

Changing Epidemiology Microbiology and Management Techniques of Retropharyngeal Abscess in Developing Economy in India

Keshav Gupta¹, Mohit Srivastava^{2*}, Pratik Kumar³

¹Gupta 1st Assistant Professor ENT GS Medical College & Hospital Hapur India.

² Srivastava 2nd Consultant ENT, Kingdom of Saudi Arabia (Corresponding author)

³2nd Post Graduate Resident ENT PGIMS Rohtak India

***Corresponding Author:** Mohit Srivastava, Srivastava 2nd Consultant ENT, Kingdom of Saudi Arabia

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Abstract

Aim: Retropharyngeal abscess are potentially fatal infections of deep neck spaces with high morbidity and mortality. We study the current clinical scenario of this fatal infection in the modern world.

Background: Retropharyngeal abscess are considered predominantly as pediatric infections of deep neck spaces. Their prompt diagnosis and management has always presented a challenge to healthcare expert

Study design: This is a retrospective multi-centric study conducted for 3 years at two tertiary care units and comprising 16 cases (2 pediatric and 14 adults). It focuses on each aspect of retropharyngeal abscess in today's world ranging from epidemiology to management to outcome.

Conclusion: We have noted an increase in regional incidence of retropharyngeal abscess in adult females. However, infection is more severe in children. Most of the cases in adults are a result of odontogenic infections. Also, there is an increase in no of cases due to *Pseudomonas* species. Increase in the number of multidrug resistant strains is seen. Case of tubercular retropharyngeal abscess is still seen and requires anti-tuberculosis therapy of long duration for complete resolution. Complete surgical drainage of abscess under General Anesthesia reduces duration of Hospital stay.

Key words: retropharyngeal abscess; presentation; diagnosis; management; antibiotic; drainage; practice; current scenario

Interference

Modern healthcare facilities with prompt diagnosis and complete surgical drainage under triple antibiotic cover should be promptly available to a child with stridor. Adults need to have better dental hygiene and anti-microbial testing with judicious use of antibiotics. Tuberculosis should always be ruled out in high incidence countries.

Introduction and Review of Literature

Noisy breathing or stridor is a matter of concern in pediatric patients [1]. In adults it presents as neck swelling and swallowing difficulty [2]. Retropharyngeal abscess is a common cause of pediatric stridor, commonly seen in children below five years of age [3]. Etiology might be infective, Traumatic, metabolic, neoplastic or iatrogenic [4]. Infective causes include bacteriological, tubercular, viral and fungal Etiology.

Respiratory obstruction is rapidly progressive in children and hence retropharyngeal abscess is invariably fatal until not diagnosed or not drained [5]. Diagnosis may be delayed despite the fact that a retropharyngeal abscess may be diagnosed simply by oral cavity examination and a plain x ray neck lateral view [6]. When suspected, contrast enhanced computerized tomography should be done to delineate its complete extent and so that complete drainage may be ensured. CT contributes greatly to the diagnosis, but it has limitations in differentiating abscess from cellulitis of the retropharyngeal space.

The plain radiograph in lateral view is very specific when it shows air in the retropharyngeal space [6]. However, steps for radiological and microbiological diagnosis should not delay any step of medical and surgical management as there is a risk of airway obstruction and death. Posterior pharyngeal wall bulge is seen on oral cavity examination [2].

Patients are started on Amoxycillin + Clavulinic acid 30mg/Kg body weight per dose maximum 1.2 gram per dose intravenous thrice daily or Injection Piperacillin + Tazobactam 75 mg/Kg body weight per dose maximum 3.375 gram per dose administered 6 hourly if *Pseudomonas* is suspected, Amikacin 10mg/Kg body weight maximum 500 mg per dose twice daily, Metronidazole 10mg/Kg body weight maximum 500 mg per dose thrice daily [8]. Plain x ray neck lateral view shows retropharyngeal opacity obstructing airway/food passage/both [6]. Immediate contrast enhanced computerized tomography is done to see extent of abscess in patients where repeat drainage is difficult.

The ideal time to make the drainage is in dispute. Some suggest local antibiotic injection at the same time as surgical drainage. Some studies suggest drainage of retropharyngeal abscess in selected cases only. Intra-oral or external drainage will be done depending on extent of involvement [7]. Procedure should be done in General Anesthesia in pediatric patients and uncooperative patients [9]. In other patients, drainage without Anesthesia in sitting position is preferred [10]. Few patients may require external drainage as well [11]. Pus culture sensitivity and AFB should be sent in all patients [12]. Average hospital stay is less than 20 days where intraoral drainage alone is sufficient [13]. But cases with external drainage take more time in healing of surgical wound and duration of stay increases to 1-3 weeks [8]. Rapid recovery is seen in most cases following complete incision and drainage of abscess [14].

Aim

1. To study etiology of retropharyngeal abscess
2. To study the effect of time taken to diagnose on the outcome of disease

3. To study the effect of prompt surgical drainage on outcome
4. To compare between outcome of complete drainage under General Anesthesia with outcome of drainage under Local Anesthesia
5. To compare the outcome of Intra-oral drainage with external drainage.

Study design

This is a multicentric retrospective study conducted at two tertiary care centres at India- PGIMS Rohtak and G S Medical College & Hospital Hapur including data of admitted patients in the Department of ENT over last 3 years (1st April 2019- 31st March 2022)

Inclusion criteria

Patients of all ages, patients of either sex who satisfied all of following criteria were included in the study.

1. Were admitted at our Institute during 1st April 2019- 31st March 2022
2. Had Retropharyngeal bulge on oral examination
3. Had Retropharyngeal opacity on imaging

Exclusion criteria

1. Patients with known malignancy at present
2. Patients with history of malignancy
3. Patients with history of radiotherapy
4. Patients with benign tumors of oral cavity or oropharynx
5. Patients with arteriovenous malformations.

S. No.	Age/Sex	Signs/ Symptoms	Duration	Antibiotics	Surgery	Primary Pathogen Detected	Acid Fast Bacilli	Duration of Hospital Stay	Outcome
1	8 Months/ F	Biphasic Stridor	2 Days	Amx, Mtz, Ami	Intra-Oral Drainage In Ga	None	Negative	3 Days	Improved
2	36 Years/ F	Neck Swelling Difficulty In Swallowing Restricted Mouth Opening	15 Days 3 Days 3 Days	Amx, Mtz, Ami	Intra-Oral+ External Drainage Both In La	None	Negative	8 Days	Improved
3	43 Years/M	Difficulty In Swallowing Fever	10 Days 5 Days	Amx, Mtz, Ami	Intra-Oral In La	None	Negative	11 Days	Improved
4	29 Years/F	Difficulty In Swallowing Fever	2 Days 2 Days	Piptaz, Mtz, Ami	Intra-Oral In Ga	Staphylococcus Aureus	Negative	5 Days	Improved
5	43 Years/F	Neck Swelling Difficulty In Swallowing	7 Days 1 Day	Piptaz, Ami Mtz	Intra-Oral, External Both In La	Pseudomonas Aeruginosa	Negative	12 Days	Improved
6	36 Years/F	Neck Swelling Difficulty In Swallowing Restricted Mouth Opening	15 Days 12 Days 10 Days	Amx, Mtz, Ami	Intra-Oral, External Both In La	None	Negative	8 Days	Improved
7	3 Years/F	Fever Difficulty In Swallowing	5 Days 3 Days	Amx, Mtz, Ami	Intra-Oral In Ga	None	Negative	4 Days	Improved

8	34 Years/M	Fever Difficulty In Swallowing	5 Days 2 Days	Piptaz, Ami, Mtz	Intra-Oral In La	Pseudom -onas Areugino s-a	Negative	8 Days	Improved
9	44 Years/ M	Neck Swelling Difficulty In Swallowing	10 Days 3 Days	Amx, Ami, Mtz	Intra-Oral, External Both In La	Staphylo c-occus - Aureus	Negative	11 Days	Improved
10	56 Years/M	Neck Swelling Difficulty In Swallowing	10 Days 5 Days	Piptaz, AmxMtz	Intra-Oral, External Both In La	Pseudom -onas Areugino s-a	Negative	14 Days	Improved
11	78 Years/M	Neck Swelling Fever	12 Days 3 Days	Amx, Ami, Mtz	Intra-Oral, External Both In La	Staphylo- coccus- Aureus	Negative	18 Days	Improved
12	28 Years/F	Fever Difficulty In Swallowing	21 Days 5 Days	Amx, Ami, Mtz. Started On Att On 4th Day.	Intra-Oral In Ga	None	Positive	18 Days	Improved
13	57 Years/F	Neck Swelling Difficulty In Swallowing	14 Days 3 Days	Piptaz, Ami, Mtz	Intra-Oral, External Both In La	Staphylo- coccus - Aureus	Negative	11 Days	Improved
14	82 Years/ M	Neck Swelling Difficulty In Swallowing	5 Days 3 Days	Piptaz, Ami, Mtz	Intra-Oral, External Both In La	Pseudom -onas Areugino -sa	Negative	21 Days	Improved
15	44 Years/M	Neck Swelling Difficulty In Swallowing	10 Days 5 Days	Piptaz, Ami, Mtz	Intra-Oral, External Both In La	Staphylo- coccus- Aureus	Negative	17 Days	Improved
16	62 Years/F	Neck Swelling Difficulty In Swallowing	3 Days 2 Days	Amx, Ami, Mtz	Intra-Oral, External Both In La	None	Negative	7 Days	Improved

Table 1.1: Clinical details of 16 cases of Retropharyngeal abscess presenting to our Tertiary Care Centre during last 3 years.

Abbreviations - S. No. - Serial Number, M- Male, F- Female, GA- General Anesthesia, LA- Local Anesthesia, Amx- Amoxicillin Clavulinic Acid, Amk- Amikacin, Mtz- Metronidazole, Piptaz- Piperacillin Tazobactam, all administered intravenously.

Material and Methods

We collected data for patients admitted with retropharyngeal abscess at PGIMS Rohtak and G S Medical College & Hospital Hapur from 1st April 2019- 31st March 2022. The data was tabulated in accordance with some significant clinical points and interference drawn regarding diagnosis, treatment approach, morbidity and outcome. Microsoft Windows SPSS 24 package was used to draw following interference.

1. We calculated the prevalence of various etiological factors in the population under study.

2. We recorded the duration of Hospital stay and outcome results. This was compared to the day of illness on which the patient got admitted, and hence significance of early diagnosis was calculated.
3. We compared duration of Hospital stay and outcome results with the day on which abscess was drained after onset of symptoms, and hence significance of early drainage was calculated.
4. We compared between results of drainage in General Anesthesia and drainage in Local Anesthesia
5. We compared between results of intra-oral drainage and external drainage

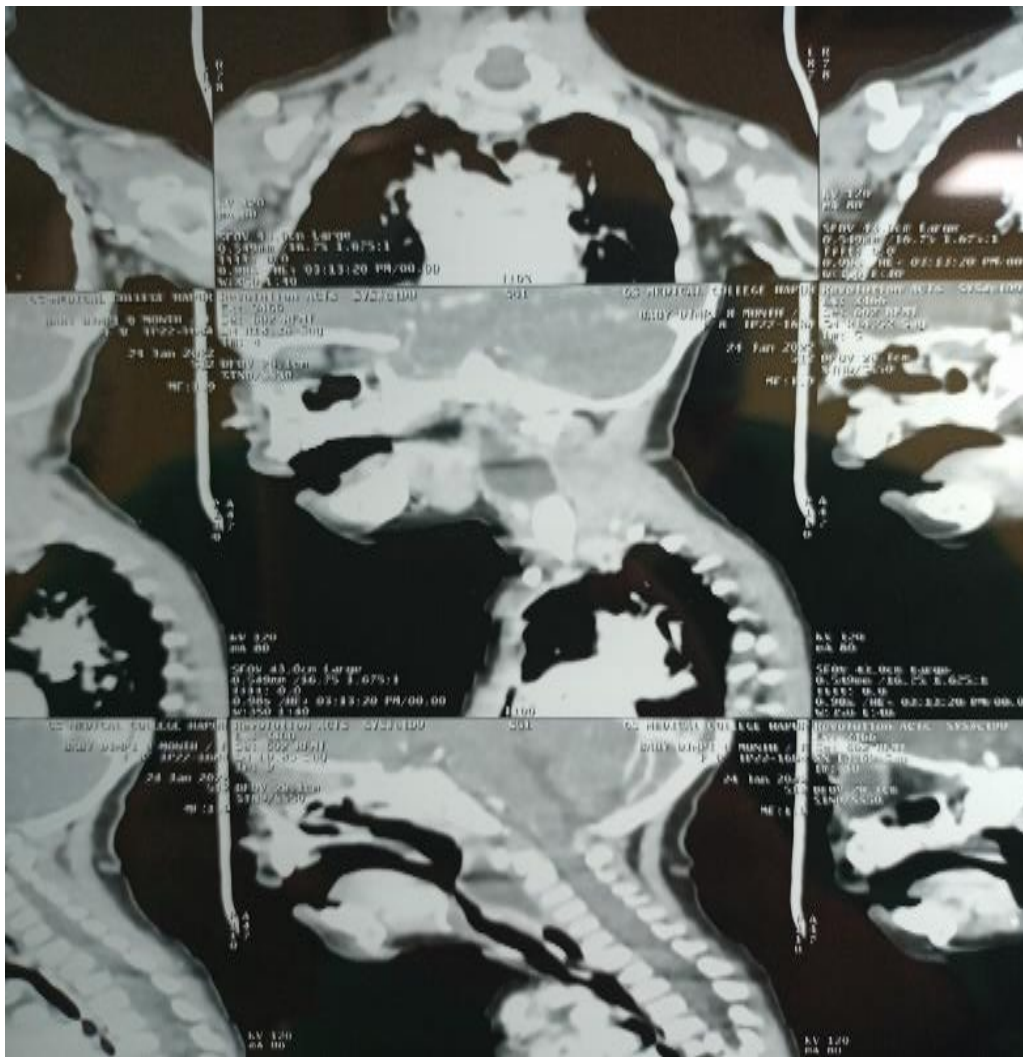


Figure 1.1: 08 months female child presented in biphasic stridor, breathing difficulty and inability to swallow. Contrast enhanced computerised tomography neck shows huge retropharyngeal, para-pharyngeal and para-tonsillar opacity with air fluid levels suggestive of retropharyngeal abscess



Figure 1.2: Patient was planned for emergency retropharyngeal abscess drainage in General Anesthesia. But had to be put on ventilator before transferring to operation theater



Figure 1.3: Pre and post-operative x-ray neck lateral view of same patient. Patient was extubated in immediate post-operative period and discharged on day 2 post-operative in fair condition.



Figure 1.4: 29 years old female presented with fever, difficulty in swallowing and difficulty in breathing. On oral examination, huge retropharyngeal bulge could be seen suggestive of retropharyngeal abscess. Intra-oral drainage was done in General Anesthesia and patient was discharged in fair condition on fourth post-operative day.



Figure 1.5: 34 years old male presented with fever and difficulty in swallowing. A small retro-pharyngeal abscess of odontogenic origin was seen on oral examination. Abscess was punctured and aspirated in Local Anesthesia. Dental treatment given and discharged on 6th post-operative day in fair condition.



Figure 1.6: 56 years male presented with external neck swelling and difficulty in swallowing. On examination, retropharyngeal bulge with external neck swelling was seen. Initially intra-oral puncture and aspiration was done in Local Anesthesia. 2 days later, on softening, external neck swelling was drained by an external incision 1 inch above and behind right angle of mandible to avoid injury to right marginal mandibular nerve. Patient recovered in 2 weeks and was discharged in fair condition.



Figure 1.7: Retropharyngeal abscess in same patient



Figure1.8: Retropharyngeal abscess with sub mental and bilateral submandibular extension



Figure 1.9: Plain radiogram neck lateral view showing retropharyngeal opacity

Observations and Result

We collected data for 16 patients over 3 years (2 children and 14 adults). First case was an eight months sick child with severe biphasic stridor and massive retropharyngeal opacity (Figure 1.1-Figure 1.3). She was intubated early during presentation and immediate surgical drainage was planned. She underwent a fast recovery and was discharged on second post-operative day. Figure 1.4-1.9 shows other clinical pictures. All the data was tabulated (Table 1.1) and results were drawn.

Majority of patients admitted with retropharyngeal abscess were adults. We saw a female predominant picture (Male: Female ratio 7:9). The cause for infection was antecedent nasopharyngeal infection in pediatric patients. Amongst adult patients (total 14, 11 had odontogenic causes, 5 had diabetes mellitus and one patient had injury by fish bone which he coughed out by himself by frequently gagging with his fingers 5 days back but developed retropharyngeal abscess. In all patients, diagnosis could be made on presentation. In patients with breathing difficulty and inability to swallow, abscess was drained on urgent basis. 6 patients required drainage on urgent basis including both pediatric patients. In three of them surgical drainage was done in GA while in other three patients puncture with 16 Gauge needle and aspiration in LA was done. In other patients also, it was ensured to aspirate pus sample soon on presentation and send it for microbiological culture-sensitivity. Empirically triple antibiotics were started soon after obtaining pus sample. Antibiotics may be changed later as per culture-sensitivity report in poorly responsive cases.

However, no such need was felt in any of our patients. All the patients improved symptomatically with drainage and antimicrobial cover. Improvement was more rapid in patients where complete excision was done in General Anesthesia (within a day) compared to patients where puncture and aspiration in Local Anesthesia was done (1-3 days). Patients with external skin incision were admitted longer (8-21 days) as complete healing took more time compared to patients with intra-oral incision only (3-11 days). Duration of hospital stay was less in patients where surgical drainage in GA was done (3-18 days) compared to those where puncture and aspiration in LA was done (8-21 days). However, the admission day on which drainage was done had no effect on duration of hospital stay.

Discussion

Retropharyngeal abscess are seen due to infection of deep neck spaces. These deep neck space infections can result in immediate life-threatening emergency, with potential for airway compromise and other catastrophic complications [15]. The retropharyngeal space is posterior to the pharynx, limited by the bucco-pharyngeal fascia anteriorly, the prevertebral fascia posteriorly, and the carotid sheaths laterally. It extends superiorly to the base of the skull and inferiorly to the mediastinum [16]. Bacteriological causes are seen in most of cases and include beta-hemolytic Streptococci and Staphylococcus aureus, anaerobic organisms (species of Bacteroides and Veillonella), or Gram-negative organisms (Haemophilus parainfluenzae and Bartonella henselae) [17]. In our patients, we isolated only two species Staphylococcus Aureus and Pseudomonas Areuginosa.

Retropharyngeal abscess has high mortality as it is capable of complications like airway obstruction, mediastinitis, aspiration pneumonia, epidural abscess, jugular venous thrombosis, necrotizing fasciitis, sepsis, and erosion into the carotid artery [18]. While in children, abscess are because of nasopharyngeal infections, in adults abscesses are usually secondary to dental infections, diabetes and trauma [19]. While retropharyngeal abscesses are considered more common in pediatric patients, we came across more adult patients. The possible explanation is that most of pediatric patients were seen by Pediatrician and ENT consultation was sought for critically ill patients only. Retropharyngeal abscess is more common in males than in females, with generally reported male preponderance of 53–55% [9]. However, we noted a female preponderance (Male:Female ratio 7:9). Adults present with neck

swelling, difficulty is swallowing and fever. The most common physical presentation is posterior pharyngeal oedema (37%), nuchal rigidity, cervical adenopathy, drooling, and stridor [19]. Carrying out radiological and microbiological examinations should not delay care [20]. Prompt diagnosis with appropriate choice of antibiotics and surgical facilities wherever required have substantially reduced mortality and morbidity in present era [21].

Conclusion

While children develop retropharyngeal abscess as a result of antecedent nasopharyngeal infections, most of the cases in adults are a result of odontogenic infections followed by Diabetes and trauma. Microbiologically, there is an increase in no of cases due to Pseudomonas species. Increase in the number of multidrug resistant strains is seen. Empirically triple antibiotics should be started after sending pus culture sample and before availability of reports. Antibiotics should be changed as soon as culture sensitivity report is available in poorly responsive cases [22]. Cases of tubercular retropharyngeal abscess are still seen and requires anti-tuberculosis therapy of long duration for complete resolution. Complete surgical drainage of abscess under General Anesthesia reduces duration of Hospital stay.

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