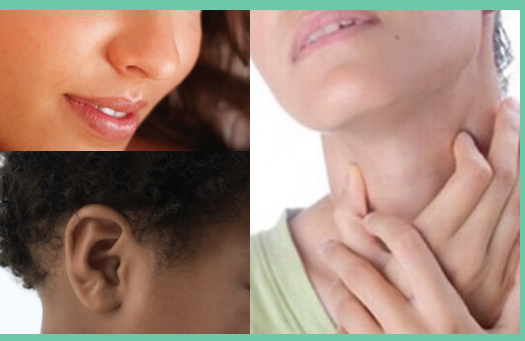

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ENT RESEARCH AND TRAINING IN AFRICA

Africa has one of the largest disease burdens in the world but has one of the lowest ratio of health workers to population. This ratio becomes worse for specialist health workers and even worse for Otolaryngologists. A recent survey of the distribution of Otolaryngologists in Africa by Fagan and Jacobs[1] found that many African countries don't have ENT surgeons. This despite the fact that about 20% of patients presenting to the general practitioner have ENT related complaints. This figure rises to about 50% in children[2]. Whereas a large proportion of these patients can be managed adequately at the peripheral health facilities, there is need for increased training of Otolaryngologists to manage cases referred for specialized treatment.

There has been an upsurge of ENT training programmes in Africa recently, a development that augurs well for the provision of ENT services. In the East and Central African region, nearly all countries now have training programmes for ENT surgeons. These programmes are faced with challenges of highly trained faculty, equipment, infrastructure and funding for research. It is therefore necessary that these training programmes link up within Africa and externally to tap into resources of well established training programmes. In addition, these training programmes should be adaptive to producing specialists that will be responsive to the nature of health challenges specific to Africa. In particular a public health approach in provision of ENT services is necessary. This would make the ENT surgeon a leader in disease prevention and health promotion in his area of specialty.

Even as development of the general ENT surgeon to provide services in peripheral hospitals take precedence, there should be a concomitant effort in developing sub-specialisation so as to develop highly specialized and skilled Otolaryngologist in the National teaching and referral centers. Opportunities for sub-specialisation in the more developed countries are greately limited and hence development of fellowship programmes initially in the few well established training programmes in Africa should be undertaken in collaboration with overseas partners who can provide both short term lectures and in some instances assist with training materials. The highly successful University of Cape Town Head and Neck Fellowship can be used as a model to develop fellowships in rhinology, laryngology, otology and paediatric otolaryngology to start with.

The field of ENT, like other areas of medicine has been transformed in the last two decades through development of excellent technology and teaching tools. Skills learned during trainee years need to be constantly upgraded and horned. For a surgeon to keep offering high quality care, he/she must commit to a lifelong learning process which involves attending scientific meetings, workshops and even visiting other centers that impart high quality specialized skills. Continued professional development is best provided through a collaboration between professional societies and training institutions. In Kenya, the Kenya ENT Society (KENTS) and the University of Nairobi have forged such a partnership that has enabled very high quality training workshops that bring world class teachers to train local ENT surgeons. These workshops have been patronized by ENT surgeons from all over the East and Central African region .

Despite the paucity of funding for research, ENT practitioners in Africa must identify low budget research activities that provide answers to the myriad ENT problems they encounter in their daily work. Accurate capturing of clinical data must be encouraged and analysis of this routine data must be used to inform clinical decisions. These data should be used to provide information on disease burden which is necessary to convince policy makers to allocate adequate resources to ENT departments. Publication of findings from such data analysis, case reports/series and prospective studies is necessary to spur growth of scientific enquiry and publishing in this part of the world. Scientific Journals publish articles that are of interest to their readers and hence medical researchers in Africa may find themselves disadvantaged in getting their work published in journals whose readership have no interest in the kind of health problems they encounter and write about . It is therefore necessary to develop regional peer reviewed specialist journals to provide a forum for publication of locally relevant scientific information. The launch of the *East African Journal of Otolaryngology Head and Neck surgery* should therefore be a stimulus to research and publication in ENT in the East and Central African region.

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From the editor's desk

It is with great pleasure I welcome you to read the very 1st issue of our own Kenya ENT journal. ENT practice is fast growing in our country and we hope that the inception of this journal will be able to publish and share knowledge of the diverse ENT pathologies seen both in the public and private ENT clinics and hospitals across the country.

This scientific journal has been the product of teamwork provided by the editors, editorial board members, publishers and authors. There is room for additional people who would like to work with us. Our aim is to have a journal that provides current knowledge and encourage all ENT practitioners in the country to develop and improve their writing and publishing skills. We acknowledge that in the past many interesting cases have been seen in our practice but have gone unreported hence we hope with this journal this bridge will be eliminated. We would like to encourage all potential authors to send in their manuscripts so that we can develop this journal to be one of the leading journals in our continent.

The editorial team is comprised of highly motivated persons who will review all manuscripts in a fair and timely manner thus avoid delays in publication. We are committed to publish 2 journals per year and we are depending on you to make this a reality.

I therefore take this opportunity to invite you to read the articles in this journal with a sense of critic and I will be delighted to publish any letters that will emerge from this first publication.

Dr. Sophie Gitonga
Editor-in-Chief

RESEARCH ARTICLE

AUDIT OF PATTERN OF ENT DISEASES IN A SPECIALIST CLINIC IN A RURAL HOSPITAL IN KENYA

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ABSTRACT

Introduction: Ear Nose and Throat (ENT) facilities in this country have only recently been established in rural district hospitals. There is no published data on the pattern of ENT diseases in these secondary facilities. This audit was undertaken to determine the main conditions presenting in a specialist clinic in a rural hospital. This would improve resource allocation, training of personnel, patient care and outcome.
Method: A retrospective review of the register of patients seen in the ENT clinic between January 2013 and December 2013. Data was extracted with regard to age, sex and diagnosis for each patient. Permission was acquired from the hospital audit and ethics committee.
Results: A total of 1183 patients were reviewed. The age range was from 3 months to 92 years. Males 607 (51.3%) were slightly more than females 576 (48.7%) giving an M: F ratio of 1.05:1. Diseases of the auditory and balance system accounted for 328 (27.7%), sino-nasal diseases accounted for 298 (25.2%), pharyngeal diseases were the most common at 394 (33.3%), head and neck together with oral cavity lesions accounted for 82 (6.9%) and post operative cases accounted for 81 (6.9%). The paediatric (<15 years) accounted for 653 (55.8%) of the total with under 5s numbering 332 (28.3%) while the adults (>15 years) accounted for 530 (44.8%) of the total. The most common paediatric conditions were tonsillitis 124 (10.4%), adenotonsillar hypertrophy 99 (8.4%), allergic rhinitis (8.0%) and adenoid hypertrophy 60 (5.1%). The most common adult conditions were allergic rhinitis 99 (8.4%), wax impaction 56 (4.7%), CSOM 34 (2.9%) and tonsillitis 30 (2.5%).
Conclusion: Paediatric cases were the most populous. Pharyngeal cases were the most likely due to the fact that this is the only ENT. department in Machakos county. Appropriate equipment, laboratory facilities, adequate personnel and more theatre time is needed in improving patient care particularly surgery in paediatric otolaryngology.

INTRODUCTION

Ear Nose and Throat (ENT) facilities in Kenya and Africa in general have generally being concentrated in the large urban centers. Only recently have they become established in rural district hospitals. According to Fagan *et al*[1], in a sample of 18 sub Saharan countries, only one had adequate access to ENT services outside of major cities. The paucity of clinical services to the rural areas and the subsequent gap in data collection, analysis and interpretation was glaring.

However, with poor facilities and few consultants, the workload of ENT conditions that present to the otolaryngologist are heavy and wide ranging. Series in Africa and elsewhere have described the burden of ENT diseases; however, most are based on tertiary facilities[2-4]. The ratio of ENT surgeons in Kenya to the general population is 0.1 per 100,000 people[1].

This audit was done to establish the pattern of ENT diseases presenting to a specialist clinic in a rural facility. The data mined would improve knowledge of disease pattern, provide evidence to review current administrative and health policies as well as increase resource allocation. It would further seal gaps in medical curricula and training personnel and ultimately enhance patient care and outcome.

MATERIALS AND METHODS

A retrospective review of the register of patients seen in the ENT clinic between January 2013 and December 2013 was done. Data was extracted with regard to age, sex and diagnosis for each patient. Although an institutional review board is not available in this institution, we obtained approval for our retrospective review from the hospital Audit and Research Committee.

RESULTS

A total of 1183 patients were reviewed. The age range was from 3 months to 89 years. Males were 607 (51.3%) and were slightly more than females 576 (48.7%) giving an M: F ratio of 1.05:1.

Table 1: Age distribution viz a viz the anatomic areas

Anatomic area	Age group (years)	Frequency (%)
Auditory and balance	0 - 14	109 (33.2)
	15 - 29	44 (13.4)
	30 - 44	39 (11.9)
	45 - 59	57 (17.4)
	60 - 74	35 (10.7)
	75 - 89	44 (13.4)
Sino-nasal	0 - 14	141 (47.3)
	15 - 29	56 (18.8)
	30 - 44	43 (14.4)
	45 - 59	34 (11.4)
	60 - 74	20 (6.7)
	75 - 89	4 (1.3)
Pharyngeal	0 - 14	298 (75.6)
	15 - 29	18 (4.6)
	30 - 44	29 (7.4)
	45 - 59	30 (7.6)
	60 - 74	15 (3.8)
	75 - 89	4 (1)
Head and neck and oral cavity	0 - 14	40 (48.8)
	15 - 29	7 (8.5)
	30 - 44	17 (20.7)
	45 - 59	15 (18.3)
	60 - 74	2 (2.4)
	75 - 89	1 (1.2)

The paediatric age group (<15 years) accounted for 653 (55.8%) of the total while the adults (>15 years) accounted for 530 (44.8%) of the total. The proportion of under 5s numbering 332 (28.1%) of the total.

Table 2: Age distribution of the patients

Age group (years)	Frequency (%)
0-5	332 (28.1)
6-14	321 (27.1)
>14	530 (44.8)

The most common paediatric conditions were tonsillitis 124 (10.4%), adenotonsillar hypertrophy 99 (8.4%), allergic rhinitis (8.0%) and adenoid hypertrophy 60 (5.1%). The most common adult conditions were allergic rhinitis 99 (8.4%), wax impaction 56 (4.7%), CSOM 34 (2.9%) and tonsillitis 30 (2.5%).

Table 3: Common conditions in age groups

Age group (years)	Condition	Frequency (% of total)
0-14	Tonsillitis	124 (10.4)
	Adenotonsillar hypertrophy	99 (8.4)
	Allergic rhinitis	94 (8.0)
	Adenoid hypertrophy	60 (5.1)
>14	Allergic rhinitis	99 (8.4)
	Wax impaction	56 (4.7)
	CSOM	34 (2.9)
	Tonsillitis	30 (2.5)

Table 4 gives the most common disease according to anatomic region. Auditory and balance diseases were 328 (27.7%), sino-nasal diseases accounted for 298 (25.2%), laryngo-pharyngeal diseases were the most common at 394 (33.3%), head and neck together with oral cavity lesions accounted for 82 (6.9%) and post operative cases accounted for 81 (6.9%).

Table 4: Common diseases according to anatomic region

Anatomic region	Condition	Frequency (%)
Auditory and balance	Wax impaction	78 (23.8)
	Chronic suppurative otitis media	50 (15.2)
	Hearing loss	39 (11.9)
	Otitis media with effusion	30 (9.1)
Sino-nasal	Allergic rhinitis	193 (64.8)
	Epistaxis	43 (14.4)
	Non allergic rhinitis	21 (7.1)
	Sinusitis	14 (4.7)
Laryngo-pharyngeal	Tonsillitis	154 (39.1)
	Adenotonsillar hypertrophy	99 (25.1)
	Adenoid hypertrophy	60 (15.2)
	Laryngo-pharygeal reflux	47 (11.9)
Head and neck and oral cavity	Neck masses	25 (30.5)
	Lymphadenopathy	19 (23.2)
	Thyroglossal cyst/duct	10 (12.2)
	Enlarged thyroid gland	7 (8.5)
Post operative	Adenotonsillectomy	55 (67.9)
	Others	26 (32.1)

DISCUSSION

This audit shows that marginally more males were seen than females and that the highest age incidence was seen in the paediatric age group with half in the under five category. In our series this was attributed to the high incidence of adeno-tonsillar diseases which almost exclusively affects the paediatric age group and tonsillitis which is also largely seen in children. This finding correlates with these series[1,2].

This high prevalence of chronic ear infection is contrary to the reports of advanced countries like Israel which has a prevalence of 0.3[5]. This is probably due to a combination of inaccessibility to health care facilities, local customs and beliefs, harmful traditional practices and poor treatment of acute cases by the first contact health personnel. In our series, CSOM was more prevalent in the adult population. The infection is most commonly acquired in children aged up to 6 years, and peaks around 2 years of age. However, the condition persists in early and middle adulthood, unless treated[4].

It is not surprising that wax (23.8%) obstructing the tympanic membrane is relatively common, because in the majority of cases it is asymptomatic and therefore not an indication for seeking medical care. The high prevalence of wax in our study corresponds to the results obtained elsewhere[4].

The values presented for prevalence rates of respiratory allergic diseases shows that it's not lower than that found in urban areas or industrialized countries. This is contrary to the hygiene hypothesis. However, this observation has been reported in the ISAAC study in Maputo and in a review of respiratory allergic diseases in Southern Africa[6]. Ascaris-specific IgE responses may be a risk factor for atopic disease in children exposed to mild Ascaris infection[7,8] as it is highly prevalent in the rural African population.

Epistaxis in children is also a common disorder that is usually due to local irritation in Kiesselbach's plexus. The most common disorders underlying epistaxis are local inflammatory diseases, infections, and trauma. Most of the epistaxis in children is self-limiting, however they can be recurrent.

The vast majority of cases involving the pharynx were due to tonsillar and adenoid diseases. Upper respiratory conditions predispose a child to complications such as tonsillitis or tonsillar-adenoid hypertrophy. Tonsillitis and hypertrophy of the adenoids and/or tonsils most often occurs in children.

Patients with laryngo-pharyngeal reflux disease were mostly women in our series, which is in keeping with other series[9]. However, it is in contrast to gastro-oesophageal reflux disease, which shows nearly equal proportions of affected men and women in general but a male predominance in esophagitis and Barrett oesophagus[10]. It is unclear whether this female predominance represents gender-specific reactions of laryngopharyngeal mucosa to reflux or whether it is the result of increased health care–seeking behavior among women.

Lymphadenopathy, despite being reported, couldn't be evaluated further to illicit the underlying pathology due to the paucity of diagnostic services. Thyroid cases however, were present and managed accordingly. Other head and neck masses were referred to tertiary institutions for more sophisticated investigations and management.

The vast majority of post op cases were adeno-tonsillectomy cases. This is due to the large patient load presenting with this condition. However, it also illuminates the fact that more complicated cases such as middle ear pathology were unable to be performed due to lack of equipment and diagnostic services.

CONCLUSION

This study on ENT out patients in the local hospital has shown patterns of ENT diseases common locally

and some diseases not of same prevalence as other countries. Tonsillitis, allergic rhinitis and adeno-tonsillar hypertrophy are the most common ENT problems in the paediatric population. Allergic rhinitis and ear conditions were more common in the adult population.

There is need for a national audit of ENT conditions in Kenya. This national audit would showcase the regional variation in ENT diseases and also stimulate research into preventive measures. This audit also highlights the need for appropriate equipment, laboratory facilities and adequate personnel.

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RESEARCH ARTICLE

QUALITY OF LIFE OF LARYNGECTOMEES OF A SUPPORT GROUP IN KENYA

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ABSTRACT

***Background*:** Laryngeal cancer is the third commonest head and neck cancer in Kenya. Up until the late 1990s, radiation was the main mode of therapy for laryngeal cancer in Kenya irrespective of the stage of disease. This was mainly due to low acceptance of total laryngectomy among cancer patients. With the launch of the Kenya Association of Laryngectommees (KAL) support group, the situation has changed with more patients seeking total laryngectomy.
Objective: To determine the quality of life of laryngectomees who are members of the KAL.
***Method*:** Twenty-three surviving laryngectomees were traced through four consecutive meetings for consent and completion of either the English or Swahili version of the University of Washington Quality of Life (UW-QOL) questionnaire. Two questionnaires were not returned. One questionnaire was rejected due to incomplete information.
Results: Nineteen male and one female laryngectomees aged 48 to 80 years completed the UW-QOL questionnaire. The domains in the questionnaire comprising of pain control, change in appearance, activity, recreation, swallowing, chewing, speech, shoulder function, taste, quantity of saliva, mood and anxiety were scored on a scale of 1 to 5 with 1 representing the poorest and 5 the best score for each domain. At least 75% of the subjects scored 4 or 5 for all the domains. The most important issues of concern to the patients in the seven days prior to the interview were saliva, swallowing, speech, taste, mood, pain and activity in descending order. QOL scores compared to a month before developing cancer had 90% of the subjects reporting much better, better or same with only 10% reporting that it was worse. Health-related QOL over the seven days prior to the interview were good or better for 55% of the subjects and fair or poor for 45%. Overall QOL had a similar distribution.

INTRODUCTION

Advanced laryngeal cancer often requires multimodality treatment consisting of either surgery or chemotherapy combined with radiotherapy. Primary surgical treatment for advanced laryngeal cancer, specifically T4 tumours, has been shown to be associated with improved 5-year survival of 49% against 21% for chemoradiation and 14% for radiation alone[1]. While this may influence the choice of treatment for advanced laryngeal cancer, the quality of life post-operatively is an important factor to consider.

Total laryngectomy is associated with a permanent tracheostomy, disfigurement, anosmia, swallowing problems and loss of normal speech. In developed countries, the latter is overcome by speech rehabilitation in the form of counseling, oesophageal speech training, electrolarynx or tracheo-oesophageal prosthesis. Kenya has only a handful of trained speech pathologists, all of whom are in the private institutions. Speech rehabilitation is almost non-existent in the public hospitals. The few laryngectomees at Kenyatta National Hospital who have received speech rehabilitation have done so through the KAL or personal initiative outside the hospital setting.

Surgery as well as radiotherapy can affect swallowing significantly especially in patients where there was significant loss of pharyngeal mucosa during surgery. Radiotherapy induces xerostomia and fibrosis of pharyngeal tissues making chewing and swallowing of normal food difficult. The resultant functional, emotional and social disturbance can have far-reaching consequences as far as quality of life is concerned.

KENYA ASSOCIATION OF LARYNGECTOMEES

The Kenya Association of Laryngectomees was launched in 1997. The membership initially consisted of two laryngectomees who had had their surgeries done in the early 1990s in the private hospitals and their Head and Neck surgeon. The main objective of the group was to create awareness about laryngeal cancer and assist laryngectomees in acquiring some form of

speech. According to the association records, there are at least ninety surviving laryngectomees in Kenya. Majority of the current KAL membership is drawn from laryngectomees and their families supported by otolaryngologists, speech therapists from the private sector, nurses and other well-wishers.

The KAL members meet at the Kenyatta National Hospital ENT clinic every first Thursday of the month. Due to financial and logistical constraints about 10 to 20 members attend each meeting. The activities of the group consist of:

1. *Sharing of Information:* The members share personal experiences, challenges and seek for solutions from amongst themselves.
2. *Counseling*: Laryngectomees with training in counseling offer free counseling services to members and their families as a group and on individual basis. Some of the counselors visit wards to do pre- and post-operative counseling to laryngeal cancer patients. One of the founders of the association is a spiritual leader and counsels members on spiritual matters.
3. *Speech therapy*: Speech therapists from the private sector who are members of the association use the meetings to give free professional services to a group that would otherwise not afford the services at the private institutions.
4. *Acquisition of electrolarynx*: The founder of the association has made links with an American company that manufactures electrolarynx and assists members in importing the gadget. At present, nearly twenty members have the electrolarynx but only a few are able to use them effectively.
5. *Home visits*: Many laryngectomees are unable to attend the monthly meetings or follow-up clinics due to financial, infrastructure and social factors. The association members organize home visits to some of the members to offer support as need be.
6. *Clinician consultations*: Laryngectomees use the meetings to consult with the clinician members on a wide range of medical issues. These consultations are not charged by the hospital. They are also a form of follow up for laryngectomees who cannot keep their clinic appointments.
7. *Socialization*: At the end of the meetings, members share a cup of tea and snacks, which help them, bond together as a family.

RESULTS

A total of 19 male and 1 female laryngectomees aged 48 to 80 years were interviewed. Table 1 shows the specific quality of life scores on a scale of 1 to 5 with 1 representing the poorest and 5 the best score for each domain.

Table 1: Specific Quality of Life scores

Domain	Patient scores Good ← Moderate → Poor				
	5	4	3	2	1
Pain (control)	10 (50%)	6 (30%)	3 (15%)	1 (5%)	0 (0%)
Appearance (change)	8 (40%)	7 (35%)	5 (25%)	0 (0%)	0 (0%)
Activity	8 (40%)	9 (45%)	3 (15%)	0 (0%)	0 (0%)
Recreation (participation)	4 (20%)	15 (75%)	1 (5%)	0 (0%)	0 (0%)
Swallowing	3 (15%)	17 (85%)	0 (0%)	0 (0%)	
Chewing	8 (40%)	12(60%)	0 (0%)		
Speech	3 (15%)	13(65%)	4 (20%)	0 (0%)	
Shoulder (movement)	11 (55%)	5 (25%)	4 (20%)	0 (0%)	
Taste	7 (35%)	8 (40%)	4 (20%)	1(5%)	
Saliva	7 (35%)	8 (40%)	2 (10%)	3(15%)	
Mood	8 (40%)	7 (35%)	3 (15%)	2 (10%)	0 (0%)
Anxiety	10 (50%)	8 (40%)	1(5%)	1 (5%)	

Seven issues out of the 12 in the domain were of most importance to the laryngectomees during the seven days preceding the interview. The combinations varied from person to person. Overall, saliva featured most frequently (27%) followed by swallowing (24%), speech (17%), taste (13%), mood (8%), pain (8%) and activity (3%).

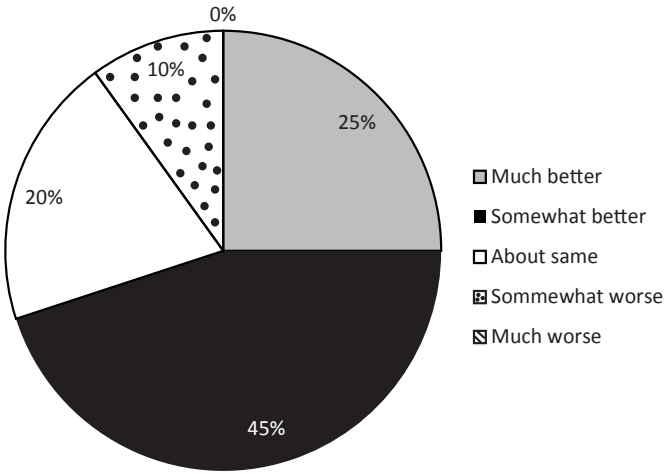

Figure 1: Health-related Quality of Life scores compared to a month before developing cancer

Table 2: Health-Related Quality of Life in the past week

Domain	Patient scores			
	Outstanding	Very good	Good	Fair
Health-related QOL in the past week	2 (10%)	9 (45%)	5 (25%)	4 (20%)
Overall QOL in the past week	1 (5%)	10 (50%)	7 (35%)	2 (10%)

DISCUSSION

Advanced laryngeal cancer often requires a combination of treatment modalities in the form of surgery, radiotherapy and chemotherapy. The main challenges associated with the treatment are with regard to verbal communication, the airway and swallowing.

The fact that total laryngectomy results in a permanent tracheostomy would portray it as a major dysfunction in a laryngectomee. A number of the laryngectomees in this study have acquired the electrolarynx but not all of them use them frequently. Three (15%) laryngectomees from the study reported that their speech was the same as always, while 13 (65%) reported having difficulty saying some words but could be understood on phone when using the electrolarynx. Only three (15%) patients said only the families and friends understood them. None of them reported not being understood when they spoke. Some studies have indicated that total laryngectomy does not translate into worse QOL as far as speech is concerned because laryngectomees tend to acquire good coping skills such that their functional limitations do not result in poorer patient rated overall quality of life[2, 3,4]. Other studies have shown that despite use of speech prosthesis upto 40% of laryngectomees have difficulties in making themselves understood or are unable to speak[5, 6]. Overall, total laryngectomy patients who receive tracheo-oesophageal prosthesis have the best QOL[7,8]. Perhaps the acquisition of some form of oesophageal speech and use of electrolarynx among the study laryngectomees can explain the favourable score as far as speech is concerned. Having had no experience with the tracheo-oesophageal prosthesis, it is understandable that the patients rating may not be comparable to studies where these are in use.

Total laryngectomy does affect a patient's physical appearance and shoulder function especially where neck dissection and/or radiation were carried out. This may further impact on participation in recreational and other activities as well as pain control. Although this study did not delve into the details of extent of surgery and treatment with radiotherapy in relation to the QOL scores, it is observed that 75% laryngectomees reported either no change (40%) or minor change (35%) in their appearance. Eighty per cent of the laryngectomees had no pain or only mild pain not needing medication while 80% had no shoulder problem or only minimal stiffness that did not affect their activity or strength. With no pain, no shoulder problems and no significant patient perception of change in appearance, it is therefore no wonder that 95% of the patients were active and able to participate in recreational activities.

The incidence of dysphagia after total laryngectomy varies between 10 and 60%[5,9]. Higher incidences are associated with female gender, advanced nodal disease and treatment with radiotherapy. This has been attributed to less piriform sinus mucosa for creation of a neopharynx in females, radiotherapy-induced fibrosis in pharyngeal muscles, xerostomia and deterioration in motor function[10]. The issue of gender may not apply in this study considering that

there was only one female. It is not known how many of the laryngectomees received radiotherapy either pre- or post-operatively but the issue of saliva stands out with only 35% reporting normal saliva, 40% less saliva though enough, 10% too little saliva and 15% having no saliva. This is in keeping with the observation that laryngectomees tend to return to their pre-treatment QOL state after one year from the end of treatment except with regard to sensation, xerostomia and sexuality[11]. Ability to taste food follows a similar pattern as saliva with 30% able to taste food normally, 40% able to taste most foods, 40% able to taste some foods and 5% unable to taste any foods. 40% of the subjects could chew food well with 60% only able to eat soft solids. Only 15% of the laryngectomees could swallow as well as ever with the rest having problems swallowing certain solid foods. This is expected considering that the ease of swallowing is not only dependent on saliva and ability to chew but also on the integrity of the oropharynx and neck structures. In an ideal situation, after total laryngectomy and creation of a neopharynx, swallowing rehabilitation is necessary for good swallowing. This service is not available at Kenyatta National Hospital and so patients devise their own coping strategies to swallow.

Patients diagnosed with cancer often experience anxiety and depression. Higher scores of anxiety and poor scores for emotional well-being have been observed in younger cancer patients, usually linked to potential loss of job and financial dependence[12]. Ten per cent of the laryngectomees were anxious about their disease with an equal number being depressed. These relatively low figures can be attributed to support drawn from the Kenya Association of Laryngectomees to which all study subjects belong. It has been demonstrated that the impact of treatment on QOL notable in the first 12 months after therapy improves as patients adjust thereafter with no difference in overall health-related QOL between laryngectomees and the general population when general health instruments are used[13]. This is more so in relation to speech and public eating and is attributed to rising confidence in social interactions as well as familiarity with voice rehabilitation measures with time[14].

It is notable that of all the domain issues, saliva, swallowing and speech featured in at least 50% of the subjects as issues considered most important in the seven days before interview.

CONCLUSION

Despite the scarcity of rehabilitation facilities, the total laryngectomees studied have comparatively satisfactory quality of life with some remaining productive and in employment. This may be attributed to the support they receive from their association. It is regrettable that we could not reach the laryngectomees who are either not members of the support group or inactive members for comparison of their QOL status.

RECOMMENDATION

It will help to assess the quality of life of the laryngectomees that do not attend the association meetings to conclusively determine whether being an active member of a support group is beneficial with regards to QOL.

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HEALTH SEEKING BEHAVIOUR AMONG HEARING LOSS PATIENTS ATTENDING KENYATTA NATIONAL HOSPITAL

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ABSTRACT

Background: In developing countries, enhancing health seeking behaviours and health care services utilization patterns are key determinants to health outcomes. Hearing loss impairment conditions are caused by health-compromising behaviours.

Objectives: To establish the determinants of enhancing health seeking behaviour among patients with hearing loss at the Kenyatta National Hospital, and establish the relationship between hearing loss and the respondents demographic, and economic characteristics, whilst seeking to establish knowledge, attitude and behaviour of patients with hearing loss.

Methods: The research adopted a descriptive cross-sectional design. A total of 322 subjects were interviewed. Chi Square (X^2) was used to test the statistical significance relationship between the dependent variable and independent variables. Correlation coefficient significant was at 0.05 levels.

Results: Enhancing health seeking behaviour was influenced by sex, religion, marital status, duration of illness and degree of hearing loss, all with a p value of less than 0.05. Age, residence and type of hearing loss did not influence EHSB.

Conclusion: Majority of patients had sort treatment at health facility at the onset of illness though there were those who did not seek treatment and those who self medicated themselves.

Recommendations: The study recommends Kenyatta National Hospital to enhance the private public partnership with all the stakeholders' involved in hearing loss in the community especially with primary health facilities.

INTRODUCTION

Hearing loss is the most frequent sensory deficit in human populations[1]. Over 5% of the world's population – 360 million people – has disabling hearing loss (328 million adults and 32 million children). The prevalence of disabling hearing loss is highest in South Asia, Asia Pacific and sub-Saharan Africa[2].

Studies have shown that there are many factors that influence health and health care seeking. Although many of these factors are similar across populations, how they exactly interact and influence the actions of people is often unique to a population[3]. In its widest sense, health seeking behaviour includes all those behaviours associated with establishing and retaining a healthy state, plus aspects of dealing with any departure from that state. In addressing this aspect it is important to recognize that this behaviour does not exist in a vacuum, but is part of a wider health behaviour. Positive health seeking behaviour was dependent on individual's acceptability and accessibility to health care[4].

The view is often that the desired health care seeking behaviour is for an individual to respond to an illness episode by seeking first and foremost help from a trained allopathic doctor, in a formally recognized health care setting[5]. Thus most studies of health care seeking behaviour have concluded that traditional and unqualified practitioners need to be recognized as 'the main providers of care' in relation to some health problems in developing countries[6].

MATERIALS AND METHODS

Research design: This was a descriptive cross-sectional study using both quantitative and qualitative methods. This methodology was adopted because cross-sectional studies provide a snapshot of the frequency of a disease or other health related characteristics. Secondly, this design is relatively quick and easy to conduct.

The target populations of this study were patients attending Kenyatta National Hospital, Ear Nose and Throat Clinic with confirmed hearing loss. Selected patients were 18 years and above and gave consent to participate in the study.

The study used non-probability sampling technique. Subjects were selected because of their hearing loss characteristics hence not randomizing the subjects of study.

Sample size determination

To determine the desired sample size, the Standard Fisher Method as cited by Mugenda and Mugenda (1999) was used.

$$\text{Sample size, } n = \frac{Z^2pq}{d^2}$$

nf = The desired sample size when the population is less than 10,000.

N= The estimated target population size

$$nf \qquad \frac{384}{1 + [384/2009]} = 322$$

The study used 2010 data of patients with hearing loss who were 2009 to get the N, since there was no ready data as at now, this was data collected from 2002-2010 as explained in problem statement.

Data collection: Data was collected using questionnaires and interview guides. These tools were pre-tested at Giants Hearing Centre at Nairobi Hospital. They were assessed for gaps, appropriateness and variation of the response.

Ethical approval was sought and granted by GLUK – Research and Ethics Committee, Kenyatta National Hospital Ethics and Research Committee. Confidentiality and privacy was assured to respondents before giving out information voluntary and informed written consent.

RESULTS

Factors influencing Enhancing Health Seeking Behaviour (EHSB)

Demographic variables: There were eight variables which were considered and depicted in Table 1. The statistically significant variables that influenced HSB included sex, religion, marital status, duration of illness and degree of hearing loss.

A relationship between the independent and dependent variable was considered present if the p value was less or 0.05. Column three indicates the chi square value and the last column indicates the type of linear relationship that exists between the demographic variables and the outcome. A value of 0 indicates no linear relationship. Correlation coefficients ranged in value from –1 (a perfect negative relationship) and +1 (a perfect positive relationship.

Table 1: Summary of demographic variables

Demographic variables	Df	P value	chi square	Person r
Age	7	0.782	3.981	0.041
Sex	1	0.030	3.071	0.02
Residence	7	0.296	8.436	0.033
Religion	6	0.007	7.815	-0.06
Marital status	3	0.037	8.496	0.076
Duration of illness	4	0.047	9.634	0.027
Type of illness	2	0.467	1.521	0.069
Degree of hearing loss	4	0.026	11.09	0.018

Economic variables influencing EHSB: The four economic variables that were investigated were: education, occupation, cost of care, and time taken before visiting KNH. Only occupation which had a p value of 0.199 did not have a linear relationship with EHSB (Table 2).

Table 2: Summary of economic variables influencing EHSB

Economic variables	df	P value	chi square	Person r
Education	4	0.006	14.452	-0.09
Occupation	3	0.199	5.861	-0.05
Cost of care	6	0.021	14.915	-0.13
Time taken before visiting KNH	2	0.008	9.552	0.105

Health facility factors influencing EHSB: There were 5 health care variables investigated. Availability of ENT services with a p value of 0.001 and chi square test of 3.218 and type of treatment with a p value of 0.013 and chi square test of 1.521 were statistically significant (Table 3).

Table 3: Summary of health facility variables influencing EHSB

HF factors Variables	Df	P value	Chi square	Person r
Referral	5	0.488	4.443	-0.060
Staff availability	4	0.824	2.100	0.019
Availability of ENT services	3	0.001	3.218	-0.320
Type of treatment	5	0.013	1.521	0.001
Treatment outcome	3	0.535	2.185	0.046

Knowledge and attitude variables influencing EHSB: This were summarised in Table 4.

Table 4: Summary of knowledge and attitude variables influencing EHSB

Variables	df	P value	chi square	Person r
Knowledge on hearing loss				
Signs and symptoms	2	0.001	3.048	0.186
Causes of hearing loss	1	0.047	3.955	-0.050
Types of hearing loss	1	0.001	5.050	0.293
Attitude on hearing loss				
View on services received	4	0.001	3.048	-0.100
Where treatment was sort	5	0.001	2.225	0.058
View on hearing loss	4	0.001	2.568	-0.100

Summary of Enhancing Health Seeking Behaviour (EHSB): Enhancing health seeking behaviour was measured using three variables; ability to identify HL signs on time, seek treatment at the health facility, adhere to HL medication (Figures 1-3).

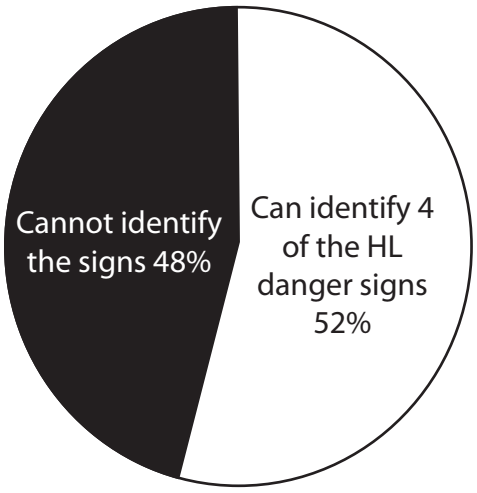

Figure 1: Ability to identifying HL danger signs

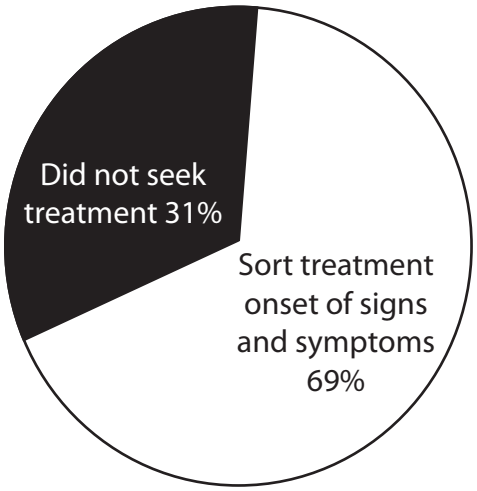

Figure 2: Seeking treatment on onset of HL signs and symptoms

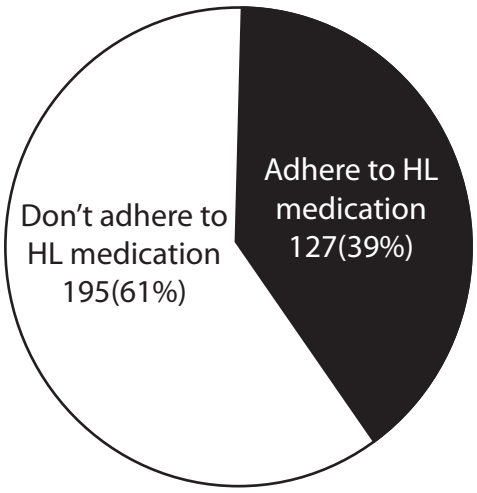

Figure 3: Adhere to HL medication

Summary of enhancing health seeking behaviour: Overall respondents with enchancing health seeking behaviour were only 127 (39%) (Figure 4).

Figure 4: Overall enhancing health seeking behaviour

DISCUSSION

The main objective of this study was to establish the determinants of enhancing health seeking behaviour among patients with hearing loss attending Kenyatta National Hospital, which was based on their socio-demographic, economic, health care factors and knowledge and attitude of patients. It is evident that the majority of the respondents sort treatments at the health facility though there was 35% that sort alternative medication or did not seek treatment at all.

From these study findings females had better health seeking behaviours than males which agree with Cohn[7] who states that sex influences HSB. Cohn[7] argues that men of all ages are more likely than women to have compromising HSB due to their occupation. Interview surveys by Brown and Ashman[8] indicate that social capital serves an extremely useful purpose in the area of enhancing health seeking behaviour as it provides a means of shifting the focus from individuals to social groups, and the social embeddedness of the actions of individuals; this may be the reason why women have better EHSB than men.

Most studies by Uzima *et al*[9] of health care seeking behaviour are coming to the conclusion that traditional health care is perceived to offer services at a low rate than their trained counterparts and this influences HSB. This finding is in agreement with this study which established that some respondents had sort health services from traditional healers and this influenced EHSB.

The provision of medical services alone in efforts to reduce health inequalities is inadequate[10]. With this broader appreciation of behaviour, some studies have suggested the need to improve integration of private sector providers with public care[11]. The findings of Ahmed *et al*[10] and Sara[12] concur with the findings of this

study which established availability of ENT services and type of treatment received had a relationship with EHSB.

CONCLUSIONS AND RECOMMENDATIONS

Health seeking behaviour studies of hearing loss had not been conducted in Kenya, and this may be a benchmark for further studies

(i) *Policy recommendation***:** The Ministry of Health in partnership with KNH department of ENT needs to collaborate more with private health partners and the community based organizations dealing with health to improve availability of hearing loss health education. This will lead to an increased hearing loss knowledge which in turn enhances hearing loss health seeking behaviour. Policy on training and employing/posting of ENT specialists at all counties for early recognition of hearing loss for early intervention to prevent progression of disease need to be formulated.

(ii) *Recommendations for community partnership***:** KNH needs to enhance the private public partnership with all the health stakeholders involved in at the community especially with lower levels health facility. This is because KNH is equipped with HL technology and human resource that may be used to equip the communities with skills and knowledge on EHSB related to hearing loss. This may promote positive health seeking behaviours. This includes the FBOs, NGOs, women groups, the business community, higher learning institutions and local research institutions.

Ministry of Health department of child health in partnership with the Ministry of Education department of school health need to review policy and source human resource to conduct regular hearing loss screening in early childhood department and primary schools.

At the community unit of the level 1 health services the training of the Community Health Workers (CHWs) is needed to enable the CHWs to identify and refer hearing loss patients for treatment at the health facility offering ENT services.

(iii) *Recommendations for further research:* There is need to conduct in-depth research on the role of religion on EHSB. Religion influenced EHSB and in this study it was established that some respondents sought faith healing and visited traditional healers before they visited the health facility.

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PEDUCULATED OROPHARYNGEAL CYST PRESENTING WITH UPPER AIRWAY OBSTRUCTION: CASE REPORT

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ABSTRACT

Background: Retention cysts arise from blockade of outflow of secretory glands which are scattered in the aerodigestive tract. Continued accumulation of the secreted substance causes progressive enlargement of the cyst. Symptoms may arise depending on size and location in the aerodigestive tract as a cyst close to the glottis may cause symptoms while one in the vallecular region remains silent. Pedunculated cysts may be found in regions remote from the site of origin where the pedicle is based. Such may cause prolapse into the glottis with airway obstruction or in the nasopharynx despite having originated in area away from these. Management of such cysts entails physical examination, radiological imaging and surgery. This article presents a patient with a cyst with pedicle based in the tonsillar region that was not visible during several oropharyngeal examinations despite having persistent symptoms. This article highlights the need for vigilance and high level of suspicion of a peduculated oropharyngeal cyst especially in patients with obstructive symptoms in whom radiology reveals no significant nasopharyngeal narrowing. This is a rare case with no previous report in literature of such a cyst arising from the tonsillar pillar found during review to the best of our knowledge.

Case presentation: An African male aged one year and ten months presented to us with upper airway obstructive symptoms dating from birth resulting from a peduculated oropharyngeal cyst that was initially missed during several hospital visits only to be identified by chance during examination when the patient gagged. He had presented with symptoms mimicking adenoid hypertrophy like nasal obstruction, snoring, disturbed sleep and poor weight gain for which medication had been given with no relief.

A postnasal space radiography revealed no adenoid hypertrophy with preservation of the nasopharyngeal airway. CT scan delineated an oropharyngeal cyst with significant narrowing of the airway.

Surgical management was deemed necessary due to the obstructive symptoms. Fibreoptic nasal intubation was performed and an oropharyngeal peduculated cyst with a pedicle arising from the right posterior tonsillar pillar identified. Excision was achieved using diathermy with immediate resolution of symptoms. Follow up confirmed marked improvement in the general condition of the patient with no evidence of recurrence of the cyst.

Conclusion: This article calls for vigilance during examination of patients with obstructive symptoms.

Key words: Oropharyngeal, Cyst, Pedunculated, Obstructive, Case report

INTRODUCTION

Cysts that occur in the aerodigestive tract are of varied aetiology. Anatomic location and dimension determines whether obstructive symptoms occur as a result of such cysts. A cyst of relatively small dimension in the region of the vocal cords may cause obstructive symptoms while a larger one in areas further away remains silent. Some cysts in this region are coincidentally discovered during radiological or routine examination for other unrelated symptoms. These cysts are clinically identical and can only be differentiated on the basis of their site of origin and on histopathological examination. Simple retension cysts in the oropharynx can cause airway obstruction or dysphagia if large and pose a challenge during anaesthesia as rupture can lead to aspiration and death. We present a case of a pedunculated simple cyst treated by complete excision giving mention to anaesthetic and surgical considerations.

CASE PRESENTATION

A 22 month old male presented to our facility with symptoms of nasal obstruction and snoring since birth. There was associated reduced feeding and poor weight gain. Medical opinion had been sought from peripheral health facilities where decongestant nasal drops had been prescribed with little relief.

A cystic mass was seen to protrude in the oropharynx only during gagging with disappearance beneath the epiglottis thereafter. Grade three tonsils were noted and thought not to be a major contributor to the symptomatology. A postnasal radiograph

revealed minimal adenoid hypertrophy with normal nasopharyngeal airway. CT Scan confirmed a non-enhancing 2.6cm x1.3cm x1.7cm orophayngeal cyst causing significant airway narrowing.

Preparation for surgery was done in consultation with the anaesthetist due to anticipated difficult and dangerous intubation. Fibreoptic nasotracheal intubation was performed as orotracheal was thought to be unsafe due to possible rupture of cyst [Figure 1]. Preparation for an emergency tracheostomy had been made in case of failed intubation.

Figure 1: Nasotracheal tube after nasotracheal intubation

The mouth was retracted using a Boyle's Davis mouth gag and throat carefully packed with wet gauze. A 2 by 2 cm pedunculated cyst was found arising from the right posterior tonsillar pillar with a pedicle and base about one centimeter [Figure 2]. Excision of cyst was achieved by monopolar diathermy without rupture [Figure 3]. Only tonsillectomy was performed as the adenoids were of miniature size. Hemostasis was achieved by pressure application, throat pack retrieved and patient reversed successfully from general anaesthesia. Pathological examination of sections hematoxylin and eosin stained showing mucosa lined by squamous epithelium beneath which cyst lined by columnar epithelium was seen [Figure 4 and 5].

Figure 2: Pedunculated cyst arising from the tonsillar pillar

The immediate postoperative period was uneventful with immediate relief of nasal obstruction and snoring. The patient was discharged after 12 hours after he was confirmed to have no airway obstruction and was taking oral feeds satisfactorily. Follow up for 12 months showed no evidence of recurrence of cyst on clinical examination. We found no need to perform any radiological investigation during the follow up period. There were reports of improved sleep, feeding and weight gain.

Figure 3: Unruptured cyst after excision

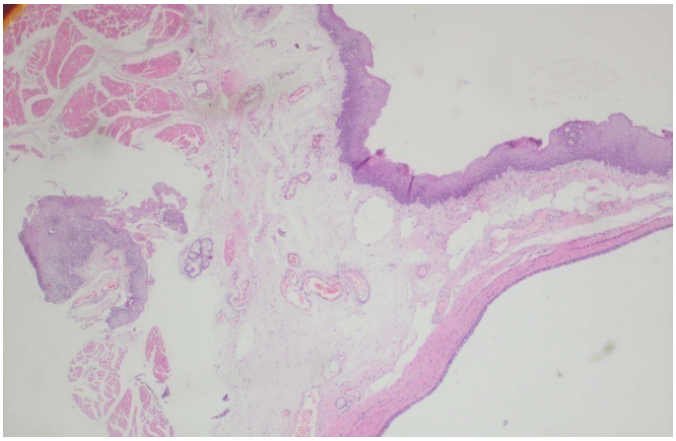

Figure 4: Hematoxylin and eosin stained sections showing mucosa lined by squamous epithelium beneath which cyst lined by columnar epithelium is seen

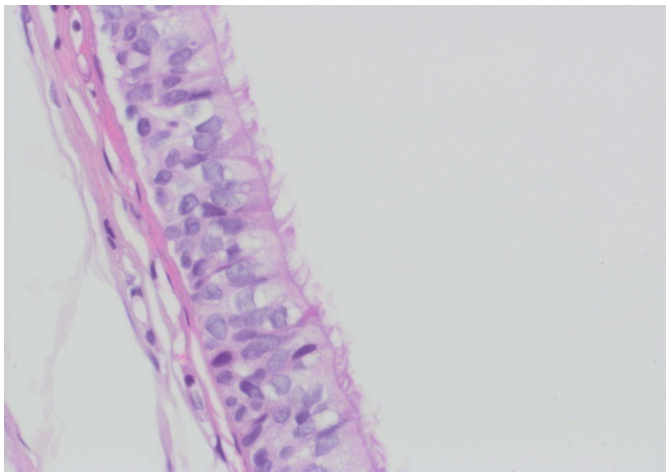

Figure 5: Hematoxylin and eosin stained sections showing cyst lined by ciliated epithelium.

DISCUSSION

Retention cysts have been reported to appear in the aero digestive tract caused by obstruction of mucous glands that continue to secrete causing enlargement in size. Reports of congenital cysts are made with the attendant risk of upper airway obstruction right from birth presenting a challenge in securing the airway. Prenatal diagnosis should be suspected in a pregnancy complicated by polyhydramnios confirmation being made by ultrasound. Ex utero intrapartum treatment has been described as a procedure that ensures a safe airway during delivery of newborns with congenital oropharyngeal cysts through a multidisciplinary approach[1].

The most common site of origin for retention cysts is the aryepiglottic fold followed by the vallecula[2]. As the cyst increases in size, propulsive forces during swallowing exert shearing forces on the base of the superficial cyst that may thin out and elongate to become a pedicle. Continued propulsive forces will allow the pedicle to elongate further and may reach such lengths capable of occluding the larynx or nasopharyx[3]. Oropharyngeal examination may not reveal such pedunculated cysts until the patient gags.

Cysts that are more than 1cm can cause obstructive symptoms with dysphagia or airway obstruction depending on location. Cysts in the aryepiglottic region are more likely to present with dysphonia even with a small size while a pedunculated cyst may cause airway obstruction irrespective of site of origin if the pedicle is long enough allowing it to reach the glottis. A pedunculated cyst lying in the nasopharynx will present with symptoms of adenoid hypertrophy despite having origin in the oropharynx. CT scan or MRI are both effective in investigation of such cysts with accurate determination of size and site. Barium studies in adults with unrelated symptoms may have coincidental finding of cysts with no requirement for further investigation or surgical management if they are not symptomatic, well circumscribed submucosal oval or circular with a smooth surface[4].

Careful anaesthetic planning is of essence if the airway is to be secured prior to surgery. Potential for failed intubation or accidental rupture of cyst with aspiration should be borne in mind during preparation. Fibreoptic nasotracheal intubation was done successfully bypassing the cyst in the oropharynx in our patient. This was deemed to be safer than orotracheal intubation due to direct visualization of the larynx with minimal manipulation of the cyst. Another technique that can be employed during intubation of such patients is aspiration of cyst to reduce size and improve visibility of the vocal cords with the added advantage of lowering the likelihood to rupture[5]. This however collapsed the walls of the cyst and reduces margin definition with risk of remnants of cyst that increases chances of recurrence. Simple aspiration as a modality of management of such cysts should be avoided due to the high incidence of recurrence. At all times during the process of intubation, emergency tracheostomy should be prepared for in the event of failure to secure airway.

Surgical management of cysts entails complete excision to relieve symptoms while preventing recurrence. Complete excision prevents recurrence that can occur if there are remnants of part of the cyst wall surgery. While this is easy for pedunculated cysts, it is technically difficult for cysts with a wide base or those that are deep seated. Injury to neurovascular structures can occur during deep dissection resulting in scaring that may cause stenosis of the oropharynx after complete healing. Marsupialization of cyst has been found to be just as effective provided that wide excision of cyst wall is achieved. The risk of recurrence following marsupialization is more likely if edges of the remnant cyst wall appose with recollection of secretions. Marsupialization with CO2 laser or electrocautery is less time consuming with less destruction of normal tissue with reduced risk of injury to neurovascular structures. Marsupialization with CO2 laser causes coagulation of edges and is associated with less recurrence rate as compared to cold steel[2]. Aspiration of cyst as management should be discouraged due to guaranteed recurrence. Spontaneous rupture of cyst and resolution of symptoms may occur with close follow up being advised to pick up recurrence at an early time.

CONCLUSION

A high level of suspicion of kloropharyngeal cysts is indicated in patients with upper airway obstruction. Management of such patients should entail a multidisciplinary approach to ensure safe surgery and good outcome.

ACKNOWLEDGEMENT

We are grateful for the parents of the patient for allowing us manage him and subsequently publish the case. We also acknowledge the input of Samuel Gakinya [Pathologist, Aga Khan University Hospital, Nairobi] who gave input regarding histological assessment and availed pathological data herein present.

Ethical consideration and consent: Written informed consent was obtained from the parent for publication

of this case report and any accompanying images. A copy of the written consent is available for review by the Editor of this journal.

Data availability: The dataset supporting the conclusions of this article are included within the article and it is additional files.

Competing interests: The authors declare that they have no competing interests.

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AESTHETIC OUTCOMES IN FACIAL NERVE PALSY TREATED WITH BOTULINIUM TOXIN INJECTIONS: CASE REPORT

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ABSTRACT

Objective: To describe our experience with the use of botulinum toxin A in a case of facial nerve palsy.
Design: Systematic review of current literature.
Methods: A 28 year old female who presented with left facial nerve palsy following exploratory mastoidectomy was evaluated. Case of tuberculosis otitis media diagnosed histologically from mastoid granulations which were biopsied at mastoidectomy. Left facial weakness noted postoperatively. Anti-tuberculosis therapy and physiotherapy was commenced. There was still significant facial weakness after completion of both treatment. Botulinum toxin A was injected on the healthy side of the face and 1 year follow up commenced.
Results: There was incremental improvement sustained over a one year follow up period. The patient eventually began regaining muscle tone.
Conclusion: Botulinum toxin A improved facial symmetry even after the effect of the drug had worn off and there was improved quality of life.

Key words: Botulinum toxin type A, Facial paralysis, Facial nerve, Quality of life

INTRODUCTION

Facial paralysis results in functional and aesthetic deficit. However, the aesthetic deficit has far reaching implications resulting in a low self-esteem and poor quality of life[1].

This asymmetry is visible while the face is at rest and in motion. The degree of asymmetry is measured using the House Brackmann grading score. This score ranges from I-VI, with the former indicating normal function of the face in all areas and the latter total paralysis of the face. The paralyzed or weak side of the face may present with shallow nasolabial folds, sagging of the angle of the mouth, drooping eyebrows, drooling and inability to close the mouth, absence of forehead lines, lagopthalmos and ectropion.

The treatment of facial paralysis involves a multi-disciplinary approach which involves physiotherapy, speech therapy, nerve grafts, microsurgical muscle transplantation and now more recently use of botulinum toxin injection.

Botulinum toxin A (BTXA)

In the late 18th century, romantic poet and medical officer Justinus Andreas Kerner described a case of lethal food poisoning which he termed 'sausage poison'. He described symptoms of mydriasis, diplopia, sweating, progressive muscle weakness and gastrointestinal complaints following consumption of blood and meat sausage[2].

In 1870 Muller a German physician coined the term botulism derived from the Latin word *botulus* which means sausage[3]. In 1897, Professor Emile Van Ermengem isolated the bacillus *Clostridium botulinum* while investigating an outbreak of botulism[4]. Botulinum toxin was used as a biological weapon in both world wars and after the second world war, DR Vernon Brooks used it to treat the wounded soldiers who presented with hyperactive muscles. This is when he made the discovery that BTXA inhibits the release of acetylcholine (Ach) in the nerve ending[5].

BTXA was first approved by the US Food and Drug Administration as 'Oculinum' in 1989 after its successful use in the treatment of strabismus and blepharospasm by the American ophthalmologist, Alan B Scott in 1980[6]. It was not until 1990, that the dermatologist Jean Carruthers and ophthalmologist Alastair Carruthers, published their first report on the cosmetic use of BTXA. They made this discovery while treating a patient for blepharospasm and saw the dynamic rhytids disappear[7,8].

Pharmacology

Muscle contraction occurs following an action potential passing along a nerve fiber to the muscle end plate. When the action potential reaches the synapse at the neuromuscular junction, it stimulates an influx of calcium ions into the cytoplasm of the nerve ending. Ach diffuses towards the synapse, fuses with the nerve ending membrane and crosses the neuromuscular junction binding with the postsynaptic receptors in the muscle fiber. This then leads to muscle contraction.

BTXA acts by inhibiting the release of Ach in the presynaptic membrane. It binds to high affinity receptor sites on the cholinergic nerve terminals. The toxin is internalized by a receptor-mediated endocytosis, and a toxin-containing vesicle is formed within the nerve ending. These vesicles then inhibit the Ach protein (SyNaptosomal Associated protein-25) that is located on the cell membrane. Muscle contraction is inhibited and leads to reversible muscle atrophy[9]. The first cessation of muscle function occurs after 2-3 days, with maximal effect occurring after 2 weeks. This mechanism laid the foundation for the development of the toxin as a therapeutic tool. Binding of BTXA to the nerve is irreversible and recovery of muscle function occurs through proximal axonal proliferation and muscle reinnervation by formation of new neuromuscular endplates. However, there is a suggestion by DePaiva and colleagues[10] that the original neuromuscular junction regenerates. Clinically, reduction of muscle contraction lasts for between 4 to 6 months and it is patient dependent.

Facial nerve anatomy

The facial nerve is essential to a person's well-being emotionally, functionally and psychologically. It contains 10,000 neurons, of which 7,000 are myelinated and innervate the nerves of facial expression. The other 3000 are somatosensory and secretomotor and make up the nervus intermedius.

Table 1: Segmental description of the facial nerve and central connections

Segment	Location	Length (mm)
Supranuclear	Cerebral cortex	N/A
Brainstem	Motor nucleus of facial nerve, superior salivatory nucleus of tractus solitarius	N/A
Meatal segment	Brainstem to internal acoustic meatus (IAM)	13-15
Labyrinthine	Fundus of IAM to facial hiatus	3-4
Tympanic	Geniculate ganglion to pyramidal eminence	8-11
Mastoid	Pyramidal eminence to stylomastoid foramen	10-14
Extratemporal segment	Stylomastoid foramen to pes anserinus	15-20

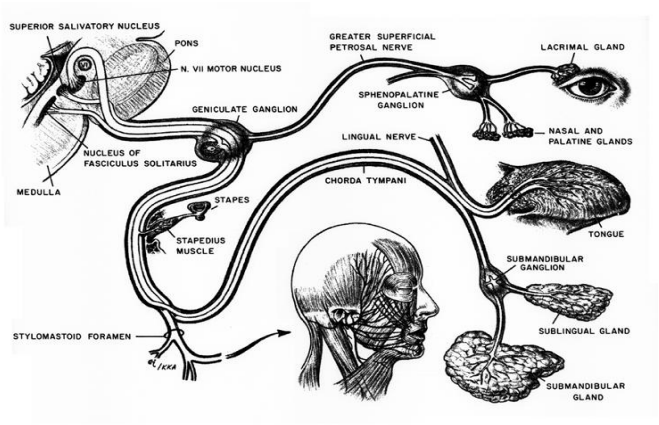


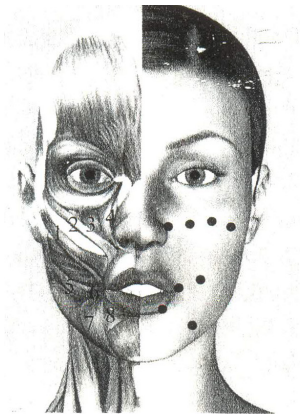
Figure 1: Schematic diagram of facial nerve and its branches

MATERIALS AND METHODS

This was a case study of a CM a 28 year old who presented at the Nairobi Ear Nose and Throat clinic in 2012 with left suppurative otitis media refractory to medical treatment. She underwent exploratory mastoidectomy and mastoid granulations were biopsied in the same sitting. Histology revealed tuberculous otitis media.

During the post- operative period she was observed to have left facial nerve palsy House- Brackmann IV. She had left lagothalmos, loss of nasolabial fold, and drooping angle of the mouth. Whilst still on the anti-tuberculosis regimen, physiotherapy was instituted. She had slight improvement but remained dissatisfied with her looks.

BTXA was administered in the non-paralyzed side beginning with lower doses of 2 Units and gradually increasing to 4 units. BTXA was injected on the following muscles- zygomaticus major and minor, levator labii superioris, depressor anguli oris, risorius and the modiolus. She received a total of 8 treatments from April 2012 to March 2013.



1. M. zygomatic major
2. M. zygomatic minor
3. M. levator alaeque nasi labii superioris
4. M. risorius
5. Modiolus area
6. M. depressor anguli oris
7. M. depressor labii inferioris

Figure 2: Injection sites for botulinum toxin used in the non paralyzed side

Table 2: Suggested injection points and doses

Site	Botox range doses
Zygomaticus major at its point of origin	3-4 U
Zygomaticus minor at its point of origin	1-2 U
Levator labii superioris alaeque nasi	1-2 U
Levator labii superioris at the orbital margin	1-2 U
Modiolus at a distance of 0.5 cm from the corner of the mouth	3-4 U
Risorius 2cm from the corner of the mouth	3-4 U
Depressor labii inferioris at 0.5 cm from the corner of the mouth	3-4 U
Depressor labii inferioris at 1 cm from the white line transition	3-4 U

Table 3: Treatment schedule of BTXA given to CM

Date	Muscle group	Doses (units)
25.11.2012	Zigomaticus major Zigomaticus minor	2 2
13.12.2012	Zigomaticus major Zigomaticus minor	2 2
13.01.2013	Zigomaticus minor Risorius Depressor labii inferioris modiolus	2 2 3 3
07.02.2013	Zigomaticus major Levator labii superioris modiolus	2 1 2
16.04.2013	Zigomaticus major Zigomaticus minor Levator labii superioris Modiolus Depressor anguli oris	3 3 2 3 3
10.08.2013	Zigomaticus major Zigomaticus minor Levator labii superioris Modiolus Depressor anguli oris	4 4 2 3 3
16.11.2013	Zigomaticus major Zigomaticus minor Levator labii superi-oris Modiolus Depressor anguli oris	4 4 2 3 3
02.03.2014	Zigomaticus major modiolus	3 3

RESULTS

Outcome of treatment was subjective. This was based on the clinician and patient observation. The dose of BTXA was gradually increased in the various muscle group with each clinical visit. Since BTXA was injected in the non-paralysed muscles it is safer to begin with a low dose and gradually increase. Treatment ceased once the patient became satisfied with appearance.

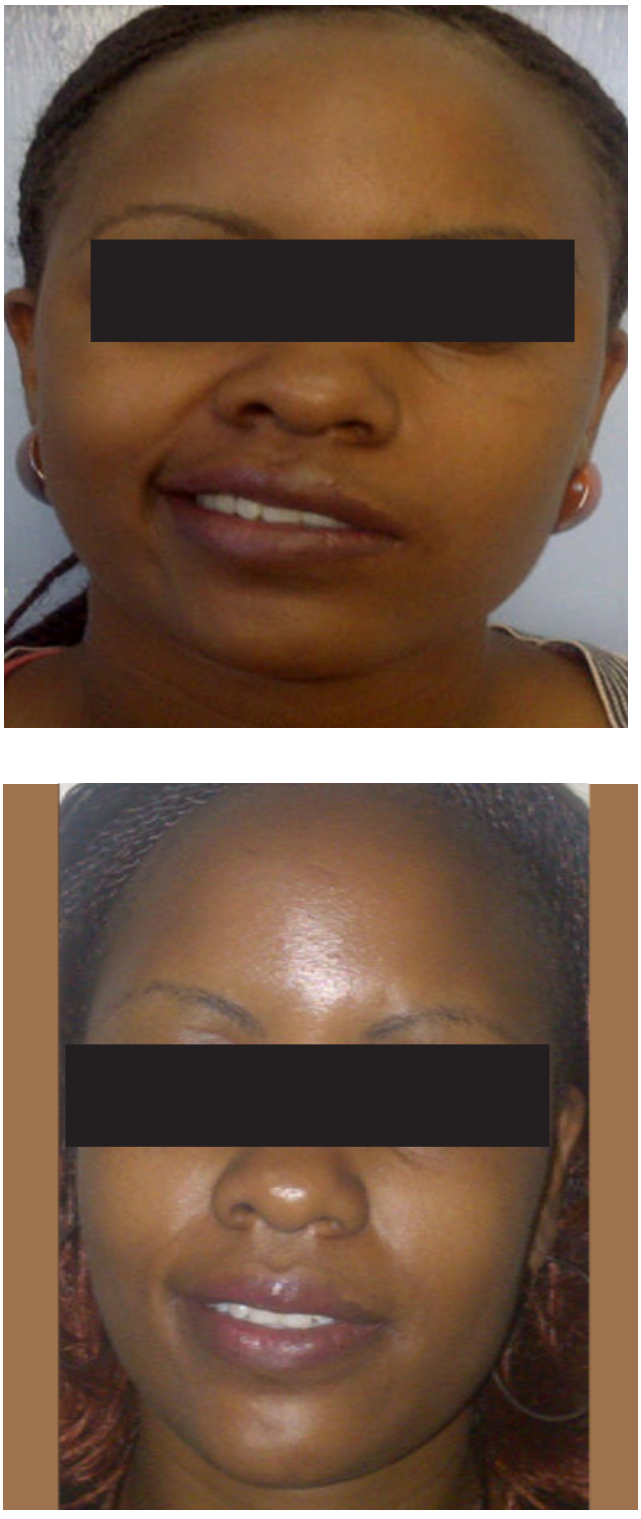


Figure 3: Before and after treatment pictures

DISCUSSION

Rehabilitation of the face in patients with facial paralysis still remains a challenge thus the need for a multidisciplinary approach. BTXA has been used successfully in the treatment of facial nerve paralysis, however most studies have been level 4 evidence.

BTXA is a minimally invasive therapy that is injected on the healthy side. It does improve symmetry of the face both at rest and while in motion as depicted in this case study. BTXA efficacy lasts 4-6 months, however even after 6 months the symmetry of the face in our patient was still significant. This could be due to the improved motion on the paralyzed side which was an effect of the unopposed action of the contralateral healthy side.

Thou this was a case study, the results obtained were comparable to the study by Alessandra *et al*[11] in which 25 patients with long standing unilateral facial paralysis were followed up for 6 months. The period from onset of paralysis varied from 2-38 years. The clinical score measured on the paralyzed hemifacial side had a significant increase post-treatment with a p value <0.001, which represented an 18% increase. The pre-treatment coefficient of asymmetry had a mean of 14.34 ±1.34 this decreased to 48.4% after 1 month of treatment and after 6 months the reduction was 16.8% with a non-significant p value of p=0.001. They also noted a reduction in the mean action potential of the middle 1/3rd of the face, with the values ranging at 25.77$\pm$7.67 to 17.25$\pm$7.59uV (p=0.014) at one month and 23.1$\pm$ 7.18uV (p=0.512).

The experience of the injector is an important factor. Prior to using BTXA in this case, we have gained experience using BTXA for aesthetic facial and neck procedures. In this case, only one injector administered the toxin.

Lower doses were used and gradually increased to 4 Units until the desired result was achieved. Higher doses are avoided as they led to immediate complications such as difficulty in speaking, drinking and eating[12-14]. Penetration of the toxin to the buccinator muscle weaken its ability to hold the food under the teeth while chewing, while paralysis of the orbicularis oris muscle causes impairment in speech and drinking.

Adverse effects seen in this case were mild and included discomfort at the injection site, redness edema which are the expected local complications and resolved the same day of treatment. We did not observe any systemic complications.

CONCLUSION

BTXA should be accepted as a complementary treatment. This can be given after surgical operation or in patients who would otherwise prefer minimally invasive procedures.

There is need to carry out more studies with larger patient samples. This was primarily a case study hence the results were subjective. We feel with the increasing numbers of patients with facial nerve paralysis in our setting, we need to develop objective tools of assessment both pre-treatment and post-treatment and if possible measure the action potential of the relevant muscle groups.

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Ethical approval: None required

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ARTERIOVENOUS MALFORMATION OF THE TONGUE: CASE REPORT

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SUMMARY

Arteriovenous Malformations (AVMs) of the tongue are a rare entity in the head and neck region. Although majority of these anomalies are present at birth they remain asymptomatic until puberty when they rapidly increase in size and may be associated with complications. We present a 14-year-old male patient with an arteriovenous malformation of the entire tongue necessitating total glossectomy.

INTRODUCTION

Arteriovenous malformations are high flow vascular abnormalities characterized by direct communication between an artery and a vein bypassing the capillary bed. They can occur in any part of the body but are rare in the head and neck region. Although they are present at birth, they tend to manifest in childhood or adolescence. Diagnosis is based on clinical and radiological findings. Definitive treatment consists of pre-operative embolization and complete surgical excision.

CASE REPORT

A 14-year-old male patient was admitted to Kenyatta National Hospital with a two-month history of a large tongue swelling associated with profuse bleeding. He was reported to have been born with a larger than normal tongue with a tinge of purple. In his childhood, he had several episodes of increased tongue swelling and bleeding with spontaneous regression. He had been treated in various hospitals in Kenya and Tanzania without improvement. The last two episodes had followed an accidental bite on the tongue and had resulted in profuse bleeding necessitating admission at the local health facility. He had no difficulties in breathing and was able to eat solid foods but with some difficulties in chewing. There was no history of bleeding disorders in his family of ten.

Examination revealed a pale young boy with tachycardia and a haemic murmur. He had a large purplish tongue filling the entire oral cavity and protruding out. He could not close the mouth over the mass. The tongue had dilated tortuous veins on the dorsal aspect with an area of ulceration on the tip and left lateral border (Figure 1). There were no pulsations palpable in the tissue. An initial impression of haemangioma was made.

He was admitted for control of bleeding, investigations and definitive management of the lesion. A haemogram done on admission showed a microcytic hypochromic picture with haemoglobin level of 3.2 g/dl. Renal and liver function tests were normal. A coagulation screen was also normal. Serology for HIV, hepatitis B and C, and VDRL were negative. A four-vessel angiography done showed a large arteriovenous malformation involving the entire tongue, both lingual arteries, left external carotid artery as well as the left internal jugular vein. Before the angiography several attempts at controlling bleeding were done including sclerotherapy with 95% alcohol, transverse resection of the ulcerated bleeding mass embolization and ligation of the lingual arteries without success. Meanwhile, the patient continued having bleeding episodes and was transfused severally up to 21 units of blood during his stay in the ward. The mass continued to increase in size resulting in airway compromise. A tracheostomy was done and a nasogastric feeding tube fixed.

Figure 1: Arteriovenous malformation pre-treatment

Following confirmation of the diagnosis of arteriovenous malformation, a decision to do total glossectomy and reconstruction with a free flap was reached. Neither MRI nor pre-operative embolization was done due to financial constraints. Applying nylon tapes on the feeder vessels in the neck controlled the amount of blood loss during surgery (Figure2).

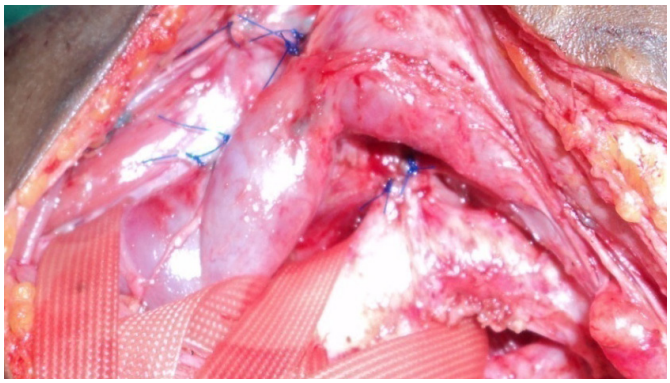

Figure 2: Nylon tapes used to control blood flow into mass during surgery

The left external carotid artery, internal jugular vein and external jugular veins were found to be markedly dilated and were all ligated. A left paramedian mandibulotomy was done for access. The entire tongue was excised. An anterolateral thigh flap was used for the reconstruction of the defect. The flap's femoral circumflex artery and vein plus the femoral cutaneous nerve were anastomosed to the right facial artery, right external jugular vein and right hypoglossal nerve. The mandible was repositioned and secured with a six-hole mandibular reconstruction plate.

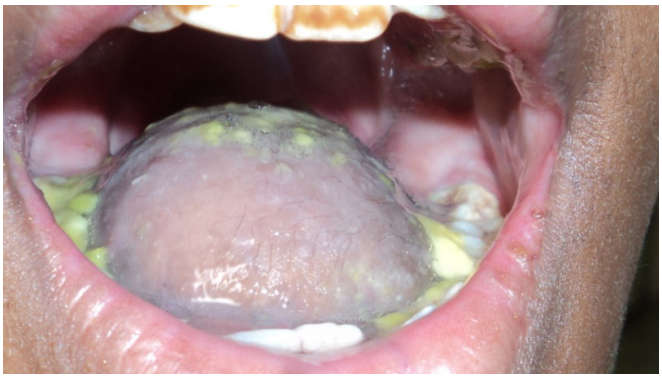

Figure 3: The patient post-operative

The patient did well post-operatively and developed good speech as well as swallowing. The last review in 3 years after surgery did not show any recurrence (Figure 3).

DISCUSSION

Arteriovenous malformations are a subset of vascular anomalies that arise from the failure to prune unwanted primitive communications between the arterial and venous systems during intra-uterine life[1]. They are composed of anomalous capillary beds that shunt blood from the arterial system to the venous system. Majority of the lesions manifest at birth and tend to grow commensurably with the child. Further enlargement is usual later in puberty or pregnancy attributable to hormonal effects or trauma[2].

Arteriovenous malformations may present as areas of blush early in life. They are initially quiescent with expansion occurring later in life. As they grow, they tend to infiltrate and destroy normal tissues eventually replacing them with abnormal blood vessels. In advanced cases, there may be pain, ulceration and bleeding. Palpation may confirm increased warmth within the mass and pulsations or bruit due to their high flow nature. AVMs have been grouped into four stages based on their severity (Table 1).

Table 1: Schobinger staging for AVMs[3]

Stage	Description
I – Quiescent	Pink-bluish warm stain. Doppler scanning reveals arteriovenous shunting. AVM mimics a capillary malformation or involuting haemangioma.
II – Expansion	Same description as stage I, plus enlargement, pulsations, thrill, bruit and tortuous veins.
III – Destruction	Same description as stage II, plus dystrophic skin changes, ulceration, bleeding, persistent pain, or tissue necrosis. Bony lytic lesions may occur.
IV - Decompensation	Same description as stage III, plus congestive cardiac failure with increased cardiac output and left ventricular hypertrophy.

Diagnosis is based on clinical and radiological characteristics of the lesions. Plain radiography and computed tomography have a limited role in high flow vascular malformations[4]. Pulsed Doppler is only useful in documenting the arterial output and for following up on progression of the lesion[5]. Although MRI is the investigation of choice in demonstrating the extent of the lesion, MRA and CTA give superior outline of AVMs[6]. CTA, in addition, demonstrates the status of the surrounding tissues, bone and feeder vessels[7]. Angiography defines the central nidus of the affected vessels and is helpful when intravascular interventional radiography is contemplated[5, 8].

Asymptomatic AVMs do not require treatment. Indications for treatment include presence of pain, ulceration, bleeding or cardiac complications[9]. Sclerotherapy has been shown to be ineffective in high flow anomalies due to the ease with which the sclerosing agents get displaced. Proximal ligation of feeder vessels as was attempted in this patient is not recommended. This is because apart from being ineffective it renders future endovascular therapy impossible[5]. Complete surgical excision facilitated by pre-operative super-selective embolization is the treatment of choice. In this patient, embolization was attempted but had no impact. This

was more due to particle displacement than growth and recruitment of collateral new vessels as there was not even transient regression. Control of bleeding intra-operatively was successfully achieved by intermittent occlusion of the feeder vessels using nylon tapes. Closure of the resulting defect is dependent on the site and size of defect as well as degree of loss of function. The choices include primary closure, pedicled and free flaps. In this case the anterolateral thigh flap was deemed most appropriate,

CONLUSION

Management of advanced stage AVMs such as the one presented is a challenge in resource poor settings where the standard facilities are either unavailable or unaffordable. With the right skills and teamwork, satisfactory intervention is possible.

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