapsed cervico-vagina usually involves, disinfection and washing the organ, reduction in size of the organ if edematous with glycerol, returning the organ back and applying stay sutures such as Buhner's sutures (Makhdoomi *et al*., 2014; Patal, 2014; Simon *et al*., 2014). This case report aimed to describe a management techniques and surgical manipulation of cervico-vaginal prolapsed case in local breed cow who had given normal birth 12hrs prior to the occurrence of the problem at field condition.

Case history and clinical examination: A six years old local breed cow having parturition prior to twelve hour was admitted by owner to the Dire veterinary Clinic, Ada'a District, East Showa zone, Ethiopia. The owner information indicated that the cow was suffering from vaginal prolapsed a soon as she gave birth. During expulsion of the calf the owner was manually and gently pulled. The client also informed as the prolapsed part was increased in length and size gradually with time. The owner tried to help the cow, but the case was complicated by continuous straining. The cow was examined carefully, where found it had a prolapsed vagina and cervix without additional organs such as bladder (Figure 23A). There is also drying of tissues that are exteriorized and hanging with some dead tissues. Depending on rigorous history and thorough examination it was diagnosed as it was cervical and vaginal prolapsed and decided to manually replace to original location and put stay sutures on the vagina to prevent recurrence.

***Preoperative preparations, anesthesia and animal control*:** The cow was restrained in standing position as shown in (Figure 23A and caudal epidural anesthesia was performed at first intercoccygeal space by using 2% Lidocaine HCl (2% lidocaine hydrochloride, jeil pharma. co. Ltd., Korea) @0.22mg/kg in to epidural space. The prolapsed mass was lifted upward above the level of ischial arch and then mass was washed and cleaned with warm clean water, followed by sterile physiological saline solution to remove the debris (Figure 23B). To decrease the a few edemas and reduce the size, cold water was poured on the mass. Finally the prolapsed mass was retracted back to normal location (Figure 23C) and sutured (Figure 23D) to prevent recurrence.

Surgical correction and management: After aseptically preparing the cervix and vagina properly, the prolapsed mass was lifted with both hands and replaced to vagina by using thumb

fist. Stay suture (Figure 23D) was applied with slightly rectangular sterilized plastic material after sterilizing with boiling and cutting in to appropriate size. The material was kept parallel to the vulva apart from vagina keeping one hand space for easy urination. Thence, a horizontal mattress suture technique was placed as in the (Figure 23B). As there is suspicion of recurrence, the non-absorbable suture material using silk 2-0 size was used and later removed after complete regression.

Figure 23: Presentation of Cervicovaginal prolpse in local breed cow and its management

A) Case presentation B) washing the prolapsed mass with cold sterile water and sugar C) After replacing the prolapsed mass D) putting stay suture with sterile plastic and suture material

Post operative care of dam and outcome: The cow was given penicillin (24mg/kg) and dihydrostreptomycin sulphate (30mg/kg) (Pen &Strep® Norbrook UK) intramuscularly for 3 consecutive days. The owner was also recommended and advised to provide well feed and

management in addition to attending and inspecting the recurrence as well as any discomfort felt such as during urination. For topical application at vulvar lips 5% Povidin iodine [Ointment viodin (Square pharmaceuticals) was recommended. The suture material was removed at day six post surgical reproductive management (Figure 23A) and completely recovered.

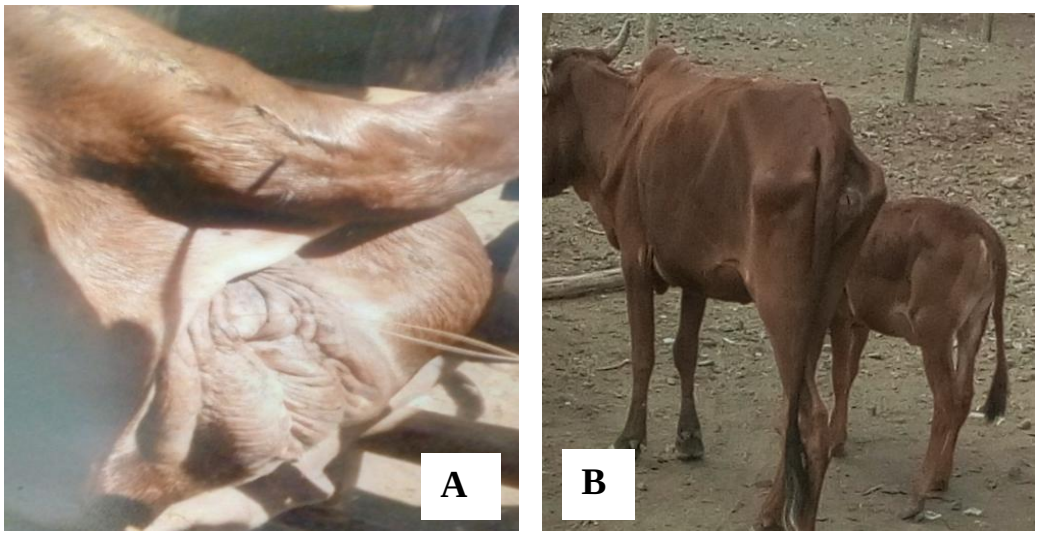


Figure 24: Stay suture removal and outcome of the cervicovaginal prolapse in local breed cow

A) After removal of stay suture at day six B) After two months with her calf

Up on the continuous follow up, the cow was slightly decreased in body condition due to the decreased feed availability but seen with her calf grown in size with good body condition (Figure 24B).

Discussion

Genital prolapse, including cervico-vaginal prolapse in ruminants, is considered as an emergency maternal disorder that needs immediate attention before any further complication that can lead to a poor prognosis (Murphy and Dobson, 2002). The goal in the treatment of cervico-vagianl prolapse is replacement of the organ followed by a method to keep it in the retained position (Yotov *et al.,* 2013). A full clinical examination of animals with the prolapse must be undertaken as signs of toxaemia like in appetence, an increased respiratory rate, raised pulse and congested mucus membranes may be consisted with cervicitis. Vascular compromise, trauma and faecal contamination may also increase toxin intake across the cervico-vaginal

mucosa. However, careful removal of these materials, after soaking with warm dilute antiseptic solution is usually successful causing only minor capillary bleeding (Senthil, and Yasotha, 2015). This is similar with the case report in which no complication was found.

Cervico-vaginal prolapse should be treated as early as possible, delay of which might lead to necrosis and lacerations of the prolapsed mass. Incidence of vaginal prolapse was reported to be rare after 48 to 72 hrs of parturition (Yotov *et al*., 2013). The present case of cervico-vaginal prolapse could be attributed to recent calving. One of the objectives of treatment of cervico-vaginal prolapse is to prevent recurrence (Yimer *et al.,* 2016). Retention sutures were applied in the present case as it might be recurred without retention sutures. Handling of the prolapsed organ invariably leads to tenesmus and therefore light epidural anesthesia is mandatory (Tyagi and Singh, 2002). This in turn similar that epidural analgesia was conducted by using local anesthetic to reduce straining and tenesmus.

In the present case report, the modified Bühner's technique was not applied due to lack of the tape and its needle rather retention suture was employed by using availlable local matterial after sterilizing and cutting in rectangular plastic tape to support tension of suture material and keeping on external vaginal wall and just bilateral to vulvar tips. It was found to be very satisfactory in preventing recurrence of the prolapsed mass and therefore is recommended as an alternative technique, particularly in developing countries where farmers cannot afford repeated costly treatment of their livestock (Prakash *et al.,* 2016). The advantages of this modified technique over the standard Bühner's technique include: i) sufficient space (between the suture knot and the ventral vulvar commissure) for urination without difficulty, ii) no need to create and suture the incisions above and below the vulva, iii) the suture can be loosened and reapplied by the owner himself, as and when required, iv) quick application with no additional man power and instruments requirement, and v) it does not lead to anatomical disfigurement or physiological defects in the vulvar area.

In conclusion, cervicovaginal prolapse is an emergency veterinary and may occur following parturition due to various factors. However the severity depends on the duration and level of contamination in addition to the size of prolapsed mass. So in this particular case report and management the condition was effectively treated by washing, cleaning and retracting back to

pelvic cavity before stay sutures are put to prevent the recurrence. So I strongly recommend as the case should have to be managed early soon rather than later by this method especially in developing countries where resources are scant and veterinary coverage is not at grass root level.

3.12.3. Rectal Prolapse in Jenny

Abstract

Rectal prolapse is a protrusion of one or more layers of the rectum through the anus. The present case report is aimed to describe surgical managements of rectal prolapse on four years old non-pregnant, local breed jenny that was brought to Donkey Sanctuary Veterinary Clinic with clinical presentation of prolapsed mass of rectum characterized by a doughnut shaped prolapsed mucosa and sub mucosa after complaint of intermittent colic sign since previous two days and showing tenesmus. On clinical examination it was found that there was congested mucous membrane, ulceration and some deadly tissues on the protruded rectum and frequent straining. In addition, there was elevation of rectal temperature 102.5 ^{O}F, pulse rate 55/minute and respiration rate 28/minute. After thorough examination it was found that it would be Type I rectal prolapse with spasmodic colic and tenesmus. Prolapsed rectal mass was washed with diluted solution of chlorhexidine solution and glycerine jelly after injection of adequate dose of lidocaine in to epidural space. After preparing aseptically and it was gently reduced to the original position without resection of the part. Thence, stay suture with purse string suture by using silk 2-0 size was applied to retain the prolapsed mass in to the pelvic cavity. Finally on fourth days of post operation the stay purse string suture was removed and was completely resolved.

Keywords: Jenny, Prolapsed, Purse String

Introduction

Rectal prolapse is a protrusion of one or more layers of the rectum through the anus (O'Connor, 2005). It is subdivided into either complete or incomplete rectal prolapse, depending on whether it involves all layers of the rectum or just the rectal mucosa (Anderson and Miesner,

2008). It can also be categorized into four types depending on the extension of tissue layers involved. In a type I rectal prolapse, only the rectal mucosa and submucosa project through the anus. A type II lesion represents a complete prolapse of the full thickness of all or part of the rectal ampulla. Type I and II prolapses are the most common. In a type III prolapse, a variable amount of small colon intussuscepts into the rectum in addition to a type II prolapse. In a type IV prolapse, the peritoneal rectum and a variable length of the small colon form intussusceptions through the anus (Jainudeen and Hafez, 2000; Beltman *et al.,* 2010).

Animals of any age, breed, or sex may be affected. Rectal prolapse is probably the most common GIT problem in pigs due to diarrhea or weakness of the rectal support tissue within the pelvis (Demirel *et al*., 2007). In cattle, it may be associated with coccidiosis, rabies, or vaginal or uterine prolapse; occasionally, excessive "riding" and associated traumatic injury may be causative in young bulls (Shakespeare, 2000). It is common in sheep with short tail docking and especially in feedlot lambs, in which high-concentrate rations may be causative. The use of estrogens as growth promotants, or accidental exposure to estrogenic fungal toxins, may also predispose large animals to rectal prolapsed (Svatopluk *et al.,* 2009). Excessive peristalsis due to periodic increase in muscular tone also brings about pain of spasmodic nature (Chakrabarti, 2006).

It occurs when support and fixation mechanisms (fascia, muscles and ligaments are overcome by pressure due to prolonged tenesmus or increased intra-abdominal pressure due to bloat, trauma, colitis, proctitis, diarrhea, act of parturition, dystocia, intestinal parasitism, tail docking, perineal hernia, constipation and congenital defects (Thomas *et al.*, 2003; Kumar *et al.*, 2004; Marjani *et al.*, 2009). If the prolapse cannot be manually reduced because of inflammation, ulceration and necrosis then surgical amputation or resection of exposed tissue may be required. In this case due to increased peristalsis there may be interruption of normal innervations of the external anal sphincter which resulted in to prolapse (Demirel, *et al.,* 2007). This case report is conducted to describe the surgical management of rectal prolapse in jenny.

Case history and clinical examination: A four years old non-pregnant, local breed jenny was brought to Donkey Sanctuary Veterinary Clinic with a prolapsed mass of rectum characterized by a doughnut shaped prolapsed mucosa and sub mucosa after complaint of intermittent colic

sign since previous two days. Colic was intermittent and animal was showing tenesmus. Owner reported that whenever there was a colic episodein addition to protrusion of mass to external environment which had become stiff and not retracting inside since then. The owner also informed as he fed the jenny on dry feed with supplementary feed such as weat bran and due to the dry season water was drunken at few days interval. On clinical examination it was found that as there was congested mucous membrane, ulceration and some deadly tissues on the protruded rectum (Figure 25A) and frequent straining. In addition, there was elevation of rectal temperature 102.5 ^{O}F, pulse rate 55/minute and respiration rate 28/minute.

In addition the prolapsed mass was differentiated from ileocolic intussusception by passing finger between the prolapsed mass and the inner rectal wall. Accordingly the finger were failed to enter indicating rectal prolapse, because of the presence of a fornix. An elongated, cylindrical mass was protruding through the anal orifice was also found as a diagnostic feature of rectal prolapse and after thorough examination it was found that that will be Type I rectal prolapse with spasmodic colic and tenesmus. Based on the examinations and clinical findings the case was diagnosed as rectal prolapse and desided to undergo surgical manipulation for repositioning.

Pre operative preparation of the Jenny: Prolapsed rectal mass was washed, with diluted solution of chlorhexidine solution and glycerine jelly. The area supposed for injection of the epidural space was also disinfected by using savlone after shaving. The ulcerated and necrotized tissues were gently debrided and removed after tying the tail to one direction and ready for retraction in to pelvic cavity.

Anesthesia and animal control: Caudal epidural anesthesia was administered by using 2% lidocaine hydrochloride (2% lidocaine hydrochloride 20mg/ml, by jeil pharma. co.Ltd. Korea) at dose rate of @0.22mg/kg through the sacro-cocygeal space to reduce straining, facilitate repositioning of the prolapse, and permit surgical manipulations. The effect of analgesia on the perineum was verified by pricking the area with a sterile needle (Demirel *et al*., 2007). The animal was manipulated in standing position after holding his fore leg in hanging position with animal owner.

Surgical correction and management: After aseptically preparing the prolapsed mass, it was gently reduced to the original position without resection of the part (Figure 25B). Thence, purse string suture using nylone 2-0 size was applied to retain the prolapsed mass in to the pelvic cavity. The suture was performed as loose enough to leave two-finger opening into the rectum in to the jenny by precaution (Figure 25C). Finally, the area was scrubbed with iodine. There was no reoccurrence of the prolapse reported later and complete successful management of rectal prolapse was done.

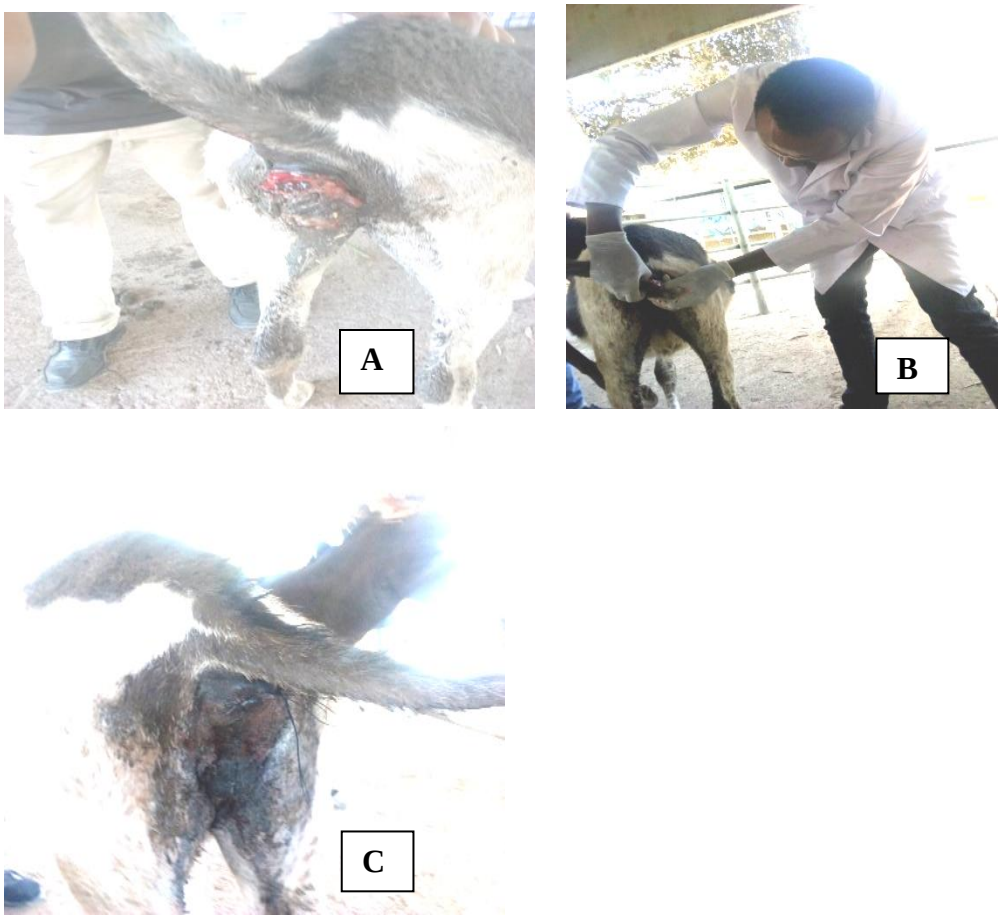


Figure 25: Uterine prolapse and its surgical management in local breed cow

A) Presentation and appearance of the prolapsed rectum B) manipulation and replcing prolapsed organ C) placement purse string suture on anal orifice.

Post operative care and outcome: Post operatively the jenny was administered penicillin (24mg/kg) and dihydrostreptomycin sulphate (30mg/kg) (Pen &Strep® Norbrook UK) IM for three days. In addition albendazole suspension peros at dose rate of 7.5mg/kg was administered

to the jenny. Feeding was withdrawn for 24 hrs in order to reduce possible irritation of the rectal mucosa during defecation. Parafin oil was also administered to lubricate the gastro intestinal lining to easily evacuate the faeces. The owner also advised to loosen the tie during defecation and follow the animal for recurrence and any sign of discomfort associated with stay suture. on fourth days of follow up there was no sign of recurrence and straining and the stay purse string suture was removed. Finally the problem was completely resolved since then.

Discussion

The common cause of rectal prolapsed includes enteritis with profuse diarrhoea, violent straining may be due to coccidiosis and pelvic fracture when complicated with loss of anal tone in young animals (Radiostits *et al.,* 2000; Lee *et al.,* 2010). The case at hand was occurred due to violent straining caused by constipation as a result of feeding with highly dried crop residues (wheat bran and hay) with less water supplementation. There was no history from the previous of feeding from the owner to ascertain dietary changes but there is a possibility of it that results constipation and subsequent occurrence of rectal prolapsed. Rectal prolapsed in equines are also related with intestinal parasitism (Bertelsen *et al.,* 2004).

The usual procedure for correction of rectal prolapse is its reduction by a gentle massage, reposition and retention by application of a purse string suture pattern using appropriate tape or fibre (Jean and Anderson, 2006; Borobia-Belsué, 2006). A one/two-fingers opening should be left when tying the purse string according to animal size. This agrees with the care case at hand in which it was managed in such away. However, surgical correction is often necessary due to various damages of the prolapse (large oedema, laceration, rupture, infection, and necrosis). If successful symptomatic treatment is done for removing the etiological agent the reoccurrence of Type I rectal prolapse can be reduced to minimal level (Patel *et al.,* 2016). This is similar with current case management in which no recurrence is observed.

After physical restraining and stabilization, the animal was controlled in standing position and administered caudal epidural analgesia with 2% lidocaine hydrochloride at dosage rate of 1ml/100Kg. Rectal prolapse may result from prolonged tenesmus or increased intra abdominal pressure due to bloat, proctitis, diarrhorea, act of parturition and constipation (Tyagi and Singh, 2010). To summarize, Rectal prolpse is one of the lower GIT upsets in equines and arise from

different factors. Once the condition is encountered it should have to be managed early before the prolapsed mass desiccated and contaminated in addition infestation with flies. So the report support that the animal owners should have to supplement and adequate water for the jenny and prevent from other predisposing factors before the problem commence in addition to requesting veterinary assistance soon.

3.12.4. Uterine Prolapse in Cow

Abstract

Uterine Prolapse is one of the most potentially dangerous complications associated with calving and involves the complete prolapse of the uterus, vagina and cervix. This case report aimed to describe uterine prolapse management on third parity local breed cow which was presented to Dire Veterinary Clinic, Ada'a District with a history of a normal parturition followed by occurrence of genital prolapse before 12 hours. Upon thorough physical examination there was hanging out of a reddish mass from the vagina with complete eversion of the uterus exposing its foetal membranes and maternal caruncles underneath. After aseptically preparing the prolapsed mass and stabilizing the cow, the everted uterine mass was gently pushed through the vaginal opening by manual pressure to region to pelvic cavity and temporary closure of the vulva with retention suture was applied in the form of horizontal mattress suture after padding even layers of gauze bilateral to each vulvar commeasure with one stitch by leaving little diameter orifices for urination and lotia.

Key Words: Cow, Dystocia, Uterine Prolapsed

Introduction

Uterine prolapse is a fairly common condition in dairy farms and is characterized by a complete inversion of the gravid cornua (Hanie, 2006). Uterine Prolapse is one of the most potentially dangerous complications associated with calving and involves the complete prolapse of the uterus, vagina and cervix (Divers and Peek, 2007). The condition almost always occurs within the first 24 hours of calving and rarely reported afterwards (Blowey and Weaver, 2011). Most of the time prolapse of the uterus is a common complication of the third stage of labour in the

cow (Joseph *et al.,* 2001). It can vary in size from about 18 inches to 3-4 feet in a large cow. The etiology of uterine prolapse is unknown, but many factors have been associated with some predisposing factors such as uterine atony, dystocia, forcible traction during parturition and hypocalcemia (Jackson, 2004; Andrews *et al*., 2008).

An uncomplicated case of uterine prolapsed usually has a good prognosis if corrected in time, hence it should be always treated as a veterinary emergency (Patal, 2014). Uterine prolapse in cattle may be treated by reduction or amputation. Euthanasia is the only choice where hemorrhage or other factors have resulted in a state of irreversible shock (Potter, 2008). The correction of a prolapsed uterus, usually involves, disinfection and washing the organ, reduction in size of the organ if edematous with glycerol, returning the organ back and applying stay sutures (Buhner's sutures) (Makhdoomi *et al*., 2014; Simon *et al*., 2014; Yadav *et al*., 2014). Early intervention and correction of cases of prolapsed uterine tissue is very vital in ensuring a good case prognosis and survival of the cow. Poor or delayed intervention may result in bleeding, contamination resulting in infection, shock, gangrene formation and death (Andrews *et al*., 2008).

Few authors reported that 40% of cows became pregnant after uterine prolapsed and prompt treatment is instituted; a post operative fertility rate of 40-60% has been recorded (Tyagi and Singh, 2002). Delayed treatment of the cases may develop fatal septicemia. Success of treatment depends on the status of case, the duration of the case, the degree of damage and contamination. This case report highlights the procedures and techniques on the management and correction of the clinical cases of uterine prolapse on local breed cows that had given birth few hours before.

Case history and clinical examination: A third parity local breed cow was presented to Dire Veterinary Clinic, Ada'a District, East Shoa Zone, Ethiopia with a history of a normal parturition. History also revealed as the normal male calf was born before 12 hours. The owner also informed as he performed forcible traction of the calf during parturition. The total uterine mass was prolapsed after the fetal membrane sheds normally. Upon thorough physical examination there was hanging out of a reddish mass from the vagina with complete eversion

of the uterus exposing its foetal membranes (Figure 26A) and maternal caruncles underneath (Figure 26C).

The animal was in standing position and showed continuous straining. Physical examination of the vital systemic parameters was also carried out. Accordingly, Temperature 39.9ºC, Heart rate 126 beats/min, Respiratory rate 79 cycles /min and pulse rate 126 beats/min. The ocular mucous membrane was pale and the prolapsed uterus mass was swollen, devitalized areas on superficial surface of uterine caruncles and stained with dung materials and debris. The general health of the cow was poor. Based on the clinical examination, it was diagnosed to be a case of uterine prolapsed and decided to undergo surgical manipulation after replacing to its original location.

Pre operative preparation: After stabilizing the cow, the surrounded area was washed with clean water and soap. The debris and dung materials were gently removed and the prolapsed uterus was washed with warm dilute chlorhexidine solution (Fubini and Ducharme, 2006). Sugar solution was introduced in the uterine surface to reduce the volume of prolapsed uterus. Some parts of necrotic area were debrided. In addition the everted uterus was washed with clean water and ready for manual reposition to the pelvic cavity.

Anesthesia and animal control: Since the cow was manifesting intermittent straining, local anesthetic by using 2% lidocaine hydrochloride was administered to epidural space. Epidural analgesia, with injection of lidocaine hydrochloride (2% lidocaine hydrochloride 20mg/ml manufactured by jeil pharma. co. Ltd. Korea) was performed @ 0.22mg/kg dosage rate at level of first sacrococcygeal space (Figure 26B) to block the coccygeal and sacral nerves so as to desensitize the tail, anus, perineum, vulva and vagina. After allowing 10 min for the anesthetics to take effect, sensitivity around the perineal region was assessed by pricking with a needle and kept in standing position in crush.

Surgical correction and treatment: After aseptically preparing the prolapsed mass and stabilizing the cow, the everted uterine mass was gently pushed through the vaginal opening by manual pressure to region to normal position. The replacement of uterus was performed little by little, starting at the vulval lips upper and lower portion. The prolapsed uterus was pushed into vagina by manual pressure and takes care of vulval lips. Thence one hand was inserted to

the tip of both uterine horns for being sure that no remaining invagination which could incite abdominal straining and reprolapse.

Figure 26: Uterine prolapse and its surgical management in local breed cow

A) Uterine prolapsed and contamination and its contamination with dusts

B) Administration of local anesthetic in to epidural space C) Visualization and washing of uterine caruncles D) After correction of prolapsed mass

After repositioning in to pelvic cavity, temporary retention suture of the vulva with silk suture material was performed to prevent recurrence. Almost most of the time some veterinarians use Buhner's suture pattern but this may cause extra pain which can leads to frequent straining contribute recurrence. In this particular case management it was tried by modifying the

buhner's suture pattern. The technique was applied after padding and cutting sterile gauze to 4cm length. Then the gauze was placed in the form of even layer bilateral to near each vulvar commeasure and sutured in place by using silk 2-0 size in the form of horizontal mattress suture with one stitch by leaving little diameter orifices for urination and lotia (Figure 26C). Finally the area was disinfected with iodine solution and later the retention suture was removed after complete recovery.

Post operative care of cow and outcome: After finishing the procedure, the cow was administered with penicillin (24mg/kg) and dihydrostreptomycin sulphate (30mg/kg) (Pen &Strep® Norbrook UK) I.M for three consecutive days. The suture line was dressed with weak iodine solution every two days. In addition, the owner was advised to inspect any discomfort associated with suture pattern, as to provide well feeding and management. Finally, the suture material was removed after five days of successful recovery.

Discussion

A uterine prolapse is considered a medical emergency. This condition is life-threatening. If the affected cow is not treated quickly, she could go into shock or die from blood loss. The goal in the treatment of uterine prolapse is replacement of the organ followed by a method to keep it in the retained position (Aiello *et al.*, 2016). A caudal epidural anesthesia is essential before replacement of a uterine prolapse as it decreases straining and desensitizes the perineum. The uterine prolapse can be replaced with the animal in standing or recumbent position (Hanie, 2006). Once the uterus is replaced, the operators hand should be inserted to the tip of both uterine horns to be sure that no remaining in vagination could incite abdominal straining and reprolapse (Fubini and Ducharme, 2006). This may be due to the fact that, if the uterus is completely and fully replaced all the way to the tips of the uterine horns, the prolapse is unlikely to occur.

Before replacement of uterus epidural anesthesia was performed by using 2% lidocaine hydrochloride. The replacement of uterus was performed little by little, starting the vulval lips upper and lower portion. The prolapsed uterus was pushed into vagina by manual pressure and takes care of vulval lips. This case management protocol agrees with the authors (kumar and Yasotha, 2015). An injectable broad spectrum antibiotics once administered for three to five

days after replacement of the prolapsed will prevent secondary bacterial infection so that animals with uterine prolapse that were properly managed can conceive again without problems (Plunkett, 2000**;** Borobia-Belsue, 2006).

Prolapse of the uterus normally occur during the third stage of labor at a time when the foetus has been expelled and the foetal cotyledons has separated from the maternal caruncles (Noakes *et al.,* 2001). The prolapsed uterus is highly susceptible to trauma, laceration, haemorrhages, necrosis and infection leading to higher morbidity of the affected cow (Jana and Ghose, 2004), if not treated earlier. According to (Pubaleem and Gunajit, 2017) hypocalcaemia plays an important role in pathogenesis of prolapse of genital tract probably because of atony with prolapse created due to it. In this case, the prolapse was probably due to prolonged labour and severe straining because of high oestrogen level. After about 12 hours the owner reported that the animal has stopped straining and has started eating and drinking normally. The case was followed up for the next 7 days and the suture was removed on 7th day. In conclusion uterine prolapse is one of the reproductive disorders in female domestic animals specially cow requiring emergency veterinary service. The condition follows parturition within a few hours and possible few days. The case can be associated with various risk factors such as forcible traction of fetus and dystocia. The case report supports as the case should have to be managed early for the future fertility of the dam and reducing the complications follow such as dryness and contamination of reproductive organ/s.

4. SUMMARY OF COMPILED SURGICAL CASE REPORTS

The present case report included the outcomes of surgical intervention and techniques performed on 27 different animal species, ages and sexes. The number of animals that undergone various surgical managements were presented in table 1 below.

Table 1: Number of small and large animals that received surgical case interventions on at VTH and Veterinary Clinics

S/no.	Animal Groups	Place			Sex		Age (years)		Out come	
1	**S.A**	**VTH**			**M**	**F**	**<5**	**≥5**	**Dead**	**Live**
	Cat	1			0	1	1	-	-	1
	Dog	8			5	4	3	5	-	8
	Total (%)	**9(33.33%)**			**5(18.5 %)**	**5(18.51 %)**	**4(14.8 1%)**	**5(18.5 1%)**	**-**	**9(33.33 %)**
2	**Large An.**	**VTH**	**Dire**	**DSVC**	**M**	**F**	**<5**	**≥5**	**Dead**	**Live**
	Sheep	4	-	-	1	3	3	1	-	4
	Goat	1	-	-	-	1	1	-	-	1
	Donk-ey	-	1	3	-	4	1	3	-	4
	Mule	-	1	-	1	-	-	1	-	1
	Pig	2	-	-	2	-	2	-	-	2
	Cattle	3	3	-	1	5	2	4	1	5
	Total (%)	**10(37.0 3%)**	**5(18.5 1%)**	**3(11.1 1%)**	**5(18.5 1%)**	**13(48.1 4%)**	**9(33.3 3%)**	**9(33.3 3%)**	**1(3.7 0%)**	**17(62.9 6%)**

(Note: S.A= Small Animal, DSVC=Donkey Sanctuary Veterinary Clinic, VTH=Veterinary Teaching Hospital, M=Male, F=Female).

Body systems of animals affected with different ailments of different causes and the surgical interventions was performed. Among these the reproductive, integumentary and musculoskeletal system predominates and presented in table 2 below.

Table 2: Various body parts affected and surgical interventions performed in different species of domestic animals

S/n	System involved	Animal species	Specific surgical cases	Total (%)
1	**GIT**	Sheep	Rumenotomy	2(7.40%)
		Donkey	Rectal prolapsed	1(3.70%)
2	**Reproductive**	Dog	Ovariohsyeterectomy	2(7.40%)
			Castration	1(3.70%)
			Parapimosis	1(3.70)
		Cat	Caesarean section	1(3.70%)
		Cow	Caesarean section	1(3.70%)
			Cervicovaginal prolapsed	1(3.70%)
			Uterine prolapsed	1(3.70%)
		Pig	Castration	2(7.40%)
		Donkey	Second degree perineal laceration	2(7.40%)
		Mule	Castration	1(3.40%)
3	**Integumentary and musculoskeletal**	**Animal species**	**Specific surgical cases**	**Total (%)**
		Dog	Aural Hematoma	1(3.70%)
			Lipoma	2(7.40%)
			Perineal hernia	1(3.70%)
		Sheep	Ventral abdominal Hernia	1(3.70%)
		Goat	Inguinal hernia	1(3.70%)
		Cow	Dehorning	1(3.70%)
			Mandibular hematoma	1(3.70%)
			Tenotomy	1(3.70%)
		Donkey	Hyena bite	1(3.70%)

5. CONCLUSION AND RECOMMENDATIONS

Livestock are essential assets for livelihoods in improving the life style of society especially in developing countries. However these animals can be exposed to different ailments and abnormalities which can be controlled and treated through different veterinary services. One of the veterinary services is surgical treatment and managements. In the present surgical case reports various surgical cases were undergone surgical treatments and managements with different procedures and techniques at Veterinary Teaching Hospital, Donkey Sanctuary and Dire Veterinary Clinics. Among these; Caesarean section, uterine and cervicovaginal prolapse and dehorning in cows, perineal hernia, ovariohysterectomy and excision of lipoma in dogs, rectal prolapse, hyena bite and pernial laceration in donkeys, ventrolateral abdominal hernias and inguinal hernia repair in small ruminants, castration in mule, dog and boar. Even though these surgical procedures were performed and almost successful in the study areas, there were no ideal place especially with regards to operation theatre, basic surgical equipments, instruments and accessibility of anesthetic drugs. Therefore, depending on the above conclusion the following recommendations were forwarded.

- All surgical instruments and equipments should have to be fulfilled in veterinary clinics and VTH to create better operation theatre for aseptic surgical procedure and techniques.
- The government should have to device and adopt strategies as well as policies in producing competent, innovative veterinary surgeons and veterinarians who can undergo surgical procedure effectively and efficiently.
- The government should have to take special consideration on coverage of veterinary services with different animal hospital and clinics at grass root level.
- The government should have to supply anesthetics drugs, surgical facilities and other relevant antiseptics to Veterinary Clinics and Veterinary Hospitals for effective and efficient services.

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7. ANNEXES

Annex 1: Case Recording and Management Format

Date._____

Case No._____

Name of the Hospital: ☐ VTH ☐ Donkey Sanctuary Veterinary Clinic ☐ Dire Veterinary Clinic

Animal Detail

Species: ☐ Bovine ☐ Ovine ☐ Caprine ☐ Feline ☐ Canine ☐ Swine ☐ Avian ☐ Equine

Breed _____ Sex ☐ Male ☐ Female Age _____

Animal identification _____ Name /if any/ _____

OWNER DETAIL

Owners' Name _____Address Town _____Kebele _____ House No___

Occupation_____ Phone No _____

CASE HISTORY

_____

_____

CLINICAL FINDING

Body Temp _____^{o}C Respiration rate _____Breaths/min Heart rate _____ Beat/min

Ruminal Motility ____/min Gut sound _____ VMM: ☐ Normal ☐ pale ☐ Congested ☐ Joundice ☐ Cyanotic CRT:_____Body Condition:_____Superficial Ln: PF___ PS___MND _____RPH_____ OTHER_____

Description of Case

_____

_____

Organ or system affected: ☐ Nerous ☐ Muskulo skeletal ☐ Respiratory ☐ Cerculatory ☐ Digestive ☐ Urogenital ☐ Intigument ☐ Other (specify)

SAMPLE TAKEN

☐ Faeces ☐ Blood ☐ skin scraping ☐ Nassal swab ☐ vaginal swab ☐ Ruminal content ☐ Urine ☐ Other

Differential Diagnosis List:_____

Laboratory Result:_____

Tentative Diagnosis: _____

Definitive Diagnosis:_____

PATIENT CARD

Prognosis:

_____

_____

OBSERVATION AND TREATMENT

CLINICAL WORK TO BE PERFORMED: ☐ Surgical_____

☐Medical_____ ☐Gynaecology/Obstetric ☐Follow up /Quarantine

MEDICAL TREATMENT ADMINISTERED

Date:_____

Name of Staff in Charge: _____Signature_____

Student in Charge: _____Signature_____

Annex 2: Pre-Anesthetic Evaluation Form

Time: _____

Date: _____

Patient Name:

_____

Requested By:

_____

History:_____

_____

Physical exam data:

_____

_____

_____

Findings/case/ and Diagnosis_____

Labs/Rads/

Other:_____

Procedure/Reason For Anesthesia:_____

Plan/Recommendations:_____

Further Diagnostics:

_____

Pre-Anesthetic Therapy: _____

Premedication: _____

Induction: _____

Maintenance: _____

Analgesia: _____

Fluids:_____

Monitoring: _____

Annex 3: Anesthetic and Intra operative Observations format

Group						**Date**		**Procedure**		
Surgeon								As.surgeon		
Anaesthetist								Patient monitor		
Animal	Sex	Weight	Physical status							
			Good	Medium	Poor					
Pre anesthetic drugs							Anesthetic drugs			
Drug	Dose		Route			Time	Drug	Dose	Route	Time
						Total dose				

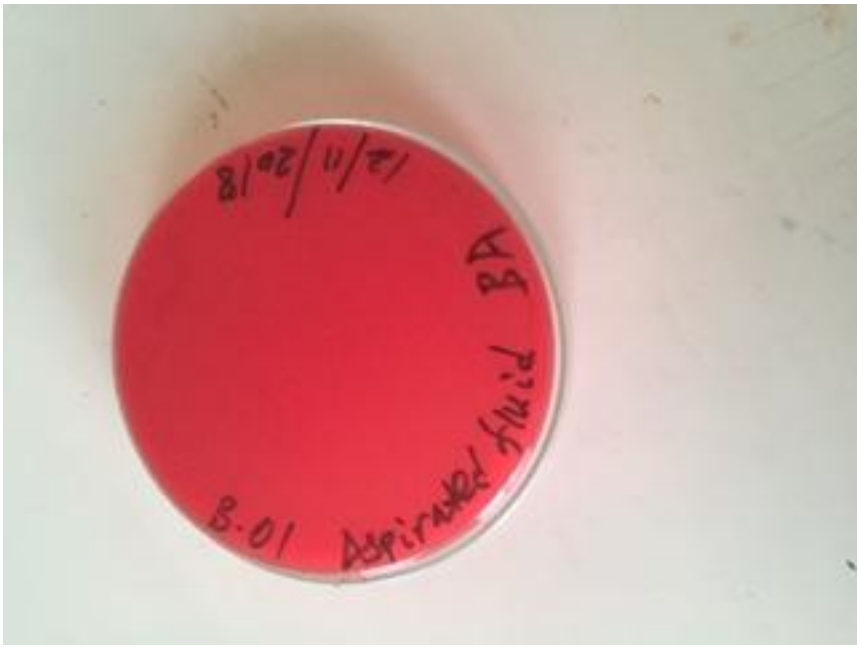
Record of Different Parameters

Vital parameters	**Before Medication**	**After Induction of Anesthesia**			
Temperature		5min	10min	20min	End
HR/min					
RR/ min					
MM Color					
Pulse quality					
CRT					

Annex 4: Post Operative Observations and Follow up Format

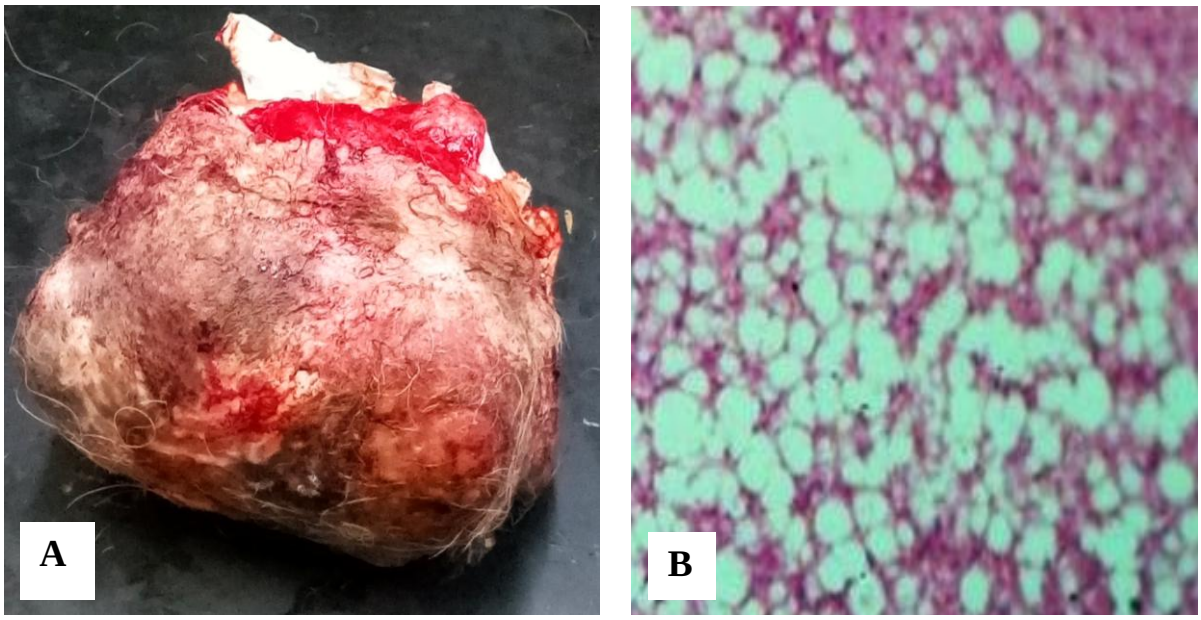
Examination of days	**Treatment/s**	**Remark/s**
Day 1		
Appetite		
Temperature		
Heart Rate		
Respiratory rate		
Exudates		
Incision sites		
Any other		
Day 2	**Treatment/s**	**Remark/s**
Appetite		
Temperature		
Heart Rate		
Respiratory rate		
Exudates		
Incision sites		
Any other		
Day 3	**Treatment/s**	**Remark/s**
Appetite		
Temperature		
Heart rate		
Respiratory rate		
Exudate		
Incision sites		
Any other		

Annex 5: Bacteriological Culture from Bovine Mandibular Hematoma



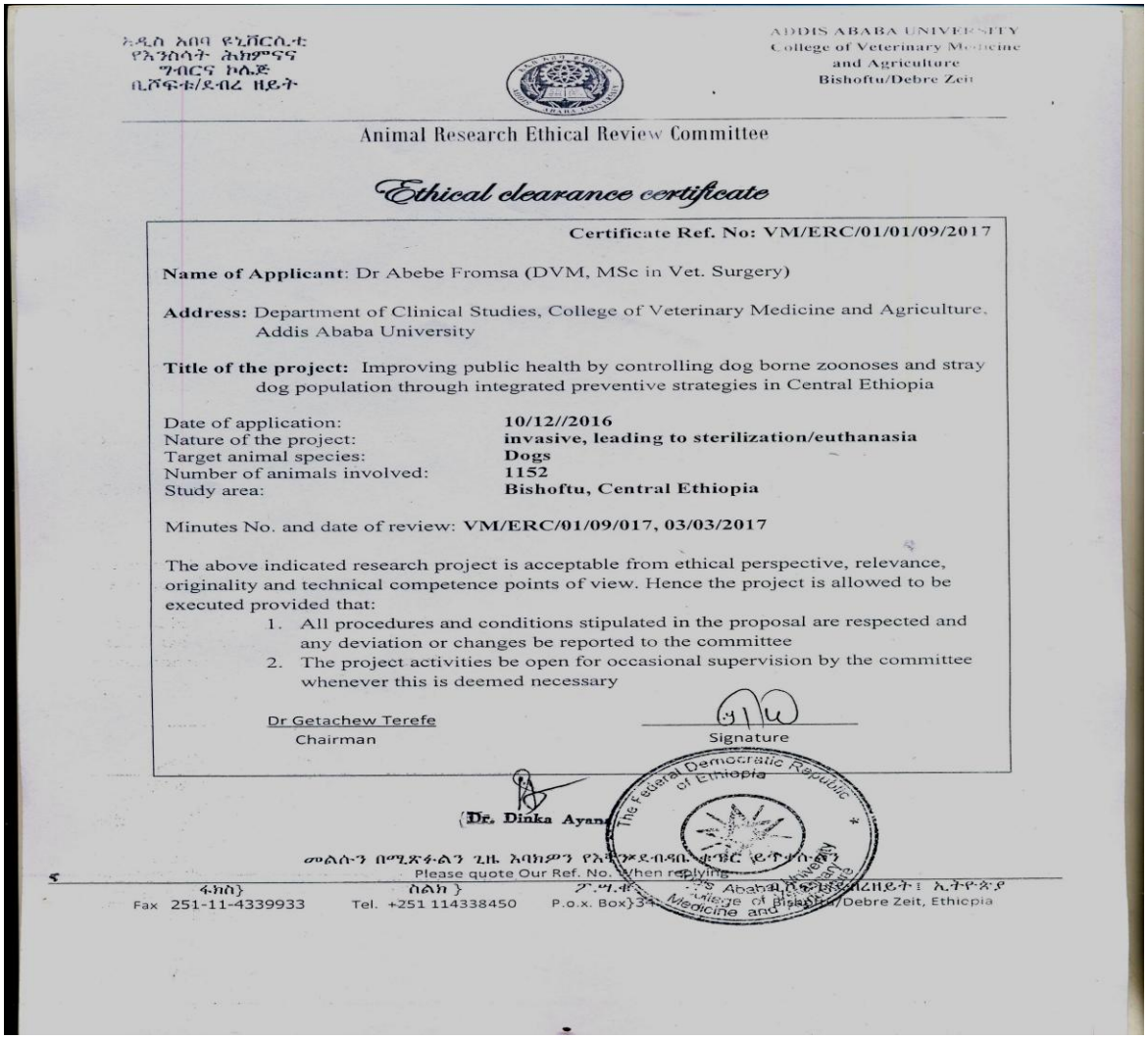
Result: No growth of bacteria on Blood agar showing the fluid is merely accumulation of blood in the cavity.

Annex 6: Histopathological examination result of lipomas in dog



A) Gross appearance of removed lipoma mass B) Histopathological appearance

Annex 7: Ethical clearance



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ADDIS ABABA UNIVERSITY
College of Veterinary Medicine
and Agriculture
Bishoftu/Debre Zeit

Animal Research Ethical Review Committee

Ethical clearance certificate

Certificate Ref. No: VM/ERC/01/01/09/2017

Name of Applicant: Dr Abebe Fromsa (DVM, MSc in Vet. Surgery)

Address: Department of Clinical Studies, College of Veterinary Medicine and Agriculture, Addis Ababa University

Title of the project: Improving public health by controlling dog borne zoonoses and stray dog population through integrated preventive strategies in Central Ethiopia

Date of application:	**10/12//2016**
Nature of the project:	**invasive, leading to sterilization/euthanasia**
Target animal species:	**Dogs**
Number of animals involved:	**1152**
Study area:	**Bishoftu, Central Ethiopia**

Minutes No. and date of review: **VM/ERC/01/09/017, 03/03/2017**

The above indicated research project is acceptable from ethical perspective, relevance, originality and technical competence points of view. Hence the project is allowed to be executed provided that:

1. All procedures and conditions stipulated in the proposal are respected and any deviation or changes be reported to the committee
2. The project activities be open for occasional supervision by the committee whenever this is deemed necessary

Dr Getachew Terefe
Chairman

Signature

Dr. Dinka Ayana

The Federal Democratic Republic of Ethiopia

College of Veterinary Medicine and Agriculture

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Please quote Our Ref. No. When replying

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