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CASE REPORT

OSTEO-CARTILAGIOUS CHORISTOMA OF TONSIL

K. Shoba[1], Harikumar[2], K. Srinivasan[3], K. Deepak Raj[4]

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ABSTRACT: Choristoma is presence of histologically normal tissue or cells in abnormal location. Osteo-cartilaginous choristoma is very rare in tonsil**.** Our intensive search did not show any results on osteo-cartilaginous choristoma of tonsil, hence this case presentation.
KEYWORDS: Tonsil, cartilage, bone, choristoma.

INTRODUCTION: Choristoma is presence of histologically normal tissue or cells in abnormal location. Osteo-cartilaginous choristoma is very rare in tonsil. Our intensive search did not show any results on osteo-cartilaginous choristoma of tonsil.

CASE REPORT: A 23years old male patient presented with history of recurrent attacks of sore throat. Throat examination showed multiple white spots on both the tonsils. Patient was provisionally diagnosed to have keratosis tonsil. Patient was counseled about the benign nature of the disease and antiseptic gargles were advised.

As the patient was not convinced, we had to proceed with tonsillectomy. During the procedure tonsil was firm, gritty and adherent to tonsillar fossa. Dissection was done with difficulty. Histopathology of tonsil showed follicular hyperplasia interspersed with immature cartilage and bone cells.

DISCUSSION: Choristoma in tonsil could be a developmental abnormality of second pharyngeal arch. The surface epithelium and the lining of the tonsillar crypts of the tonsil develop from endoderm of the second pharyngeal pouch.

The mesenchymal cells that surround the crypts arise from materials of second pharyngeal arch. Developmental abnormality leading to formation of cartilage and bone within tonsil can result in osteo-cartilaginous choristoma of tonsil.

The extra-skeletal proliferation of cartilage in head and neck probably reflects the multipotential nature of primitive mesenchymal cells, which could be stimulated to grow by inflammation, trauma or irritation. The other reason could be cartilage development from heterotopic fetal cartilaginous remnants.

Cartilage choristoma in head and neck is common in oral cavity. Tongue is the usual site, followed by buccal mucosa and soft palate.[1,2,3]

Cartilage choristoma should be differentiated from metaplasia. Metaplasia is characterised histologically by diffuse deposits of calcium and scattered cartilaginous cells in various stages of maturation in single or clustered foci.[4,5]

This patient had both bone and cartilaginous cells surrounded by normal tonsillar tissue.

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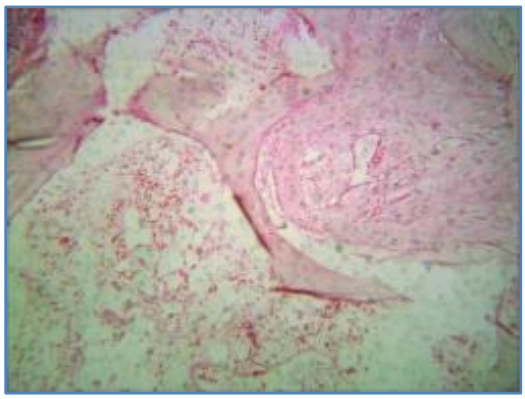

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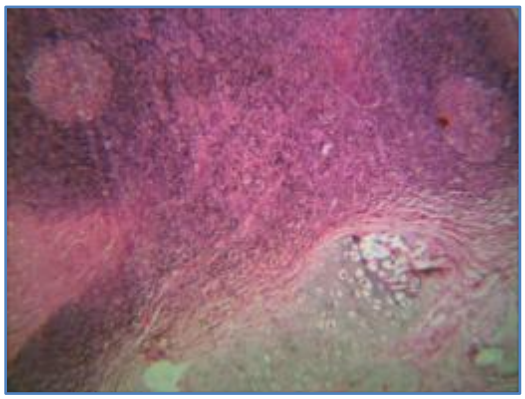

Cartilage

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CASE REPORT

DELAYED FACIAL PALSY - AN UNCOMMON COMPLICATION OF TYMPANOMASTOIDECTOMY

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ABSTRACT: Facial nerve palsy after ear surgery is a troublesome postoperative complication for both patient and the surgeon. Though most of the palsies occur in the immediate post-operative period, in rare instances patients may develop facial nerve palsy anywhere from several hours to several days after ear surgery. We hereby present a case of delayed facial nerve palsy, after 5 days following surgery, in 48 year old women operated for tubotympanic type of chronic suppurative otitis media. Patient recovered well with oral steroid therapy. Delayed facial nerve palsy is a very rare complication of ear surgery. Reactivation of virus is the probable etiology.
KEY WORDS: Facial nerve palsy, Delayed, Tympanomastoidectomy.

INTRODUCTION: Facial nerve palsy is troublesome post-operative complication for both the patient and the surgeon. Delayed facial nerve palsy is a rare complication of ear surgeries. It is reported only after tympano-mastoidectomy, stapes surgery, cochlear implant and endolymphatic surgery. However it is not reported after myringoplasty or myringotomy. Herein, we report a case of delayed facial nerve palsy after tympano-mastoidectomy.

CASE REPORT: A 48 year old female patient presented to ENT outpatient department with copious, non-foul smelling mucopurulent ear discharge and decreased hearing in the left ear for the past 10 years. On examination she had a moderate sized central perforation. We planned tympanomastoidectomy as discharge was copious. Patient underwent a simple mastoidectomy. Aditus was made patent. Type-1 tympanoplasty was done by underlay technique. In the immediate post-operative period patient was fine. On the 5th postoperative day patient developed grade-3 facial nerve palsy. Steroids and physiotherapy were started. Patient improved over a period of 2 weeks. Graft take up was good.

DISCUSSION: Delayed facial palsy is the one which occurs after otology and neurological surgeries in a delayed fashion. It is commonly seen after acoustic neuroma surgeries (2.2-29%) [1]. It has also been described after vestibular neurectomy (0-18%)[1,] stapes surgery (0.5-1%)[1,] endolymphatic sac surgery(1%)[1,] cochlear implantation surgery(0.4-0.7%)[1] and mastoidectomy (0.38-1.4%)[1].

If stress is expected to be the cause for delayed facial palsy as with Bell's palsy, all types of major surgical procedures could produce this. But delayed facial palsy is seen only in patients who undergo otological and neurological surgeries. All ear surgeries, except for endolymphatic sac procedures, exposed the chorda tympani, and all surgeries, except for stapedectomy/stapedotomy, underwent drilling of mastoid. Hence the two important surgical procedures probably causing the delayed facial palsy are the 'mastoidectomy procedure' and 'facial nerve and/or chorda tympani nerve exposure'[2]. Furthermore, delayed facial palsy was always observed on the same side as the

operated ear. Therefore, there is a strong relationship between delayed facial palsy and the ear surgeries[3]. It can occur up to two weeks after ear surgery.

Review of literature showed many causes of facial nerve palsy.

1. Reversible delayed facial paralysis is usually due to compression of nerve fibers by edema, damage to blood supply to facial nerve during surgery[4], drilling induced heat or inflammation in the early post-operative period[5, 6].
2. Late post-operative delayed facial nerve palsy could be due to viral reactivation. Exposure of facial nerve / chorda tympani, thermal or mechanical manipulation around facial nerve or steroid / antibiotics soaked gel foam around geniculate ganglion can cause herpes virus reactivation[2]. Varicella zoster virus is the most probable etiology[7]. This complication is more in patients with a history of viral reactivation.
3. Allergy to BIPP pack can cause progressive delayed facial nerve palsy[8].
4. Post-operative infection could cause delayed facial palsy.

Serological test can confirm viral reactivation in some patients. Gadolinium enhancement of the labyrinthine portion of the facial nerve is recorded in MRI in a few studies [9].

Prognosis is generally good if the palsy does not progress to complete paralysis. Patients with complete paralysis have a more variable prognosis, which ranges from normal function to permanent total paralysis. This could be due to edema around facial nerve due to surgery. Steroids are the important first line management for this condition. Intra-operative decompression of the meatal foramen has been used with some success in a few studies[10]. Acyclovir has been advised by a few[11].

Acyclovir can be given for patients with history of viral activation as prophylaxis to delayed facial palsy[12].

CONCLUSION: Delayed facial nerve palsy is a rare complication of ear surgery. Recovery rate is very high.

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Original Research Article

Comparative study between microscopic and endoscopic stapes surgery

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ABSTRACT

Background: To investigate whether endoscopic stapes surgery is safer and less invasive than conventional stapes surgery using an operating microscope.
Methods: The subjects were 60 patients who were divided consecutively into group A undergoing microscopic stapedotomy and group B undergoing endoscopic stapedotomy. The procedures for endoscopic surgery were fundamentally the same as those for microscopic surgery, except for post aural incision used in some patients in microscopic group. The two surgical techniques were compared with respect to the operating time, approach, drilling of posterosuperior canal, manipulation of chorda tympani, visualisation of anterior crus, postoperative hearing, postoperative pain, and complications.
Results: There were no differences of operating time or postoperative hearing between the endoscopic and microscopic groups. There was very little postoperative pain in the endoscopic group. Drilling at the posterosuperior part of the external auditory canal was less extensive in the endoscopic group than in the microscopic group. Visualisation of anterior crus of stapes was good in endoscopic group.
Conclusions: Endoscopic stapes surgeries are technically feasible, safe and promising. The main advantages were: easy access, virtually no trauma to the chorda tympani nerve and excellent vision. The disadvantages were the lack of stereoscopic vision, having to work with one hand only and the learning curve.

Keywords: Endoscope, Stapedotomy, Otosclerosis, Microscope

INTRODUCTION

Stapedectomies and stapedotomies are done in most centres of the world under the operating microscope with excellent results and very low risk of complications.[1-3] Surgical microscopes provide a good quality amplified image in a straight line. However, it limits visual field when we make exclusively transcanal access in the narrowest segment of the external ear canal. In narrow and curved external auditory canals, this may represent an even greater limitation, requiring other access pathways to the middle ear like posterior auricular approach.[3,4] Even with extended access to the middle ear, one of the important steps in performing stapes surgery under the microscope is to partially remove the bony wall of the posterosuperior part of the external auditory canal. This important step in this surgery enables a better exposure of the incudostapedial joint, oval window, pyramidal eminence and other important middle ear structures. In some cases, irreversible trauma of the chorda tympani nerve can occur. Another important point to be considered during stapes surgery under the microscope is the visualization of the stapes suprastructure in which the surgeon is unable to see the anterior crus, forcing him to blindly fracture it.

Although endoscopes were introduced in ear surgeries over 15 years ago, their role has been limited in the treatment of middle ear inflammatory disorders and otosclerosis.[1-5] Sinonasal scopes with 4mm diameter and 18 cm length, with wide-angle lens and different angles, allow for an amplified image which can be quickly modified by advancing or pulling the instrument back.[2] Among otological disorders, otosclerosis is considered to

be a most suitable disease for endoscopic surgery for the following reasons: very good vision can be obtained with the endoscope because stapes surgery only requires viewing the area around the stapes; and the transcanal approach is superior to the postauricular approach as a route for assessing the stapes.

In the present study we compare the outcome of endoscopic stapes surgery with that of conventional surgery under the operating microscope to determine which method achieved better results.

METHODS

We studied sixty consecutive cases of otosclerosis selected by inclusion and exclusion criteria, admitted in Saveetha Medical College, Chennai between July 2013 and July 2016. All patients were counselled about the nature of the study and informed written consent obtained. All cases were randomized into two groups consecutively. Group A included cases undergoing microscopic stapedotomy and Group B undergoing endoscopic stapedotomy.

Inclusion criteria were patients diagnosed with otosclerosis - based on clinical history, normal otoscopy and with audiometric tests showing conductive hearing loss with an air-bone gap larger than or equal to 30 decibels (dB), no stapedius reflex, with normal bone conduction values at 500, 1000, 1500 and 2000 Hertz (Hz), without middle ear disease and with normal temporal bone CT scan.

Exclusion criteria's were past middle ear infectious disease, audiometry showing conductive hearing loss with an air-bone gap less than 30 dB.

Surgical technique

All procedures were carried out under hypotensive general anesthesia. The same technique and instruments were used in both groups, except for the use of the 4mm diameter and 18cm long endoscope with 0 to 30 degrees, curved micro aspirators and curved tip micro scissors in endoscopic surgery. The external auditory canal was infiltrated with 1% lignocaine containing 1/200,000 epinephrine. Tympanomeatal flap was raised in the posterior region of the external auditory canal. In microscopic surgery, patients with narrow or curved ear canal were operated with post aural incision for good exposure. In microscopic method while preserving the chorda tympani, the bony wall in the posterosuperior part of the external auditory canal was drilled out until the pyramidal eminence and the horizontal part of the facial nerve came into view. In endoscopic method, 30º endoscope was used to inspect middle ear for oval window, facial nerve and stapes crura. Minimal drilling was done if required. Ossicular chain was checked for stapes fixation. The stapes tendon was cut with a micro-knife or a curved micro-scissors and the incudostapedial joint cut. The stapes superstructure was carefully fractured in the anterior and posterior crura and removed, leaving the footplate fully exposed. A small, 0.6 mm diameter hole was punched in the posterior portion of the stapes foot-plate. The Teflon prosthesis was placed in this hole and fit along the long process of the incus. In order to seal the footplate, small pieces of dry gelfoam were used. Tympanomeatal flap was repositioned and gelfoam dressing was done in the external auditory canal, without ointments or creams.

Parameters investigated

Intraoperative parameters like operating time, approach, extent of drilling at the posterosuperior part of the external auditory canal, need to manipulate the chorda tympani nerve, visibility of the stapes crura (especially the anterior crus), and complications.

Postoperative parameters like pain, hearing improvement and complications.

Operative time is calculated from injecting the local anaesthetic agent in external auditory canal to repositioning of tympanomeatal flap and placing gel foam in canal.

Approach to middle ear can be transcanal, or by posterior auricular incision. Transcanal approach used in wide canals while posterior auricular incision made in narrow and curved canals.

Severity of postoperative pain at approximately 6 hours after surgery was recorded using three grades; grade 1- almost no pain, grade 2- mild pain requiring no analgesics, and grade 3- pain requiring analgesics.

Patients were usually discharged on the first or second postoperative day if there were no complications. On the seventh postoperative day, support materials in the external ear canal were carefully cleaned. Ear drops containing topical antibiotics were administered for prevention of local infections. Patients were reviewed after 6 weeks and 6 months postoperatively.

Pure tone thresholds were analyzed at 6 weeks postoperatively for the first audiological assessment and repeated at sixth postoperative month. For evaluating the success of surgery on hearing, the pure tone air-bone gap averages were compared to the preoperative records. The patients were classified into three groups of 10 dB or less, 11-20 dB, and 21 dB or more according to postoperative air-bone gap results.

RESULTS

The results were compared between two groups using paired t test. With mean age of 41.5 years, 12 males and 18 females underwent microscopic stapedotomy while 10

males and 20 females with mean age of 40.5 years underwent endoscopic stapedotomy.

The mean operating time were 53.0 and 54.1 minutes in microscopic and endoscopic group respectively, showing no significant difference between the two groups.

In microscopic stapedotomy, 22 surgeries done by transcanal approach while the other 8 required post auricular incision. All patients in endoscopic method were operated transcanally.

In microscopic method, drilling of posterosuperior canal was done and chorda tympani nerve was manipulated during drilling in all patients. Only 2 patients required posterosuperior canal drilling and tympani nerve manipulation in endoscopic method. Thus the extent of drilling required for endoscopic surgery was smaller than that for microscopic surgery.

In endoscopic group, stapes crura were visualised using 30 degree endoscope and fractured under vision in all patients while in microscopic group, stapes crura were visible only in 4 patients. Comparison of intra operative parameters is shown in Table 1.

Table 1: Comparison of intraoperative parameters.

S.	Parameter	Group A (n=30)	Group B (n=30)
1	Mean Age (in years)	41.5	40.5
2	Sex		
	Male	12	10
	Female	18	20
3	Mean Operative time (in minutes)	53	54.1
4	Approach		
	Transcanal	22	30
	Post aural	8	0
5	No. of cases drilling done	30	2
6	No. of cases Chorda tympani manipulated	30	2
7.	No. of cases Anterior crus visualised	4	30

In microscopic method, 14 patients had grade 1 pain,10 patients had grade 2 pain and 6 patients had grade 3 pain while 22 patients had grade 1 pain, 8 patients had grade 2 pain and none had grade 3 pain in endoscopic method as shown in Table 2.

Postoperative air bone gap at 6 weeks was less than 20 decibel in 26 patients and 27 patients respectively in microscopic and endoscopic method showing no significant difference between two groups as shown in Table 3.

Table 2: Grading of postoperative pain.

Grade of pain	Group-A (n=30)	Group-B (n=30)
Grade-1	14	22
Grade-2	10	8
Grade-3	6	0

Table 3: Postoperative air bone gap at 6 weeks.

Air bone gap	Group-A (n=30)	Group-B (n=30)
< 10 db	16	17
10-20 db	10	10
>20 db	4	3

In endoscopic method 1 patient had perilymph gusher intraoperatively which was managed appropriately. In microscopic method 1 patient had floating foot plate intraoperatively and 6 patients had temporary dysguesia post operatively. As chorda tympani nerve was preserved in all patients, temporary dysguesia may be attributed to traction and excessive manipulation of the nerve.

DISCUSSION

Ear surgery is usually performed with both hands under an operating microscope. However, endoscopes have been used for observation and treatment of conditions in the areas that may be hard to visualize completely under the microscope.[6–8] In treatment of cholesteatoma, we have employed an endoscope combined with a microscope to minimize drilling, thereby preserving hearing and facial nerve called as "endoscopy assisted surgery".[10] Few reports have been published concerning stapes surgery that is entirely performed by endoscopy.

In this study, we preferred to use 4 mm diameter and 18 cm long sinonasal scopes instead of 3 mm diameter and 10 cm long otological scopes. These sinonasal scopes were used for its easy availability and with wide-angle lens and different angles, allow for an amplified image.

Comparison of the operating time showed no difference between endoscopic surgery and conventional surgery under the operating microscope. Considering that endoscopic stapes surgery was only introduced 6 months before commencement of the present study, the operating time will become shorter with improvement of the surgical technique in the future.

In our study it was seen that there was no need for post aural incision even in narrow and curved canals in endoscopic group. As there was no need for additional incision in endoscopic group, postoperative pain was less and they recovered early.

There was minimal or no drilling required in endoscopic group compared to microscopic group. This was in

accordance to Nogueira et al who minimized the extent of drilling by using a 30^0 endoscope and completed surgery without drilling in some cases.[9]

Migirov and Volf reported that they achieved to preserve chorda tympani nerve in all 8 endoscopic stapedectomy procedures.[10] Similarly our study also preserved chorda tympani in all cases in endoscopic group while there was some temporary dysguesia in microscopic group. In endoscopic group, anterior crus was visualised in all cases and hence improves the quality of surgery, obviating need for blind procedure.

Postoperative hearing was satisfactory in both groups, showing no difference between the two surgical methods. In 2013, Ataide et al observed the same result in 75.8% of patients undergoing stapedotomy.[11] In 2006, Vincent et al performed a prospective study in which the results of 3050 stapedotomies were analyzed over a period of 14 years.[12] The mean preoperative and postoperative air–bone gap was 25.6 and 1.7 dB, respectively, and the gap was 10 dB in 94.2% of cases. Therefore, the audiometric results obtained in the present study are consistent with those in the literature.

In our study postoperative pain was less in endoscopic group. This was mainly due to avoidance of post aural incision and minimal posterosuperior canal drilling.

Kojima et al compared endoscopic versus microscopic stapedectomy procedure.[13] They reported that there were no differences of operating time or postoperative hearing between the endoscopic and microscopic groups. There was very little postoperative pain in the endoscopic group. Postoperative dizziness was mild in all patients who underwent endoscopic surgery. Drilling at the posterorsuperior part of the external auditory canal was less extensive in the endoscopic group than in the microscopic group. Our study results were consistent with this comparative study.

Over the last 20 years, the number of stapes operations performed has decreased steadily. Possible reasons for the reduction could be the fluoridation of water supplies and improvement of the quality of hearing aids. Yung et al investigated the learning curve in stapes surgery and its implication to training.[14] They reported that only 900 stapedectomies were performed in England and Wales in year 2000. In their study, it took at least 60 to 80 cases for two different authors to reach a landmark point in their learning curves. Therefore as the number of practicing otolaryngologists steadily increases, it is inevitable that fewer cases of otosclerosis present to each surgeon. Endoscopic stapedectomy procedure can also facilitate the learning curve of surgical technique and anatomy for trainees. Since both the surgeon and assistants can view the monitor, the surgical anatomy and procedure can be understood more easily.

CONCLUSIONS

Endoscopic surgery is particularly suitable for stapedial disease. Endoscopic stapes surgery can be performed despite a curved and narrow external auditory canal and is minimally invasive, being characterized by little drilling and almost no postoperative pain. Endoscopic surgery is also suitable for education; the surgical anatomy can be easily understood and both the surgeon and assistants can observe procedures on the same monitor. It should only be performed by experienced surgeons because the operation has to be done one handed and stereoscopic vision is unavailable.

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Recent trends in microbial flora of chronic otitis media

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ABSTRACT

Introduction: Aim of this study is to identify the microbes causing active mucosal Chronic otitis media (COM) and to know sensitivity pattern in this group.

Materials and method:

Pus swabs were collected using sterile swabs and sent to microbiology laboratory to be cultured immediately. Antibiotic susceptibility was assessed with Kirby-Bauer disc diffusion method.

Results:

The most common microbes isolated were Staphylococcus aureus followed by Pseudomonas aeruginosa. The most effective antibiotic against Staphylococcus aureus is linezolid and for Pseudomonas aeruginosa is piperacillin-tazobactam.

Discussion:

Pseudomonas aeruginosa followed by Staphylococcus aureus is the common known bacteria isolated but in our study staphylococcus aureus followed by pseudomonas aeruginosa was the common isolate. Our empirical antibiotic policy is oral erythromycin with topical ofloxacin.

Conclusion:

The trends in antibiotic policy have to be reviewed from time to time, to see the changing susceptibility pattern of the bacteria.

Introduction:

Chronic otitis media (COM) is defined as chronic inflammation of middle ear and mastoid cavity which presents with hearing loss and ear discharge. COM is classified into active mucosal, inactive mucosal, active squamous and inactive squamous type. Chronic otitis media- active mucosal type is a treatable condition which limits the quality of life. Management of active mucosal COM starts with medical management with an appropriate antibiotic followed by surgical management. Successful management gives the patient a normal hearing and dry ear. Success of surgery depends on appropriate antibiotic cover during the perioperative period. The microbial pattern of COM varies from place to place. Also with increasing use of antibiotics, the antibiotic sensitivity is constantly changing. Awareness about this is a must to start appropriate antibiotic therapy. As culture takes two days, starting the antibiotic empirically after taking culture is the common practice. Aim of this study is to identify the microbes causing active mucosal COM and to know antibiotic sensitivity pattern in this group.

Materials and Methods:

This prospective study was conducted from 2013-2015 after obtaining ethical committee approval. All patients attending our outpatient department with ear discharge for more than 3 months and central perforation of tympanic membrane were included in this study. Patients who had taken systemic or topical antibiotic during the past four weeks were excluded from the study. Also patients with cholesteatoma and otitis externa were excluded from the study. About 176 patients were included in this study.

Sterile swab was used to collect pus from the ear and was sent to microbiology laboratory immediately. Pus swabs were cultured with blood, chocolate and MacConkeys agar. Antibiotic susceptibility was assessed with Kirby-Bauer disc diffusion method.

Results:

This study included 176 patients. Out of this 104 patients were male and 72 patients were female. 32 patients were under 18 years of age and the rest were 18 years or above.

Out of the 176 samples, 128 samples were positive for the bacteria. The antibiotic sensitivity pattern of these bacteria was identified. Staphylococcus aureus was isolated in 48 samples and Pseudomonas aeruginosa in 42 samples. Enterobacter species, Escherichia coli, Providencia species, Coagulase negative staphylococcus, Streptococci species, Citrobacter freundii, Klebsiella pneumoniae, Proteus mirabilis, Haemophilus species and Acinetobacter species were the other bacteria isolated (Fig. 1). Out of this no aerobic organism could be identified in 36 patients and 12 culture showed fungus.

The most effective antibiotic against Staphylococcus aureus as shown in fig. 2 was linezolid(100%) followed by vancomycin(95.8%) , erythromycin(87.5%), clindamycin(87.5%), methicillin (87.5%), cephalexin(79.2%), co-trimoxazole(70.8%), ofloxacin(62.5%), ciprofloxacin(62.5%) and penicillin(37.5%). Methicillin resistant Staphylococcus aureus was identified in 6 out of the 48 Staphylococcus aureus isolated.

The antimicrobial sensitivity pattern for Pseudomonas aeruginosa as shown in fig. 3 shows maximum sensitivity to piperacillin-tazobactam(100%) followed by amikacin(90.5%), cefoperazone-sulbactam(90.5%), ofloxacin(90%), ciprofloxacin (85.7%), gentamicin(76.2%), ceftazidime(76.2%) and cefepime(66.7%).

Among the other microbes as per the like Escherichia coli, Enterobacter species, Klebsiella, Citrobacter etc the most effective antibiotic was amikacin, linezolid, clindamycin, vancomycin and cefoperazone- sulbactam (fig. 4).

Discussion:

COM is a curable condition which causes severe limitation to the patient's quality of life. Identification of microbes that cause this and their antibiotic sensitivity helps the ENT surgeon to treat this condition in the best way.

Collection of pus using ear swabs from middle ear via external auditory canal under microscope is a reliable method in obtaining specimen.[1] We followed the same method to obtain pus.

Pseudomonas aeruginosa followed by Staphylococcus aureus is the common known bacteria isolated from COM. [2,3,4] In our study we found staphylococcus aureus followed by Pseudomonas aeruginosa as common isolate in COM. Similar results were noted in study conducted by Agrawal (2013).[5] There is a slow change in the bacteriology pattern of COM. Fungus was identified in 12(7%) out of 176 specimens collected. Candida and Aspergillus are the common fungus identified. In the study conducted by Prakash(2013) the fungus was isolated in 25% of samples.[6] In the present study most effective antibiotic against Staphylococcus aureus is linezolid(100%) followed by vancomycin (95.8%), erythromycin(87.5%), clindamycin(87.5%), methicillin (87.5%), cephalexin(79.2%), co-trimoxazole(70.8%), ofloxacin(62.5%), ciprofloxacin(62.5%) and penicillin(37.5%).

The study conducted by Agarwal(2013) showed 38.3% sensitivity with ampicillin, 55.3% with ciprofloxacin and 61.7% to macrolides. In Nazir's(2014) study vancomycin was the most efficient antibiotic against Staphylococcus aureus.[7] In Madana (2011) study sensitivity of Staphylococcus aureus was maximum to vancomycin followed by ciprofloxacin and erythromycin.[8] The first line treatment for Staphylococcus is penicillin group and macrolides. The sensitivity of Staphylococcus aureus to penicillin group is reducing and that for erythromycin is good. Hence it could be used for starting empirical antibiotic for gram positive cocci before the culture report arrives.

The antimicrobial sensitivity pattern for Pseudomonas aeruginosa shows maximum sensitivity to piperacillin-tazobactam(100%) followed by amikacin(90.5%), cefoperazone-sulbactam(90.5%), ofloxacin(90%), ciprofloxacin(85.7%), gentamicin(76.2%), ceftazidime (76.2%) and cefepime(66.7%). In Nazir's (2014) study amikacin followed by imipenem and piperacillin-tazobactam was the most effective antibiotic against Pseudomonas aeruginosa.[7] Ceftazidime followed by ciprofloxacin and amikacin is the most sensitive antibiotic for Pseudomonas in Madana (2011) study.8 For Pseudomonas, quinolones would be a good option. As quinolones are available for topical use, ofloxacin ear drops can be started empirically for all gram negative bacilli.

For microbes like Escherichia coli, Enterobacter species, Klebsiella and Citrobacter most efficient drug was amikacin followed by linezolid, clindamycin, vancomycin and cefoperazone- sulbactam.

Empirical treatment for active mucosal COM is with antibiotics which cover Pseudomonas aeruginosa and Staphylococcus aureus. Empirical antibiotic is to be started before gram staining and arrival of culture report. This should have good susceptibility to both gram positive cocci and gram negative bacilli. Hence our empirical antibiotic policy is oral erythromycin with topical ofloxacin.

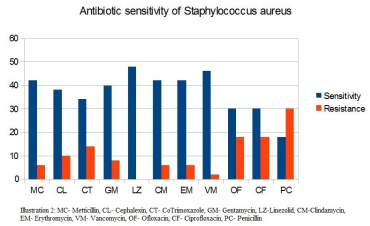

Figure 2

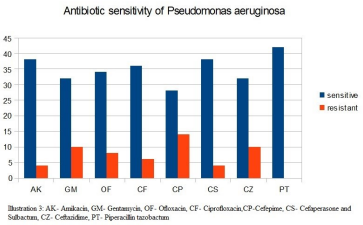

Figure 3

Conclusion:

Microbial pattern and antibiotic sensitivity of COM is constantly changing. Awareness about this is a must for the effective management of COM active mucosal type. That is why the trends in antibiotic policy have to be reviewed from time to time, to see the changing susceptibility pattern of the bacteria.

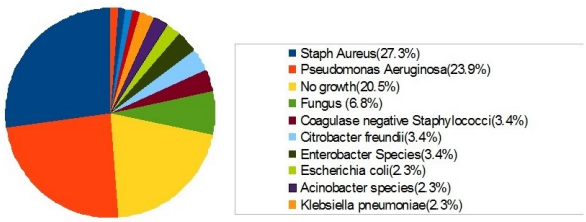

Figure 1

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ORIGINAL ARTICLE

Routine Histopathological Analysis of Pediatric and Adult Tonsils

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ABSTRACT

Introduction: Making a protocol is a must to overcome the controversy of doing routine histopathological examination of tonsillectomy specimen.

Materials and methods: Histopathological report of 100 consecutive tonsillectomy specimens that reached the pathology department of Saveetha Medical College was analyzed.

Results: Histological examination of the 154 pediatric tonsils showed reactive lymphoid hyperplasia in all the patients. One specimen had a small cartilaginous choristoma. In the 46 adult tonsils, there were two lymphoma, one extensive osteocartilaginous choristoma, and one epidermoid cyst of tonsil.

Discussion: As the histopathological examination in the pediatric group did not reveal any finding, it can be done only in patients with risk factors. The adult group showed two cases of Hodgkins lymphoma, one epidermoid cyst of tonsil and one osteocartilaginous choristoma tonsil. Hence, we suggest to continue the practice of routine histopathological analysis in adults.

Conclusion: We suggest continuing the practice of routine histopathological examination of all adult tonsillectomy specimens.

Keywords: Adult, Histopathology, Pediatric, Tonsil.

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INTRODUCTION

Tonsillectomy was first performed by Cornelius Celsus in the first century BC. It is one of the most common and oldest procedures done by an ENT surgeon. The indications are wide, including diagnostic, therapeutic, and as an approach to deeper structures. Cost of medical treatment and medicolegal issues have created controversy as to whether routine histopathology is a must or not. Making a protocol for histopathological examination is a must to avoid this controversy.

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AIMS

We aim to study histopathological features of 100 consecutive tonsillectomy specimens that reached the pathology department of Saveetha Medical College and to study the presence of various pathologies in pediatric and adult study group.

MATERIALS AND METHODS

In total, 100 consecutive tonsillectomy specimens that reached the pathology department of Saveetha Medical College were included in this study. The clinical information of these patients was collected. The specimens were examined under light microscope after hematoxylin and eosin staining. The findings were recorded. Chronic tonsillitis, keratosis tonsil, and tonsillar cyst were the indications for surgery. Their histopathology reports were analyzed.

RESULTS

Out of the 100 tonsillectomy patients, 58 were male and 42 female. Twenty-three patients were adults with ages varying from 18 to 60 years. The pediatric group had 77 patients with ages ranging from 4 to 17 years. All 77 pediatric patients underwent tonsillectomy for chronic tonsillitis. Histological examination of the 154 tonsils from this group showed reactive lymphoid hyperplasia in all the patients. Only one patient had a small cartilaginous choristoma of tonsil.

Among the adult group, 20 patients came with chronic tonsillitis, 2 had tonsillar cyst, and 1 had keratosis tonsil. Histopathology examination of the 46 adult tonsils showed two lymphomas, one extensive osteocartilaginous choristoma, and one epidermoid cyst of tonsil.

Two tonsil specimens showed Hodgkin's lymphoma: One in a 46-year-old male and the other in a 60-year-old female.

Patient with keratosis tonsil had extensive osteocartilaginous choristoma. Epidermoid cyst presented with tonsillar cyst.

DISCUSSION

Palatine tonsils are a part of inner Waldeyer's ring and are present in the lateral wall of the oropharynx. They are

lined by nonkeratinized stratified squamous epithelium on the medial aspect. The epithelium forms multiple crypts that invaginate into the parenchyma. The parenchyma is made of lymphatic tissue with germinal centers for B-lymphocyte production. On the lateral aspect is a dense fibrous tissue capsule that separates the tonsil from deeper structures. Tonsil develops from the second pharyngeal pouch, epithelium develops from the ectoderm, and lymphoid tissue from the mesoderm.[1]

In our study, histological examination of 154 pediatric tonsils showed no evidence of malignancy or tuberculosis. In a study done by Brien[2] in 2010, malignancy was diagnosed in 0.026% of pediatric patients. After review of literature, we concluded that histopathological examination in pediatric group can be done only in patients with risk factors, such as unilateral enlargement of tonsil, lesion in tonsil, firmness of tonsil, neck mass, history of cancer, unexplained loss of weight, and constitutional symptoms.[3,4]

Out of the 46 adult tonsils collected from 23 patients, two cases of Hodgkin's lymphoma were noted. Histopathology in both the patients showed features suggestive of Hodgkin's lymphoma. The incidence is very high in our group. Both the patients presented with chronic tonsillitis and had no risk factors. Beaty[5] in 1998 recorded 25 malignancies out of the 476 adult tonsillectomy specimens. However, all 25 patients had at least one risk factor as in pediatric patients. In the study done by Papouliakos[6] in 2008, the incidence of malignancy in pediatric and adult tonsillectomy specimen was 0.13 and 2.04% respectively. In the study done by Booth[7] in 2013, the incidence of tonsillar malignancy in routine tonsillectomy was 1.2% in adult and 0.52% in pediatric patients. All these studies show a higher incidence of tonsillar malignancy in routine adult tonsillectomy specimen similar to our study. Though our adult group was small, review of these literatures also suggest further evaluation of routine histopathology of adult tonsil before discontinuing the same.

One patient who presented with keratosis tonsil had extensive osteocartilaginous choristoma. Choristoma is a histologically normal tissue in abnormal location. Cartilaginous choristoma in tonsil has been recorded.[1] Osteo-cartilaginous choristoma is very rare in tonsil.

Epidermoid cyst of tonsil is the other rare finding. Patient had recurrent infection of epidermoid cyst and presented as tonsillar cyst.

This inference points out to continue the practice of routine histopathological analysis of all adult tonsillectomy specimens.

CONCLUSION

Some centers still do histopathology of all specimens, whereas others do not. Though cost-effectiveness of routine tonsillectomy is high, there are still many hidden entities that are discovered with every study. Further studies are required to correlate these benign findings with recurrent tonsillitis. However, in our study, we have not identified any occult malignancy in pediatric age group at least. Histology of adult tonsil in our study has revealed many interesting findings. Hence, we suggest continuing the practice of histopathological examination of all adult tonsillectomy specimens.

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Epidermoid cyst in tonsil – a rare presentation.

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Case Report

Epidermoid cyst in tonsil - a rare presentation

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Abstract

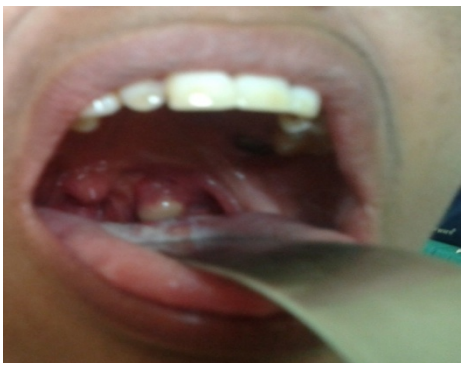
Epidermoid cysts are benign lesions that are histologically characterized by cystic spaces lined by simple squamous epithelium. Epidermoid cysts are common in head and neck. Epidermoid cyst in the pharynx is a rare presentation. It could present as unilateral swelling of the tonsil or as cyst in the tonsil. In our case it presented as a cyst in the left tonsil. Diagnosis is mainly based on the histopathological examination. Surgical excision is the curative treatment.

Introduction

Epidermoid and dermoid cysts are benign lesions developing from abnormal epithelial components of ectodermal tissue formed during the fetal period, or implanted epithelium arising after trauma or surgery.[1] Hence it can arise anywhere in the human body. Epidermoid cysts are common in head and neck region. Epidermoid cyst in the pharynx is a rare presentation.[2] Dermoid cyst arise from epithelium that has been trapped in deeper tissue either during embryogenesis or traumatic implantation in body tissue. Epidermoid cysts are benign lesions lined by statified squamous epithelium.

Case report

A 45 year old woman presented to our out patient department with sore throat. On examination she had enlargement of her left tonsil with yellowish cyst in upper pole. Left tonsil was larger than right. Regional lymph nodes were not palpable. Blood and urine examination were normal. We planned tonsillectomy as asymmetrical adult tonsils with normal mucosa in the absence of cervical adenopathy are associated with 7% risk of malignancy.[3] Tonsillectomy was done under general anaesthesia. The procedure was uneventful. Specimen was sent for histology. Histopathology showed tonsil with a cyst lined by stratified squamous epithelium filled with cholesterol clefts, keratin flakes, foamy macrophages and lymphocytes. Post operative period was uneventful. Patient was discharged on the 2nd post-operative day. Follow up was uneventful.



Discussion

Epidermoid cysts are benign lesions that are histologically characterized by cystic spaces lined by squamous epithelium. They generally appear in areas where embryogenic elements fuse. They can be classified as being either congenital or acquired based on its origin.

Histologically there are three types of dermoid cysts– epidermoid cyst, true dermoid cyst and

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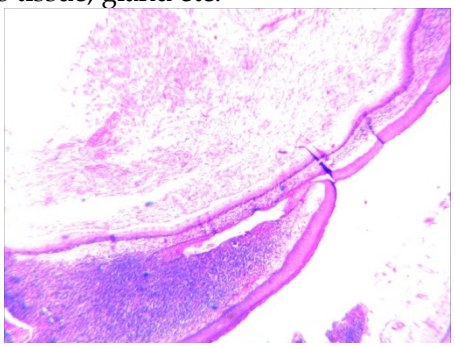
teratoid. Epidermoid is a type of dermoid cyst, lined by squamous epithelium, contains keratin and has no adnexal structures. True dermoid cyst contains appendages such as hair follicle, sweat glands, sebacious gland etc. Teratoid cyst contains elements from all germ layers- skin, nail, teeth, nervous tissue, gland etc.



Tonsillar retention cyst is most common cyst seen in tonsil. Dermoid cyst in tonsils is very rare. Other rare causes of tonsillar cyst include lympho-epithelial cyst, hydatid cyst etc. Tonsillar cyst is asymptomatic in many patients. Presence of swelling in the throat may cause difficulty in swallowing. Our patient had recurrent episodes of sore throat probably due to cyst infection. Epidermoid and dermoid cysts can be in any location of the body. Head and neck constitutes approximately 7% of all cases of epidermoid and dermoid cyst.[4] Surgical excision is the treatment of choice. If the cyst can be excised completely, there is no chance of recurrence. Histopathology will confirm the benign nature of the cyst.

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Original Research Article

Clinical profile and management options in patients of Ludwig's angina: a 5 year prospective study

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ABSTRACT

Background: The objective of the study was to study the etiology, clinical presentation, bacteriology and management options in 38 cases of Ludwig's angina.
Methods: 38 patients of Ludwig's angina admitted in ENT Department of Saveetha Medical College, between March 2012 to April 2017, were included in the study. Various parameters like etiological agents, clinical features and management options were analysed.
Results: Ludwig's angina was found to be more prevalent between age group of 41 to 70 years with a mean age group of (60.3yrs). Males were found to be more commonly affected (71%) as compared to females (29%). Odontogenic infections still accounted for majority (81%) of causes with uncontrolled type 2 diabetes mellitus emerging as the main associated comorbidity. Patients mainly presented with symptoms like submental and submandibular swelling (100%), dysphagia (67%), odynophagia (55%), and stridor (42%). Almost all the patients required intravenous antibiotics, analgesics and steroids (100%) with (82%) requiring tooth extraction and (74%) requiring incision and drainage. Among the patients who presented with stridor (29%) underwent tracheostomy for airway management. The culture of the discharge obtained after incision and drainage found pseudomonas (71%), staphylococcus aureus (34%) and beta hemolytic streptococcus (42%) as common microbial agents.
Conclusions: Ludwig's angina is a serious and life threatening condition which can have fatal outcome if not treated aggressively, therefore a thorough understanding of the clinical presentation, common etiological factors, microbial agents and treatment methods is needed to manage these patients.

Keywords: Ludwig's angina, Odontogenic, Diabetes mellitus, Pseudomonas

INTRODUCTION

Ludwig's angina is a serious, potentially life threatening infection of the floor of mouth usually seen in adults with poor oral hygiene and concomitant dental infections.[1]

With the increasing prevalence of comorbidities like diabetes mellitus the incidence of Ludwig's angina and other deep neck space infections is on the rise. While dental infections account for majority of cases, trauma and conditions like osteoradionecrosis following radiotherapy account for the rest of the causes.[2] The microbiology in Ludwig's angina shows a mixture of gram positive, gram negative and anaerobic organisms, with *Pseudomonas, Staphylococcus aureus and Citrobactefreundi* being the commonly isolated organisms.[3] Management of Ludwig's angina needs an aggressive monitoring and management of the airway either by tracheostomy or awake fibreoptic intubation.[4] Apart from securing the airway other treatment modalities like tooth extraction, incision and drainage

play a crucial role along with adequate intravenous antibiotics and anti-inflammatory drugs.[5]

METHODS

Study setting

Patients who were diagnosed and treated for Ludwig's angina in ENT Department of Saveetha medical college, Chennai.

***Study design**:* A prospective study, descriptive analytical.

***Study duration**:* 5 year (from March 2012 to April 2017)

Sample size

38 patients of Ludwig's angina diagnosed clinical and / or radiologically using Xray/CT/MRI.

Inclusion criteria

All the patients who were diagnosed clinically or radiologically as Ludwig's angina and treated for the same in ENT Department of Saveetha medical college, Chennai.

Exclusion criteria

Patients who did not give consent for the study.

Procedure

A total of 38 patients were included in the study based on the inclusion and exclusion criteria. Detail history was taken and examination of the patient was done. Data was collected on various parameters like age, sex, presenting complaints, associated comorbidity, etiology, organisms isolated and treatment methods. The patients were followed up after admission and relevant clinical history was recorded. All the patients were started with empirical intravenous antibiotics, steroids and analgesics. Patients who had stridor at presentation underwent conventional tracheostomy or fibreoptic intubation based on feasibility. The odontogenic source of infection was removed by tooth extraction with the help of dentist. Incision and drainage was done wherever needed and the fluid obtained was sent for culture and sensitivity. Depending on the organism isolated and sensitivity pattern antibiotics were added or changed later. All the patients were followed up till complete recovery and discharge. Details about surgical interventions done for the patient, were recorded and analysed. All the data available during the disease progression was recorded and analysed using suitable statistical analysis methods.

RESULTS

38 patients of Ludwig's angina examined and treated in the ENT department of Saveetha medical college, Chennai during the period of March 2012 to April 2017 were included in the study. The age of the patients ranged from 10 to 70 years with maximum number of patients (29) between ages 40 to 70 years. The mean age was found to be 60.3 years. A total number of 14 patients (37%) were seen in the age group of 40 to 50 years (Figure 1).

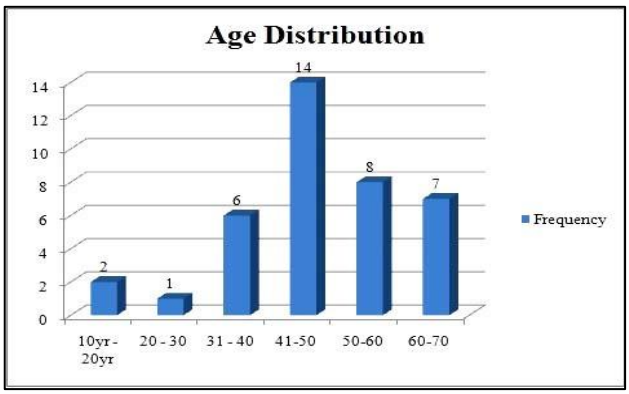

Figure 1: Graph showing frequency of Age distribution (n=38).

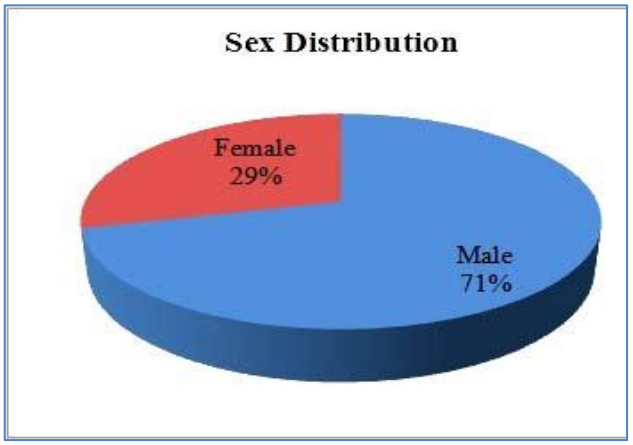

Figure 2: Pie chart showing sex distribution (n=38).

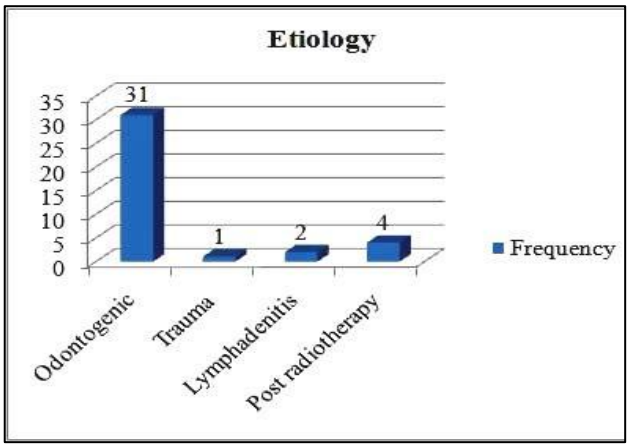

Figure 3: Graph showing frequency distribution of etiological factors (n=38).

Among the 38 patients 27 patients (71%) were male and 11 patients (29%) were females with female to male ratio being (0.40) (Figure 2).

Out of the etiological factors odontogenic cause was found to be most common, and was seen in 31 patients (81%) (Figure 3).

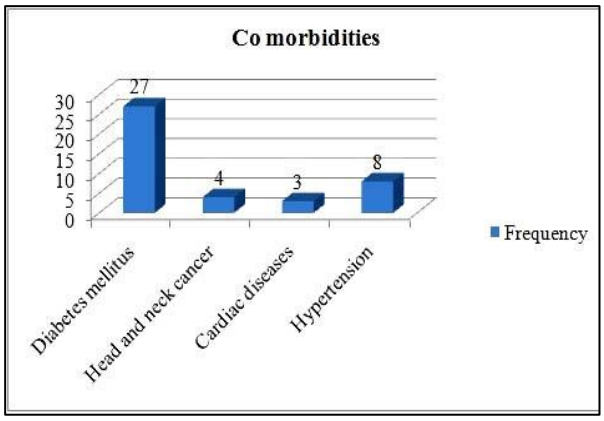

Figure 4: Graph showing frequency of associated co morbidities (n=38).

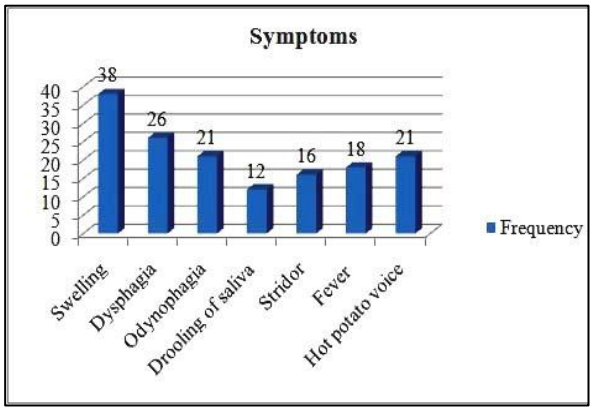

Figure 5: Graph showing frequency of symptoms (n=38)

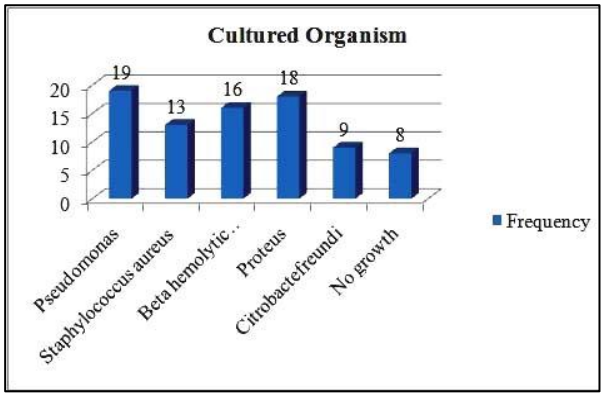

Figure 6: Graph showing frequency distribution of various cultured organisms (n=38).

Among the 38 patients 27 patients (71%) were found to have uncontrolled type 2 diabetes mellitus at the time of presentation, and thus can be said as the most common predisposing factor nowadays (Figure 4).

Swelling in the submental and submandibular region was seen in all the 38 patients (100%), followed by dysphagia (67%), odynophagia (55%), stridor (42%), hot potato voice (55%), and drooling of saliva (32%) (Figure 5).

The results of the bacterial culture were positive in 20 patients (53%). Pseudomonas was isolated in 19 cultures (95%), followed by beta hemolytic streptococcus in 16 cultures (80%), Proteus in 18 cultures (90%), and Staphylococcus aureus in 13 cultures (65%) (Figure 6).

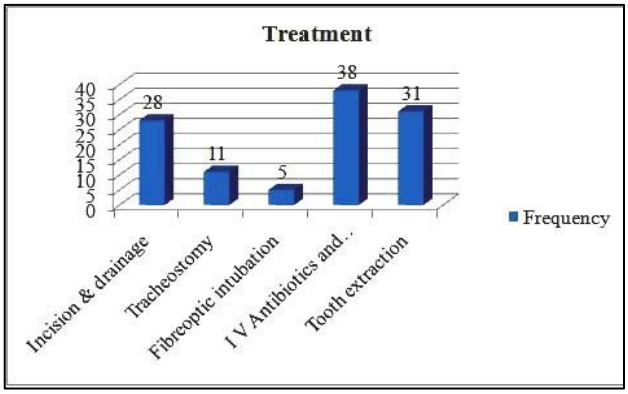

Figure 7: Graph showing frequency of different treatments given (n=38).

All the 38 patients (100%) were given appropriate intravenous antibiotics and analgesic for control of infection. Out of them 28 patients (74%) required incision and drainage in the neck for decompression of swelling, and 31 patients (82%) needed tooth extraction by dentist. 16 patients had stridor at the time of presentation out of which in 5 patients (13%) only fibreoptic intubation was feasible while rest 11 patients (29%) required a tracheostomy for airway management (Figure 7).

DISCUSSION

Ludwig's angina was first described by a German physician *Wilhelm Friedrich von Ludwig* in 1836 as a rapidly progressive life threatening cellulitis involving the submandibular, sublingual and submental spaces.[6] This disease needs an aggressive management and careful monitoring of associated comorbidities like diabetes mellitus.

Age

In our study most of the patients were between 40 to 70 years, with nearly 76% of the patients above the age of 40 years and 24% of patients below the age of 40 years.

The mean age group was 60.3 years. So the prevalence of the disease was more in the elderly population above the age of 40 years. Various studies done by Chen et al, Wang et al, Huang et al, showed that the disease is more commonly seen in adults with a mean age group within 40 to 50 years.[7-9]

Sex

The sex distribution showed a more male dominance with female to male ratio being 0.40. This is comparable to the studies done by Chen et al (0.37), Wang et al (0.49), Huang et al (0.69) which also had a male dominance.[7-9]

Etiology

The most common cause was found to be odontogenic infections (81%), which is consistent with the studies done by Huang et al (42%), Parhiscar and Har-El (43%), Marioni et al (38.8%), Eftekharian et al (49%) and Saifeldeen et al (42%).[9-13] The lower second and third molar was most common source of infection in our study. 11% of the patients were found to have osteoradionecrosis of the mandible after a course of radiotherapy for oral cancer. 5% of the patient reported Ludwig's angina following suppurative inflammation of the cervical lymph nodes.

Comorbidities

Diabetes mellitus was reported as the most common co morbidity with 27 patients (71%) suffering from the disease at the time of admission. Diabetes mellitus was also the common associated comorbidity in case of study done by Saifeldeen et al.[13] The presence of diabetes had a significant correlation with the management of the disease. The patients who had more severe uncontrolled diabetes at the time of admission presented with more severe symptoms of Ludwig's angina and needed a control of the blood sugar levels to achieve a complete cure. The duration of hospital stay and morbidity was more as compared to the non-diabetic Ludwig's angina patient. The response to conservative medications was poor in such patients and they frequently needed surgical interventions. Therefore patients of Ludwig's angina with uncontrolled diabetes need to be managed aggressively along with monitoring of blood glucose levels so as to avoid fatal outcomes.

Symptoms

In our study all the patients (100%) presented with submandibular and submental swelling, while 67% had dysphagia, 55% had odynophagia, 42% had stridor, and 55% had hot potato voice at the time of presentation. This is consistent with recent studies which show neck swelling odynophagia, dysphagia, hot potato voice and stridor as the common presenting symptoms.

Microbial flora

The culture obtained from incision and drainage did not show any microbial growth in 40% of cases. The rest 60% of cases revealed a mixed microbial flora consisting of gram positive, gram negative and anaerobic organisms. *Pseudomonas* was found in maximum cases (95%) along with beta hemolytic *Streptococcus* (80%), Proteus (90%) and *S. aureus* in 65% of cases. Similar studies done by Co et al and Ovassapian et al revealed a mixed microbial flora made up of beta hemolytic *Streptococcus*, *Proteus* and *Staphylococcus* as the common organisms.[14,15]

Management

All the patients received intravenous antibiotics, analgesics and steroids. Around 82% of patients needed a tooth extraction by the dentist, while 74% needed incision and drainage for surgical decompression of the neck swelling. 42% of patients had stridor at the time of presentation among which 29% had severe laryngeal and tongue base edema making fibreoptic intubation difficult and thus had to undergo a temporary conventional tracheostomy for immediate airway management. In rest 13%, awake fibreoptic endotracheal intubation was done to secure the compromised airway. Barakate et al studies advocated the use of mainly intravenous antibiotics, steroid and analgesics for curing patients of deep neck space infections.[16] But with the rise in incidence of co morbidities like diabetes mellitus, surgical intervention measures help in faster and complete cure of the patients.[17]

CONCLUSION

Ludwig's angina is an acute, rapidly progressing, life threatening infection which needs aggressive IV antibiotics therapy and steroids along with surgical intervention measures like tooth extraction, tracheostomy or fibreoptic intubation and incision drainage at the site. A thorough clinical understanding of the etiological factors, clinical features and management methods help in rapid diagnosis and management so that the morbidity of the patient can be reduced.

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