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Contents

Overview of articles in this issue

Gitonga S 1

Accuracy of clinical assessment in determining benign pathology in adenotonsillectomy disease in children: a Zimbabwean perspective

Chidziva C, Soko ND, Matinhira N, Ngara B, Dzongodza T 2

Barriers to ear surgery in developing countries: a look at East, Central and Southern Africa

Chidziva C, Soko ND, Matinhira N 7

Intermediate laryngotracheal outcome of patients (adults and paediatrics) intubated at Kigali University Teaching Hospital

Umutoni J, Kaitezi M, Nuss RC 11

Correlation of symptoms and computed tomography scan findings in patients with chronic rhinosinusitis at the Kenyatta National Hospital

Abdikadir MH, Obura HO, Nyagah S 14

Coil embolization for lingual artery pseudo-aneurysm causing massive post tonsillectomy bleeding: a case report

Magabe PC, Patel AI, Mukora NK, Tsindoli JA 20

A large laryngeal vallecular cyst causing acute upper airway obstruction: a case report

Gathere S 23

Importance of anatomical landmarks during parotidectomy: a case report of a huge pleomorphic adenoma of the parotid gland

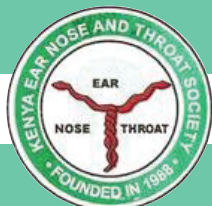
Mashamba V, Saitabau Z, Nkya A 25

Utilizing primary ear care in universal health coverage for better hearing: short communication

Wahome I 30

Reviewers of the issue 31

Authors guidelines 32



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OVERVIEW OF ARTICLES IN THIS ISSUE

It is my pleasure to welcome you to peruse through the 3rd issue of the *East and Central African Journal of Otolaryngology Head and Neck Surgery*. This edition is rich both in articles and has good representation of articles from Zimbabwe, Rwanda, Tanzania and Kenya.

The articles range from case reports to original research. In these pages, you will read about a large parotid pleomorphic adenoma that was present for 35 years, weighing 5.2kg after excision, the remarkable thing is the morbidity of surgery and injury of facial nerve was averted due to anatomical and surgical landmarks used during the surgery. It was also interesting to note that in adenotonsillar diseases, routine histopathology of adenoid or tonsil tissue is not dispensable especially in

our region due to low risk of malignancy in the paediatric patient and high cost of routine histopathology in our region.

From Kigali, we see that the complication rates following endotracheal intubation were minimal, at 0.3-2%, and these complications were mainly seen in patients who had prior history of prolonged intubation, which is a known risk factor worldwide.

I would like to inform our readers the journal has now been assigned an ISSN 2664-0376 and I therefore, invite you to read this interesting articles from our region.

Dr. Sophie Gitonga
Editor-in-Chief

ACCURACY OF CLINICAL ASSESSMENT IN DETERMINING BENIGN PATHOLOGY IN ADENOTONSILLECTOMY DISEASE IN CHILDREN: A ZIMBABWEAN PERSPECTIVE

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ABSTRACT

Objectives: Controversy surrounds routine histopathological examination of adenotonsillar specimens obtained from paediatric patients. The advocacy for dispensability of routine histopathological examination of paediatric adenotonsillar specimens is strongest in resource-limited settings like ours.

Objective: The main aim of this study was to evaluate the accuracy of clinical assessment in determining benign pathology in adenotonsillar disease in children aged 18 years and below.

Design: We conducted a single centre retrospective study at an otorhinolaryngology clinic in Harare, Zimbabwe.

Methods: Data was retrieved from the medical records of all the paediatric patients who had adenotonsillectomies from January 2016 to December 2017. Descriptive statistics tools were used to analyse all collected demographics and categorical variables. Accuracy of clinical assessment was expressed as the probability that clinical assessment correctly classified the patient when measured against histopathology and surgery findings.

Results: A total of 194 children aged below 18 years had adenotonsillectomies during the period under review. The major indication for surgery was adenotonsillar hypertrophy (41.8%). A hundred and six (53.6%) children sent their adenotonsillar specimens for histopathological examination. Adenotonsillar lymphoid hyperplasia and chronic tonsillitis, together, accounted for 74.6% of all histopathological findings. None of the adenotonsillar specimens sent for histopathological examination had malignant pathologies. Accuracy of clinical assessment in predicting benign pathology was 98.25% (93.81 to 99.79%).

Conclusion: Given the high accuracy of clinical assessment coupled with the rarity of malignancies in children, routine histopathological examination of paediatric adenotonsillar specimens in resource limited settings like ours, may not be necessary.

Key words: Adenotonsillectomy, Histopathology, Paediatrics, Africa, Tonsillitis, Adenotonsillar hypertrophy

INTRODUCTION

Adenotonsillectomy, the surgical removal of the tonsils and adenoids is the most common operation in children who visit Ear, Nose and Throat (ENT) practices across the globe. Indications for adenotonsillectomy include recurrent tonsillitis, upper airway obstruction, sleep disorders and adenotonsillar hypertrophy. Adenotonsillectomy specimens are subjected to routine histopathology examination as part of standard care. However, controversy surrounds the necessity of routine histopathology in the treatment of adenotonsillar disease in children. Tonsillar malignancies have been shown to occur at a higher incidence in adults than in paediatrics¹⁻³. As a result, recent studies advocate for limited use of histopathology in adenotonsillar disease in children^{2,5,6}. Based on this argument, there is a general push towards dispensability of histopathology in adenotonsillar disease in paediatrics attending ENT clinics. This push

is even stronger in resource-limited settings where routine histopathology adds a heavy financial burden on patients. It therefore becomes important to set criteria and guidelines that enable surgeons to recognise patients at risk of significant pathology; however, these guidelines remain elusive.

In an effort to add to the voice on the dispensability of routine histopathology in resource limited settings in paediatric patients presenting with adenotonsillar disease; we set out to evaluate the accuracy of clinical assessment in determining benign pathology in adenotonsillar disease in children aged 18 years and below. We describe the prevalence of different indications for adenotonsillectomies, incidence of abnormal pathological findings in adenotonsillar specimens sent for histopathological examination and we estimate the accuracy of clinical assessment by senior otorhinolaryngologists in determining benign pathology in adenotonsillar disease in paediatric patients.

MATERIALS AND METHODS

Study site and ethical considerations: We conducted a single centre retrospective study at a private otorhinolaryngology clinic in Harare, Zimbabwe. Ethical approval to conduct the study was obtained from the Joint Research Ethics Committee for the University of Zimbabwe College of Health Sciences and Parirenyatwa Group of Hospitals.

Study population: The study population were all children aged 18 years and under who had adenotonsillectomies at AudioMax Clinic, Harare, Zimbabwe during the period of January 2016 to December 2017. Data was retrieved from the medical records of all the paediatric patients who had adenotonsillectomies at AudioMax Clinic from January 2016 to December 2017. Medical reports reviewed include the clinicians' clinic notes and diagnosis, histopathology reports and surgery findings. Variables recorded included gender, age at time of surgery, indication for surgery, histopathological and surgery findings.

Data analysis: All statistical analysis was done using Stata (StataCorp LLC, College Station, Texas, United States of America). Diagnostic test evaluation was done using MedCalc (MedCalc Software, Ostend, Belgium). Accuracy of the clinicians' diagnosis was expressed as the probability that clinical assessment correctly classified the patient; that is the clinical assessment outcome was the same as the histopathology or surgery findings calculated as:

$$(a + d) / (a + b + c + d)$$

Where **a** is the true positive, **b** is the false negative, **c** is the false positive, **d** is the true negative.

True positive (**a**), was defined as the histopathology report or surgery findings confirming presence of adenotonsillar disease, where adenotonsillar disease is indeed present. False negative (**b**), was defined as the histopathology report or surgery findings confirming absence of adenotonsillar disease, where adenotonsillar disease is indeed present. False positive (**c**), was defined as the histopathology report or surgery findings confirming presence of adenotonsillar disease, where adenotonsillar disease is absent. True negative (**d**), was defined as the histopathology report or surgery findings confirming absence of adenotonsillar disease, where adenotonsillar disease is indeed absent.

RESULTS

A total of 194 children aged 18 years and below had adenotonsillectomies at our clinic during the twenty four months under review. One hundred and six of these children were boys. Average age at time of surgery was 5 years with a range of 1 to 15 years of age. Indications for surgery are shown in Table 1. Of these 194 children, 114

had histopathological examination of their adenotonsillar specimens. Histopathology findings are shown in Table 2. Surgery findings were recorded for 192 of the patients and are shown in Table 3. Patients without surgery findings and/or histopathology reports were excluded from further analysis.

Table 1: Indications for surgery (n= 194)

Indication	No.	(%)
Adenotonsillar hypertrophy	81	41.8
Recurrent tonsillitis	69	35.6
Severe obstructive sleep apnoea secondary to adenotonsillar hypertrophy	16	8.2
Recurrent tonsillitis with adenotonsillar hypertrophy	8	4.1
Upper airway obstruction	7	3.6
Upper airway obstruction and adenotonsillar hypertrophy	6	3.1
Upper airway obstruction and recurrent tonsillitis	3	1.5
Acute tonsillitis and adenotonsillar hypertrophy	2	1.0
Severe obstructive sleep apnoea and recurrent tonsillitis	2	1.0

Table 2: Histological diagnosis for 114 tonsil and adenoid specimen pairs

Histological diagnosis	No.	(%)
Tonsils/adenoids: lymphoid hyperplasia	61	53.5
Chronic tonsillitis	24	21.1
Acute on chronic tonsillitis	12	10.5
Adenoids: reactive follicular hyperplasia	9	7.9
Tonsils: reactive lymphoid hyperplasia	6	5.2
Tonsils: reactive lymphoid hyperplasia with actinomycetes	1	0.9
Nasopharyngeal and palatine tonsils: reactive lymphoid hyperplasia	1	0.9

Table 3: Surgery findings from 192 adenotonsillectomies

Surgery finding	No.	(%)
Adenoidal hypertrophy only	38	19.8
Grade 1	6	3.1
Grade 2	7	3.6
Grade 3	21	10.8
Grade 4	4	2.1
Tonsillar hypertrophy only	26	13.5
Grade 2	3	1.6
Grade 3	12	6.2
Grade 4	4	2.1
Grade 4 palable tonsil hypertrophy	1.6	1.6

The major indications for surgery were adenotonsillar hypertrophy (41.8%) and recurrent tonsillitis (35.6%). Together the two conditions accounted for at least 77.4% of all indications for surgery. Histopathology findings confirmed clinical assessment observation as lymphoid hyperplasia for 53.5% of histopathology findings whilst chronic tonsillitis was second with 21.1%. Together adenotonsillar lymphoid hyperplasia and chronic tonsillitis account for 74.6% of all histopathology findings. Fourteen patients with adenotonsillar hypertrophy also had bilateral Otitis Media with Effusion (OME). Whilst, otitis media with effusion was present in four of the patients with recurrent tonsillitis. A single patient had reactive tonsillar hyperplasia with actinomycetes void of cryptitis.

Accuracy of clinical assessment as measured by histopathology findings was 98.25% (93.81 to 99.79%). Accuracy of clinical assessment as measured by surgery findings was 91.15% (86.20% to 94.76%). None of the 194 patients had preoperative risk factors. None of the 114 adenotonsillar specimens showed malignant histopathology.

DISCUSSION

Diseases of the tonsils and adenoids are common amongst children and adolescents presenting at Ear, Nose and Throat (ENT) clinics. The impact of infection and/or obstruction from tonsils and/or adenoids presents in a variety of ways from mouth breathing, snoring, fatigue and obstructive sleep disorder. Adenotonsillectomies therefore excise tonsils and adenoids that are a common cause of upper respiratory obstruction in children. To the best of our knowledge this is the first report on indications for adenotonsillectomy in a Zimbabwean setting.

A total of 194 children were included in our study. Of these children, 81 had adenotonsillar hypertrophy whilst 69 had recurrent infection of the tonsils. At the start of the millennium, Ikram *et al*⁵ and colleagues carried out a retrospective evaluation of 400 tonsil specimens from 200 patients 68.3% contained reactive lymphoid hyperplasia, 13.5% had follicular hyperplasia, 10% presented with acute tonsillitis and only one case of malignancy was observed. Closer to home, Van Lierop *et al*⁶, found out that of 172 children, 70 had recurrent tonsillitis whereas 50 had Obstructive Sleep Apnoea (OSA), 33 had OSA with recurrent tonsillitis whilst 10 had OSA with OME; no malignancies were observed. Indications for adenotonsillectomy in our setting are therefore very similar to indications reported elsewhere. With recurrent tonsillitis and lymphoid hyperplasia

being the leading indications of adenotonsillar disease in paediatric patients. A single patient had *Actinomycetes* on their tonsillar specimen. Histopathological examination revealed *Actinomycete* colonies with a surrounding tissue reaction. *Actinomycetes* are slow growing Gram-positive bacteria, that occupy the human oral cavity as commensals. Controversy surrounds the role of *Actinomycetes* in the aetiology of tonsillar diseases. Some authors suggest that *Actinomycetes* are an aetiological factor in tonsillar hypertrophy⁷⁻⁹, whilst others implicate them as mere saprophytes¹⁰ and others report no relationship between *Actinomycetes* presence on tonsillar specimens and tonsillar disease^{6,11}. In our case, the presence of tissue reaction surrounding the *Actinomycetes* colonies could implicate *Actinomycetes* colonisation in the recurrent tonsillitis observed in this patient.

Preoperative risk factors for malignancy include unilateral enlargement of tonsils, significant lesions on the adenoidal or tonsillar tissue, neck mass accompanied with unexplained weight loss and a history of malignancy in the head and neck region. Clinical examination of all 194 patients excluded preoperative risk factors whilst histopathological examination confirmed benign adenotonsillar disease. The accuracy, therefore, of clinical assessment predicting benign pathology was 98.25%. This confirms that clinical examination by senior ENT surgeons can accurately predict benign pathology especially in the absence of preoperative risk factors. This could strengthen the call that microscopic analysis of routine tonsillectomy and/or adenoidectomy in the absence of clinical suspicion of malignancy is dispensable.

Reports show that adenotonsillar malignancy in children is rare²⁻⁴. In a study on histopathological factors of a 100 tonsillectomies¹², none of the paediatric specimens showed evidence of malignancy, however, two cases of Hodgkin's lymphoma were noted from a total of 46 adults. Numerous studies confirm the low incidence of malignancies in paediatric patients^{5,12,13,15} and thus argue against the need for routine histopathological examination of adenotonsillar specimens in this age group. Similar results were obtained in retrospective evaluation of histopathological reports from paediatric patients, by Papouliakos *et al*¹, Sturm-O'Brien *et al*¹⁴ and Shoba *et al*¹². In these three studies, lymphoid hyperplasia was the most common observation whilst malignancies were diagnosed at 0.026%¹⁴ and 0.13%¹. Based on these observations, Shoba and colleagues¹² concluded that histopathological examination of paediatric

adenotonsillar specimens is dispensable. Malignancies of the adenoids and/or tonsils have been shown to be higher in adults than children^{1,14}, with an incidence ranging from 1.2% to 2.04% in adults versus 0.026% in children. Given the rarity of clinically significant diagnosis and malignancy in paediatric adenotonsillar diagnosis, histopathological examination of specimens from children may not always be necessary, however, routine histopathology of adult adenotonsillar specimens is indispensable.

Limited resources and finances in developing nations make it both impractical and difficult to send all adenotonsillectomy specimens for histopathological examination. Spending on the microscopic examination of tonsillar specimens is estimated to be US\$35,467,800¹⁵ per annum in the United States alone. Calculated average cost of histological examination of 154 adenotonsillectomy and 18 tonsillectomy specimens was R45,488⁸. In Zimbabwe, the cost for routine adenotonsillar histopathological examination ranges from US\$32 to US\$50 per specimen. This is a cost most of the population cannot afford. In our clinic 114 out of 194 patients were able to send their adenotonsillectomy specimens for histopathological examination. This represents 60% of the patients seen in a period of 24 months. The patients who come to our clinic comprise of children from middle income and high income families thus the number of patients able to afford histopathology at a national scale is expected to be far less. Apart from the high financial burden on our patients; histopathology of adenotonsillectomy specimens is also strained by the limited pathologists in our current settings. Thus, routine histopathological examination of adenotonsillar specimens from patients where clinical assessment has diagnosed as benign, throws financial burden on the patient and fails to make good use of the scarce histopathologist's person-hours much to the detriment of specimens needing urgent attention.

CONCLUSION

Given the high accuracy of clinical assessment in predicting benign outcome in paediatric adenotonsillar disease, routine histopathological examination of all adenotonsillar specimens in paediatrics is not necessary in resource-limited settings like ours.

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Declaration of interest: Dr. Clemence Chidziva is the head ENT surgeon at AudioMax Clinic where the study was conducted.

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BARRIERS TO EAR SURGERY IN DEVELOPING COUNTRIES: A LOOK AT EAST, CENTRAL AND SOUTHERN AFRICA

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ABSTRACT

Background: A report on the progress of ear, nose and throat in sub-Saharan Africa showed minimal progress in ear healthcare services in the region over the period of 2015 to 2017.

Objective: Progress in ear healthcare in sub-Saharan Africa remains subdued. We highlight the state of ear health care in member states of the East, Central and Southern EHC forum, outline barriers to increased ear disease surgery as provided by ear surgeons in the region and give a glimpse into the initiatives ear personnel are taking in the region as an effort to improve ear disease prevention and management.

Methods: In an effort to initiate discussion on possible barriers to better service delivery within the East, Central and Southern African region, we collected information on the status of ear health care from members of the East, Central and Southern African EHC forum. We also carried out a snap survey accompanied by a round table discussion with service providers within our region. Respondents to the snap survey were obtained from five countries namely Tanzania, Rwanda, Malawi, Zambia and Zimbabwe. All respondents had at least five years working experience in otorhinolaryngology units in teaching universities in their respective countries, ear disease constituted at least 26% of all outpatient cases in the units but however all respondents felt they could not meet demand.

Results: Reasons for low service delivery were inadequate theatre time, inadequate trained personnel and lack of adequate equipment. All respondents performed myringotomy, grommet insertion and tympanoplasty.

Conclusions: Middle ear reconstruction was performed by 20% of the respondents whilst none of them performed bone anchored hearing aids. Respondents agreed that improving hospital facilities and equipment accessibility would enhance service delivery. The East, Central and Southern African EHC forum consists of eleven member states from East and Southern Africa. The primary aim of this forum is to strengthen service delivery by pooling together scarce resources to address these healthcare service delivery challenges. The size of the association has attracted international organisations that have begun assisting with funding, training of personnel and equipment provision.

Recommendation: Formation of regional bodies could be an effective means of improving ear healthcare delivery in East, Central and Southern Africa.

Key words: Africa, ENT, Otorhinolaryngology, Surgeons, Prevalence

INTRODUCTION

In 2017, Mulwafu *et al*¹ and his fellow workers reported on the progress of Ear, Nose and Throat (ENT) service provision in sub-Saharan Africa. In their report, they compared progress made in ENT service provision in fifteen sub-Saharan African countries over a six year period, from 2009 to 2015. The authors report minimal improvement in ENT services across sub-Saharan Africa. There was a 43% increase in the number of ENT surgeons¹ which was offset by a 23% increase in general population across the continent. As a result the shortfall of ENT surgeons in Africa when compared to Europe persisted. Upon this background, we took the opportunity of a regional Temporal Bone Workshop to discuss the issues that impede ear surgery in East and Southern Africa. We also collected information on the status of ear health care in member states of the ear and hearing healthcare forum

(EHC) in East, Central and Southern Africa. We therefore highlight the state of ear and hearing healthcare in eleven countries in selected countries in sub-Saharan Africa, outline the impediments of progress in management of ear disease in these countries and give a glimpse of some of the initiatives member states are taking to improve the state of ear and hearing healthcare in East, Central and Southern Africa.

MATERIALS AND METHODS

We designed a snap survey via an online questionnaire (link to survey: <https://goo.gl/forms/qh3BSYxhUaVNLVGE3>) targeted at practising otorhinolaryngologists in five different countries in East, Central and Southern Africa. Questions were targeted specifically at ear surgeons and pertained to the quality of training received, access to continual training, access to the latest information on diagnosis and treatment of ear diseases, quantity of

ear disease work, nature of equipment available and accessible to the surgeons and types of ear surgeries done. The Questionnaire was distributed to ENT surgeons who were attending the UZ Temporal Bone Workshop via email prior to attendance. We also took the opportunity to invite responses to our questionnaire during an annual IFOS-UZ Regional Temporal Bone Workshop held at the University of Zimbabwe by the Faculty of Medicine through the Department of Surgery in April 2018. Data on the status of ear healthcare was collected from eleven member countries of the East, Central and Southern Africa EHC forum. Each country provided data on service delivery, health workforce, health information systems, access to essential medicines for EHC, financing and leadership/governance.

RESULTS

The East, Central and Southern African EHC forum consists of eleven member states namely Burundi, Democratic Republic of Congo, Ethiopia, Kenya, Madagascar, Malawi, Rwanda, Tanzania, Uganda, Zambia and Zimbabwe. Table 1 is a summary of the information gathered from member states at the meeting held in Nairobi, Kenya in September of 2018. We received feedback from ten out of the eleven countries; with the exception of the Democratic Republic of Congo. Ratio of ENT surgeons per 100,000 remained low in all countries (Figure 1). Funding for ear and hearing healthcare also remained subdued with the government being sole funder in all the countries. Access to medicines remained marginal.

Table 1: State of ear healthcare in East, Central, Southern African EHC member states

Country	Popula- tion (to the nearest million)	People living with hearing loss	Human resources										Health Information Management Systems (HIMS)	National Policy on EHC
			ENT Surgeons		Audiologists		Speech therapists		Clinical officers		Hearing aid professionals			
			2015	2018	2015	2018	2015	2018	2015	2018	2015	2018		
Burundi	11	-	6	10	10	0	0	-	-	-	-	0	EHC data not captured on HIMS	Present
Ethiopia	105	-	22	34	1	0	1	-	-	-	-	2	EHC data captured	Present
Kenya	48	-	76	80	7	8	16	20	-	188	-	2	-	Present
Madagascar	25	2 million	15	8	10	8	1	1	-	-	-	-	EHC data collected into National Database	Present
Malawi	14	250,000	2	1	3	0	0	-	-	30	-	-	-	Present
Rwanda	12	600,000	8	16	4	3	1	1	-	-	-	0	EHC indicators not clearly defined in HIMS	Present
Tanzania	57	-	18	37	1	5	3	5	-	-	-	-	HIMS under construction	None
Uganda	43	430,000	35	31	15	7	0	-	-	35	-	-	EHC data not captured on HIMS	Compo- nent of National Health Policy
Zambia	17	-	7	3	1	1	1	1	-	-	-	5	-	Present
Zimbabwe	17	-	8	10	0	7	1	7	-	-	-	-	EHC data not captured on HIMS	Present

Key: -no data available

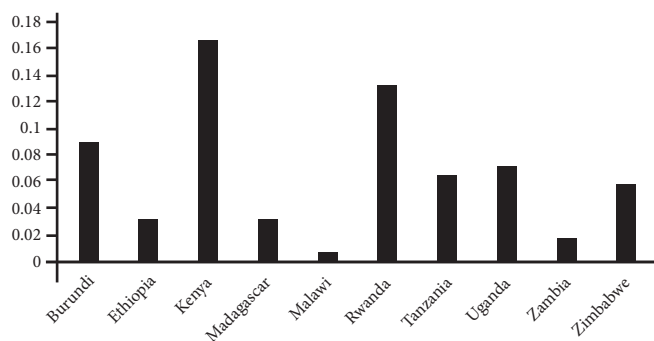


Figure 1: Ratio of ENT surgeons per 1000,000 per country

We received responses to the survey from senior ENT surgeons from five countries namely, Rwanda, Tanzania, Malawi, Zambia and Zimbabwe. All respondents worked in ENT departments of University Teaching Hospitals in their respective countries. Of these respondents, 50% were specialists with over ten years experience whereas the second half comprised of specialists with less than 5 years experience. The respondents rated the quality of their training at a mid mark of 5, where 0 was poor whilst 10 was excellent. Confidence in quality of training was highest in respondents from Malawi and Zambia. Despite ear disease constituting at least 26% of all outpatient work in all the respondents' practices, all respondents felt they were failing to meet the demand as less than 10% of all surgical work was ear related. Some of the reasons cited for low service delivery include inadequate theatre space and time for theatre, lack of equipment and lack of personnel in particular anaesthetists. All respondents had access to operating microscopes whilst 50% of the respondents had access to otology drills, Magnetic Resonance Imaging (MRI) and Computerised Axial Tomography (CAT) scanning. In all hospitals myringotomy, grommet insertion and tympanoplasty were performed. However, mastoidectomy for cholesteatoma and mastoiditis were done by half of the respondents. Cochlear implants were done by at least 25% of our respondents. Middle ear reconstruction was performed by only 20% of the respondents. None of the respondents performed bone anchored hearing aids. In response to an open ended question, all respondents suggested improved access to theatre and training as possible ways of improving ear surgery services in their respective hospitals. Improved equipment was suggested by half of the respondents whilst overall improved hospital facilities were suggested by 25% of the respondents.

DISCUSSION

Latest indications show that the prevalence of disabling hearing loss stands at 360 million people globally²; this is about 5.3% of the world's population. Hearing loss prevalence is highest in South Asia, Asia Pacific and sub-Saharan Africa. Whilst 2014 World Health Organization³ estimates show hearing impairment in sub-Saharan African adults is 15.7% and 1.9% in sub-Saharan

African children. Data on ear disease prevalence and burden in sub-Saharan Africa remains scanty, therefore it is possible that ear disease burden is much higher than officially reported. Indeed in our snap survey, ear disease constituted at least 26% of all ENT cases despite less than (10%) of ENT theatre time being devoted to ear surgery. All respondents felt that they were limited in the amount of ear surgery they could perform primarily by lack of theatre time, insufficient equipment and lack of expertise amongst them ENT staff and anaesthetists.

ENT personnel who include audiologists, speech therapists, clinical officers and hearing aid professionals remain low when compared to the population of African countries. However, improvement in training services has seen increased output in terms of ENT personnel. Indeed all eleven countries of the East, Central and Southern African EHC forum have seen a modest increase in ENT surgeons, trained and retained within member states. However, brain drain and conflict still affect ENT personnel in some countries like Madagascar, and search for better remuneration is a major reason in the loss of audiologists. Scarcity of data on ear disease and ear healthcare remains a challenge. Part of the challenge is driven by the inadequate capture of ear healthcare in health information management systems at national level. Adoption of ear healthcare policies at national level in most of the member states should see improvement in capture of ear healthcare indicators and subsequently improve data availability on ear disease and ear healthcare in member states.

In May of 2017, the World Health Assembly passed a series of resolutions regarding improvement of Ear Health Care (EHC) across the globe. Some of the resolutions included collection of quality data on ear disease and hearing loss, integration of EHC strategies within public health systems, establishment of suitable training programs within EHC and improvement of access to affordable, cost-effective, quality hearing technologies and products. Realising that countries in Africa are resource limited, countries in the East, Central and Southern African region formed an EHC forum. This forum includes the following countries; Burundi, DRC, Madagascar, Kenya, Rwanda, Tanzania, Ethiopia, Malawi, Uganda, Zambia and Zimbabwe. The primary aim of this forum is to strengthen EHC by pooling scarce resources to enhance training of personnel in EHC service delivery. The forum also brings together health practitioners within the region to discuss the challenges they face and offer practical solutions to address these challenges. The forum works hand in glove with the World Health Organisation and together has begun to make inroads into policy advocacy offering strategies of incorporating EHC into national public health care systems of member countries. Due to its size, the forum has been able to attract international organisations willing to offer funding and assistance in training of personnel and provision of equipment. These global partners include CBM, Starkey Hearing Foundation, Worldwide Hearing and Global coalition for hearing healthcare.

These concerted efforts have begun to bear early fruits with some countries like Zimbabwe and Rwanda already recording increased number of ear surgeons.

A major limitation of this study was the low response to our snap survey. We received five responses each from a senior ENT surgeon in the respective countries. However, the pool of ENT surgeons in African countries is limited, therefore, we believe the overall view of these five senior surgeons correctly points to a need to improve equipment and hospital facilities as a way of aiding personnel training efforts in the area of ear healthcare in East, Central and Southern Africa.

CONCLUSIONS

The major barriers to ear surgery remain inadequate personnel, inadequate theatre space and time and challenges with hospital infrastructure and equipment. There is modest increase in ENT personnel in countries of the East, Central and Southern African EHC forum since 2015 to date. Training of ear healthcare personnel has improved coupled with increased buy in from national governments as seen by adoption of healthcare policies at national level. Formation of large regional groups has facilitated attraction of international organisations that assist with provision of equipment, improved training of personnel and increased efforts to capture ear disease related data in member states. Formation of regional

groups therefore has begun to break barriers related to ear surgery in East, Central and Southern Africa.

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INTERMEDIATE LARYNGOTRACHEAL OUTCOME OF PATIENTS (ADULTS AND PAEDIATRICS) INTUBATED AT KIGALI UNIVERSITY TEACHING HOSPITAL

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ABSTRACT

Background: Endotracheal intubation is a lifesaving procedure used since long ago to provide ventilation for patients who cannot breathe by their own. However as any medical procedure intubation causes complications.

Objective: The aim of this study was to evaluate the incidence of intermediate post extubation complications in patients intubated in Intensive Care Unit (ICU) and Paediatric Intensive Care Unit (PICU) at Kigali University Teaching Hospital (KUTH) and to evaluate the possible risk factors.

Methods: We conducted a retrospective descriptive study where data was collected from medical files of patients intubated in ICU and PICU at KUTH from January 2014 to December 2016. Demographic characteristics, conditions and material of intubations, co-morbidities as well as complications post intubation were recorded.

Results: In total 302 patients met inclusion criteria in ICU and PICU. ICU patients and PICU patients were analyzed separately. In ICU 64.35% were male and 35.7% were female. As intermediate post- extubation outcome, we found 95.65% no complications, 1.3% with subglottic stenosis, 0.9% with tracheal stenosis, 0.3% had laryngeal granuloma, 0.3% had stoma site granulation tissue. In PICU, 72 patients met inclusion criteria; 61.1% were male and 38.9% female. The outcome was as follow; 95.8% no complications, 2.78 subglottic stenosis, 1.3% laryngeal oedema.

Conclusion: Our study showed an overview of the outcome of intubation at Kigali University Teaching Hospital. We evaluated possible risk factors documented in the literature, however we could not conclude on predominant risk factors at KUTH. Further prospective studies are needed for better understanding of risk factors and improvement of care given to patients intubated at KUTH.

Key words: Intubation, Outcome, Complications, Subglottic stenosis, Tracheotomy

INTRODUCTION

The introduction and widespread use of endotracheal intubation for respiratory support of critically ill patients began in 1940¹. However, intubation causes complications, which occur at the time of intubation, while the ETT is in place, during extubation or after extubation. This study will focus on complications post-extubation. These include: laryngeal oedema, hoarseness, superficial laryngeal ulcer, laryngeal granuloma, glottic and subglottic granulation tissue, laryngeal synechia, vocal cord paralysis, aspiration, laryngotracheal web, tracheal stenosis, tracheomalacia, trachea - oesophageal fistula, and trachea innominate fistula². The incidence of laryngotracheal stenosis after prolonged or repeated endotracheal intubation ranges from 3% to 8% in both adults and children¹. In Spain by minimizing the risk factors on intubated patients the incidence of complications was 1.5%³. Katsanos *et al*⁴, performed a study on 19 patients critically ill, and found: true vocal cord granuloma 63%, which resolved in 3 months for 75% of those patients, 31% developed early tracheal

lesions tracheitis, 10% developed tracheal stenosis preceded by ring shaped tracheitis. Stenosis following tracheostomy results from abnormal wound healing with excess granulation tissue around tracheal stoma site⁵. Among other predisposing factors to development of stenosis include hypertension, diabetes and HIV⁶. The duration of intubation also plays a role; patients who were intubated endotracheally for 2 to 5 days had a 0% to 2% incidence of chronic laryngotracheal stenosis, those intubated for 5 to 10 days had a 4% to 5% incidence, and those intubated for more than 10 days had a 12% to 14% incidence. Tracheotomy may prevent laryngotracheal stenosis in patients who need endotracheal intubation for more than 10 days. It should be remembered, however, that the type of tracheotomy incision and biomechanical factors related to the tracheotomy tube also contribute to the development of stenosis⁷. The other main risk factor to have complication post extubation is the pressure cuff⁸.

MATERIALS AND METHODS

This study was a retrospective study conducted at Kigali University Teaching Hospital (KUTH). Data was collected

from files of patients admitted in Intensive Care Unit (ICU) and Paediatric Intensive Care Unit (PICU) from January 2014 - December 2016. We excluded patients with laryngotracheal injury and patients who were not decanulated due to neurological sequelae. We evaluated the size of endotracheal tube, the duration of intubation, the condition of intubation (elective vs emergency), associated cormorbidities (diabetes and hypertension and HIV), the use of proton pump inhibitors and presence of complication after extubation or decanulation. Complications were suspected from the complaint of the patients and most of them were complaining of stridor. The diagnosis was confirmed by bronchoscopy.

The study proposal was approved by KUTH Ethical Committee. Data entry tool was EpiData and analysis was done using Stata 11.1. Chi-square test was used to study associations. P-value was less or equal to 0.05. (ethical committee approval).

RESULTS

Intensive Care Unit (ICU): Two hundred and thirty patients met the inclusion criteria, 64.35% were male and 35.6% female. As intermediate post-extubation outcome, we found 95.65% no complications, 1.3% with subglottic stenosis, 0.9% with tracheal stenosis, 0.3% had laryngeal granuloma, 0.3% had stoma site granulation tissue. The overall complications necessitating surgical management was 2.98%. The length of intubation was a contributing factor in development of complications P-value $0.032 < 0.05$. Having other comorbidities diseases like HIV, hypertension and diabetes did not contribute to the development of complication (P-value $0.72 > 0.05$). The use of proton pump inhibitors and antibiotics was not preventive (P-value $0.34 > 0.05$).

Paediatric Intensive Care Unit (PICU): Seventy two patients met the inclusion criteria; 61.1% were male and 38.9% female. The outcome was as follows; 95.8% no complications, 2.78% subglottic stenosis, 1.3% laryngeal oedema. There were no correlation between the length of intubation and the development of complications (P-value 0.18).

Patients demographics

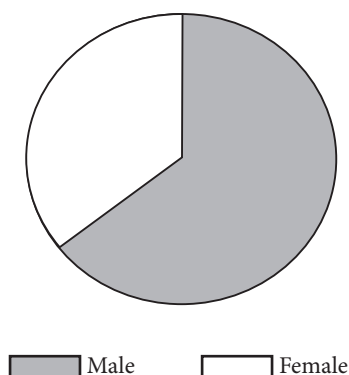


Figure 1: Distribution by sex : ICU

Sex	Freq.	Percent	Cum.
Male	44	61.11	61.11
Female	28	38.89	100
Total	72	100	

Table 1: Outcome of intubation in ICU

Diagnosis at re-admission	No.	(%)
No complications	220	95.65
Subglottic stenosis	2	0.87
Tracheal stenosis	3	1.3
Laryngeal granuloma	1	0.43
Stoma site granulation tissue	1	0.43
Laryngeal oedema	3	1.3
Total	230	100

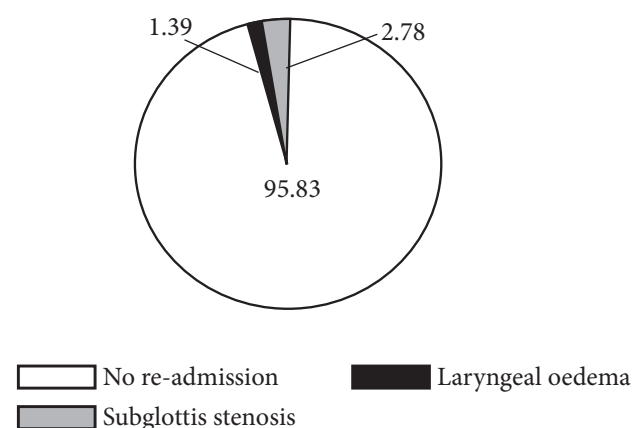


Figure 2: Outcome of intubation in PICU

Table 2: Length of intubation (Days)

	1-5	6-10	> 10	Total
Diagnosis at re-admission				
No re-admission	123	61	36	420
Subglottic stenosis	0	0	2	2
Tracheal stenosis	1	1	1	3
Laryngeal granuloma	0	0	1	1
Stoma site granulation tissue	0	0	1	3
Laryngeal oedema	1	1	1	3
Total	125	63	42	230

P-value: 0.032

DISCUSSION

The occurrence of post - extubation complication is comparable to what Re¹ observed, as ranging between 3% -8%. This is an elevated incidence as the health care system improved from the time of Re. There is a relationship between the length of intubation and complication as it is stated in the literature⁶. However there are other factors contributing to complications which were not evaluated because this was a retrospective study; They include the cuff pressure status of sedation,

the adequacy of the ETT and the number of intubation. Again it is difficult to evaluate the role of tracheostomy in the development of tracheal stenosis. Patients were not assessed by bronchoscopy before tracheostomy hence the origin of tracheal stenosis cannot be specified.

CONCLUSION

Complications post-intubation is a reality at KUTH. That is why we would like to recommend increased awareness of the risk factors to every medical provider giving care to intubated patients in order to minimize complications. It can be achieved through regular training.

A prospective study for better understanding of the most common risk factors of post intubation in low income countries needs to be undertaken.

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CORRELATION OF SYMPTOMS AND COMPUTED TOMOGRAPHY SCAN FINDINGS IN PATIENTS WITH CHRONIC RHINOSINUSITIS AT THE KENYATTA NATIONAL HOSPITAL

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ABSTRACT

Background: Rhinosinusitis is a significant health problem resulting in a large financial burden on society. Despite the high prevalence, worldwide diagnosis of rhinosinusitis still poses a challenge. Combination of nasal symptoms, nasal endoscopy and CT scan findings are usually used to make the diagnosis but very few studies have been done to correlate severity of symptoms with CT scan findings.

Objective: To determine the correlation between clinical symptoms and findings of CT scan in patients with chronic rhinosinusitis attending Ear, Nose and Throat (ENT) clinic at Kenyatta National Hospital (KNH).

Design: The study employed a descriptive cross sectional study design.

Methods: A total of 79 patients with Chronic Rhinosinusitis (CRS) attending KNH ENT outpatient clinic were enrolled consecutively in the current study. SNOT-22 questionnaire was then administered to all recruited patients to establish severity of symptoms. CT scan findings were scored using Lund-MacKay scoring system. Correlation between severity of symptoms and CT scan findings was assessed using Pearson's correlation coefficient.

Results: The symptoms, which were most frequently rated as severe, were nasal blockage (57%) and decreased sense of smell (56%). Overall symptom severity score was significantly correlated with CT scan scores ($p < 0.001$). There was no significant correlation of sneezing ($p = 0.420$), dizziness ($p = 0.883$), facial pain/pressure ($p = 0.239$) and reduced concentration ($p = 0.181$) with CT scan scores. All the other symptoms were well correlated with CT scan scores.

Conclusion: Overall disease and selected symptoms severity does correlate well with severity of rhinosinusitis on CT scan. Isolated symptoms of facial pain/pressure, sneezing, dizziness and decreased concentration does not necessarily indicate rhinosinusitis on CT scan.

Key words: Chronic rhinosinusitis, Lund MacKay score, Computed Tomography Scan, SNOT-22

INTRODUCTION

Chronic Rhinosinusitis (CRS) is becoming a significant health problem with increase in frequency of allergic rhinitis, resulting in a large financial burden on society¹. According to European Position Paper on Rhinosinusitis, rhinosinusitis is defined as inflammation of the nose and the paranasal sinuses characterized by two or more symptoms, one of which should be either nasal blockage/obstruction/congestion or nasal discharge (anterior/posterior nasal drip) \pm facial pain/pressure \pm reduction or loss of smell and either endoscopic signs of nasal polyps, and/or mucopurulent discharge primarily from middle meatus and/or oedema/mucosal obstruction primarily in middle meatus and/or CT changes which include mucosal changes within the osteomeatal complex and/or sinuses². If the symptoms persist for 12 weeks or more it becomes CRS.

The American Academy of Otolaryngology-Head & Neck Surgery (AAO-HNS) defines chronic rhinosinusitis as 12 weeks or longer of two or more of the following signs and symptoms: mucopurulent drainage (anterior, posterior, or both), nasal obstruction (congestion), facial pain/pressure/fullness and decreased sense of smell. An objective measure is required for the diagnosis, that is, inflammation documented by one or more of the following findings: purulent mucus or oedema in the middle meatus or ethmoid region, polyps in nasal cavity or the middle meatus, radiographic imaging demonstrating inflammation³.

Numerous instruments to measure severity of symptoms associated with CRS exist. These instruments include Visual Analogue Score (VAS), Short Form-36 health survey (SF-36), Sinonasal Assessment Questionnaire (SNAQ-11), Sinonasal Outcome Test-16 (SNOT-16), SNOT-20 and recently SNOT-22.

SNOT-22 includes assessments of nasal, paranasal and psychological symptoms, and those associated with sleep. SNOT-22 questionnaire is in English, widely used and has been translated and validated in several other languages. It stems from the SNOT-20 and primarily aims at assessing rhinosinusitis treatment. It has 22 questions about sinonasal symptoms and general status aspects; graded in six levels from zero to five (zero meaning no problems and five is the worst possible problem). Final score is obtained by adding scores for items (0 to 110). It is considered the most adequate questionnaire to assess the quality of life of patients with CRS and has the advantage of evaluating the impact of sinonasal disease on both specific and general health issues. It can be used in pre and post-operative patients. Toma *et al*⁴ proposed a statistically validated definition for stratification of the SNOT-22, where mild was defined on the SNOT-22 score as 8-20 inclusive, Moderate as >20-50 and Severe as >50.

Computed Tomography (CT) scan of the paranasal sinuses is the gold standard diagnostic radiological tool for chronic rhinosinusitis⁵. An axial with coronal and sagittal reconstruction of 3mm cuts is recommended. CT scan is indicated after failed medical treatment or when surgical treatment is planned and when assessing for complications.

The Lund-Mackay system of staging CT scan severity of the disease is the only system recommended by rhinosinusitis taskforce (RTF) of AAO-HNS³. This is because it is simple and has excellent inter-observer and intra-observer agreement. The right and left sinuses are each scored differently. The severity of mucosal inflammation or fluid accumulation is scored as zero for no opacification, one for partial opacification and two for complete opacification. OMC is scored as either zero (not obstructed) or two (obstructed) as it is difficult to grade partial obstruction of OMC. Many other staging systems exist. However, these staging systems are too complex to be used in routine clinical evaluation hence they did not gain wide acceptance⁶.

The current study aimed at determining the severity of symptoms using SNOT-22 questionnaire and the findings of CT scan using Lund-Mackay score in patients with CRS attending ENT clinic at KNH. In addition, the study investigated the correlation between severity of symptoms and CT scan findings.

MATERIALS AND METHODS

The hospital-based study adopted a descriptive cross sectional study design. The study site was the ENT outpatient clinic at KNH while the study population comprised of patients aged 18 years and above diagnosed with CRS attending ENT outpatient clinic at KNH. Patients aged 18 years and above diagnosed with CRS based on the AAOHNS criteria³ and had a paranasal sinus

CT scan done within one month to the time of interview, and had given consent, were enrolled consecutively until the desired sample size was attained. Patients with a history of previous nasal surgery or trauma, those with known sinonasal pathology other than rhinosinusitis as well as those with known immunocompromised conditions, such as HIV, were excluded from the study. The principal researcher recorded the biodata of the study subjects and also administered SNOT-22 questionnaire to all recruited patients. CT scan scoring was then done using Lund-Mackay scoring system to all the recruited patients with the assistance of a qualified radiologist. All data collected in the study was sorted, coded and entered in a computer using Statistical Package for Social Sciences (SPSS v. 21). The study variables were analyzed descriptively. Correlation between the severity of the symptoms and CT scan findings was done using Pearson correlation coefficient (*r*). The threshold of statistical significance was set as $p < 0.05$. Ethical approval to conduct the study was obtained from KNH/University of Nairobi Ethics Review Committee. Written informed consent was sought from all the study participants.

RESULTS

The study enrolled 79 patients with CRS, 61% of whom were females. The female to male ratio of the enrolled subjects was 1.5:1. The age of the participants ranged from 18 to 73 years with a median age of 38 years. Eight patients (10%) were aged 18-25 years while fifteen (19%) were above 55 years of age. Those who were between 26 and 35 years were 27 (34%) (Figure 1).

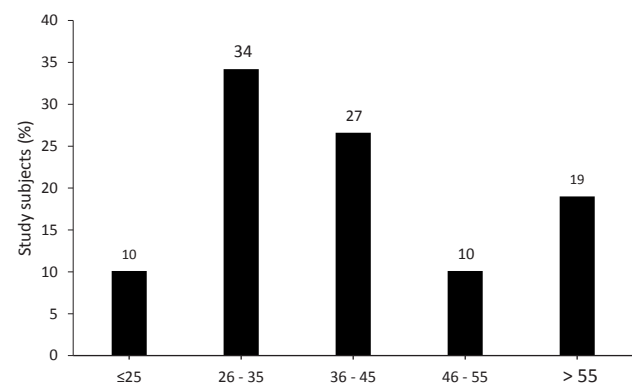


Figure 1: Distribution of the age of the study subjects

Enquiries on the medications taken in a period of one month prior to the day of the interview showed that majority of the patients had been on intranasal corticosteroids (INCS) 51(65%). In the same period, eight (10%) patients reported having taken antibiotics. Patients who had been on INCS only were 43 (54%) while eight (10%) had taken steroids and antibiotics during the one-month period preceding the day the interview was conducted.



Figure 2: Medications taken in the last one month

Table 1: Severity of symptoms experienced by patients

Symptom	Response n (%)					Mean ± SD [†]
	No Problem	Problem	Problem's Ratings			
			Mild (1-2)	Moderate (3)	Severe (4-5)	
Need to blow nose	7(8.9)	72(91.1)	19(24.1)	16(20.3)	37(46.8)	3.0±1.55
Nasal blockage	3(3.8)	76(96.2)	13(16.5)	18(22.8)	45(57.0)	3.5±1.39
Sneezing	10(12.7)	69(87.3)	35(44.3)	16(20.3)	18(22.8)	2.3±1.50
Runny nose	12(15.2)	67(84.8)	19(24.1)	15(19.0)	33(41.8)	2.8±1.69
Cough	38(48.1)	41(51.9)	24(30.4)	8(10.1)	9(11.4)	1.2±1.53
Post nasal discharge	22(27.8)	57(72.2)	23(29.1)	18(22.8)	16(20.3)	2.0±1.66
Thick nasal discharge	21(26.6)	58(73.4)	23(29.1)	16(20.3)	19(24.1)	2.1±1.62
Ear fullness	51(64.6)	28(35.4)	12(15.2)	8(10.1)	8(10.1)	1.0±1.49
Dizziness	43(54.4)	36(45.6)	24(30.4)	6(7.6)	6(7.6)	1.0±1.34
Ear pain	60(75.9)	19(24.1)	9(11.4)	6(7.6)	4(5.1)	0.6±1.21
Facial pain/pressure	24(30.4)	55(69.6)	19(24.1)	13(16.5)	23(29.1)	2.1±1.71
Decreased sense of smell /taste	16(20.3)	63(79.7)	10(12.7)	9(11.4)	44(55.7)	2.0±1.23
Difficulty falling a sleep	36(45.6)	43(54.4)	11(13.9)	15(19.0)	17(21.5)	1.8±1.83
Wake up at night	35(44.3)	44(55.7)	8(10.1)	21(26.6)	15(19.0)	1.8±1.73
Lack of good night sleep	32(40.5)	47(59.5)	21(26.6)	12(15.2)	14(17.7)	1.7±1.68
Wake up tired	29(36.7)	50(63.3)	11(13.9)	15(19.0)	24(30.4)	2.1±1.85
Fatigue	30(38.0)	49(62.0)	17(21.5)	17(21.5)	15(19.0)	1.8±1.70
Reduced productivity	30(38.0)	49(62.0)	19(24.1)	16(20.3)	14(17.7)	1.8±1.70
Reduced concentration	37(46.8)	42(53.2)	22(27.8)	11(13.9)	9(11.4)	0.9±1.03
Frustrated /restless/irritable	35(44.3)	44(55.7)	12(15.2)	14(17.7)	18(22.8)	1.2±1.23
Sad	40(50.6)	39(49.4)	18(22.8)	11(13.9)	10(12.7)	0.8±1.97
Embarrassed	32(40.5)	47(59.5)	12(15.2)	13(16.5)	22(27.8)	1.3±1.27
Overall						42.2±20.76

[†]Standard deviation

The most frequently reported problems were; nasal blockage 74 (96%), need to blow nose 72 (91%), sneezing 69 (87%), runny nose 67 (85%) and decreased sense of smell/taste (80%). The least reported problems were; feeling sad 38 (49%) dizziness 36 (46%), ear fullness 28 (35%) and ear pain 19 (24%). The symptoms which were most frequently rated as severe were nasal blockage 45 (57%), decreased sense of smell/taste 44 (56%), need to blow nose 37 (47%), runny nose 33 (42%) and waking up tired 24 (30%) as shown in Table 1. The total SNOT 22 scores ranged from six to 91 with a mean of 42.2 \pm 20.76 and a median (IQR) of 40 (28 – 53).

Patients were stratified into those with mild, moderate and severe symptoms. It was found that 19% of the patients had mild symptoms, 48.1% had moderate while 32.9% had severe symptoms as shown in Table 2.

Table 2: Stratification of SNOT-22 scores into mild, moderate or severe (N = 79)

SNOT-22 Categories	Number	(%)
Mild (≤ 20)	15	19.0
Moderate ($>20 - 50$)	38	48.1
Severe (> 50)	26	32.9

Seventy four (94%) patients had maxillary sinusitis while 76 (96%) and 74 (94%) had anterior and posterior ethmoid sinusitis respectively. Sixty seven (85%) patients were found to have an obstructed osteomeatal complex. Sphenoid and frontal sinusitis were observed in 56 (71%) and 60 (76%) patients respectively. Generally, bilateral sinusitis was more common among the study subjects with the anterior ethmoid sinusitis being the most prevalent 60 (76%) followed by posterior ethmoid sinusitis 59 (75%) and maxillary sinusitis 58 (73%). Amongst those with unilateral sinusitis, osteomeatal complex obstruction was most frequently observed among the studied patients 22 (28%).

The total Lund Mackay CT-Scan scores ranged from 2 to 24 with a mean of 14.6 ± 6.82 . Those who had mild disease had a CT scan score ranging from 5-20; those with moderate symptoms had a CT scan score of 2-24 while those who had severe symptoms had a score of 8-24.

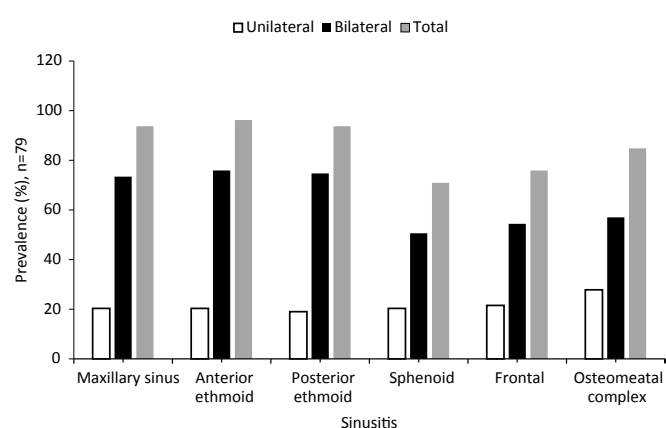


Figure 3: Distribution of sinonasal disease among the study subjects

Table 3: Correlation of the severity of symptoms and CT scan findings

Symptom	Correlation coefficient(<i>r</i>)	P-value
Need to blow nose	0.329	0.003
Nasal blockage	0.233	0.039
Sneezing	0.092	0.420
Runny nose	0.357	0.001
Cough	0.246	0.029
Post nasal discharge	0.339	0.002
Thick nasal discharge	0.320	0.004
Ear fullness	0.109	0.340
Dizziness	0.017	0.883
Ear pain	0.280	0.012
Facial pain/pressure	0.134	0.239
Decreased sense of smell /taste	0.663	<0.001
Difficulty falling a sleep	0.253	0.024
Wake up at night	0.255	0.023
Lack of good night sleep	0.255	0.023
Wake up tired	0.290	0.009
Fatigue	0.329	0.003
Reduced productivity	0.336	0.002
Reduced concentration	0.155	0.174
Frustrated /restless/ irritable	0.228	0.043
Sad	0.339	0.002
Embarrassed	0.336	0.002
Total scores	0.544	<0.001

The results from the correlations of SNOT-22 questionnaire scores (severity scores) and CT scan findings are presented in Table 3. Majority of the symptoms correlated well with CT scan findings. Facial pain/pressure was not significantly correlated with findings from the CT scan ($r = 0.134$, $p=0.239$). Other symptoms whose severity scores failed to show significant correlations with results from CT scan include; dizziness ($r = 0.017$, $p=0.883$), sneezing ($r = 0.092$, $p=0.420$), ear fullness ($r=0.109$, $p=0.340$) and reduced concentration (r

=0.153, $p=0.181$). Of note was a very strong correlation between decreased sense of smell/taste and Lund MacKay CT scan scores ($r=0.663$, $p<0.001$). Analysis of the overall scores from SNOT-22 questionnaire scores (severity scores) and CT scan findings showed a highly significant correlation ($r = 0.544$, $p<0.001$).

DISCUSSION

CT scan is used by surgeons to delineate extent of the disease, identifying anatomical variations, to assess severity of the disease and as part of the diagnostic tool as recommended by AA-OHNS³. Our study aimed at documenting the correlation between severity of symptoms and findings of CT scan scores using Lund MacKay score.

The study showed majority of patients with chronic rhinosinusitis were females compared to males in a ratio of 1.5:1. This finding agrees with other similar studies which showed female predilection of CRS with female to male ratio of 1.5:1^{7,8}. Contrary to our study findings, there are some studies that have shown male sex predilection of the disease^{9,10}. Kenny *et al*¹¹ documented a male sex predilection of CRS. The observed disparity in findings between the various studies could be attributed, at least in part, to the differences in the study populations with the other studies including paediatric subjects.

The most frequently reported problems were; nasal blockage need to blow nose, sneezing, runny nose and decreased sense of smell/taste. The symptoms, which were most frequently rated as severe, were nasal blockage and decreased sense of smell /taste. These results are similar to those of a study done in Nigeria which found that the most frequent symptoms patients presented with were nasal obstruction and nasal discharge⁷.

The median SNOT-22 severity symptoms score was 40. Majority of the patients had moderate symptoms. This was comparable to what was reported in a study by Amodu *et al*⁹ which also found that majority of his patients had moderate symptoms. Another study by Nair⁸ found majority of patients with CRS had moderately severe symptoms.

In the current study, majority of patients were found to have an obstructed osteomeatal complex. Generally, bilateral sinusitis was found to be more common than unilateral sinusitis. In this study, we found that the ethmoidal and maxillary sinuses were almost equally involved. Mucosal thickening of ethmoid sinuses could explain the finding of alteration of smell in most of our patients. Just like in the present study, Nair⁸ and Amodu *et al*⁹ found the most commonly involved sinuses to be maxillary sinus closely followed by ethmoids. They also found bilateral sinusitis to be more prevalent than unilateral sinusitis. The mean Lund Mackay CT scan score of the patients in our study was 14.6 ± 6.82 which was comparable to other studies^{9,12}.

In this study, it was found that there was statistically significant correlation between most of the SNOT 22

symptoms and Lund MacKay CT scan scores. Sneezing, dizziness, ear fullness, facial pain/pressure and reduced concentration did not correlate with Lund MacKay CT score. This finding means that isolated symptoms of facial pain/pressure, sneezing, dizziness and reduced concentration might not predict CT scan changes of rhinosinusitis. Although facial pain/pressure is one of the main diagnostic criteria in EPOS and AA-OHNS, studies by Kenny *et al*¹¹ and Shields *et al*¹³ found no correlation between facial pain/headache and CT scan severity score. Amodu *et al*⁹ found significant association between nasal obstruction and nasal discharge while all the other symptoms had no significant correlation. Basu *et al*¹² found that there was no correlation between SNAQ scores and Lund MacKay CT scores. But this may be attributed to the small sample size in their study.

In this study, overall SNOT-22 symptom scores correlated well with overall Lund Mackay CT scan scores. This means that patients who had high SNOT 22 symptom scores were more likely to have a higher Lund Mackay CT scan score and vice versa. This finding can be attributed to the fact that most of the patients in our study belonged to a population who presented late, did not respond to medical therapy for rhinosinusitis, and were awaiting surgery. Our findings are similar to findings of other studies^{7,8,14,15}. However, there are some few studies which had findings that are different from the current study^{9,12}. The difference between this study and those that reported no correlation between severity of symptoms and CT scan scores could be caused by studying symptom correlation of all patients referred for evaluation of CRS as opposed to those with known CRS referred for surgery, use of different method of symptom assessment (SNOT-22 versus SNAQ or VAS) and average interval of time between when CT scan was done and when symptom questionnaire was filled (one-month versus three months).

In conclusion, our study demonstrated that SNOT-22 symptoms severity scores correlate well with severity of rhinosinusitis on CT scan. Patients with more severe symptom scores are more likely to have CT scan imaging supporting the clinical diagnosis of rhinosinusitis except for facial pain/pressure, sneezing, dizziness, and decreased concentration. The study also showed a significant correlation between the overall severity symptom score and the total CT scan scores. This study indicates that SNOT-22 symptoms scores can accurately predict severity of CT scan score except for facial pain/pressure, ear fullness, sneezing, dizziness and reduced concentration.

Competing interests: The authors declare no competing interests.

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COIL EMBOLIZATION FOR LINGUAL ARTERY PSEUDO-ANEURYSM CAUSING MASSIVE POST TONSILLECTOMY BLEEDING: A CASE REPORT

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ABSTRACT

Severe haemorrhage is a life-threatening complication of tonsillectomy. A case of a 40 year old male with severe post tonsillectomy haemorrhage due to left lingual artery pseudo-aneurysm is presented. The patient presented with recurring massive post tonsillectomy haemorrhage occurring three times over a one month period. Intravenous fluid and blood transfusions were required in the last two episodes in addition to surgical evaluation for bleeders. An initial CT angiogram was normal. A subsequent digital subtraction angiogram of the common carotid arteries showed a lobulated pseudo-aneurysm of the left lingual artery which was the cause of the bleeding. This was successfully embolized with coils. No further bleeding was experienced in a two year follow up period.

Key words: Lingual artery pseudo-aneurysm, Embolization, Post tonsillectomy haemorrhage

CASE REPORT

A 40 year old male, who had undergone tonsillectomy for recurrent tonsillitis at another facility, presented to our facility in hypovolemic shock after a massive haemorrhage on the twenty seventh post-operative day. The haemorrhage started while he was asleep at night and stopped spontaneously after about 5 minutes. Prior to this episode, the patient had two other similar episodes of haemorrhage on the eighth and fourteenth post-operative days, which had been managed with intravenous fluid and blood transfusions and cauterization of the left tonsillar fossa under anaesthesia.

During the current presentation, the patient was admitted to the high dependency unit for stabilization and resuscitation with IV fluids and two units of packed cell blood. Oropharyngeal examination did not reveal any bleeders on the tonsillar fossae or any palatal or parapharyngeal swelling.

In view of the history and the severity of the bleeding, a CT Angiogram of cerebral and neck vessels was done and it was normal (Figure 1). The patient was then taken for examination under anaesthesia and except for an area of erosion on the left tonsillar fossa which was cauterized, there were no frank bleeders identified.

Subsequently a digital subtraction angiography of the carotid arteries revealed a lobulated pseudo-aneurysm,

2cm in the proximal left lingual artery with no active bleeding (Figure 2a). This was successfully obliterated by coil embolization via trans-femoral arterial route (Figures 2b, 2c). The pseudo-aneurysm was obliterated using 8mm by 5mm and 7mm by 3mm Tornado coils.

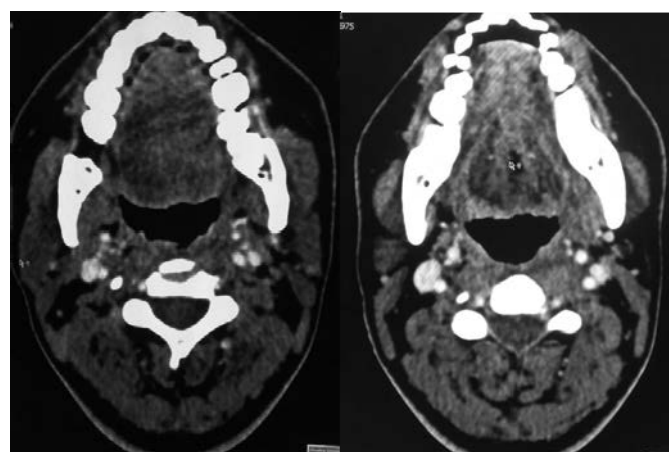


Figure 1a

Figure 1b

Figures 1a, 1b: CT Angiogram - Axial views of neck carotid arteries and their branches are normal in calibre. No vascular abnormality or active bleeding was seen.

After the embolization, there were no further episodes of haemorrhage and the patient was discharged after 3 days. The patient presented after a period of three months, with history of foreign body sensation on

the left side of the throat on swallowing and occasional choking sensation but did not have any bleeding. Rigid laryngoscopy showed a slough covered extruded coil on the left lateral oropharynx below the inferior tonsillar fossa abutting on the lingual surface of the epiglottis and moving with swallowing.



Figure 2a

Figure 2b

Figure 2c

Figures 2a-2c: Digital subtraction angiogram of the left common carotid artery showing a lobulated pseudo-aneurysm measuring about 4mm in diameter [2a], obliterated by coil embolization via trans-femoral arterial route [2b]; the coils seen along the extent of the artery beginning from the ostial origin [2c].

A diagnostic carotid angiography showed there was no recurrence of the pseudo-aneurysm but part of one of the coils was coiling and uncoiling with deglutition. At direct laryngoscopy under anaesthesia, the extruded part of the coil was successfully removed. No further complications or bleeding were experienced in a further two year follow up period.

DISCUSSION

Tonsillectomy is a common surgical procedure representing approximately 20%-40% of ENT surgical procedures¹. This procedure can be performed as a day case or with admission for at least one day, depending on the severity of complications anticipated. Post tonsillectomy complications include haemorrhage, infection, nausea, vomiting, odynophagia, and pain. Dehydration may occur in children due to delayed or poor oral intake. Of these, the most common cause of morbidity and the most serious complication remains post-tonsillectomy haemorrhage².

More than half (67%) of post tonsillectomy bleeding originates in the tonsillar fossa and the rest in the nasopharynx³. There are two major time frames for the post-operative bleeding. Most often, the bleeding occurs within the first 24 hours after surgery and accounts for about 75% and is described as primary bleeding. This is generally related to the surgical technique. Its incidence

has declined over the past few years due to improved surgical techniques. Secondary haemorrhage occurring more than 24 hours post tonsillectomy accounts for 25%. This is usually due to secondary infection and occurs between 7 – 10 days. The most severe life-threatening haemorrhages are rare and are due to arterial dissections or pseudo-aneurysms. Pseudo-aneurysms can be caused by blunt or penetrating trauma during dissection including traction and thermal injury or the placing of ligation sutures in the tonsillar bed. They can form in a lingual artery, ascending palatine artery, linguofacial trunk, tonsillar artery, internal carotid artery and facial artery⁴. The pseudo-aneurysm is actually a collection of blood that forms between the two outer layers of the artery, the muscularis propria and the adventitia. In this case, the pseudo-aneurysm is believed to have been caused by trauma to the lingual artery during the primary surgery possibly from diathermy coagulation or suture ligation.

Lingual artery pseudo-aneurysms are quite uncommon although there are sporadic case reports in the literature. They are associated with severe life-threatening haemorrhage^{2,5}. The diagnosis can be made by CT angiography although it can be missed like in this case due to the small size. Digital subtraction angiography is more often required to establish the diagnosis and also guide the endovascular management.

While surgery was the gold-standard treatment in the past, several less invasive treatment options are popular today⁶. Endovascular methods of managing haemorrhage caused by the pseudo-aneurysm may include Ultrasound Guided Compression (USGC), thrombin injection, arterial embolization, endovascular stent graft insertion among others. In this case, coil embolization was done. 8mm by 5mm and 7mm by 3mm Tornado coils were used. The choice for embolization was due its selective nature as compared to ligation which carries the risk of damage to the vagal and accessory nerves. Over-suturing of the tonsillar fauces may help but the pseudo-aneurysm is likely to bleed once the sutures absorb and edema of the tonsillar bed tissues resolve. Ultimately complete obliteration of the pseudo-aneurysm is required and this is best done with embolization which obliterates the sac, and if need be, the parent artery is also embolized to prevent further bleed by recanalization of the parent artery from distal collateral circulation.

CONCLUSION

Lingual artery pseudo-aneurysms although rare, can cause life-threatening post-tonsillectomy haemorrhage and should be considered as cause, in recurring profuse post-tonsillectomy haemorrhage. These are safely

and effectively embolized with a minimally invasive endovascular procedure which needs to be considered in the initial stages of management and not as a last resort.

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A LARGE LARYNGEAL VALLECULAR CYST CAUSING ACUTE UPPER AIRWAY OBSTRUCTION: A CASE REPORT

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ABSTRACT

Vallecular cysts are rare, accounting for 10.5% to 20.1% of all laryngeal cysts. These cysts can cause obstruction to the airway, swallowing of food or liquids and voice changes. We describe the case of a 30 year old female who presented with acute obstruction of the airway and voice changes.

Key words: Vallecular cysts, Airway obstruction

INTRODUCTION

Epidemiology: Laryngeal cysts are rare and have an incidence of 1:1250 to 1:4200¹. The prevalence of laryngeal cysts range from 3.2% to 4%¹. Cysts of the vallecular are a subset of the laryngeal cysts and consist 10.5% -20.1% of all laryngeal cysts. Laryngeal cysts are common in the 6th decade but can occur in any age¹⁻³. Most of the cysts in adulthood are found incidentally during intubation or esophagoscopy. However, the true incidence is not known.

Aetiology: These cysts can be induced by inflammation, irritation, or trauma. Vallecular cysts, are also called epiglottic mucus retention cysts or base of tongue cysts. The genesis is thought to happen when the duct of a mucous gland or lingual tonsillar crypt becomes obstructed or dilated^{1,2}. The cysts that arise are then referred to as ductal cysts, retention cysts, and lymphoepithelial cysts. The lingual surface of the epiglottis is the commonest site for the vallecular laryngeal cyst. Henderson *et al*² demonstrated that 52% of the laryngeal cysts originated from the lingual aspect of the epiglottis in their study.

CASE REPORT

This is a case report of a 30 year old female who came to our ENT clinic with history of dysphagia, mild difficulty in breathing, hoarseness of voice, and lumpy and choking sensation for five days. She also complained of panic attacks at night, and poor feeding derived from “fear of feeding”.

Two weeks earlier she had an untreated Upper Respiratory Tract Infection (URTI) characterized by running nose, throat pains and throat irritation. On clinical examination, the main findings were a large cystic-like mass at the base of the tongue obliterating the fauces (Figure 1). This mass was abutting to the posterior pharyngeal wall. The tonsillar fossa on the left was visible but slightly obscured on the right. There were no signs of inflammation or infection.



Figure 1: Cystic mass at base of tongue

A CT scan of the neck was done, which showed a globular mass at the level of the mandible (Figure 2).

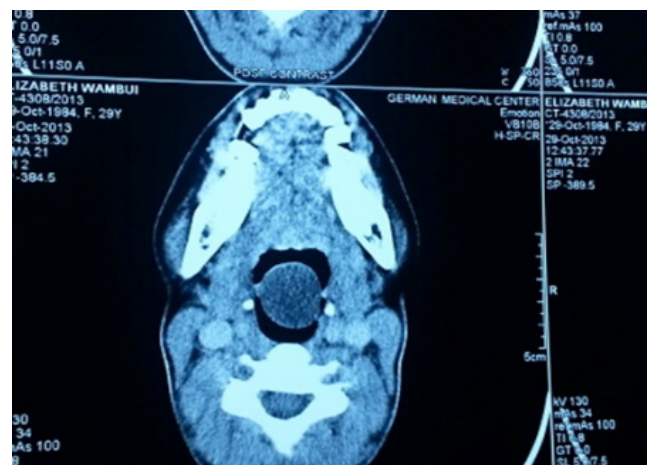


Figure 2: CT-scan of the Globular cyst in the oral cavity at the mandibular level. Notice the radio-lucency

Pre-anaesthetic assessment was done and endoscopic nasal intubation was planned to secure the airway hence prevent breaching the mass at intubation after patient consented for surgery.

During the procedure, a bronchoscope was used on which a cuffed endotracheal tube size 7.0mm was rail-loaded and this was introduced nasally and behind the posterior wall of the mass. The glottic inlet was brought into view after a few attempts and the airway was secured. The examination revealed a broad based cystic mass which was approximately 5 by 3cm in dimension. The cyst was attached to the left anterolateral portion of the epiglottic cartilage and obliterating the pyriform sinus on the left (Figure 3).

The mass was decompressed via needle aspiration. The mass was then excised in total using cold instruments. Histology showed stratified squamous cell epithelia lined cystic lesion. There was no evidence of malignancy. The yellow light fluid had some neutrophils and lymphocytes but no mucin.

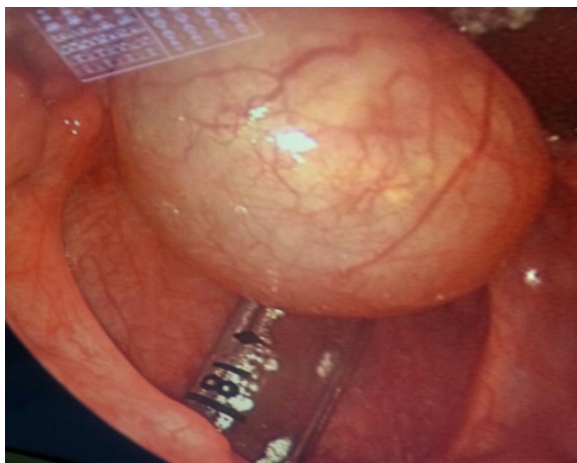


Figure 3: A large lucent and cystic mass filling the fauces

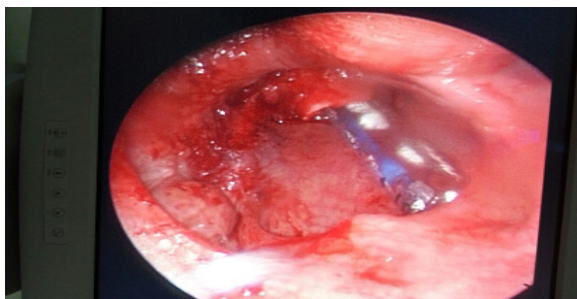


Figure 4: Post-surgical view; notice the Epiglottis now exposed

DISCUSSION

This case is reported because in our literature search this is possibly the first such case to be reported locally and regionally. Obstructive laryngeal vallecular cysts of sudden onset in adults are rare globally. In our case the cyst could have been caused by inflammation from the preceding upper respiratory tract infection.

Vallecular cystic lesions are commonly found in children. These children can present with stridor, respiratory difficulties and even difficult in swallowing. Usually the cysts are very small and rarely as big as the one in this case. The importance of this case is the sudden and serious airway obstruction. This is traumatizing and in our case was associated with “fear of feeding”.

The operation to drain the cyst is also challenging and is fraught with anaesthetic and surgical risk.

De Santos *et al*¹ classified these cysts in 1970 into ductal or saccular cysts. Newman *et al*³ in 1984 however modified the classification based on the histology of the cysts. These were either epithelial, tonsillar, and oncocytic. Ductal cysts arise from obstruction and are characterized with mucus retention. Saccular cysts arise from the area of the laryngeal saccule and tend to obstruct the ventricle. Saccular cysts must be distinguished from a laryngocele in the diagnosis. Laryngeal cysts can arise from any mucosa site and while De Santos *et al*¹ stated that vallecular cysts are often multiple, there are no literature reports of the same^{1,4}. CT and MRI scans can help narrow the diagnosis prior to definitive management.

The methods of management depend on various factors including the symptoms, presentation, site and the health facilities available. Surgical intervention can be open or endoscopic. Needle aspiration can be lifesaving in large obstruction masses but it may be difficult in children or for thick mucinous fluid^{3,4}. Endoscopic assessment and management should be ideal. Excision, needle aspiration, endoscopic marsupialization or laser excision can be carried out^{4,5}. This is done either singly or a combination of the methods. It is imperative that pre surgical planning is done with the anaesthetic team. Rapture of the cysts before the airway is secured must be mitigated. Indeed tracheostomy can be done to secure the airway and can be closed immediately once the cystic mass is excised.

CONCLUSION

Vallecular cysts in adults can occur at any age and can cause life threatening airway obstruction. Prompt surgical intervention with pre-operative planning with the anaesthetic team is paramount to choosing the best option to secure the airway without breaching the mass.

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IMPORTANCE OF ANATOMICAL LANDMARKS DURING PAROTIDECTOMY: A CASE REPORT OF A HUGE PLEOMORPHIC ADENOMA OF THE PAROTID GLAND

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ABSTRACT

Pleomorphic adenoma is the predominant histocytopathological variant among parotid gland neoplasms involving more frequently the superficial lobe. It's a benign tumour, and without intervention it can grow to an appreciably large mass causing significant morbidity. Normally, the parotid gland weighs about 15 grams. Identification of the surgical landmarks during parotidectomy is of paramount importance since facial nerve preservation is one of the goals in such surgeries. We report a case of a giant pleomorphic adenoma of the parotid gland and its surgical technique in a 70-year old female with a history of that tumour for more than 35 years. Upon examination, a giant mass on the left side of the face was found with no features of facial nerve involvement. Total parotidectomy was done with facial nerve preservation. Macroscopically, the mass weighed 5.2 kilograms with 35× 40 ×32 centimeters. Functional and aesthetic functions were preserved.

Key words: Parotid, Pleomorphic adenoma, Facial nerve landmarks, Muhimbili, Tanzania

INTRODUCTION

Pleomorphic adenomas are benign salivary gland tumours, which affect predominantly the superficial lobe of the parotid gland. They are described to have "pleomorphism" due to dual presence of epithelial and connective tissue components histologically¹⁻³. Pleomorphic adenomas of the parotid gland present as painless slow growing masses of varying sizes and involve the superficial lobe in about 80% of cases^{4,5}. It may undergo malignant transformation to carcinoma ex pleomorphic adenoma and may then involve the facial nerve. The standard surgery done for benign parotid tumours is parotidectomy with adequate resection of the margins and care taken to preserve the facial nerve^{3,6-8}. For giant benign parotid tumours, total parotidectomy may be warranted. Identification of the facial nerve landmarks serves an important basis for any successful parotidectomy. The reliable landmarks to identify the facial nerve trunk are the tympanomastoid suture line, the tragal cartilage, branches of occipital artery, styloid process and the posterior belly of the digastric muscle. Taking into consideration such set landmarks should be the goal of any surgeon when doing parotidectomy regardless of any size of the tumour to be resected.

There are few cases of giant pleomorphic adenomas of the parotid gland reported and to the best of our knowledge, this is among the biggest parotid pleomorphic adenomas ever reported in the available literatures in East Africa and is the only documented case in Tanzania.

CASE REPORT

A 70-year old female presented to our department complaining of a painless swelling on the left side of the face for the past 35 years. The mass had been growing insidiously in size. No history of fevers, excessive night sweats, bone pain or rapid increase in size of the mass was reported, and there was no history of prior head and/or neck irradiation, chewing tobacco or alcohol consumption.

Upon examination, she was ill looking and wasted with stable vital signs. She had a huge mass on the left side of the face involving the preauricular, infra-auricular regions and mastoid. It was pedunculated hanging down to mid-chest but with no airway compromise or difficulty in swallowing (Figure 1). The mass was nodulated and non-tender, mobile and the overlying skin was tense with some areas of ulceration. The mass measured 35 × 40cm in its greatest dimensions. No palpable regional lymph nodes were noted, and facial nerve was intact. Computerized tomography scan showed a large left parotid tumour with areas of calcification and necrosis with no lymph node involvement (Figure 2).

Fine Needle Aspiration Cytology (FNAC) showed clusters of spindle shaped cells in a myxoid background, suggesting a pleomorphic adenoma (Figure 3).

The patient underwent surgery in June 2018. She consented to the use of her medical records and images for specific purpose of this case report.



Figure 1: 70-year old female with giant parotid mass

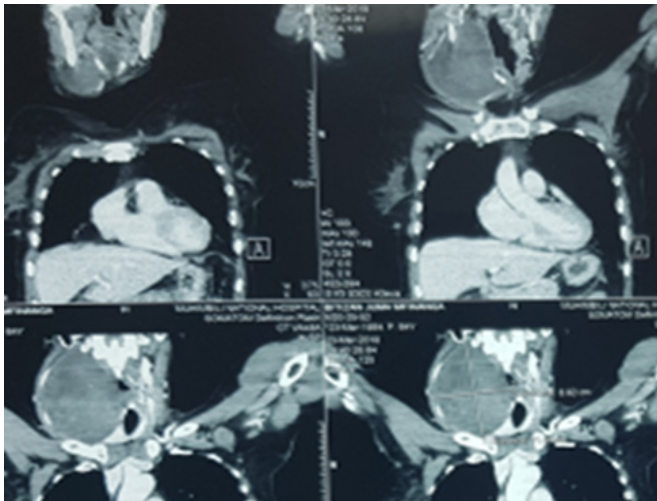


Figure 2: CT scan of giant parotid tumour

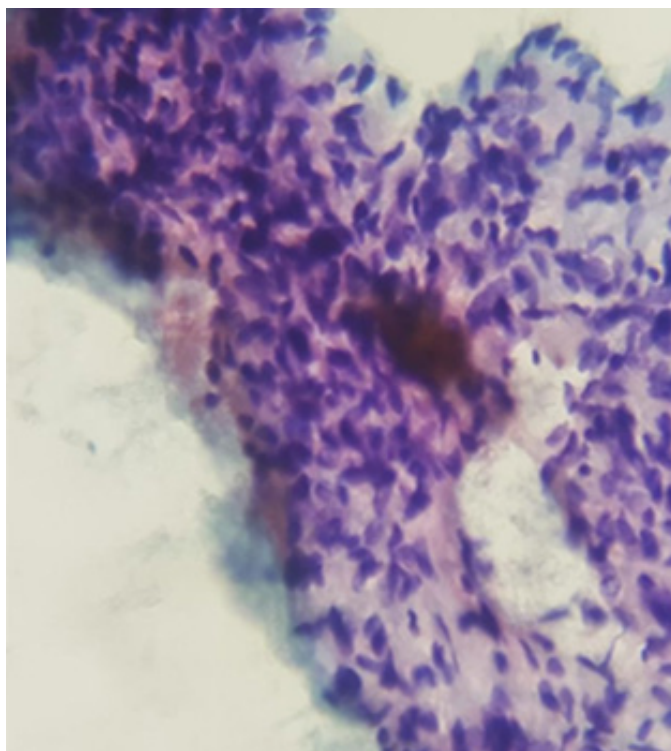


Figure 3: FNAC showing clusters of spindle shaped cells in a myxoid background, suggesting a pleomorphic adenoma

Surgical technique

The operation was done under general anaesthesia without muscle relaxation so that the facial nerve could be mechanically stimulated. A lazy-S incision was made with some modification to remove the ulcerated skin (Figure 4).



Figure 4: Lazy-S incision being planned with modification to remove the ulcerated skin

The sternocleidomastoid muscle was first identified, and the greater auricular nerve located and divided as it crossed the lateral surface of the muscle. This allowed the sternocleidomastoid to be retracted posteriorly (Figure 5). The next structure to identify was the posterior belly of digastric muscle (Figure 6), which was displaced medially by the tumour. The muscle was followed posteriorly up to the mastoid process. The tragal cartilage was then identified and skeletonized to the cartilage pointer, which is normally located about 1cm superior and lateral to where the facial nerve exits the stylomastoid foramen (Figure 7). The tympanomastoid suture line was identified by palpation. This, together with the previously mentioned surgical anatomical landmarks, was used to find the trunk of the facial nerve where it exited the stylomastoid foramen (Figure 8).

The facial nerve was dissected anteriorly and found to be laterally displaced by the large tumour mass. The temporal, marginal mandibular and cervical branches could be preserved, while the midfacial branches had to be sacrificed to permit resection of the tumour (Figure 9).



Figure 5: Tip of forceps (M) points to anterior margin of sternocleidomastoid muscle

D Figure 6: Posterior belly of digastric muscle (D) displaced medially by the tumour

Figure 7: Forceps showing the tragal cartilage

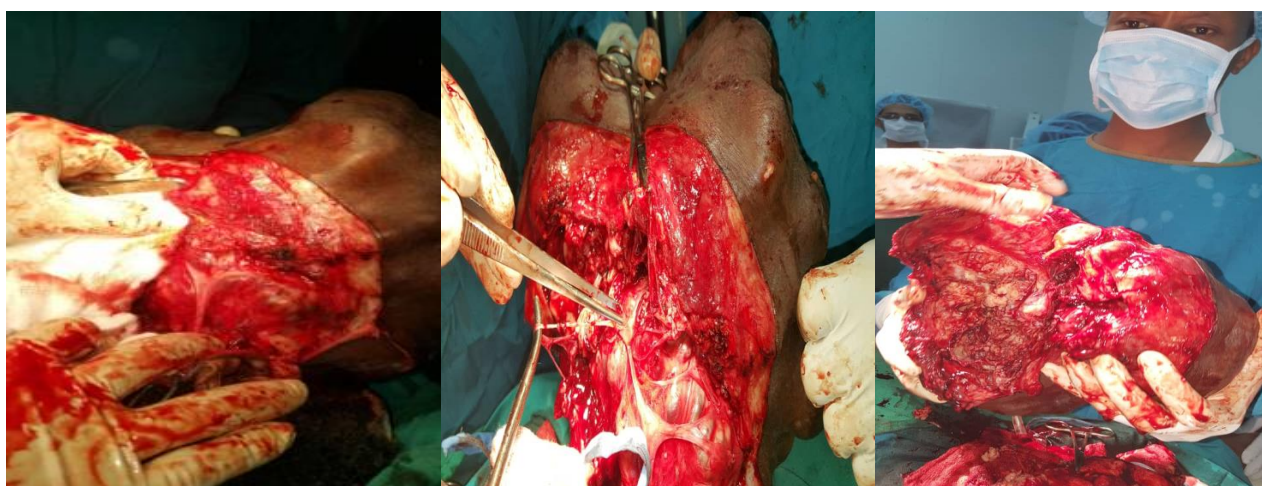


Figure 8: Facial nerve running lateral to the tumour

Figure 9: Forceps identifying the preserved marginal mandibular branch of the facial nerve

Figure 10: Encapsulated 5.2kg, 35 x 40 x 32cm tumour completely removed by total parotidectomy



Figure 11: Skin closed in layers

Figure 12: 14 days postoperative with resolving facial nerve neuropraxia

Figure 13: Histology confirms pleomorphic adenoma

DISCUSSION

Pleomorphic adenomas of the parotid gland present as painless slow growing masses of varying sizes. In majority of cases, the superficial lobe is involved. However, it may involve the deep lobe and parapharyngeal space^{4,5,7,8}. In this patient, both the deep and superficial lobes were affected. This tumour may have originated from the deep lobe due to lateral displacement of the facial nerve and retromandibular vein.

Various approaches for a successful parotidectomy with facial nerve preservation are described and can involve retrograde or anterograde facial nerve approaches⁹. Anterograde dissection was preferred for this particular case owing to difficulties in identifying the terminal branches due the enormous size of the tumour.

It is always important to identify the key surgical landmarks of the facial nerve during parotidectomy as previously described in the dissection steps. By using these surgical landmarks, we were able to remove this giant pleomorphic adenoma with success with preservation of the facial nerve. Finding all the facial nerve landmarks was however challenging in this case due to the tumour size, and such cases should not be attempted by inexperienced surgeons.

Reliable landmarks used to identify the facial nerve trunk in this particular case were the tympanomastoid suture line, cartilaginous part of the external auditory canal, tragal cartilage and the posterior belly of the digastric muscle (Figure 14). There is no consensus in the available literature regarding the most reliable facial nerve pointer, as while some literature report tympanomastoid suture line to be the most precise landmark for facial nerve¹⁰⁻¹², others report otherwise.

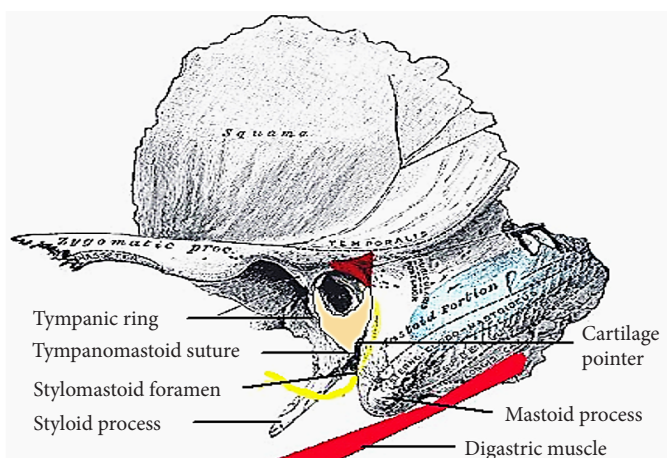


Figure 14: Schematic surgical landmarks for the facial nerve trunk (Courtesy: Open Access Atlas of Otolaryngology, Head and Neck Operative Surgery)¹²(<https://vula.uct.ac.za/access/content/group/ba5fb1bd-be95-48e5-81be-586fbaeba29d/Parotidectomy-1.pdf>)

CONCLUSIONS

Our case report shows that pleomorphic adenomas can grow to an enormously massive size (5.2 kilograms) over a period of more than 35 years. This long duration may be attributed to several factors such as a patient's lack of information, customs and traditions, and fear of surgery¹. Prolonged duration of pleomorphic adenomas is associated with increased risk of transformation to carcinoma ex-pleomorphic adenoma. Parotid gland surgery, regardless of the tumour size, requires a clear understanding of the surgical anatomy to safely identify and preserve the facial nerve. In this case we managed to remove a huge mass weighing about 5.2kg with clinical identification and preservation of the facial nerve and other adjacent important structures.

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UTILIZING PRIMARY EAR CARE IN UNIVERSAL HEALTH COVERAGE FOR BETTER HEARING

Hearing loss is a silent, invisible debilitating disability that has detrimental physical, psychological, economic and societal consequences. The ENT Clinical Officers in Kenya are trivial to this at the community level and there continued effort in advocacy and management should be applauded.

The commonest group of persons faced with disabling hearing-impaired are the extreme of ages i.e. the elderly and children. In the developed countries the total number of persons considered as elderly are increasing and therefore the need for hearing device's has exponentially grown to an extent FDA is working round the clock to make over--the counter hearing device's.

In the developing countries majority of the population is youthful. For the elderly or geriatric persons, with hearing loss amongst the challenges they face are; hearing care services and devices are not only inaccessible but costly. There is a severe shortage of hearing experts both in the private and more-so government health facilities. Most families cannot afford to purchase hearing devices and routine maintenance cost associated with hearing devices. The National health insurer has yet to give clear guidelines on issuance of the said appliances which would reduce the financial burden in developing countries.

The age structure of a population affects a nation's key health and socioeconomic development. Globally WHO estimates that 34 million people have moderate to severe hearing impairment and these persons are under 15 years of age¹. In Kenya persons of 0-14 years of age accounts for 40.02% of the total population a category that can simply be classified as a school going bracket. This high percentage under age 15 years needs a robust and proactive approach in preventing hearing disabilities prior to adulthood.

Sixty percent hearing loss is preventable. In Africa particularly in Kenya we lack data on hearing impairment. In one systematic review on causes of hearing loss in mainstream schools and general population, the most common cause of hearing impairment was middle ear disease (36%), followed by undetermined causes (35%) and cerumen impaction 24%². All levels of health facilities in the country can easily manage such cases if sensitization, training and primary ear care protocols are implemented.

WHO estimates the global number of persons with disabling hearing impairment have increased substantially

42, 120, 278, 360 and most recently 466 million from the year 1985,1995, 2005, 2012 and 2018 subsequently .

As we approach millennium goals and vision 2030 all countries are geared towards universal health coverage Kenya being one of them. There's need to sensitize and advocate for hearing prevention strategies alongside management of common ear diseases such as otitis media. Primary prevention of ear diseases should be prioritized at all cost by health care practitioners especially ENT Clinical Officers who are distributed across the country and in the rural parts of the country. One of the ways we can achieve a reduction in prevalence of hearing loss is by embracing World Health assembly resolution of ensuring hearing care is enshrined in the universal health coverage. The national government through the Ministry of Health has rolled its Universal Health Coverage (UHC) programme on pilot basis in four out of the 47 counties. (Kisumu, Isiolo, Machakos and Nyeri). The primary focus of intervention is at the primary level advocating for preventive strategies in hearing care through improved immunization coverage, universal newborn screening, adequate human resource, health education, surveillance and early treatment of infectious diseases as well as monitoring ototoxic medication amongst many others. Secondly, there are several health policy document such as the primary ear and hearing care.

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Submitted manuscripts should follow the guidelines below;

- (i) *Original research*: Should follow the IMRAD format ie Abstract, Introduction, Methods, Results, Discussion. The abstract should be structured with the following sub-headings; Background, Objective(s), Design, Methods, Results, Conclusion(s). The manuscript should have about 3000 words and not more than 30 references.

- (ii) *Review articles*: Should be written by an authority in a particular area. The abstract should be structured with the following sub-headings; Background, Objective(s), Data source, Data synthesis, Conclusion(s). The review should have about 5000 words with not more than 50 references.

- (iii) *Case reports*: Should have a brief summary, introduction, case report description and a discussion. The case report should have not more than 2000 words and about 15 references.

Note that the submitted manuscripts should follow the Vancouver style and references should be numbered in order of appearance and only those cited should appear in the reference list.

