Addis Ababa University

College of Health Sciences,School of Medicine, Department of Surgery

Intraoperative accident and associated factors in Carotid Body Tumor surgery at tertiary Hospital in Addis Ababa ,Ethiopia

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A THESIS SUBMITTED TO THE SURGICAL DEPATMENT ,SCHOOL OF MEDICINE,COLLEDGE OF HEALTH SCIENCE ADDIS ABABA UNIVERSITY IN THE PARTIAL FULFILMENT OF SPECIELITY TRAINING IN GENERAL SURGERY

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Full title of the Research	**Intraoperative accident and associated factors in Carotid Body Tumor surgery at tertiary Hospital in Addis Ababa ,Ethiopia**
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Postgraduate program

I, Dr. Abdi Beshir hereby declare that this research report entitled "Intraoperative accident and associated factors in Carotid Body Tumor surgery at tertiary Hospital in Addis Ababa ,Ethiopia." in line with the requirement of graduate studies was fully undertaken by me under the guidance of my advisors and that I have, to the best of my knowledge and effort, avoided plagiarism or duplication of materials unless and otherwise cited and/or acknowledged and that it has not been so far submitted for any form of research application or consideration.

Dr. Abdi Beshir	_____	_____
Principal investigator	Signature	Date

We hereby certify that we have read and evaluated this research report relating to "Intraoperative accident and associated factors in Carotid Body Tumor surgery at tertiary Hospital in Addis Ababa ,Ethiopia 'under our guidance from its inception up to in its current format and that it can be submitted for final approval for his partial fulfillment to the Degree of Specialty in General surgery.

Professor .Nebyou Seyoum	_____	_____
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Dr. Feron Getachew	_____	_____
2. Advisor	Signature	Date

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Contents

List of tables

Acronyms/abbreviation

AEs……adverse effects

CBTs…….carotid body tumors

CCA……..common carotid artery

CN…….cranial nerve

CNI……cranial nerve injury

CT……..computed tomography

CTA……...computed tomography angiography

DM…….diabetes mellitus

ECA……..external carotid artery

MRI……magnetic resonance imaging

MRA……...magnetic resonance angiography

ABSTRACT

Background– Carotid body tumors (CBTs) are the rare tumors of the head and neck region, accounting for 60% of the cervical paragangliomas. CBTs classified etiologically into sporadic, hyperplastic and familial type. Anatomic classification designed by shamblin describes how CBTs envelope carotid vessel and grouped into 3 according to degree of encasement. Patients commonly present with slowly growing painless mass at carotid triangle. They may have local compressive symptoms like dysphagia or dysphonia.Surgical excision is safe and main treatment option for resectable CBTs. However, complication like bleeding, cranial nerve injury, and stroke continue to be major concerns even in the hands of experienced surgeon. Therefore, the study aimed to assess intraoperative accident during carotid body tumor excision at tertiary hospital in Ethiopia.

Method: A retrospective cross-sectional study was conducted among 153 patient operated over the past 10 years period by reviewing medical record at tertiary hospital in Ethiopia. Data was collected through structured questionnaire. The data was summarized using frequency (percentage) table and graph. To identify significant factor associated with intraoperative accident, mulitvariable binary logistic regression model was used, where Adjusted Odds Ratio (AOR), 95% CIs for AOR and p-value were used for interpretation.

Result: Among 153 cases patient operated 132(86.3%) were female and mean age was 39.42± 11.161. . Almost all patient presented with neck mass (98.7%) which were painless in 58.8% of cases. Most patient presented more than 3 years after onset of symptoms (61.5%).Tumor size more 5 cm was found in 72.1% of cases. Patients were mostly investigated with neck ultrasound(97.4%) and neck CT(71.22%). Overall, 14.45% were Shamblin I CBTs; 54.2% were Shamblin II; and 31.4% were ShamblinIII. There were Intra operative accident in 24.8 % of patient. Hypoglossal nerve (9.2%) and ECA (9.2%) were commonly injured structure. shamblin class of the tumor was found to be significant exposure for the development of intraoperative accident for those shamblin III as compared to shamablin I with odds increasing with shamblin class (AOR=6.6067, 95% CI=1.07,34.4, p=0.018 for shamblin III).

Conclusion: The prevalence of intraoperative accident during CBT excision in our setup comparable with the current literature from different country which implies CBT excision can be done safely in our institution with acceptable level complication with available resource. major factor associated with intraoperative accident was shamblin class of the tumour.

1.INTRODUCTION

1.1 Background

The carotid body is the largest mass of chemoreceptor tissue in the body which is located within the periadventitia of the posterior surface of the carotid bifurcation. The normal carotid body is ovoid in shape and approximately 5 mm in its longest dimension. The carotid body is stimulated mainly by low partial pressure of O2, and to a lesser degree hypercarbia and acidosis . In response, the type I glomus cells release neurotransmitters that sends Signal to the cardiopulmonary center in the medulla oblongata that regulate breathing and blood pressure(1–3)

Carotid body tumors (CBTs) are the rare tumors of the head and neck region , accounting for 60% of the cervical paragangliomas.They are neoplastic growth of chemoreceptive tissue. Carotid body tumors are also known as carotid chemodectomas, carotid paragangliomas, and glomus tumors. These tumors are more common in condition that result in low oxygen tension like in patient with COPD and people living in high altitude(2,3).

CBTs classified etiologically into sporadic, hyperplastic and familial type. Sporadic type accounts for about 90% of cases and hyperplastic type is related to chronic hypoxia. Sporadic CBTs are more common in women and between 40 to 50 years of age but familial case present at earlier age and more commonly in men. Anatomic classification designed by shamblin is useful in treatment plan and predicting intraoperative difficulty. It describe how CBTs envelope common carotid, external and internal carotid artery(2,4).Most CBT s are benign but there is risk of malignant transformation in less than 10% of cases. Malignancy can be defined by the presence of vascular invasion, perineural invasion, and metastasis. They are bilateral in 10 % of cases.(5,6).

Patients commonly present with slowly growing painless mass at carotid triangle . They may have local compressive symptoms like dysphagia or dysphonia. In extremely rare case, the tumors may become functional resulting in symptoms related to catecholamine release headaches, dizziness, palpitations, flushing, diaphoresis, and photophobia(2,7).physical examination revel rubbery, non-tender mass along anterior border of sternocleidomastoid muscle which is mobile side to side with limited vertical mobility. Carotid bruit or pulsation found in 30% which support diagnosis. Neurologic deficit related to cranial nerve VII,IX,X,XI and XII dysfunction might be found in some patients. Imaging modalities such as Doppler ultrasound ,CTA and MRA are essential for diagnosis of CBTs(2,8).

Surgical excision is main treatment option for resectable CBTs .Currently, CBT resection is considered safe with lowmorbidity and mortality due to the better understanding of the disease, theimprovement in accuracy of preoperative imaging assessment, advancement anesthesia in care and the modern vascular surgical technique, including arterial revascularization. However , complication like bleeding , cranial nerve injury , and stroke continue to be major concerns even in the hands of experienced surgeon.(2,6,9).

Radiation therapy is the another option of treatment for CBTs especially for patients with poor surgical outcome , and for large , unresectable,or recurrent tumors. The role of preoperative embolization still remain controversial. It may decrease intraoperative blood loss but rate of cranial nerve injury is the same(2,10).

1.2 Statement of the problem

The exact prevalence is not known but estimated to be 1/30,000 to 1/100,000 population accounting for 3% of paraganglioma. Even though the overall prevalence is low carotid body tumor make significant proportion of patient presenting to vascular center. CBTs account for 15.4% of vascular patients seen in our hospital following peripheral arterial disease(34.2%) and varicose vein(25.9%).(3,7,11,12).

1.3 Significance of the study

This study will assess clinical outcome of CBT excision at tertiary hospital in Ethiopia. The result will be critical in patient selection who can undergo surgical resection safely in our setup. Since it is the only vascular center in the country data can be extrapolated into national level.

2. LITRATURE REVIEW

Retrospective Study done in Turkey by Sevilet.al.reviewed 67 patient who undergone surgical resection of CBTs. Among this 12 were male and 55 were female patient . The average age was 51.95±16.59 years. Of the surgically excised tumors;11(16.4%) were Shamblin Type I, 30 (44.8%) were Shamblin Type II, and 26 (38.8%) were Shamblin Type III. The procedure took mean of 109.10±32.36 minutes. There was significant difference in the amount volume of intraoperative blood loss in the Shamblin Type I, Type II, and Type III groups were 98.64±23.46 cc, 215.33±75.74 cc, and 351.73±62.51 cc; respectively.. Cranial nerve injury developed in 10 (15.0%) patient. Postoperative stroke developed in two (3%) patients. No death or permanent nerve injurywas observed in the patients during the 12 month follow-up period(13).

Systematic review and meta-analysis done by Robertson et.al.which included 104 observational studies identified 4418 patients with 4743 CBTs . The mean age was 47 years, female accounts for 65% of cases . The commonest presentation was a neck mass (75%) followed by Dysphagia, cranial nerve injury (CNI), and headache which were present in 3%. The majority (97%) underwent excision, but only 21% underwent pre-operative embolization. Overall, 27% were Shamblin I CBTs; 44% were Shamblin II; and 29% were Shamblin III. The mean 30 day mortality was 2.29%. The mean 30 day stroke rate was 3.53% while the mean 30 day CNI rate was 11.5%. The rate of 30 day stroke correlated across different shamblin group .Shamblin I CBTs were associated with a 1.89% stroke rate, 2.71% for Shamblin II CBTs and 3.99% for Shamblin III tumours.CNI rates was also correlated with Shamblin status:3.76% for Shamblin I CBTs, 14.14% for Shamblin II, and 17.10% for Shamblin III tumors. The prevalence of neck hematoma requiring re-exploration was 5.24% . preoperative embolization not shown to reduce blood loss(1).

Cobb et.al compared the safety of CBT resection with and without preoperative embolization on patient who undergone CBT excision across five states in USA from 2006-2013. A total of 547 patients were identified. Of these, 472 underwent CBT resection without preoperative embolization and 75underwent CBT resection with embolization. Mean age was 54.7 ±16 years. There were no significant differences in mortality , cranial nerve injury, and blood loss between the two group(3).

Denvila et.al undergone retrospective analysis on patient who undergone CBT resection from 1994 to 2015 at Mayo clinic.183 patient were operated and majority(67.7) were female. Neck mass was found in 57.9% of patient ,neck pain or tenderness in 12.1% of cases and 3 of them had cranial nerve dysfunction. Computed tomography(51.3%) and MRI(57.9%) were the most commonly used imaging modalities. Preoperative angiography was performed in 73 patients (39.8%), and 62 of them (84.5%) underwent embolization or internal carotid balloon occlusion testing, or both. The average tumor size was 3.2 cm which range from 0.6-7.2 cm. There were 71 (38.8%), 75 (41%), and 37 (20.2%) Shamblin type 1, 2, and 3 tumors, respectively. The procedure took average of 224 minutes(52-696 minutes). Estimated blood loss was 143.9 mL (range, 10-2000 mL). Arterial reconstruction with an interposition graft was required in 10, and

patch angioplasty was performed in four. Cranial nerve injury was permanent in 10 (5.5%), and the rate of stroke was 1%. A total of 382 lymph nodes were excised, and all were benign. There were no mortality in 30 days(11).

Study done in France with the objective of assessing short term and long term result of sub adventitial resection of carotid chemodectomas with deliberate resection of external carotid artery . From 1981-2006,39 CTBs were resected with average age of 44.7 years. At 3 months, the observed complications were thrombosis of a vein graft resulting in stroke , eight peripheral facial nerve palsies, 12 vocal palsies, seven Horner syndromes, eight palatal paralyses, and 10 nociceptive pains. Some of these complications did persist: nine vocal cord paralyses that were successfully treated by speech therapy, three mild CBH syndromes, and nociceptive pains in 6% of the cases (15.4%), sever in one case. With long term follow-up of 115 ±27 (range 1-298) months, three local recurrences were recorded at 6 and 10 years. In two cases, local recurrence occurred when initial resection of the ECA had not been performed. They concluded that Sub adventitial resection of carotid body tumors with deliberate resection of the ECA is a simple and efficient procedure. It is the preferential treatment for these slow-growing localized tumors(14).

Torrealba et.al reported 30 years' experience from Chile from 1984 to 2014.They operated 30 patients with 32 CBTs with male to female ratio of 1:2.3 and mean age was 45.5 years. Neck was presenting symptom in 86.7% of cases. CT scan was commonly used imaging study which revealed average tumor size of 44.5mm and 19 (63%) were grouped as Shamblin II , and 6 (20%) as Shamblin's III. pathology report showed 93% of specimen were paraganglioma and 2 cases were schwanoma. Preoperative embolization was given for two; five patients (17%)required simultaneous carotid revascularization, all of them ShamblinIII.Average hospitalization stay was 4.5 days (1-35 days).Temporary cranial nerve injury was observed in 7 patients (23,3%). Three Shamblin III patient required blood transfusion. There was no perioperative death nor procedure-related stroke. No malignancy or tumor recurrence were observed during follow up(7).

In the study done in china and japan by zhang et.al which compared rate of complication with and without preoperative embolization < 48 hrs. from procedure .They enrolled 32 patients with in time frame of 2005 to 2010.Preoperative embolization was done in 21 patients and it reduced intraoperative blood loss(280 ml vs 450 ml), operative time(180 minutes vs 220 minutes) and length of hospital stay (5 vs 8 days)(14).

Metheetrairut et.al reviewed medical records of 38 patient operated from 1988 to 2013 in siriraj hospital, Thailand .The study included 25 female(65.8%) and 13 male(34.2%) with average age of 36.9 years (15-59).Six patient had positive family history of CBTs and bilateral tumors were found in seven cases. Majority of patient (89.5%) present with neck mass with the mean duration of 12 month (2 month to 10 years). 25% of cases had prior history of biopsy or unsuccessful surgical attempt. Preoperative cranial nerve deficit was noted in 2.5% of cases. Tumor size range from 1.5 cm to 10 cm with average of 4.2 cm. Nine tumors (22.5 %) in the study were labeled as Shamblin class I, 14 tumors (35 %) were Shamblin class II and 17 patients (42.5 %) were classified as Shamblin class III. rate of vascular injury was 66.7 % in the first five year of study but dropped to 22.4% in the last two decades. the rates of vascular injury were different among the three classes of tumors: 11.1 % for Shamblin I, 21.4 % for Shamblin II, and

58.8 % for Shamblin III (p = 0.034).there was statically significant difference in the amount of blood loss among shamblin groups (200 ml; , 450 ml and 1500 ml for Shamblin I,II,III respectively). The rate of neural injury was 20% which includes either single or multiple cranial nerves deficit .Two patient developed complicated with stroke post operatively and both recovered progressively several week after the surgery(9).

The effect of pre-operative embolization on surgical outcome after CBT resection was evaluated by Power et.al at mayo clinic.pre-operative embolization simplify resection and decrease blood loss but there was no statically significant difference in transient cranial nerve injury ,duration of surgery ,length of stay and stroke risk(10).

Single center retrospective study conducted in china by Han et.al and medical record of 101 patient who undergone CBTs excision without preoperative embolization was evaluated. Post-operative adverse events (AEs) mostly observed during hospitalization were as follows: tongue bias , hoarseness , dysphagia and No other serious AEs were observed. Three most commonly injured cranial nerves after surgical resection of CBT were CN XII (hypoglossal nerve, 21.9%), CN X (vagus nerve, 20.3%) and recurrent laryngeal nerve (18.8%)(5).

Darouassi et.al.retrospectively studied 10 patient with CBTs who were operated at military hospital found in morocco from 2008-2013.The mean age was 35.4 years with the range of 26-55 and 7 of them were male. A slow-growing neck mass was the main clinical presentation. Other symptom were pain, dysphonia, dizziness, headache, and tinnitus. Physical examination showed, in most cases, a neck non tender mass with side to side mobility. They used Imaging modality like Doppler ultrasound(8), computed tomography scan(7), magnetic resonance imaging(5), and catheter arteriography. Urinary metanephrine test was done in 1 case. The location was in the right side in 50% of patient ,40% of them had left side CBT and bilateral in one case. Tumors were grouped according to Shamblin : group 1 in 2 case (20%), group 2 in 6 cases (60%), and group 3 in 2 cases (20%). surgical excision was done in all cases associated with a preoperative embolization in 1 case and a postoperative radiotherapy was given in 2 cases. Post course was uneventful in 8 cases but post-operative dysphonia occurred in two patient which subsided after 1 and 8 month respectively.

Prospective study was done in Tikur Anbesa specialized hospital to see patter of vascular patient over a year period (February 9, 2016 to February 8, 2017) by Nebyou et.al. Total of 386 patient were seen and CBTs account for 15.4% of case following peripheral arterial disease(34.2%) and varicose vein(25.9%)(12).

3.OBJECTIVES

3.1.General objective

-To describe prevalence of intraoperative accident and associated factor Carotid Body Tumor surgery

3.2.Specific Objectives

-To describe the sociodemographic feature of Carotid Body Tumor
-To describe its clinical presentation
-To describe prevalence of intraoperative accident

-To describe associated factor

4.METHODS

4.1.Study Setting

The study was conducted at Tikur Anbessa Specialized Hospital, Addis Ababa University, Addis Ababa,Ethiopia.TASH is a tertiary hospital in Addis Ababa, the capital of Ethiopia. Surgical department has several units one of which is Vascular unit. Vascular unit is the only center in the country that gives inpatient and outpatient service for patients referred from different parts of the country. The unit has three elective table and two referral clinic day per week. It gives 24 hours emergency service throughout the year.

4.2.Study design

Institution based retrospective cross-sectional study

4.3.Source population

All surgical patient operated in our hospital over study period

4.4.Study Population

Patients for whom CBT excision was done from January 2018 to December 2022

4.5.Inclusion criteria

All patients operated for CBT during the study period.

4.6.Exclusion criteria

- lost or incomplete medical record charts.

4.7.Study variables

4.7.1.Independent variables

-Age, Sex, Size of tumor ,Shamblin status, Duration of illness

4.7.2.Dependent Variables

-Intraoperative accident

4.8.Data collection tool

-structured questioner will be used as data collection tool

4.9.Data collection procedure

-Medical record numbers of patients operated for CBT during the specified time period was taken from the operation theater logbook of the vascular unit and the charts was collected. Structured questionnaires was pre tested. Data was collected from the charts and the Hospital's electronic medical record system(i care).Data collection was done by the principal investigator and two other trainedpersonnel.

4.10.Quality Control Measure

During the data collection supervision of data collectors was under taken by the principal investigator . The completeness of the data will be checked and stored properly.

4.11.Data analysis

The collected data was cleared, entered to SPSS version 25, and analyzed.

4.12.Ethical clearance

The study will be conducted after ethical approval is granted from the research committee of the department of surgery.

5.RESULT

Total of 153 patient diagnosed to have CBT who were operated over the past 10 years were included in the study. Among this female were 132 which account for 86.3 % and 21 were male which account for 13.7 %.Mean age at time of surgery was 39.42 ± 11.161. About half of patients were from Addis Abeba(50.3%) followed by Oromia(21.6%) and Amhara(17.6%) region(**Table 1**).

Table 1 Socio-demographic characteristics among CBT patient (n=429)

Variable	Frequency	Percentage
Sex		
Male	21	13.7
Female	132	86.3
Age(years)		
Mean ±SD	39.42 ±11.16	
Range	17-67	
Region		
Addis Abeba	77	50.3
Oromia	33	21.6
Amhara	27	17.6
SNNRP	13	8.5
Tigray	2	1.2
Gambela	1	0.7

Left and right side affected equally and 1 patient presented with bilateral tumor. Almost all patient presented with neck mass (98.7%) which were painless in 58.8% of cases. Comorbidity illness was found in 14 patient. The tumors were mobile horizontally in 93.5% of patient and 10 patient presented with fixed mass. Most patient presented more than 3 years after onset of symptoms(61.5%).Tumor size more 5 cm was found in 72.1% of cases(**Table** 2).

Table 2: Clinical presentation among CBT patient (n=153)

Variable	Frequency	Percentage
Location		
Right	76	49.7
Left	76	49.7
Bilateral	1	0.7
Symptoms		
Neck mass	151	98.7
Pain	63	41.2
Headache	47	30.7
Sweating	8	5.2
Dysphagia	6	3.9
Stridor	1	0.7
Hoarseness of voice	2	1.3

Duration of symptoms(years) <1 1-3 3-5 >5	14 42 45 52	9.2 27.5 29.4 34
Mobility Mobile Fixed	 145 8	 94.8 5.2
Tumor size <2 cm 2-5 cm >5 cm	 2 40 111	 1.3 26.1 72.1

Neck ultrasound was performed in almost all cases(97.4%) and CT scan was done in 71.2% of cases. Based on Shamblin classification, more than half of patient had Shamblin II tumor 54.2%(n=83) (**Table 3**).

Table 3: Imaging modality used and Shamlin classification (n=153)

Variable	Frequency	Percentage
Imaging used Neck ultrasound CT MRI CTA	 149 109 5 6	 97.4 71.2 3.3 3.9
Shamblin I II III	 22 83 48	 14.4 54.2 31.4

Longitudinal incision along anterior border of sternocleidomastoid was used in 96.1% of casestumor excised after Proximal control of CCA in 73.2% of patient. Only 7.2 % of cases required procedure beyond tumor excision and completed in 2-4 hours in 49.7 % of time. Blood loss was less than 500 ml in majority of cases (80.4%)(**Table 4**).

Table 4:Procedure details(n=153)

Variable	Frequency	Percentage
Incision type Longitudinal Transverse	 147 6	 96.1 % 3.9 %
CCA control Yes No	 112 41	 73.2 26.8

Procedure performed Tumor excision Tumor excision with ECA ligation	141 12	92.2 7.2
Duration (hours) 1-2 2-4 >4	 72 76 5	 47.1 49.7 3.3
Blood loss(ml) <500 500-1000 >1000	 123 24 6	 80.4 15.7 3.9

There were Intra operative accident in 24.8 % of patient and 12.4% had vascular injury. Among this Hypoglossal nerve and ECA were commonly injured structure(**Table 5**).

Table 5:Intraoperative accident type(n=153)

Variable	Frequency	Percentage
Intraoperative accident type Vascular Nerve Both	 19 15 3	 12.4 9.8 2
Vascular injury type CCA injury ICA injury ECA injury IJV injury	 2 7 14 6	 1.3 4.6 9.2 3.9
Nerve injury type Hypoglossal nerve injury Vagus nerve injury	 14 4	 9.2 2.6

Factor associated with intapopertaive accident

To identify factor related to intraoperative incident among patient who under gone CBT excision, binary logistic regression was applied between independent and dependent variable . age,sex,tumour size ,Shamblin , duration of illness and side affected were found to have association to intraoperative accident and included in the final model.However,only shamblin class was found to be significantly associated to intraoperative accident in the multiple regression model al 5% level of significance. Accordingly , after adjusting for other covariate patients who had shamblin III tumor had six times higher odd of intra operative accident during CBT excision compared to shamblin I patients (AOR=6.6067, 95% CI=1.07,34.4, p=0.018)(**Table 6**).

Table 6: Factors associated with intraoperative accident during CBT excision(n=153)

Variable	COR(95% CI)	AOR(95% CI)	p-value
Age			
<30	1	1	0.25
30-39	0.41(0.15,1.15)	0.46(0.13,1.65)	0.23
40-49	0.69(0.25,1.90)	0.71(0.20,2.52)	0.60
50-59	0.25(0.60,1.02)	0.23(0.041,1.15)	0.07
60-69	1.82(0.38,8.73)	1.73(0.25,11.72)	0.58
Sex			
Female	1	1	
Male	0.38(0.14,0.98)	1.76(0.53,5.84)	0.36
Duration of illness			
<1	1	1	0.08
1-3	2.75(0.67,11.32)	2.21(0.47,11.12)	0.34
3-5	0.36(0.07,1.84)	0.36(0.06,2.30)	0.28
>5	1.22(0.30,5.07)	1.066(0.21,5.48)	0.94
Size			
<5 cm	1	1	
>5 cm	0.99(0.46,2.14)	1.55(0.60,4.05)	0.37
Shamblin			
Shamblin I	1	1	**0.018***
Shamblin II	1.86(0.39,8.92)	1.81(0.33,9.81)	0.49
Shamblin III	9.20(1.93,43.78)	6.61(1.07,34.40)	0.04
Side of tumor			
Right	1	1	0.599
Left	1.15(0.55,2.40)	1.51(0.65,3.81)	0.31
Bilateral	0	0	1

Note: COR, crude odd ratio; AOR, Adjusted odd ratio; CI, Confidence interval;*statistically significant

6.DISCUSSION

The study was conducted among 153 patients who undergone surgery for CBT with the aim of assessing the prevalence and associated factor of intraoperative accident during CBT excision. Among all cases,38(24.8%) of cases had intraoperative injury to major vessel and or cranial nerve. The prevalence almost similar to study conduct in morocco and where intraoperative vascular and/or nerve injury reported to be 20%.similary report from Italy reveled intraopertive CN injury to be 24%. However, it is lower than studies from china ,where reported frequency reach as high as 34%.Comparable rate of CN injury was reported by meta analysis done by Robertson et.al which was 25.4%. Study from Chile reported CN injury to be 23.3%.

The most common CN injured were Hypoglossal and Vagus nerve. Hypoglossal nerve was injured in 14 patient (9.2%) and Vagus nerve was injured in 4 patient(2.6%).This finding is in line with most studies published until now. The main reason is close proximity of the tumor to the cranial nerves which makes them prone to injury during surgery or direct evasion by growing tumor.

on multivariate regression analysis model, shamblin class of the tumor was found to be significant exposure for the development of intraoperative accident for those shamblin III as compared to shamablin I with the odd increasing with class. Most Studies conducted elsewhere in the different corner of the world showed similar finding. This is an expected finding as the shamblin class increases the tumor encases surrounding neurovascular structure predisposes to injury during tumor excision.

The size of tumor is one of the factor strongly associated with intraoperative accident. In contrast to this fact our study did show statically significant association between intraoperative injury and size. Study conducted in Italy showed similar finding where tumor volume is not related to risk of CN injury. However, study from Ohio showed increased nerve injury in tumor with bigger diameter.

The finding of this study add significant contribution to current fact about surgical management of CBT. It provides finding from tertiary hospital with large number of cases from most part of the country over ten year period which makes it first of its kind in Africa.

7.STRENGTHS AND LIMITATION OF THE STUDY

7.1.Strength

To the best of our knowledge there is no study conduct in Ethiopia to assess intraopertaive accident during CBT excision.

7.2 Limitation

Because we used secondary data, there were inaccurate registration, incomplete data and some of the medical chart were missed.

8. CONCLUSION and RECOMMENDATION

8.1.Conclusion

The prevalence of intraoperative accident during CBT excision in our setup is almost the same as reported in the current literature from different country .this shows that CBT excision can be done safely in our institution with acceptable level complication with available resource. major factor associated with intraoperative accident was shamblin class of the tumour.

8.2.Recommndation

To give public education about CBT so that the patient will seek medical attention at early stage of the tumor which can be operated with low morbidity. To expand the surgical care of CBT to other set up which can decrease waiting time for surgery

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ANNEX:DATA COLLECTION TOOL

Section 1-sociodemographic features

1. Age

2. Sex male female

3. Marital status married unmarried widowed divorced

4. Region Tigray Amhara

Oromia SNNPR

GambelaBenshangul

Harari Somali

Afar

5.MRN ----------

Section 2-Clinical presentation

6.Symptoms neck swelling dysphonia

neck pain dysphagia

headache other

7.Chronic medical illness

none Hypertension

DM cardiac other(Specify)

8.Duration of illness ----------months

9.Preoperative investigation

Doppler ultrasound CTA

MRA conventional angiography

FNAC/biopsy

9.Side of the tumor Left right bilateral

10.Size of the tumor ---------cm

11.Shamblin group I II III

Section 3-Intraoperative data

12.Duration of surgery ----------minute

13.estimated blood loss ----------ml

14.Type of vascular injury none CCA ECA ICA IJV

15.Type of vascular repair

Ligation primary repair

bypassinterposion

Section 4-Postoperative course

16.immediate post-operative complication

Stroke CNI

Hematoma collection other(specify)

17.length of hospital stay ----------days

18.peri operative mortality yes no

19.complication after at 3 month post-surgery

None Stroke CNI