ADDIS ABABA UNIVERSITY

PROSPECTIVE EVALUATION OF FACTORS AFFECTING POST THYROIDECTOMY OUTCOME AT THREE TEACHING HOSPITALS FROM OCTOBER 1 2019- APRIL 30 2020 ,IN ADDIS ABABA, ETHIOPIA

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A FINAL REASEARCH THESIS SUBMITED TO DEPARTEMENT OF SURGERY, SCHOOL OF MEDICINE, CHS, ADDIS ABABA, ETHIOPIA AS PART OF PARTIAL FULFILMENT OF THE REQUIRMENT FOR THE POST GRADUATE STUDY (GENERAL SURGOEN).

OCTOBER, 2019

ADDIS ABEBA, ETHIOPIA

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ABSTARCT

Background: Postoperative complications after thyroidectomy are problematic for patients and surgeons. The postoperative outcome of thyroidectomies is related to risk factors concerning the patient, the thyroid disease and the surgeon. Thyroidectomy complications may be divided into transient or permanent. The transient may vary from severe, life threatening ones, all the way to mild and meaningless events. Permanent complications, which prevalence is variable, represent the main concern of those who treat thyroid diseases surgically. Despite its importance, the risk factors associated with post-thyroidectomy complications are not enough analyzed.

Objectives: To evaluate factor affecting post thyroidectomy outcome in three teaching Hospitals in Addis Ababa Ethiopia.

Method: A prospective study was conducted in surgical department of Black Lion, Yekatit and Zewuditu Memorial Hospital. The study has included patients diagnosed for thyroid swelling and operated from October 1 2019 –April 30, 2020, meeting the following criteria: MNG; operation by surgeons with various experiences; and minimum follow-up of 1 month. Age, thyroid function test, indication for surgery, types of surgery, surgeon experience, intraoperative adhesion and estimated blood loss were analyzed as risk factors for post thyroidectomy outcome.

Data was analyzed using SPSS version 20.0. P values < 0.05 were considered statistically Significant.

Result: During the study period 120 thyroidectomies were performed. There were 20 (16.66%) males and 100 females (83.33%) with Male to female ratio was 1:5.Total Thyroidectomy+,LND performed in 4(3.3%) and Total thyroidectomy alone was performed in 10(8.3.%) patients. Total complications occurred was 23 (19.16%) in 120 patients. Wound infection was the most complication seen in 7(5.8%) of patients and hematoma was seen in 6(5%) patients. 3(2.5%) of patients suffered from recurrent laryngeal nerve palsy and hypocalcemia.

There was association b/n early postoperative complication with

age (p value=.025[b]), Indication for Surgery (p value.031[b,]) and type of surgery (p value.045[b]). Estimated Blood Loss was significantly associated with hematoma (p value.000[b]). Early

postoperative complication also has significantly associated with thyroid function test (p value.005[b]), adhesion (p value.035b) and operating surgeon (p value .022b).

no association b/n early postoperative complication with, size and duration of goiter

There was no postoperative mortality in this study.

Conclusion

The factors affecting post thyroidectomy outcome were indication for surgery, estimated blood loss, type of surgery, thyroid function test, adhesion and surgeon experience.

Patient with these factors should be advised for possible higher rate of complications and the surgeon should be prepared beforehand.

Recommendation:

Patients with thyroid malignancy, with considerable intraoperative bleeding needs careful hemostasis, can rebleed and develope hematoma.

Further study is necessary to identify the cause of wound site infection as commonest complication observed was sugical site infection.

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Contents

ABBREVIATIONS

ZMH- Zewuditu Memorial Hospital

RLN –Recurrent Laryngeal Nerve

RLNP- Recurrent Laryngeal Nerve Palsy

BLH- Black Lion Hospital

PI –Principal Investigator

DC- Data Collector

U/S- ultrasound

MG- multinodular goiter

ST- Subtotal thyroidectomy

TT- Total thyroidectomy

ACS-NSQIP- American College of Surgeons National Surgical Quality Improvement Program

RR- relative risk

OR- Operation

FNAC- Fine Needle Aspiration Cytology

M-F- Male to Female

JUMC- Jimma University Medical College

PTC- papillary Thyroid carcinoma

LND-Lymph node dissection

SPHMMC-St Paul's Hospital Millennium Medical College

CHAPTER ONE

INTRODUCTION

Background Information

Thyroidectomy is a very common surgical procedure worldwide and is performed by surgeons with varied training, such as general surgery, thoracic surgery, endocrine surgery, oncological surgery, and head and neck surgery. Thyroid surgery has followed all the steps of evolution to reach the time of endoscopic surgery. Thyroid surgery has been performed since ancient times. It is one of the most frequently performed surgical procedures worldwide, even if the risks of lethal postoperative complications prevented its evolution until the beginning of the 20th century. In early 20th century thyroidectomy became a safe and acceptable operation with the advent of general anesthesia, antisepsis and haemostatic techniques. Surgical talent of Theodor Kocher of Berne, Switzerland raised thyroid surgery to scientific level, his excellent work in this regard led to a reduction in mortality from 50% to less than 4.5% (1)

Thyroid disorders are one of the most common endocrine diseases. Surgical resection of the thyroid gland may be necessary for the treatment of these disorders. Thyroidectomy is recommended for benign condition such as symptomatic large goiters and for the treatment of malignant disease of the thyroid gland. Thyroidectomy has potential complications. The major postoperative complications are hypocalcemia, wound infection, hematoma, recurrent laryngeal nerve (RLN) injury, Horner's syndrome and hypothyroidism. Hypocalcemia is the important postoperative complication of thyroid surgery causing potentially severe symptoms and increasing hospitalization time. Hypoparathyroidism is the usual cause of hypocalcemia; it results from accidental gland injury, removal, or devascularization.

Hoarseness is mostly caused by RLN injury, which often results in vocal and laryngeal dysfunction. The patient's quality of life can be negatively influenced by the incidence of potential complications leading to increase in individual's health-care costs and requiring a lifelong alternative therapy.Complications associated with thyroidectomy are related to the type of disease, extent of disease, removal approaches, surgeon's training, and experience. Several studies have shown that increased surgeon experience is significantly associated with decreases in complications after thyroid surgery(2).

Most patients undergoing surgery for multinodular goiter (MG) require bilateral thyroid resection. However, there is currently no consensus on what the most appropriate technique is.Subtotal thyroidectomy (ST) has been the surgical treatment of choice in surgery for MG, but it does have several inconveniences, among which is a high rate of recurrence (10 to 30%). Total thyroidectomy (TT) does not have these disadvantages, but it does involve a higher potential risk of complications. Reported morbidity rates are as high as 3.5% for definitive hypoparathyroidism and 3.1% for permanent recurrent laryngeal nerve (RLN) injury, to reach 5% and 17%, respectively, when there are recurrent goiters. These figures are unacceptable for the surgical treatment of a benign pathology occurring in a relatively young population. It has now been seen that with skilled training these complications could be reduced. However, there are few prospective studies to confirm these data.

The risk factors for complications, whether hypoparathyroidism or recurrent lesion, have not been investigated systematically. There are exceptional multivariate analyses that evaluate the influence of risk factors for disease and hospital on the rates of complications of benign thyroid surgery, and those that exist are very heterogeneous with regard to surgical technique and surgeons' experience.(3)

The objective of this study was to evaluate the factors affecting post thyroidectomy outcome in Black Lion, Yekatit and Zewuditu Memorial Hospital.

1.2. Statement of the problem

The fact that thyroidectomy are one of the commonest surgery performed in most Hospitals the knowledge of magnitude of complications in our set up and identifying the factors which increases the rate of complications may help significantly in reducing morbidity and mortality related to this common procedure. The results can be used in training the more trained surgical community safer in their routine surgical practice.

Significance of the study

This study evaluate in to factors affecting post thyroidectomy outcome in three teaching Hospitals in the study period and outline certain specific factors which may have contributed to the complications. The result was given the surgeon an important evidence to the protective measures to prevent the morbidity and mortality of these surgery and outcomes.

CHAPTER TWO

LITRETURE REVIEW

A retrospective chart and complications review of 1020 patients (1990–2000) underwent thyroidectomy in Brazil for benign and malignant goiter. Results showed that of the 1020 patients underwent thyroidectomy, the main postoperative complications consisted of transient hypocalcemia in 134 (13.1%) patients, permanent hypocalcemia in 26 (2.5%) patients, transient vocal cord palsy in 14 (1.4%) patients, and permanent vocal cord palsy in 4 (0.4%) patients. The type of thyroidectomy, neck dissection, and paratracheal lymph node dissection were

significantly associated with transitory and permanent hypocalcemia. The conclusion was thyroid surgery can be performed safely in a surgical residency training program under direct supervision of an experienced surgeon with little morbidity to the patients. Hypocalcemia is the most significant complication. Neck and para-tracheal lymph node dissections were the most significant predictors of hypocalcemia in patients who underwent total thyroidectomy.(4)

According to study done in Brazil from January 1990 to December 2000, 1020 patients were submitted to thyroidectomy in the Head and Neck Surgery and Otorhinolaryngology Department. A retrospective chart and complications review of 316 consecutive patients who underwent thyroidectomy for differentiated thyroid carcinoma. Of the 316 patients, the main postoperative complications were transient hypocalcemia in 87 (27.5%), permanent hypocalcemia in 16 (5.1%), transient vocal cord palsy in 4 (1.2%), and permanent vocal cord palsy in 2 (0.6%). Neck dissection and paratracheal lymph node dissection when associated with total thyroidectomy were significantly related to transitory and permanent hypocalcemia. most of these operations were performed by 3rd to 5th year medical residents in surgical oncology or head and neck surgery fellows under the direct supervision of one experienced head and neck surgeon.(5)

A retrospective cohort study data from the 2005 to 2014 multi-institutional, risk-adjusted American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) database, a multivariate regression model with corresponding odds ratios and 95% confidence intervals was used to determine 30-day morbidity and mortality after total thyroidectomies, and also risk factors of postoperative outcomes. From 2005 to 2014, 40,025 total thyroidectomies were performed (48.5% inpatient, 51.5% outpatient). The 30-day complication rate for all

total thyroidectomies was 7.74%. Multivariate logistic regression analysis was performed to control for potential confounding variables. Preoperative factors that affected complications rates for inpatient thyroidectomies included: age ≥70, non Caucasian race, dependent functional status, history of congestive heart failure, smoking history, bleeding disorder, wound infection, and preoperative sepsis ($P<0.05$). In addition, preoperative factors affecting complications in thyroidectomy performed as an outpatient surgery included malignant thyroid pathology (P 0.05).(6).

A retrospective analysis of 53 patients from January 2012 to December 2014 underwent total thyroidectomy for Multinodular Goiter in the Department of Thoracic Surgery, Hospital of Mali, and Bamako, Mali. Patients who underwent total thyroidectomy for Toxic and non-toxic multinodular goiter was included in the study. The indications of surgery were bilateral multinodular toxic or non toxic goiter in 49 cases and 4 cases of recurrence after subtotal thyroidectomy. The mean age was 47 years for all patients. The youngest patient was 24 years and the oldest was 70 years. There were 47 (88.68%) females and 6 (11.32%) males. Among the patients 37 (69.81%) were presented euthyroidism and 16 (30.19%) were presented hyperthyroidism. the result were Hematoma developed in one case while wound site infection developed in one patient. Recurrent laryngeal nerve (RLN) palsy occurred in 2 (3.77%) cases. All RLN palsy cases were unilateral. Permanent palsy was not documented in this study in the postoperative period, hypocalcemia developed in 4 (7.55%) cases. No persistent hypocalcemia was observed after total thyroidectomy.(7)

According to the Indian journal of surgery, a total of 332 patients underwent thyroid surgery between April 2004 and May 2008 was evaluated retrospectively to identify the factors influencing the complications in surgery lasting more than 90 minutes.

The risk of permanent recurrent laryngeal nerve (RLN) injury was high, daily drainage more than 50 cc increases the risk of seroma formation, retrosternal goiter surgery have higher risk for bleeding. The flap edema rates were high found in the operations made by resident surgeon and patients with size 3–4 thyroid glands. Low complication rates can be achieved after thyroidectomy with better knowledge of the surgical anatomy of the neck, thyroid pathology and required surgical treatment (8).

Scientific Research Journal of Bangladesh to evaluate the early post-operative complications and the risk factors in relation to the extent of surgery in patients undergoing thyroidectomy in a tertiary level hospital. a cross-sectional observational study done from 1st November 2017 to 30th April, 2018 in department of ENT & Head Neck surgery, Camilla Medical College Hospital, Camilla, 50 patients who underwent thyroid surgery were included this study. The result showed that in total 50 patients' thyroid surgery were performed for different indications. The patients were between 21- 60 years of age with a maximum incidence in 4th decade, out of them 42 patients were female and 8 patients were male with a female to male ratio 5.25:1. Among the 50 patients, 27 patients were diagnosed as nodular goiter, 8 patients as papillary carcinoma, 11 patients as follicular adenoma & 4 patients as follicular carcinoma. In this study papillary carcinoma is prevalent in 3rd decade and follicular carcinoma in 4th to 6th decade & Nodular goiter 4th decade. Nodular goiter was the most frequent indications (54%) which were followed by papillary carcinoma of thyroid (18%). The only six complications noted in these 50 patients. Postoperative hematoma occur in 1 patient, transient hypocalcemia in 2 patients, unilateral RLN palsy in 2 patients and airway obstruction in 1 patient.(9)

According to Brazilian Journal of Otorhinolaryngology, cross-sectional cohort study done on 228 patients who underwent thyroidectomy, between 1991 and 2004. Transient, permanent and total complications as well as persistence and recurrence of

the basal disease were studied in relation to clinical and laboratory factors. The results was; total complications occurred in 34.65%, transient complications in 18.86% ,(9.21% had hypocalcemia, 0.44% had vocal cord paralysis), associated with the first postoperative years and pressure complaints, and permanent complications in 17.98% (8.77%: hypoparathyroidism; 1.75%: vocal cord paralysis), associated with malignancy and more radical surgeries. The thyroid disease persisted in 17.98% of the cases, associated with age and recurrence in 10.96%, associated with the first operative years, benign diseases and less radical surgeries. The complications were associated with pressure complaints, shorter complaining period, malignancy and more radical surgeries. The recurrence was associated with the first operative years, non-neoplastic thyroid diseases and less radical surgeries. The persistence of disease was associated with older age.(10)

American journal research done at the university of Kansas medical center from January 1979 through August 1985, 274 thyroidectomies were performed for benign and malignant disease at the University, 52 patients were excluded from this study because of concurrent parathyroid disease or failure to have both preoperative and postoperative serum calcium level determinations. The remaining 221 patients and 222 operations (1 patient was reoperated for residual cancer) were reviewed for disease process, operative procedure, preoperative thyroid function, and other factors such as medications, intraoperative fluid administration, and thyrocalcitonin levels that could affect postoperative hypocalcemia. The result was Postoperative hypocalcemia occurred in 185 of the 221 patients (83%) undergoing thyroidectomy. The mean preoperative calcium level decreased from 9.6 mg/dl to 8.1 mg/dl at 16 hours. No treatment was required in 157 of these patients, whereas 28 patients (13%) became symptomatic and required either calcium therapy for transient hypocalcemia (19%) or calcium and vitamin D therapy for permanent hypocalcemia (9%).(11)

From 2004 to 2006, 26 Scandinavian Departments registered 3,660 thyroid operations in a database. Risk factors for complications were analyzed with multiple logistic regressions. Results After thyroidectomy, re-bleeding occurred in 2.1% and was associated with older age (OR 1.04; p=0.014). Postoperative infection occurred in 1.6% and associated with lymph node operation (OR 8.18; p p<0.0001) Postoperative unilateral paresis of the recurrent laryngeal nerve was diagnosed 3.9% and bilateral paresis in 0.2%. Unilateral paresis was associated with older age, intrathoracic goiter, thyrotoxicosis, and if routine laryngoscopy was practiced (OR 1.92; p=0.0002). After 6 months, the incidence of nerve paresis was 0.97%. After bilateral thyroid surgery (n=1,648), hypocalcaemia treated with vitamin D analogue occurred in 9.9% of the patients at the first follow-up and in 4.4% after 6 months. Conclusion Complications to thyroid surgery are not uncommon. The high frequency of hypocalcaemia treated with vitamin D after 6 months is a cause of concern (12)

A nationwide survey was conducted in 2014 by senior surgeons from 16 medical centers and 5 regional hospitals in Taiwan to thyroid operations performed over 3 years. 3846 cases were retrospectively examined to identify factors influencing complications. The Results showed that: Eighty-four percent of patients were female. Seven percent of the patients had immediate postoperative hypocalcemia (mild and severe) and 2.3%, hoarseness (recurrent laryngeal nerve (RLN) injury, temporary/permanent). Logistic regression analysis identified an association between hypocalcemia and RLN injury with age, hospital category; surgical procedure types (total thyroidectomy, unilateral, bilateral subtotal or total resection). A lower incidence of hypocalcemia was related to preoperative neck ultrasound and FNAC analysis (the odds ratio (OR) ¼ 0.5 and 0.65, [95% confidence interval (CI) 0.331e0.768 and 0.459e0.911], P ¼ 0.0014 and 0.0127, respectively), while RLN injury was not associated with any preoperative evaluation. The ORs of

hypocalcemia and RLN injury for patients older than 50 years were 0.55 and 2.15, [0.393e0.763 and 1.356e3.4], P < 0.001 and 0.0012, respectively. (13)

A prospective study included 301 patients diagnosed and surgically treated for MG between January 1996 and January 2001 in Spain. The study was conducted on 301 MGs meeting the following criteria: (1) bilateral MG; (2) no prior cervical surgery; (3) operation by surgeons with experience in endocrine surgery; (4) no associated parathyroid pathology; (5) no initial thoracic approach; and (6) minimum follow-up of 1 year. Age, sex, time of evolution, symptoms, cervical goiter grade, intrathoracic component, thyroid weight, and presence of associated carcinoma were analyzed as risk factors for complications. The results showed that Complications were presented by 62 patients (21%), corresponding to 29 hypoparathyroidisms, 26 recurrent laryngeal nerve injuries, 4 lesions of the superior laryngeal nerve, 3 cervical hematomas, and 1 infection of the cervicotomy. The variables associated with the presence of these complications were hyperthyroidism (P = 0.0033), compressive symptoms (P = 0.0455), intrathoracic component (P = 0.0366), goiter grade (P = 0.0195), and weight of excised specimen (P = 0.0302); hyperthyroidism (relative risk [RR] 2.5) and intrathoracic component (RR 1.5) persisted as independent risk factors. Definitive complications appeared in 3 patients (1%), corresponding to 2 hypoparathyroidisms and 1 recurrent laryngeal nerve injury. Two cases corresponded to a toxic goiter, and the third to an intrathoracic goiter with compressive symptoms (14)

The prospective study includes 137 patients admitted to surgery for thyroid disease at St. Mary's Hospital of Lacor in North Uganda, from April 2012 to December 2015.
The Results was performed 84 lobotomies' (61.3%), 13 loboisthmusectomies (9.49%), 25 sub-total thyroidectomies (18.25%), and 15 TTs (10.95%). We observed

5 postoperative complications and 1 intraoperative death. TTs increased in number compared with partial thyroidectomies ($p=0.02$) and STTs ($p<0.0001$).(15)

According to Study in New York From 1972 to 1984, 64 total thyroidectomies were performed by members of head and neck service. There were 18 men and 46 women, ranging in age from 18 to 82 years (mean age, 50 years). The pathologic findings were benign in 34 cases; of the 30 malignant lesions, 21 were papillary cancer, 6 were follicular cancer, and each was medullary, lymphoma, and Metastatic cancer. The indications for total thyroidectomy in these 64 cases were bilateral nodularity or diffuse involvement of the entire gland. In the benign cases, it was thought that the advanced, nonresponsive disease in the contralateral lobe necessitated resection. Six patients underwent neck dissection. Paratracheal dissection was performed in 17 cases, of which nine were bilateral. The recurrent laryngeal nerve was stretched in four cases and deliberately transected in one. A minimum of one parathyroid gland was autotransplanted in 12 patients. The results were nine patients (14%) were hoarse postoperatively, but only one (1.5%) had permanent vocal cord paralysis. The remaining eight patients recovered recurrent laryngeal nerve function by 6 months. Transient hypocalcemia below 8.5 mg/dl was found in 48 patients (75%); hypocalcemia below 8.0 mg/dl occurred in 30 patients (47%). However, at 6 months postoperatively, only six patients (9.3%) had hypocalcemia below 8.5 mg/dl, of whom five were asymptomatic and have not experienced any untoward sequelae. Only one patient (1.6%) has permanent hypocalcemia below 8.0 mg/ dl requiring exogenous supplementation.(16)

A retrospective study of complications arising from consecutive thyroidectomies was carried out in the University of Abuja Teaching Hospital for over a 5-year period between January 1, 2012 and December 31, 2017. Clinical data on each case were extracted from patient folders using a structured questionnaire. the result showed that,

total of 72 thyroidectomies were carried out during the period. There were seven males and 65 females with M:F ratio of 1:9. The median age of the patients was 38.5 years (range 18–75 years). Preoperative diagnoses included simple goiter ($n = 6$, 8.3%), nontoxic multinodular goiter ($n = 51$, 70.8%), toxic nodular goiter ($n = 6$, 8.3%), Grave's disease ($n = 2$, 2.8%), toxic multinodular goiter ($n = 5$, 6.9%), simple multinodular goiter ($n = 1$, 1.4%), and others such as solitary thyroid cyst ($n = 1$, 1.4%) . The operations were total thyroidectomy ($n = 15$, 20.8%), subtotal thyroidectomy ($n = 13$, 18.1%), near-total thyroidectomy ($n = 33$, 45.8%), lobectomy ($n = 10$, 13.9%), and extended lobectomy ($n = 1$, 1.4%); 72.1% of the patients had no complications whereas 27.9% of the patients developed complications. The complications were temporary recurrent laryngeal nerve (RLN) palsy 9.7%, recurrent goiter 1.4%, hypothyroidism 1.4%, hypocalcemia 5.6%, hypertrophic scar formation 5.6%, and hematoma collection 4.2%. No patient developed wound infection, transient or permanent hypoparathyroidism, permanent RLN palsy, superior laryngeal nerve palsy, recessed scar, or mortality. All the patients were followed up for a period of 1 to 5 years. (17)

A retrospective analysis was made of patients who underwent operation for thyroid diseases during a surgical help program in Leo/Burkina Faso during a 7-year period from 2001 to 2008.The result showed that total of 253 cases presented with goiters grade III (WHO classification) were operated on: 134 hemithyroidectomy, 108 hemithyroidectomy combined with subtotal contralateral resection, and 11 total thyroidectomies were performed. The recurrent laryngeal injury rate was 0.8%, and the re-exploration rate for bleeding was 1.2%. Median hospital stay was 3.1 days. Histological examinations showed Graves' disease in 6 cases, and multinodular goiter in 231 cases. Follicular cancer was found in 15 cases, and anaplastic carcinoma was found in 1 case (18)

A retrospective review aimed at determining the incidence, pattern, pathology, postoperative complications of 137 cases of goiter operated at the Gondar College of Medical sciences, Ethiopia, over a period of four years were reviewed. The Results showed that the female to male ratio was 5:2 and the mean age of patients was 32.3 years. The mean duration of illness was 9.1 years. The commonest reasons for seeking medical attention were bulk of the mass (82%), rapid growth (9.5%) and compressive symptoms (2.9%). The goiter size was grade III and above in 83.1% of the patients. There were 14 (10.2%) thyroid carcinomas. Follicular carcinoma was the most common type of malignancy. Thyroiditis and toxic goitres were seen in 8 and 5 of the patients respectively. Subtotal thyroidectomy and lobectomy were the commonest procedures done. A total of 36 post-thyroidectomy complications occurred in 20 patients. Eight patients developed airway obstruction six of them requiring tracheostomy. Eleven patients (8%) had blood transfusion. The postoperative mortality was 1.5%. (19)

A prospective study done at the Ataturk University Medical Faculty, Department of General Surgery, between October 15, 2007 and October 15, 2008 total thyroidectomy was done on 196 patients. Aim was to Assess Factors Affecting Hypocalcaemia Following Total Thyroidectomy. Results was- One hundred and fifty three patients were female (78.1%) and 43 were male (21.9%). The female/male ratio was 3.55/1 and the mean age was 49.11+13.7. For 76% of the patients, the diagnosis was multinodular goiter and 77% was euthyroid. Parathyroid injury was observed in seven patients. The mean amount of hemorrhage in these patients was 127.60 cc Hypocalcaemia developed in 47 of 196 patients. Conclusion: The factors associated with hypocalcaemia were defined to be “gender, preoperative diagnosis, parathyroid gland injury, nodule size and vitamin D deficiency”, it is a multifactorial problem and it would not be proper to define a few etiological factors.(20)

Retrospective study of consecutive patients who underwent total thyroidectomy by a single high-volume surgeon JAMA Otolaryngology-head & neck surgery between February 1, 2010, and November 30, 2012. The results showed that, 304 total thyroidectomies were performed. Mild and significant hypocalcemia occurred in 68 (22.4%) and 91 (29.9%) patients, respectively, of which the majority were female (P = .003). The development of significant hypocalcemia was associated with postoperative IPTH level (P < .001). On multivariate analysis, males had a decreased risk of developing mild (odds ratio, 0.37 [95% CI, 0.16-0.85]) and significant (odds ratio, 0.57 [95% CI, 0.09-0.78]) hypocalcemia. Every 10-pg/mL increase in postoperative IPTH level predicted a 43% decreased risk of significant hypocalcemia (P < .001) and an 18% decreased risk of hospitalization beyond 24 hours (P = .03). Presence of malignant neoplasm carried a 27% risk of mild hypocalcemia (P = .02). There was a progressively increasing risk of lower IPTH levels for each parathyroid gland inadvertently resected or autotransplanted. Male sex and African American race were independently predictive of higher IPTH levels.(21)

A prospective study done in Gondar College of Medical Sciences in December 2003 and August 2004. Thyroidectomy was done on 80 patients. Aim was determining the pattern and surgical management of goiters in patient seen at teaching and referral Hospital, North Western Ethiopia. The patients' history, physical findings and relevant laboratory results were recorded using a standard uniform format. Operative findings, postoperative course and follow up information were noted. The results were, The male to female ratio was 1: 4.7. The mean duration of illness was 8.8 years. A total of 78.8% of the patients had a Grade III goiter. Cosmetic disfigurement and respiratory symptoms were the leading reasons for hospital visit. Simple goiters, thyroid carcinoma and toxic goiters occurred in 80%, 11.3% and 6.25% of the patients respectively. The incidence of thyroid carcinoma was found to be higher

compared to other studies in Ethiopia, Africa and Asia. Clinical evaluation was found to be valuable in identifying patients with toxic goiters. Seventy-five (93.8%) of the cases were treated surgically. The weight of thyroid tissue removed ranged between 20-1200 grams (Mean=320 grams). Blood transfusion was required in twelve patients for significant intra operative bleeding and four patients required tracheostomy post operatively. Three patients died. Blood group O+ was found to be frequently associated with goiter. (22)

A prospective study of 45 patients undergoing thyroid surgery in eastern Nepal from March 2014 to September 2015. The postoperative complications and the risk factors associated with these complications were evaluated. The Results was main postoperative complications were: hypocalcemia (6 or 13.33% cases) and vocal cord palsy due to recurrent laryngeal nerve injury (5 or 11.11% cases). Temporary hypocalcemia was observed in 3 (6.67%) cases while permanent hypocalcemia developed in other 3 (6.67%) cases. Similarly, the temporary and permanent recurrent laryngeal nerve palsy occurred in 3 (6.67%) cases and 2 (4.44%) cases respectively. The risk factors associated with hypocalcemia were: malignancy, repeat operation, central compartment neck dissection and non-identification of parathyroid glands during surgery. Similarly, recurrent laryngeal nerve palsy was observed in cases of malignancy and central compartment neck dissection. The overall postoperative complication rate was 28.9%. Other complications were poor scar in 1 (2.2%) case and chyle leak in 1 (2.2%) case.(23)

A retrospective study done on 222 patients who underwent thyroid surgery in St.Paul’s Hospital Millennium Medical College, Over two year period from January 2013-december 2014 to determine the burden and the pattern of thyroid disease in this hospital. The Result was the common mode of presentations was anterior neck

swelling (91.4%) and toxic (29.7%) and pressure symptoms (19.4%). The common physical findings identified were multi nodular goiter (57.2%), diffuse goiter (23.9%) and solitary nodule (5.8%). FNAC showed that Nodular colloid goiter was common diagnosis (68.5%). Neoplasms accounted for 15.9% of the diagnosis; of this follicular neoplasm make (54%) and papillary cancer (20%). Functionally, hyperthyroid goiter 28.8% and euthyroid goiters (64 %).

Transient hypocalcaemia (3.2%) and hoarseness of voice (1.8%) were the commonest complications (24).

CHAPTER THREE

OBJECTIVES

3.1 General Objective

To evaluate factors affecting postoperative outcome after thyroid surgery in (Black Lion, Yekatit 12 and zewuditu Memorial Hospital.)

3.2 Specific Objectives:

- To assess the prevalence of different post thyroidectomy complications
- To determine factors affecting surgical outcome of thyroid surgery
- To determine type of surgery performed for different pathologogy of thyroid gland.
- To determine factor associated with mortality following thyroidectomy.
- To evaluate associations of indications, types of surgery, experience of surgeon, estimated blood loss, intraop adhesion with thyroid surgery complications.

CHAPTER FOUR

METHODS AND MATERIALS

4.1. Study area and period

The study was conducted in Tikur Anbessa Specialized Hospital, Yekatit 12 and zewuditu Memorial Hospital, Addis Ababa, Ethiopia. The study has included patients operated from October 1 2019 –April 30, 2020.

4.2. Study design

The study was prospective observational study involving all consecutive patients undergoing thyroid surgery was enrolled in the study.

4.3. Inclusion and Exclusion criteria

1. Inclusion criteria

   All Patients of age fourteen and above, who underwent thyroidectomy for thyroid swelling during the study period.

2. Exclusion criteria

   All patients age less than fourteen year

   Lost patient from follow-up

4.4. Source populations

All patients' undergone elective surgery during study period, in the specified hospital.

Operational definition

Bleeding- post-thyroidectomy bleeding which need wound reopening for hematoma evacuation or when drain stays more than 24hours with significant output.

Adhesion-when enlarged thyroid gland adhered to nearby important structure.

EBL-Intraoperative bleeding which is estimated interims of milliliter.

Hypocalcemia –patient with clinical or biochemical evidence of low serum calcium.

4.5. Study Variables

4.5.1. Dependent Variables

- Outcome of patients (morbidity and mortality of patients with thyroidectomy).

4.5.2. Independent Variable

- Age
- sex
- Estimated blood loose
- Intraoperative adhesion
- Indication for surgery
- type of procedure
- surgeon experience

4.6. Questionnaires

A structure and pretested questionnaire in English language was prepared to determine factor affecting post thyroidectomy outcome during study period.

4.7. Data Collection and Analysis

The data was collected by four personnel who have knowledge about the disease and know how to follow the patient. The data collector was trained and oriented as to how data collection proceed and the nature of questionnaire and the investigator was supervise each as required during the data collection.

After data collection, cleaning and checking of the content was done, rates, ratio and percentage were calculated using SPSS 20 software version.

From literature review age, thyroid function test, indication for surgery, types of surgery, surgeon experience, intraoperative adhesion and estimated blood loss were analyzed as risk factors for post thyroidectomy outcome and Statistical significance test was applied to see the association in stated hospital.

4.8. Ethical Consideration

Data collection was started after permission has been obtained from Addis Ababa University, t the objective of the study was thoroughly explained and confidentiality was secured.

4.9. Limitation

Limited accessibility of internet.

There are no available (published) studies with similar context in Ethiopia setting recently.

Insufficient budget allocated to conduct the research.

CHAPTER FIVE

ANALYSIS

Results

We had 125 patients with thyroidectomy, of which 5 have lost from follow up and excluded. So data recovery rate was 120/125= 96%.

A prospective study of all patients who underwent thyroid surgery in Black Lion, Yekatit, and Zewuditu Memorial Hospital, over a six Month -period, from OCTOBER 1, 2019- APRIL 30, 2020 was undertaken. The three hospitals are a teaching hospital, located in Addis Ababa Ethiopia. During the study period 120 cases were analyzed.

All the patients were adimited on elective bases. Detail history was taken and through physical examination was carried out. Final diagnosis was made on the basis of history, clinical examination, thyroid function test, FNAC, and histopathology after surgical excition.The goitres were graded according to WHO classification system. Operative findings, postoperative course and follow up information was noted, the data was entered into a computer and analyzed using SPSS Version- 20 statistical package.

Socio-demographic data

A total of 120 case records of thyroid operations were analyzed. The male to female ratio was 1:5 and Frequency was 20 (16.66%) and 100(83.33%) respectively. 15(12.5%) of the patients are between 14-25 years, 46(38.3%) of patients are 26-35 years, 26(21.7%) are from 36-45 years, 21 (17.5%) are from 45-55 years and 12(10%) patients are >55 years of age. Most of the patients came from Addis Ababa (Table1)

Table 1. Socio demographic profile of patients operated for goiter

Desorption		Frequency (n=120)	percentage(100%)
Sex	Male	20	16.66
	Female	100	83.3
	Total	**120**	**100**
Age of patient	14-25	15	12.5
	26-35	46	38.3
	36-45	26	21.7
	46-55	21	17.5
	>55	12	10.0
	Total	120	100
Residency of patient	Addis Ababa	97	80.8
	Out of Addis Ababa	23	19.2
	Total	120	100

Duration of Illness- 62 (51.7%) of patients presented within 1-5yrs,22 (18.3%) presented with 6-10yrs, 11(9.2%) presented within <1yr and >15yrs of illness respectively (Table2)

Table 2. clinical presentation of patients operated for goiter

Duration of Illness	Frequency (n=120)	percentage(100%)
<1yr	11	9.2
1-5yrs	62	51.7
6-10yrs	22	18.3
11-15yrs	14	11.7
>15yrs	11	9.2
Total	120	100.0

- About (100%) of patients presented with Anterior neck swelling, 48(40%) of patients have hot intolerance, 44(36.7%) have palpitation,47(39.2) patients have emotional liability, 19(15.8%) of patients have Horsiness of voice, 8(6.7%) have

shortness of breath, 47(39.2%) of patients have Tiredness and 23(19.2%) have pain at presentation.

- About 78% of patients had thyroid gland grade III and above 42% have grade II during presentation (Table 3).

TABLE 3. SHOWING CLINICAL PRESENTATIONS

Variables		Frequency	N%
Anterior Neck swelling	Yes	120	100%
hot intolerance	Yes	48	40%
	No	72	60%
Palpitation	Yes	44	36.7%
	No	76	63.3%
Emotional Liability	Yes	47	39.2%
	No	73	60.8%
Pain at neck swelling	Yes	23	19.2%
	No	97	80.8%
Shortness of breath	Yes	8	6.7%
	No	112	93.3%
Tiredness	Yes	47	39.2%
	No	73	60.8%
Horsiness of voice	Yes	19	15.8%
	No	101	84.2%
Thyroid gland size Grade	Grade		
	II	42	35(%)
	III	78	65(%)

TABLE 4. INVESTIGATION

		Frequencey	**Percentage**
TFT	Normal	67	**55.83**
	Controlled toxic	52	**43.33**
	Uncontrolled	1	**0.833**
FNAC	Colloid MNG	92	**76.66**
	Follicular neoplasia	13	**10.833**
	Papillary ca	12	**10**
	Hurthle cell neoplasia	3	**2.5**

Neck CT Scan	Done	5	4.2
	Not Done	115	95.8

The most common diagnosis at admition was controlled toxic goiter, which is followed by simple multy nodular goiter.

Table 5. DIAGNOSIS AT ADMITION OF PATIENTS OPERATED ATTHREE HOSPITALS

Dx	frequency	Percentage
Simple MNG	**49**	**35**
Controlled Toxic MNG	**42**	**40.833**
Papillary ca	**12**	**10**
Follicular neoplasia	**13**	**10.833**
Hurthle cell neoplasia	**3**	**2.5**
Thyroid cyst	**1**	**0.833**
Tatal	**120**	**100%**

89(74.2%) of patients had histologic diagnosis of colloid MNG & 6(5%) have follicular adenoma, Papillary ca was the leading among CA 13(10.8%) which is followed by follicular CA 9(7.5%) (Table 4).

Table 6. Histologic diagnosis of patients operated for Goiter in three Hospitals

Discretions	Frequency	N%
Benign Goiter		
Colloid MNG goiter	89	74.2
Follicular adenoma	6	5.0
Thyroid cancer	25	**20.8%**

papillary CA	13	10.8
follicular CA	9	7.5
Hurtle cell CA	3	2.5
➢	**120**	**100%**

In 120 patients a total of 23 (19.16%) complications occurred. The major complication seen was Wound Infection 7(5.8%) followed by postoperative Bleeding in 6(5%). Horsiness of voice and Hypocalcemia seen in 3(2.5%) of patients respectively. shown in (Table 7)

Table 7. Frequency of complications

Complications	NO	Percentage
Bleeding	6	5.0%
Wound Infection	7	5.8%
Horsiness of voice	3	2.5%
Hypocalcemia	3	2.5%
Seroma	4	3.3%
Total	23	19.16

The commonest operation performed was near total thyroidectomy 44(36.7%),followed by Dunhill procedure 21(17.5%).Total thyroidectomy done for 10(8.3%),subtotal thyroidectomy done for 18(15%),total thyroidectomy and lymph node dissection done for 4(3.3%),completion thyroidectomy done for 3(2.5%) and lymph node picking done for lymph node recurrence for 1(0.8%) of patients(Table 8).

Table 8. Types of surgical procedures in patients operated for goiter in 3 hospitals,October 1 2019- April 30 2020.

Types of procedure	Frequency (n=120)	percentage(100%)
Near Total Thyroidectomy	44	36.7%
Dun hill Procedure	21	17.5%
Lobectomy+ Isthmusectomy	19	15.8%
Subtotal thyroidectomy	18	15%

Total thyroidectomy	10	8.3%
Total thyroidectomy +LND	4	3.3%
Completion Thyroidectomy	3	2.5%
Lymph node removal	1	0.8%
Total	120	100%

It can be seen from the table 10 below that there was significant association b/n age and early postoperative complication with more complication seen at age range of 14-25yrs, P value of 0.25,OR 33.585.There was statistically significant association b/n early postoperative complication and indication for surgery with more complication seen in patients with toxic symptoms (52%) and malignancy (26%) ,P value of 0.31, OR 29.491.The least complication(8.6%) seen in the patient who operated for cosmoses.

Intraoperative estimated blood loss also has statistically significant association with hematoma, P value of 0.00, OR 113.27.

Types of surgery had association with early postoperative complication with P Value of 0.045,OR of 60.65. Total thyroidectomy with or without LND has Significant association with hypocalcemia and hoarseness of voice.

There was statistically significant association b/n thyroid function test and early postoperative complication with P Value of 0.005, OR of 47.075, intraoperative a

Adhesion P value 0.035,OR 16.69 , surgeon experience P value of 0.022 OR19.95.

No postoperative mortality in this study.

Table 9. Statistical relation between Impact of Age, Thyroid Function test, Indication for surgery, Types of Surgery, Surgeons experience, Adhesions and Estimated Blood Loss On postoperative complication Rate .

Variable		Bleeding	Wound infection.	Horsiness of Voice	Hypocalcemia	Seroma	Chi-square	p-value	**Total**
		N(%)	**N(%)**	**N(%)**	**N(%)**	**N(%)**			
age in years	14-25	3(13.0%)	0	0	1(4.34%)	0	**33.585[a]**	**.025[b]**	**4(17.4%)**
	26-35	1(4.34%)	3(13.0%)	1(4.34%)	1(4.34%)	0			**6(26.0%)**
	36-45	0	1(4.34%)	2(8.6%)	0	3(13.0%)			**6(26.0%)**
	46-55	0	3(13.0%)	0	0	1(4.34%)			**4(17.7%)**
	>55	2(8.6%)	0	0	1(4.34%)	0			3(13.0%)
Total		**6(26%)**	**7(30.4%)**	**3(13.0%)**	**3(13.0%)**	**4(17.7%)**			**23(100%)**
Indication for Surgery	patient wish	0	1(4.34%)	1(4.34%)	0	0	**29.491[a]**	**.031[b]**	2(8.6%)
	toxic symptoms	1(4.34%)	4(17.7%)	1(4.34%)	2(8.6%)	4(8.16%)			**12(52%)**
	Malignancy	3(13.0%)	1(4.34%)	1(4.34%)	1(4.34%)	0			**6(26%)**
	pressure symptoms	2(8.6%)	1(4.34%)	0	0	0			3(13.0%)
Total		**6(26%)**	**7(30.4%)**	**3(13.0%)**	**3(13.0%)**	**4(17.7%)**			**23(100%)**
Estimated Blood Loss	<100ml	0	1(4.34%)	1(4.34%)	0	1(4.34%)	**113.27[a]**	**.000[b]**	**3(13%)**
	100ml-400ml	0	6(26%)	2(8.7%)	3(13.0%)	3(13.0%)			**14(60.9%)**
	500ml-700ml	2(8.7%)	0	0	0	0			**2(8.7%)**
	700ml-900ml	3(4.34%)	0	0	0	0			3(13%)
	900ml-1100ml	1(4.34%)	0	0	0	0			1(4.34%)
Total		**6(26%)**	**7(30.4%)**	**3(13%)**	**3(13%)**	**4(17.7%)**			**23(100%)**
Types of Surgery	Total thyroidectomy	2(8.7%)	0	1(4.43%)	2(8.7%)	0	**60.650[a]**	**.045[b]**	**5(21.7%)**
	sub Total Thyroidectomy	0	1(4.43%)	0	0	0			**1(4.43%)**
	Near Total Thyroidectomy	0	2(8.7%)	0	1(4.43%)	4(17.4%)			**7(30.5%)**
	Dun hill	0	4(17.4%)	2(8.7%)	0	0			**6(26%)**
	TT +LND Dissection	2(8.7%)	0	**1(4.43%)**	1(4.43%)	0			**4(17.4%)**
Total		**4(8.7%)**	**7(30.4%)**	**4(17.4%)**	**4(17.4%)**	**4(17.4%)**			**23(100%)**
Thyroid Function Test	Normal	5(21.7%)	3(13%)	2(8.7%)	1(4.34%)	**0**			**11(47.8%)**
	controlled toxic	1(4.34%)	4(17.4%)	1(4.34%)	1(4.34%)	4(17.7%)	**47.075[a]**	**.005[b]**	**11(47.8%)**
	Uncontrolled	0	0	0	1(4.34%)	0			**1(4.34%)**
Total		**6(26%)**	**7(30.4%)**	**3(13%)**	**3(13%)**	**4(17.4%)**			**23(100%)**
Adhesion	Yes	2(33.33%)	0	1(4.34%)	0	0	16.690[a]	.035[b]	**3(13%)**
Surgeons	Endocrine surgeon	4(17.7%)	0	2(1.66%)	1(4.34%)	0	**19.957a**	**.022b**	**7(30.4%)**

Experience	General surgeon	1(4.34%)	6(11.76%)	1(4.34%)	2(3.92%)	1(4.34%)			**11(47.8%)**
	Residents	1(4.34%)	1(4.34%)	0	0	3(13%)			**5(21.7%)**
Total		**6(26%)**	**7(30.4%)**	**3(13%)**	**3(13%)**	**4(17.%)**			**23(100%)**

DISCUSSION

During the study period a total of 125 operations were performed.

This figure is significantly higher than reports from Bangladesh Camilla Medical College by Rashid (9), where 50 patients underwent thyroidectomy over one year period, but it is significantly lower than reports from St. Mary's Hospital of Lacor in North Uganda where137 patients undergo thyroidectomy by **Burali G**(15).

20(16.66%) of study participants were male whereas 100(83.33%) were female, giving male to female ratio 1:5

This female predominance is also reflected in study done in Mali Bamako by Ouattara MA(7)where out of 53 patients who underwent thyroidectomy 47 were female and 6 were male.

Report from University of Abuja Teaching Hospital by **Samuel A**(17),shows similar report where 72 thyroidectomies performed,Male to Female ratio 1:9.

In this study about 62(51.7%) of patients came to the hospital within 1-5 years of illness and 11 (9.3%) come after 15yrs.

This figure is nearly similar to report done in Gondar by **Abebe B**(22),where out of 137,58 (42.3%) patient come with 1-5yrs,13(9.4%) came after 15years.

In our study the most common indications for surgery was controlled toxic goiter 49(40.8%),which was different from study done in Gondar College by **Abebe B**(22),where 80 patients underwent thyroidectomy, indications for 60(80%) patients was simple MNG for Cosmetic disfigurement.

Gondar is also one of iodine deficient areas in the country, but why simple goiter is common in this area need to be investigated.

The extent of thyroidectomy in the management of thyroid diseases is a disputed issue among researches and there is still no consensus as to how much thyroid tissue should be left behind.

In this survey the commonest operation performed was near total thyroidectomy 44(36.7%), followed by Dunhill procedure 21(17.5%).

This is different from the report done in North Uganda by Burali G(15),among 137 thyroidectomy,84(61.3%)lobectomy was the most common procedure, followed by subtotalthyroidectomy.

In our serious totalthyroidectomy with or without lymph node dissection and age were associated with hypocalcemia and hoarseness of voice, P value 0.045, OR 60.65,

Which is similar to report from hospitals in Taiwan by Huang C. (13), where 3846 patient's reviwed, association seen with types of surgery and age of patients.

In our study hematoma was a complication in 6(5%) cases and reoperation was undertaken in two patients due to ongoing hemorrhage.

This may be explained by bleeding is associated with large goiter and thyroid malignancy which is seen in our study

This is different from study done at Bangladesh by **Rashid MS** (9) Where 50 patients reviewed, Postoperative hematoma occurs in 1 patient.

In our study surgical site infection was the most common postoperative complication 7(5.8%) which is different from study in Scandinavian over two year period by Bergenfelz(12) ,where 3660 thyroid operations performed , post operative wound infection occur in 1.6% ,least common complications occurred.

Conclusion

The factors affecting post thyroidectomy outcome were indication for surgery, estimated blood loss, type of surgery, thyroid function test, adhesion and surgeon experience So it is a multifactorial problem and it would not be proper to define a few etiological factors.

Recommendations

Patients with thyroid malignancy, with considerable intraoperative bleeding needs careful securing hemostasis, can rebleed and develope hematoma. Further study is necessary to identify the cause of wound site infection as commonest complication observed was sugical site infection

LIMITATIONS

One patient followed only for 1month

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QUESTIONNAIRE

Addis Ababa University College of health sciences.

Questionnaire for prospective analysis of factor affecting Post thyroidectomy complication.

Part I : Socio demographic Characteristics.

1.Card No_____

2.Age A. 14-25 B. 20-35 C. 35-45 D. 40-55 E.>55

3.Regions A.Addis Abeba B . Out of Addis Abeba

4.Sex A. Male B.Female

5.Duration of anterior neck swelling A.<1yr B.1-5yr C.5-10yr D.10-15yr E. >15yr

Part II :Symptoms at presentation (main symptoms)

A. Anterior neck swelling A. Yes B. No

B. Hot intolerance A. Yes B No

C. palpitation A. Yes B.No

D. shortness of breathing A. Yes B.No

E. Pain A. yes B. No

F. tiredness A.Yes B. No

G. weight loss A.Yes B. No

H. excessive appetite A.Yes B. .No

I. emotional lability A.Yes B. No

Part III : Medical history (comorbidities)

A. Hypertension A. Yes B. No

B. DM A. Yes B. No

C. Cardiac disease A. Yes B. No

d. Pulmonary disease A. Yes B. No

E. Renal disease A. Yes B. No

F. other A. Yes B. No

G. None A. Yes B. No

Part IV : Clinical findings .

i. Anterior neck mass A. Grade II B. Grade III C. Grade IV

ii..Tachycardia A. Yes B. No

ii. .Arrhythemia A. Yes B. No

iv. Exophthalmos A. Yes B. No

vi. Lid retraction A. Yes B. No

vii. none

ii. U/S findings.

A. Solid nodule A. Yes B. No

B. Cystic mass A. Yes B. No

C. Calcification and risk of malignancy A. Yes B. No

D. Cervical LAP A. Yes B. No

E .Not done A. Yes B. No

iii. Electrocardiogram (ECG) findings.

A. Sinus rhythm A. Yes B. No C. Normal finding A. Yes B. No

B. Atrial fibrillation A. Yes B. No D. Not done

iv. Indications for surgery

A. cosmoses(pt wish) A. Yes B. No C. Pressure symptoms A. Yes B. No

B. toxic symptoms A. Yes B. No D. malignancy A. Yes B. No

v. FNAC

A. Colloid multinodular goiter A. Yes B. No D . Hurthle cell neoplasia A. Yes B. No

B. follicular neoplasia A. Yes B. No E. other----------

C. papillary ca A. Yes B. No

Part vi. Neck CT scan.

A. Large fixed goiter A. Yes B. No C. other _____

B. Substernal goiter A. Yes B. No D. Not done

Part Vii: Type of surgery performed for goiter

A. Lobectomy alone A. Yes B. No E. Total Thyroidectomy A. Yes B. No

B. .isthmusectomy alone A. Yes B. No F. Dunhill procedure A. Yes B. No

C .lobectomy +isthmusectomy A. Yes B. No G. TT +lymph node dissection A. Yes B. No

D. Near- total thyroidectomy A. Yes B. No H. other----------

Part Viii: Histologic examination of Thyroidectomy

A. Colloid MNG A. Yes B. No D. follicular CA A. Yes B. No

B. follicular Adenoma A. Yes B. No E. Hurtle cell CA A. Yes B. No

C. Papillary CA A. Yes B. No

Part iX: Early post-operative complication.

A. Hemorrhage A. Yes B. No D. Hoarseness of voice A. Yes B. No

B. Wound infection A. Yes B. No E. Hypocalcemia A. Yes B. No

C. Seroma A. Yes B. No F. others----------

Part X: Admition diagnosis of patients with thyroidectomy

A. Simple MNG A. Yes B. No

B. Controlled toxic MNG A. Yes B. No

C. Papillary Ca A. Yes B. No

D. Follicular neoplasia A. Yes B. No

E. Hurtle cell neoplasia A. Yes B. No

F. Thyroid Cyst A. Yes B. No

G. Others----------

Part Xi: Mortality of patient with post thyroidectomy.

A .During Hospital stay A. Yes B. No

B. After discharge A. Yes B. No

C. Not known A. Yes B. No

Part Xii-thyroidectomy is performed by

A. Endocrine surgeon A. Yes B. No

B. General surgeon A. Yes B. No

C. Residents A. Yes B. No

Part Xiii -Surgical technique and intra operative finding.

A. extensive adhesion A. YES B. No

B. Identification of recurrent laryngeal nerve A. YES B. NO

C. Identification of parathyroids A. YES B. NO

D. Other----------

Part. Xiv - . Estimated blood loss----------

A. <100ml

B. 100ml-300ml

C. 300ml-500ml

D. 500ml-700ml

E. 700ml-900ml

F. 900ml-1100ml