

## HEAD AND NECK ABSCESSSES- ALGORITHMIC MANAGEMENT

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Received in revised form : 24/03/2023  
Accepted : 06/04/2023

## Keywords:

ENT Abscess, Thorwald's cyst, lacrimal abscess, dentigerous cysts, thyroglossal cyst abscess.

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DOI: 10.47009/jamp.2023.5.3.146

Source of Support: Nil,

Conflict of Interest: None declared

Int J Acad Med Pharm  
2023; 5 (3); 712-715

## Abstract

**Background:** Abscesses in ENT are usually restricted to Peritonsillar abscesses, Mastoid subperiosteal abscesses, and dental abscesses. Also, microbial penetration into head and neck tissues leads to a focal reaction causing superficial soft tissue infections. However, some of these can potentially develop into a life-threatening diseases. The aim is to study the incidence, comorbidities associated with cases going in for complications and management of head and neck abscess. To arrive at an algorithm for approach to these cases. **Materials and Methods:** We present a descriptive study of 34 patients not commonly encountered in ENT practice and that presented to our tertiary care hospital between Dec 2017 to Dec 2019. All patients were given inpatient care, and Broad-spectrum IV antibiotics started after causes for immunocompromise were ruled out. Incision and drainage were done under general anaesthesia. Patients Followed up for six months. **Result:** The study included thyroglossal duct cyst abscesses, preauricular sinus abscesses, submandibular abscesses, and other rare unclassified abscesses. In our study, 62% of patients had diabetes. Multidrug-resistant Staphylococcus aureus was the most common organism encountered. **Conclusion:** These patients are being presented to guide the budding ENT surgeon about possible complications and algorithmic steps in managing such patients.

## INTRODUCTION

Abscesses in ENT are usually limited to a peritonsillar abscess, subperiosteal mastoid abscess, and dental abscess. However, microbial penetration into head and neck tissues can result in superficial soft tissue infections. Several of these, meanwhile, have the potential to progress into fatal illnesses. These rare abscesses have emerged because of coexisting diabetic immunocompromise and multidrug-resistant organisms.<sup>[1,2]</sup>

A neck abscess is an infection of the throat's potential spaces by bacteria that can be difficult to diagnose and cause life-threatening complications. These used to have greater mortality rates, but today's early detection techniques, wide-spectrum antibiotics, and surgical procedures have greatly reduced mortality rates.<sup>[1]</sup> Neck abscesses must be diagnosed and treated immediately to avoid serious sequelae such as respiratory distress, mediastinitis, pseudoaneurysm, empyema, hypoxia, and jugular vein thrombosis.<sup>[3]</sup>

Staphylococcus and Streptococcus are the most often found microbial pathogens recovered from abscesses. The risk factors, examination, and management of abscesses are discussed in this

activity, which also emphasises the value of the interprofessional team in enhancing patient care.<sup>[4]</sup>

## Aim

To study the incidence, comorbidities associated with cases going in for complications and management of head and neck abscess. To arrive at an algorithm for approach to these cases.

## MATERIALS AND METHODS

This descriptive study was conducted in the Department of ENT at Sree Balaji Medical College, Chromepet, Chennai and included 34 patients with infective abscesses admitted to the ENT ward between Dec 2017 and Dec 2019. We received approval from the institutional ethics committee before initiating the study. Informed consent was collected from each participant before their inclusion in the study.

## Inclusion Criteria

Patients with tender swelling with or without fever in the head and neck region requiring hospitalisation. Patients with negative Covid swab. Patients with comorbidities – diabetes, HIV, hypertension, etc and with head and neck space infection.

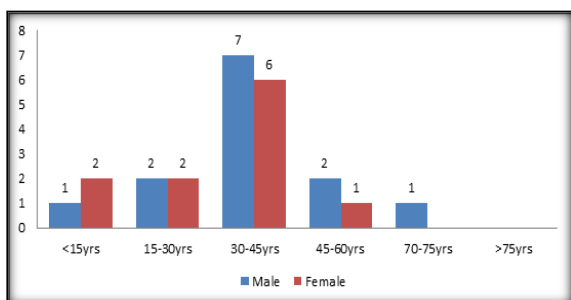
### Exclusion Criteria

Patients extremely sick with severe comorbidities – requiring ICU care, Patients with simple cervical adenitis or infective processes which could be managed with oral antibiotics and OPD care. Sick patients unwilling for inpatient care or unwilling to give consent.

All patients were screened for diabetes and Immunocompromise (HIV), and strict diabetic control with insulin and ART – if indicated was also initiated. Broad-spectrum Intravenous Antibiotics were initially started, and the patient was prepared for general anaesthesia. USG neck was the initial investigation; CT Neck was done in indicated patients. CT PNS was done if indicated. The patient was prepared for aesthetic fitness, and Incision and Drainage were done under general anaesthesia. Pus culture and sensitivity were done, appropriate antibiotics were started, and the patient followed up for six months.

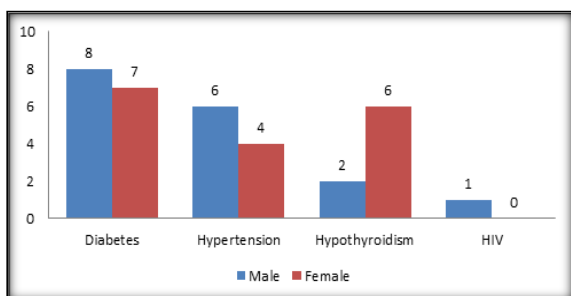
## RESULTS

Our study had a nonspecific age and sex ratio, but middle-aged persons were more commonly seen to face such complications than younger adults (30-50 years old) [Figure 1].



**Figure 1: Age and Sex distribution**

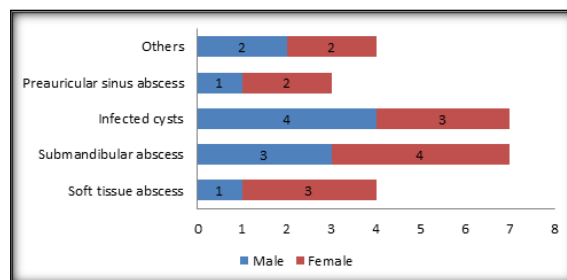
The most common comorbidity in male patients was diabetes, seen in 8 patients, hypertension in 6 patients and hypothyroidism in 2 patients. The most common comorbidity in female patients was diabetes, seen in 7 patients, hypothyroidism in 6 patients and hypertension in 4 patients [Figure 2].



**Figure 2: Associated comorbidities in male and female participants**

Of the 34 patients, the most common were secondarily infected cysts (7 patients – 29%). We encountered bilateral infected dentigerous cysts,

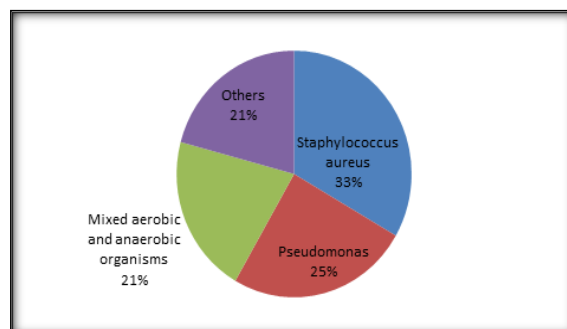
sebaceous cysts, dermoid, and even a case of infected thyroglossal cysts. Another common occurrence was abscesses secondary to dental extraction (50% of patients) – most of the submandibular abscesses (7 patients – 29%) and the soft tissue abscess (4 patients – 16%) in maxillary and cheek area were due to this cause. Other head and neck abscesses like a lacrimal abscess (1 case – 4%), infected preauricular sinus abscess (3 patients – 12%), and other unclassified abscesses were also included in our study [Figure 3].



**Figure 3: Different Diagnoses encountered in our study**

Every patient had an imaging investigation done. The most common for neck swelling was USG Neck. In some patients, even CT or CECT neck was taken when required. CT PNS was preferred in patients with complaints and swelling of the face. The other important investigation was Pus culture and sensitivity, done in all patients.

Of the organisms isolated, the most common was Staphylococcus aureus. Staphylococcus aureus was usually treated with piperacillin-tazobactam IV. In one case where the Staphylococcus aureus was resistant to even the Piptaz combination, we had to start the patient on Vancomycin. Pseudomonas aeruginosa was the next most common organism isolated, usually treated with IV gentamycin. Both Staphylococcus aureus and Pseudomonas had multidrug-resistant strains [Figure 4].



**Figure 4: Organism isolated**

In the presence of immunocompromise, the healing was protracted and was enhanced if the diabetes was better controlled or if the CD 4 count was improved with ART [Figure 5].



**Figure 5: A treatment algorithm**

## DISCUSSION

We have not found similar studies of this nature in the literature, so our comparison is with Isolated Case reports and their modalities of treatment of these conditions. We also take the opportunity to present these patients as individually odd presentations and otherwise simple-looking patients that got complicated, leading to significant morbidity to patients. This study highlights the importance of a proper protocol for diagnosis and management. Some abscesses were secondary to trauma and interventional procedures, and other patients had an infection in pre-existing cysts.

We had three patients of children from poor socioeconomic status who presented to us with recurrent swelling in the preauricular region since childhood. It was diagnosed as a preauricular sinus abscess & was treated by incision and drainage with complete excision of the fistulous tract with primary closure,<sup>[5,6]</sup> which is routine management. This was uncommon compared to the routine infected preauricular sinus; hence, we included these three patients in this study.

Nine patients had maxillary and submandibular abscesses secondary to Dental procedures (Root canal, extraction for caries tooth). A 32-year-old male patient [Figure 6] presented with a huge swelling on the right side of the cheek in the last ten days following root canal treatment. The patient also

had uncontrolled diabetes for the past five years. CECT neck revealed a well-defined abscess involving the right parotid space and upper deep cervical region with multiple infected nodes on the right. The patient was taken up for I & D under GA, followed by administering appropriate antibiotics. The regular dressing was done with constant monitoring of blood sugars. The wound healing time was protracted, and he received multiple courses of antibiotics before the wound healed completely. This is a highly unusual course for dental infection, though the most common etiology of head and neck space infections are those of dental origin. Diabetes coexists in around 5% of patients but in our study, 62% of patients.<sup>[7,8]</sup>

We encountered one lacrimal abscess where the 65-year-old patient [Figure 7] presented with swelling near the right medial canthus, associated with obstruction of the visual field with h/o foul-smelling nasal discharge on and off for five months. The patient was a known case of diabetes and hypertension. This patient was treated with antibiotics and Endoscopic Endonasal Dacryocystorhinostomy, the standard of care. Insertion of the Crawford tube is another alternative management suggested in a study.<sup>[9]</sup>

A 23-year-old male patient with a thyroglossal duct cyst [Figure 8] underwent FNAC outside and presented to our hospital ten days after the procedure with tender swelling and fever complaints. CECT neck was done, and it showed an infected thyroglossal cyst with abscess formation. Incision and drainage of the abscess were done as a primary procedure, and complete excision of the tract was done as a secondary procedure after three weeks.

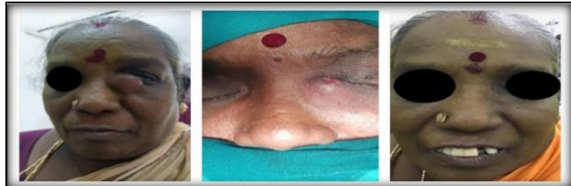
A 19-year-old female patient came to us with left-sided facial pain and small cystic swelling over the left gingiva-buccal sulcus above the incisors [Figure 9]. The patient underwent surgery the same a few years ago, details of which were unavailable. CT PNS revealed an infected dentigerous cyst with the impacted tooth in the left maxillary sinus. Marsupialization is the treatment of choice, whereas in this case, I&D was followed by complete excision taking into account the poor oral hygiene, cooperation and the socioeconomic status of the patient.<sup>[10]</sup> This rare case was described in very few journals, and the treatment was according to these guidelines.

A 16-year-old male patient presented to the OPD with a nose block and ear-blocking sensation for six months. A diagnostic nasal endoscopy was done, and adenoid hypertrophy completely obstructing the choana was noted. A preoperative CT scan also was done, which confirmed the findings. Intra-operatively abscess noted, and I&D done. Postoperatively the HPE noted an infected Thorwald's cyst. This is a very rare presentation of Thorwald's cyst masquerading as a simple adenoid hypertrophy, and the standard practice was to drain the cyst as suggested by various journals.<sup>[11,12]</sup>





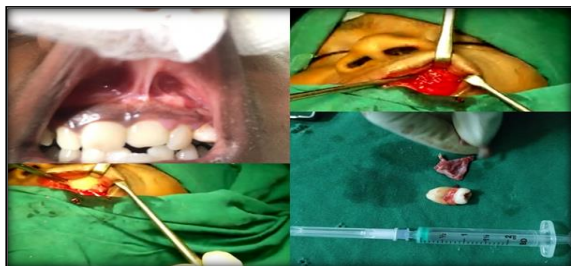
**Figure 6:** 32-year-old diabetic with cheek abscess secondary to dental infection.



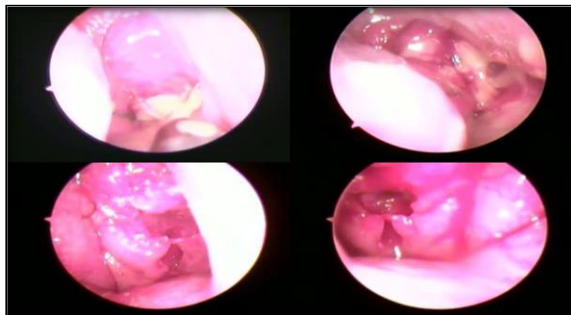
**Figure 7:** 65-year-old diabetic with left lacrimal abscess, endonasal DCR, and complete resolution



**Figure 8:** Thyroglossal duct cyst abscess in a 23-year-old boy, I&D done as a primary procedure, thyroglossal duct cyst, and tract excision as a secondary procedure.



**Figure 9:** Infected recurrent bilateral dentigerous cysts in a 19-year-old girl



**Figure 10:** Infected thornwaldts cyst presented as adenoid hypertrophy - endoscopic picture of the nasopharynx

## CONCLUSION

When we compiled the results of this study to look for comparative statistics, we could not trace any similar studies published anywhere. Isolated case reports of similar patients were present, but the algorithm to manage these patients was not found in any literature. Also, the rarity of patients made it very difficult for us to approach every case. Hence, we decided to publish this study to guide budding ENT surgeons with guidelines on approaching these patients and highlighting these probabilities that should be brought to light.

We have observed that infection of pre-existing cysts is a real but rare possibility in patients presenting with a tender fluctuant abscess. A dental abscess, submandibular and maxillary abscesses are other infective processes that can occur in diabetic or immunocompromised individuals – these must first be diagnosed with high suspicion. The first step in treatment would be a broad-spectrum antibiotic with both aerobic and anaerobic coverage. Incision and drainage are again the treatment of choice, and General anaesthesia is to be preferred. Culture-directed antibiotics and correction of the immunosuppression with postop wound care help in early discharge.

**Funding:** This study received no specific grant from public, commercial, or not-for-profit funding agencies.

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