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Original Article

Clinical Assessment with Bacteriological Evaluation of Patients with Retropharyngeal Abscess in a Tertiary Hospital in Thiruvananthapuram

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Abstract

Introduction: Retropharyngeal abscess is an infection of one of the deep spaces of the neck. An abscess in this location is an immediate life-threatening emergency with potential for airway compromise and other catastrophic complications. It is a condition with potential for significant morbidity and mortality if not detected early.

Aims of the Study: (1) To evaluate the underlying etiology of retropharyngeal abscess in patients in the Department of Otorhinolaryngology (ENT), Medical College, Thiruvananthapuram, Kerala, India (2) to evaluate bacteriology of the pus obtained from the abscess, (3) to study the management and prognosis of patients presenting with retropharyngeal infection and effect of co-morbid illness on outcome of the disease.

Materials and Methods: (1) Source of data: This study was a prospective analysis performed on a group of 53 patients with retropharyngeal abscess who attended the Department of Otorhinolaryngology (ENT), Medical College, Thiruvananthapuram, Kerala, India, during the period of 1-year from November 2006 to December 2007, (2) method of data collection: Data were collected using a standardized questionnaire, personal interview, physical examination, and biochemical investigations.

Results: In our study, 53 patients were taken, 62.26% of the patients were males and 37.74% were females) with mean age of 44.5 years. The majority of the patients in the study group presented with odynophagia and dysphagia. In the bacteriological evaluation of pus most common organism was *Streptococcus* viridians and *Pseudomonas*. The main predisposing factor was foreign body ingestion. Out of the 53 patients, 8 had complications of which 5 were diabetic.

Conclusion: Retropharyngeal abscess was more seen in male adults following foreign body ingestion. Bacteriological studies showed *Streptococcus* viridians and *Pseudomonas* to be the common pathogens in the pus. The main complication was respiratory distress and comorbidities like diabetes mellitus affected the outcome of the disease.

Key words: Bacteriology, Comorbidities, Foreign body, Retropharyngeal abscess

INTRODUCTION

Retropharyngeal abscess is an infection of one of the deep spaces of the neck. An abscess in this location is an immediate life-threatening emergency with potential for airway compromise and other catastrophic complications. It is a condition with potential for significant morbidity and mortality if not detected early. They account for 12-22% of all deep neck infections in the neck.

Etiologies of retropharyngeal abscess can vary from infections of retropharyngeal lymph nodes, adenoids, nose, nasopharynx, paranasal sinuses, tonsils, pharynx or from cervical adenitis, foreign bodies penetrating posterior pharyngeal mucosa, penetrating injuries of posterior pharyngeal wall of cervical esophagus or due to

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tuberculosis of the cervical spine. Rarely, it can occur as sequelae of suppurative otitis media.

The patient can present with fever, progressive dysphagia, odynophagia, drooling, neck stiffness and rarely stridor and neck swelling.

Clinical suspicion of retropharyngeal abscess can be further confirmed by complete blood count with differential count, lateral soft tissue radiograph and if needed computed tomography (CT) scan of the neck with contrast. Once diagnosis is confirmed, antibiotic therapy is directed empirically toward aerobic and anaerobic flora of nasopharynx. The definitive treatment is surgical drainage of abscess and sending the pus for culture and sensitivity. The appropriate antibiotic is started postoperatively.

Complications of retropharyngeal abscess can range from acute upper airway obstruction, spontaneous abscess rupture, aspiration pneumonia, mediastinitis to septicemia and even death.

With early suspicion of the clinical possibility of a retropharyngeal abscess along with CT imaging, good anesthesia, prompt surgical drainage and good antibiotic coverage, complications should be extremely low with zero mortality.

In this study, a prospective analysis of patients with retropharyngeal abscess attending the Department of Otorhinolaryngology (ENT), Government Medical College, Thiruvananthapuram, Kerala, India, from November 2006 to December 2007 is done.

Factors such as age, sex, etiology, presenting symptoms and signs, methods of diagnosis, treatment, and complications are reviewed. In this study, the bacterial profile of the pus obtained during surgical drainage of the abscess is also studied.

AIMS OF THE STUDY

1. To evaluate the underlying etiology of retropharyngeal abscess in patients in the Department of Otorhinolaryngology (ENT), Medical College, Thiruvananthapuram, Kerala, India
2. To evaluate bacteriology of the pus obtained from the abscess
3. To study the management and prognosis of patients presenting with retropharyngeal infection
4. To study the effect of co-morbid systemic illnesses on the prognosis and outcome of the disease.

MATERIALS AND METHODS

Source

This study was conducted on a group of 53 patients with retropharyngeal abscess who attended the Department of Otorhinolaryngology (ENT), Medical College, Thiruvananthapuram, Kerala, India, during the period of 1-year from November 2006 to December 2007.

Period-12 Months

In all the patients with retropharyngeal abscess, detailed clinical evaluation was done which included a detailed history, general examination, and thorough ENT examination. The findings were recorded on a proforma. Investigations included blood and urine examination and specific investigations for diabetes, immunosuppression, and tuberculosis in indicated patients.

A lateral soft tissue radiograph of the neck taken in inspiration and normal extension of the neck was the main diagnostic tool used in all the cases.

Retropharyngeal space widening greater than half the width of vertebra and loss of lordosis were the main criteria used for diagnosis. Chest X-ray postero-anterior view was also taken in all the cases. CT scan of the neck was recommended in certain cases especially in children and those with complications. All the patients were subjected to surgical drainage under general anesthesia/local anesthesia after proper airway maintenance. Pus obtained from the surgical drainage of the abscess was sent for bacteriological evaluation to the microbiology lab.

In the microbiology lab, the specimen was inoculated into 4% human blood agar, chocolate agar, McConkey's agar, and salt agar. These plates were incubated at 37°C aerobically and examined after 24 h. Organisms were identified on the basis of colonial, morphological and cultural characteristics and biochemical reactions. In case of poor growth in solid media, subcultures were made using glucose broth.

After identifying the microorganisms, they were tested for their antimicrobial sensitivity. The antibiotic disc used was cloxacillin, tetracycline, first generation cephalosporin, erythromycin, gentamicin, carbenicillin, chloramphenicol, ciprofloxacin, amikacin, penicillin, ampicillin, and cotrimoxazole.

Based on the culture and sensitivity results, appropriate antibiotics were started for all patients. Management of comorbid systemic illnesses was done. Complications following retropharyngeal abscess noted and adequately managed. The mean hospital stay assessed in all patients. The prognosis and outcome with respect to age, predisposing

factors and comorbid systemic illnesses assessed. All the patients were followed for 6 months for recurrence.

RESULTS

Sex Distribution

Study was done in a total of 53 patients.

Out of 53 cases (Figure 1):

- Male - 33 (62.26%)
- Females - 20 (37.74%).

Of the 53 cases:

- Adults - 49
- Children - 4 (3 females and 1 male).

Age Distribution

The age of presentation varied from 0-10 years to 60-70 years and most of the patients were between 40 and 49 years of age (Figure 2 and Table 1).

Predisposing Factors

The main predisposing factor was trauma due to ingestion of foreign bodies, which accounted for about 40 out of 53 cases. The second main etiology was upper aerodigestive infections. In 9 cases etiologies were not clear (Figure 3 and Table 2).

Comorbid Systemic Illnesses

Out of the total no of cases, 13 had diabetes mellitus, 1 patient had human immunodeficiency virus (HIV) and tuberculosis spine. 6 people had other comorbid illnesses (1 - rheumatoid arthritis, 2 - hypertension, 1 - asthma, 1 - Kawasaki's disease, 1 - coronary artery disease) (Figure 4).

Presenting Complaints

Presenting complaints of each patient was studied. Adults with foreign body trauma presented mainly with foreign body sensation/sore throat, odynophagia, dysphagia and/or fever. Children mainly presented with difficulty in feeding and drooling (Figure 5 and Table 3).

Associated Abscesses

In some patients, there were other deep neck space abscesses along with retropharyngeal abscess. of 53, 6 had other neck space abscesses of which 5 were parapharyngeal abscess and 1 submental abscess. Among the 5 parapharyngeal abscess, 2 people were diabetic, 1 had HIV, 1 of them was a child, and 1 had no other illnesses (Figure 6).

Bacteriological Study

Pus obtained from the surgical drainage of the abscess was sent for culture and sensitivity and the following result obtained.

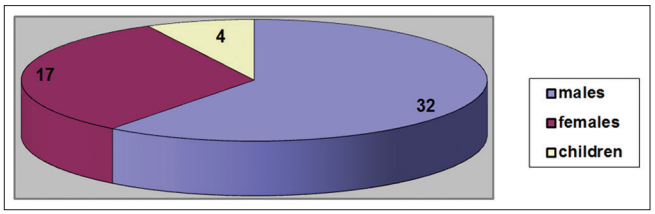

Figure 1: Number of patients - 53

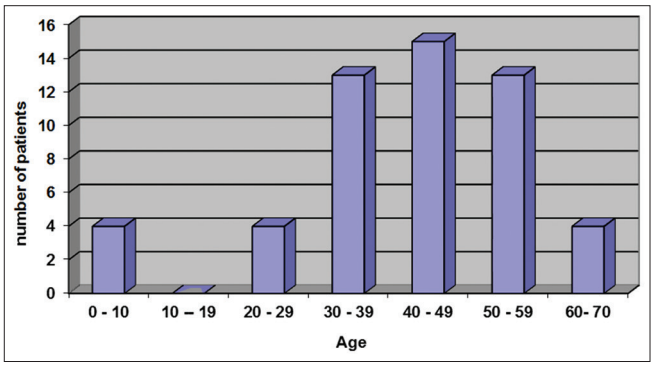

Figure 2: Age distribution

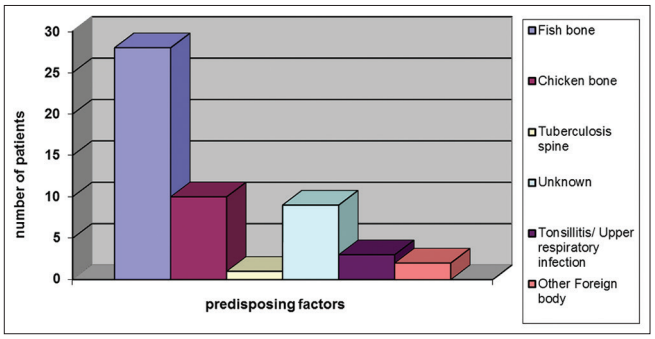

Figure 3: Predisposing factors

Table 1: Age distribution in study of retropharyngeal abscess

Age	Number of patients
0-10	4
10-19	0
20-29	4
30-39	13
40-49	15
50-59	13
60-70	4

Table 2: Predisposing factors in retropharyngeal abscess

Predisposing factors	Number of patients (%)
Fish bone	28 (52.8)
Chicken bone	10 (18.86)
Other foreign body	2 (3.77)
Upper respiratory infection/tonsillitis	3 (5.66)
Tuberculosis spine	1 (1.88)
Unknown	9 (16.98)

Streptococcus species were mostly sensitive to penicillin or cephalosporins. *Pseudomonas* showed variable sensitivities to amikacin, ciprofloxacin, piperacillin tazobactam, and vancomycin. Methicillin-resistant *Staphylococcus aureus* (MRSA) sensitive to vancomycin. In case of sterile cultures and retropharyngeal cellulitis, a general empirical treatment with ampicillin, cloxacillin, and metronidazole were started. In mixed flora ampicillin, cloxacillin, gentamicin, and metronidazole were started (Figure 7 and Table 4).

Radiological Investigation

X-rays were obtained from all 53 patients and widening more than ½ the vertebral width was diagnostic. Loss of lordosis seen in some cases. Foreign bodies were seen in some cases. CT was mostly taken in children. It was also taken in some adults who had complication and in some patients in whom the foreign body could not be localized, also in some to differentiate between cellulitis and abscess.

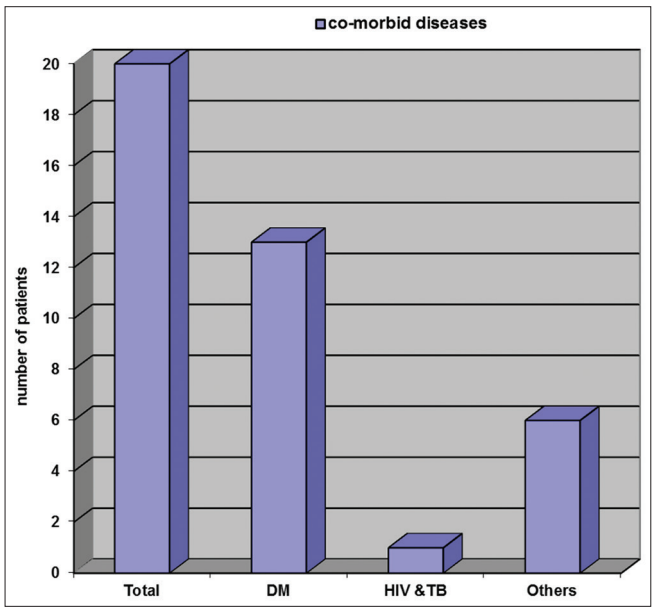

Figure 4: Comorbid diseases

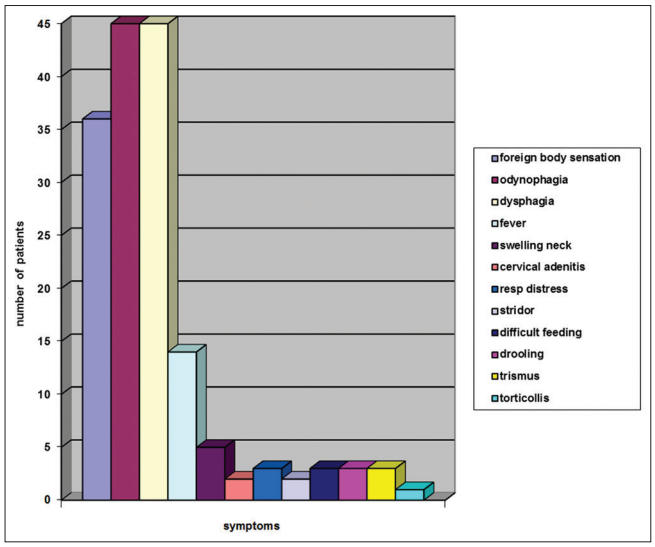

Figure 5: Presenting complaints

Complications

Of the 53 patients, 8 had complications, 7 had upper airway obstruction causing respiratory distress and 1 had mediastinitis and empyema chest. Hence, the percentage of patients having complications was 15.09%. Among the patients who had complications, 5 were diabetic and 1 was a child (Figure 8 and Table 5).

Tracheostomy

Tracheostomy was done in 8 (13.2%) of the 53 patients. 7 patients had acute airway obstruction causing respiratory distress of which one was a child. Tracheostomy was done in 6 adult patients and the child who was put on non-invasive ventilation for respiratory distress. Two people underwent tracheostomy as a precaution (Figure 9 and Table 6).

Table 3: Presenting complaints of patients with retropharyngeal abscess

Presenting complaints	Number of patients (%)
Foreign body sensation	36 (67.92)
Odynophagia	45 (84.9)
Dysphagia	45 (84.9)
Fever	14 (26.4)
Swelling neck	5 (9.43)
Cervical adenitis	2 (3.77)
Respiratory distress	3 (5.66)
Stridor	2 (3.77)
Difficult feeding	3 (5.66)
Drooling	3 (5.66)
Trismus	3 (5.66)
Torticollis	1 (1.88)

Table 4: Bacteriology in retropharyngeal abscess

Organisms	Number of patients (%)
Streptococcus viridans	12 (22.64)
Pseudomonas	8 (15.09)
Beta streptococci	4 (7.54)
Mixed flora	2 (3.77)
MRSA	1 (1.88)
AFB	1 (1.88)
No pathogen	18 (33.92)
Minimal to no pus	7 (13.2)

MRSA: Methicillin resistant *Staphylococcus aureus*, AFB: Acid-fast bacilli

Table 5: Complications in retropharyngeal abscess

Complications	Number of patients
Acute upper airway obstruction (respiratory distress)	7
Mediastinitis	1
Empyema	1

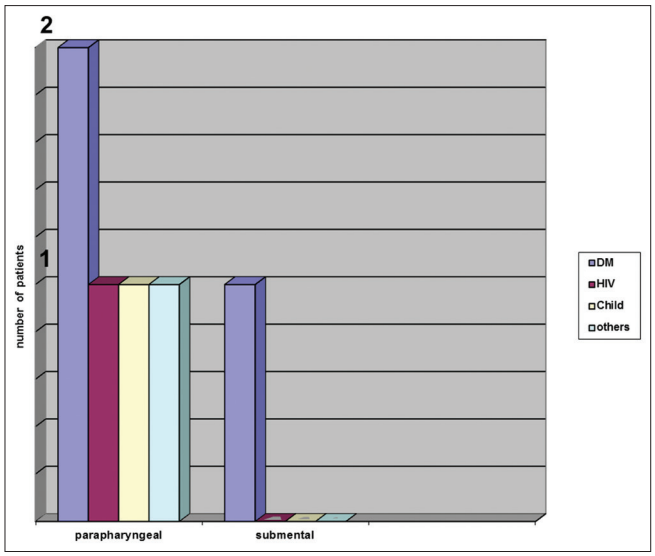

Figure 6: Associated abscesses

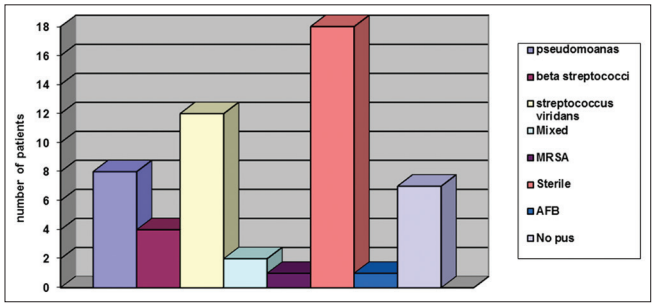

Figure 7: Microbiology

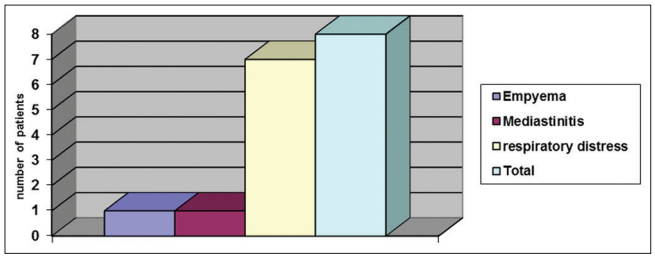

Figure 8: Complications

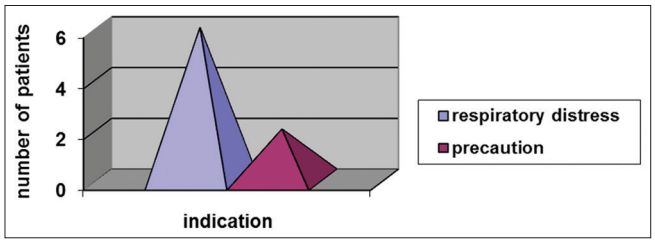

Figure 9: Tracheostomy

Hospital Stay

Of the 53 patients, longer hospital stay was seen in patients who had diabetes, complications, associated abscesses and in children. All patients after discharge were followed up for 6 months. There was no recurrence (Figure 10 and Table 7).

Table 6: Tracheostomy in patients with retropharyngeal abscess

Indication	Number of patients
Acute upper airway obstruction (respiratory distress)	6
As a precaution	2

Table 7: Hospital stay in patients with retropharyngeal abscess

Number of days	Number of patients
0-5	21
5-10	22
10-14	6
14-21	2
30	1
60	1

DISCUSSION

The management of retropharyngeal abscess remains an area of debate and development in otolaryngology circles.

Once most exclusively a disease in children, it is now seen increasingly in adults. The correct diagnosis and evaluation of this condition remain crucial for the proper and adequate treatment of the disease.

Among the 53 patients included in this study, 33 were males and 20 were females. This showed a slight male preponderance. This was consistent with the study of Poluri *et al.*[1] in 2000, where male: female ratio was 1.2: 1.

Most of the patients in this study were adults. There were 49 adults and 4 children. This was consistent with studies of Tetsuo *et al.*[2] in 1999 and Sethi and Stanley[3] in 1991 where retropharyngeal abscess was more seen in the adult population. The most common predisposing factor was a trauma due to ingestion of foreign bodies and it included 40 of the 53 cases (75.4%). Fish bones were the most common ingested foreign body. Sethi and Stanley[3] study in 1991 also showed 56.5% of the retropharyngeal abscess was due to foreign bodies. In Poluri *et al.*,[1] 2000, the study showed fish bones to be the most common ingested foreign body.

Comorbid diseases affect the general outcome of retropharyngeal abscesses. There were 14 patients of which 13 had diabetes mellitus and 1 had tuberculosis spine and HIV. Complications were more seen with people who had diabetes mellitus. The most common complications were upper airway obstruction causing respiratory

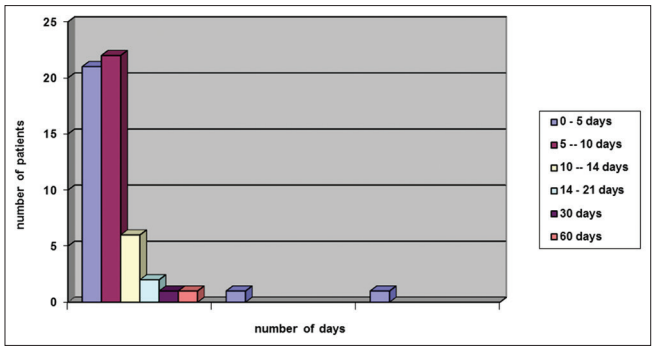

Figure 10: Hospital stay

distress (7 patients), 1 patient developed mediastinitis and empyema chest which was managed along with Department of General Surgery. Of the 8 people who developed complications 5 had diabetes mellitus. There were 6 of 53 patients who had other deep neck space infections other than retropharyngeal abscess. Parapharyngeal abscess was dealt along with the help of the Department of General Surgery. Among them, 3 were diabetic. These correlated with the studies of Tetsuo *et al.*[2] in 1999, which showed increased incidence of retropharyngeal abscess in patients with diabetes.

The presenting complaints varied from patient to patient, and the most common symptoms were foreign body sensation (67.9%), dysphagia and odynophagia (84.9%), fever (26.4%), swelling neck (9.43%), respiratory distress (3.77%), and stridor (3.77%). Whereas in the study conducted by Craig and Schunk[4] in 1991, which was mainly conducted in children, the main symptoms were fever 17%, neck mass 16%, respiratory distress or stridor 5%.

The microbiological flora of retropharyngeal abscess varied from study to study. In our study, the most common organisms were *Streptococcus* viridans, *Pseudomonas aeroginosa,* and beta-hemolytic streptococci. Most of the cultures were sterile. This may be due to the use of broad-spectrum antibiotics at local hospitals for the infection before the patient was referred to Medical College, Thiruvananthapuram, Kerala, India, for expert management. Our study correlated with findings of Pontell *et al.*[5] in 1995 in which *Streptococcus* viridans and *Klebsiella pneumonia* were most common pathogens. In 1991 study by Coulthard and Isaacs,[6] the most common pathogens were staphylococcus, *Streptococcus,* and *Klebsiella* species. Antibiotics sensitive for *Streptococcus* species was penicillins and cephalosporins. In patients with *Pseudomonas* infection sensitivity varied from ciprofloxacin, amikacin, and piperacillin - tazobactam to vancomycin. MRSA showed sensitivity to vancomycin.

X-ray was the diagnostic tool used in this study as in the study by Sethi and Stanley[3] in 1991. The widening of the retropharyngeal space more than ½ the width of vertebra and loss of lordosis were the criteria used.

In our study, all of them recovered from the complications. There were no deaths. There were no recurrences as well. In the study by Daya[7] in 2005, there were no deaths but there were 5 recurrences.

Tracheostomy was done in 8 of the 53 patients of which 6 were for respiratory distress and 2 were done as a precaution.

The hospital stay of the 53 patients varied from as short as 5 days to 2 months. Longer hospital stays were seen in patients who were diabetic as seen in studies by Leibovici *et al.*[8] in children, in patients with complications and in patients with associated other abscesses. Patients with tracheostomy also had longer hospital stay than other patients who had no complications.

CONCLUSION

1. Retropharyngeal abscess in this study was seen more in adults
2. There was a slight male predominance
3. Foreign body ingestion was the main predisposing factor
4. Immunocompromises like diabetes mellitus affected the outcome of the disease. Complications, associated abscesses and longer hospital stay were seen in these patients
5. The main bacterial flora was *Streptococcus* viridans and *P. aeroginosa*
6. Respiratory distress was the most common complication seen in our study
7. The most common associated abscess was parapharyngeal abscess, which was more seen in patients with diabetes mellitus
8. Hospital stay was longer in patients with diabetes mellitus, complications, associated abscesses and in children
9. No deaths or recurrences were seen in our study.

A sensible approach, awareness of the pitfalls and good clinical acumen should enable clinicians involved in cases of the retropharyngeal abscess to ensure that they are well managed.

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