



## Retropharyngeal Abscess - When to Drain?

Sudhir BS\*, Shawn L, Chan K and Samridh S

Department of ENT, Georgetown Public Hospital, Guyana

### Abstract

RPA, a life threatening but a rare disease. It is more common in children than in adults. In children, URTI is commonest etiology for an RPA compared to trauma in adults. The case presented is an adult diabetic patient with a retropharyngeal abscess in whom surgical drainage was delayed leading to its extension into other deep neck spaces, producing suppurated lymphadenitis and neck abscesses.

**Keywords:** RPA: Retropharyngeal Abscess; RPI: Retropharyngeal Infection; PPA: Para-Pharyngeal Abscess; Endoscopy, I&D: Incision and Drainage; USG: Ultrasonography

### Introduction

Neck infections can be superficial, typically involving the skin and subcutaneous tissue, and the superficial fascia. It can be non-necrotizing or necrotizing. Deep infections involve the deeper neck tissues and potential spaces between them [1]. One of the spaces is retropharyngeal, which extends craniocaudally from the base of the skull to the posterior mediastinum and enclosed anteriorly by the buccopharyngeal and posteriorly by alar fascia. In children RPA usually follows an upper respiratory tract infection or primary infections of the tonsils and tooth and because in children the retropharyngeal space contains chains of lymph nodes chains [get atrophied and involute typically by age four to five years] that drain the nasopharynx, adenoids, posterior paranasal sinuses, and middle ear this leads to adenitis and abscess formation. In older children and adults, a trauma to the posterior pharynx leads to inoculation of the retropharyngeal space and abscess formation. Direct expansion from spinal discitis or osteomyelitis is a rare cause. An increase in size of an RPA can lead to odynophagia and upper airway obstruction. Treatment of retropharyngeal abscess ranges from prolonged courses of intravenous antibiotics to surgical incision and drainage [2].

### Etiology

Some predisposing factors such as underlying comorbidities, cervical lymphadenitis, neck cellulites and delay in diagnosis time have a positive correlation. A similar correlation was found in elderly male patients with neutrophilic leukocytosis and a high fever. Risk factors also include poor oral hygiene, Diabetes M, immunocompromised and low socioeconomic status. For these high-risk groups of patients, the use of aggressive therapy may reduce the incidence of complicated deep neck infection [3]. Trauma to the posterior pharynx results in inoculation of the retropharyngeal space produces cellulitis, phlegmon formation and eventually a retropharyngeal abscess [4].

### History/Signs and Symptoms

Early RPA presents like pharyngitis following upper respiratory tract infection or trauma to the posterior pharynx. The patients typically are febrile and ill-appearing and as the disease progresses, patients will have extreme discomfort symptoms from upper aerodigestive obstruction producing dysphagia and drooling of saliva, "Hot potato voice," muffled voice, neck stiffness, flexed neck and torticollis. They may also show trismus, neck swelling, cervical lymphadenopathy, respiratory distress (stridor, tachypnea, retractions) or a chest pain (mediastinal extension). In a retrospective study with 169 children in a tertiary children's hospital who were surgically treated for deep neck abscesses [between 1989 and 1999], children presented commonly with neck mass, fever, cervical adenopathy, poor oral intake and neck stiffness. Patients younger than 4 years presented with agitation, cough, oropharyngeal abnormalities, respiratory distress, retractions, rhinorrhea, stridor and trismus. Retropharyngeal or para pharyngeal regions were involved in children 1 year or older, yielding group A *Streptococcus* [5].

### Evaluation

**Blood tests:** Complete blood count, blood cultures [Both aerobic and anaerobic] and

### OPEN ACCESS

#### \*Correspondence:

Sudhir B Sharma, Department of ENT, Georgetown Public Hospital, Georgetown, Guyana, Tel: 5926782013

Received Date: 31 Jul 2023

Accepted Date: 21 Aug 2023

Published Date: 25 Aug 2023

#### Citation:

Sudhir BS, Shawn L, Chan K, Samridh S. Retropharyngeal Abscess - When to Drain?. Clin Surg. 2023; 8: 3656.

**Copyright** © 2023 Sudhir BS. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

preoperative labs are necessary. In another study on patients with retropharyngeal abscess, a white blood cell counts greater than 12,000 was reported in 91% of individuals [6].

**USG:** In children, ultrasound is preferred as it does not involve radiation and is portable. In experienced hands, ultrasound can help determine the size and location of the abscess.

## Radiographs

**X-rays:** Lateral neck radiographs [obtained during inspiration with the neck held in normal extension] are studies of choice. They have the benefit of lower radiation exposure and are better tolerated by patients who are exhibiting signs of airway compromise. Retropharyngeal infection increases the depth of the prevertebral space which in healthy children, the upper limit of normal prevertebral space is 7 mm at C2 and 14 mm at C6 and in healthy adults, the upper limit of normal prevertebral space is 7 mm at C2 and 22 mm at C6. A width of 30 mm at C6 indicates abscess collection. Additionally, patients who are presenting with chest pain, should have a chest X-ray obtained to investigate for mediastinal involvement. CT of the neck with intravenous contrast is the most definitive imaging modality. The sensitivity of CT scan for detecting retropharyngeal abscess varies in the literature ranging from 64% to 100%.

**MRI vs. CT:** The initial evaluation of acute neck infections was done in a prospective study [7] of 47 patients with neck infections and it was found that MRI was superior to CT in regard to lesion conspicuity, number of anatomic spaces involved, extension, and source.

Additionally, although not statistically significantly, MRI detected a greater number of abscess collections. CT can assist in the detection of intra-lesion gas and calcium and showed fewer motion artifacts but not significantly better than those of MRI. Hence MRI was considered superior to CT in the initial evaluation of neck infections and may be used as the first and perhaps the only modality to initially evaluate patients with neck infections when clinically feasible.

## Microbiology

Retropharyngeal abscesses are often polymicrobial infections. Bacteria that commonly contribute to these infections include Group A *Streptococcus pyogenes*, *Staphylococcus aureus*, *Fusobacterium*, *Haemophilus* species, and other respiratory anaerobic organisms. In a study [8] the most common organism cultured was *Streptococcus*, followed by *Staphylococcus*, *Bacteroides*, *Micrococcus* and *Neisseria*. Uncommon are *Candida*, *Enterobacter*, *Enterococcus*, *Peptostreptococcus*, *Proteus*, *Propionibacter*, and *Pseudomonas*. Few patients may have no growth on culture despite having organisms found on Gram's stain. Another retrospective analysis [9] of deep neck abscesses in 51 patients, managed at the Los Angeles County-USC Medical Center revealed that hemolytic streptococci and anaerobic species, especially *Bacteroides* and *Peptostreptococci*, were the most common organisms isolated.

## Management

Patients with deep neck infections should be treated urgently and airway management should always be a priority in patients with acute or imminent airway obstruction. In selected cases contrast enhanced CT scan is helpful to confirm the diagnosis and assess the extent of the disease. Clinically it may be difficult to distinguish between cellulitic changes or abscess formation in the deep tissues.

CT also can help to assist in making the proper treatment choice that is medical [for cellulitis] or surgical [for abscesses]. In superficial neck abscess there may be an underlying complication hence a CT scan is advisable. Patients with a confirmed diagnosis of retropharyngeal infection require hospital admission and intravenous antibiotics and may need a surgical intervention. Antibiotic therapy should cover upper respiratory organisms, including anaerobic organisms. Patients presenting with airway compromise should have immediate surgical incision and drainage performed [10]. The ground rule is that an abscess needs to be drained and patients should be started on antibiotics. Broad spectrum antibiotics are initially advocated and changed accordingly. By making an early diagnosis and treatment and addressing the patient's underlying disease we can then avoid complications and reduce the mortality rate of neck abscess [11]. In patients not presenting with severe respiratory distress or airway compromise, management typically begins with a 24 h to 48 h trial of intravenous antibiotic therapy. After 24 h to 48 h of antibiotic therapy, the need for surgical incision and drainage should be reevaluated. There is no evidence that patients presenting with mature abscesses greater than 3 cm, benefit from surgical intervention before 24 h to 48 h of antibiotic therapy. All patients must have careful airway monitoring when undergoing treatment of retropharyngeal abscess, especially during the first 24 h to 48 h of antibiotic therapy and be continued until patients are clinically improved and afebrile for 24 h and then it may be switched over to oral antibiotics for 14 days and the patient may be discharged home with strict return precautions.

Factors that have been associated with an increased need for surgical incision and drainage include an abscess with a cross-sectional area greater than 2 cm and symptoms for greater than two days. In a selected group of patients without imminent airway obstruction and uniloculated neck abscesses initial management by US-guided needle aspiration [small collections] or catheter drainage [large collections] under local anesthesia, can be done before resorting to open surgical drainage. If there is a pyogenic lymphadenitis at the same location then it can be treated successfully by repeated needle aspirations [12].

## Complications

RPA may get ruptured during the examination of the posterior pharynx, leading to aspiration and potential asphyxiation. To prevent this, examination should be performed with patients in the Trendelenburg position and suction equipment should be readily available. Other serious complications may be jugular vein thrombosis, carotid artery rupture, mediastinitis and rarely meningitis from a large retropharyngeal-para pharyngeal abscess. Although mortality from sepsis can occur in these patients, the number one cause of death in patients with retropharyngeal abscess remains upper airway occlusion [13].

## Case Presentation

A 67 years old female, known Diabetic Mellitus (controlled), came to A&E with complaints of pain in throat and right side of neck associated with odynophagia of 4 days duration. The patient has a history of oral trauma following attempted removal of a fish bone from her throat. On physical examination she had a swelling and bruises on superior pole of right tonsil and adjoining soft palate [around 2 cm × 3 cm] with few inflammatory follicles and congestion. There was no trismus and the uvula was central. There was no report of fever, cough, SOB or bleeding per mouth. She was admitted and an aspiration of the soft palate, [right side] returned 0.5 cc of foul-



Figure 1: Right retropharyngeal cellulitis, lymphadenitis [Suprahyoid].

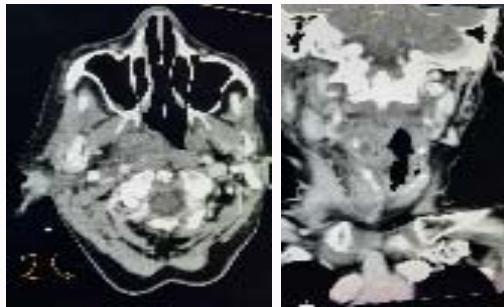


Figure 2, 3: Hypodense collections in right para-pharyngeal space producing a mass effect in oropharynx, epiglottis and pyriform fossa.



Figure 4: A repeat CT with contrast revealed a large RPA extending from nasopharynx to superior mediastinum.

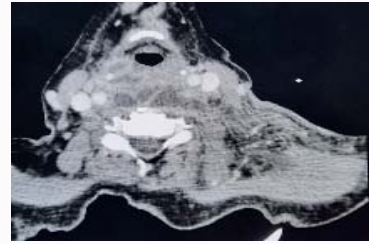


Figure 5: Cellulitis with lymphadenitis on left side of neck.



Figure 6: Left side of neck showed fluctuant suppurative lymphadenitis, one of it burst open and remaining were incised and drained.



Figure 7: Retropharyngeal space swelling resolving at upper level, on 8th post drained day.

smelling pus which was sent for C&S.

A provisional diag. of palatal [traumatic] abscess [RT side] extending to retropharyngeal space with an associated right side cervical lymphadenitis was made and a C T scan of neck was advised.

**CT Scan** - report showed thickening of prevertebral soft tissue (Figure 1), more on right side suggestive of right retropharyngeal cellulitis [4.4 cm on AP., 5 cm in length and 3 cm in transverse dimension], the level being just above the hyoid bone.

There were also few hypodense collections [largest- 2.4 cm × 1 cm × 1.9 cm] seen with in right peritonsillar region extending to right para-pharyngeal space producing a mass effect in oropharynx (Figure 2) and to a lesser extent in nasopharynx also.

Also, few small lymph nodes (approx. size 6 mm) were seen at level 2 of neck on right side (Figure 3). Mass effect was also noticed on epiglottis with effacement of right Pyriform sinus.

No mediastinal extension was noticed.

**Impression** - Right peritonsillar abscess extending to the hypopharynx and para-pharyngeal space with cellulitis.

**Progress** - An intraoral drainage of RPA under G.A. was planned but could not be done because no consent was obtained. The patient was placed on broad spectrum parental antibiotics and during first 3 days of treatment there were some improvements in pain and reduction in size of swelling [Right side of neck] along with reduced dysphagia but on 4<sup>th</sup> day [of admission] a painful swelling appeared on other side [Left] of neck [from level 2 to supraclavicular region]. The swelling was tender, firm, warm, non-fluctuant and was progressively enlarging. The odynophagia became worse and the patient had few episodes vomiting [not pus or blood mixed]. There were no spikes of temperature. A NG tube was passed and a repeat CT with contrast was ordered which revealed a large retropharyngeal abscess extending from nasopharynx to superior mediastinum (Figure 4) and cellulitis with lymphadenitis on left side of neck (Figure 5).

On 7<sup>th</sup> day of admission, the consent was given to go ahead with the surgery hence an I&D was planned. Under G.A the bulging



**Figure 8:** On 9<sup>th</sup> postoperative day the RPS swelling in lower cervical region started reducing.



**Figure 9:** On 9<sup>th</sup> postoperative day the drained neck abscesses on left side of neck were seen resolving.



**Figure 10:** On 10<sup>th</sup> Post- drainage day the RP swelling reduced to minimum as seen in neck X-ray.

of the RPA on post pharyngeal wall was incised [through a rigid hypopharyngoscope] to drain and to remove some slough and necrotic tissue [sent for culture and sensitivity]. Post op. the blood test revealed a moderate leukocytosis, mostly neutrophils but the culture report showed no pathogenic organisms. During next two days the neck swelling on left side of neck showed suppurative cervical lymphadenitis with matted glands which became fluctuant and one of it burst open (Figure 6). Remaining fluctuant abscesses were incised and drained. On the 8<sup>th</sup> day, RPS swelling, at lower level, was still seen (Figure 7). On 9<sup>th</sup> postoperative day the RPS swelling in lower cervical region started reducing (Figure 8) and the drained neck abscesses on left side of neck (Figure 9) were seen resolving. On 10<sup>th</sup> post-drainage day, the RP swelling reduced to minimum as seen in neck X-ray (Figure 10) and the patient had minimal dysphagia. The

patient was discharged with oral antibiotics and anti-inflammatory medicines for two weeks and later she was reviewed and was found asymptomatic with no swelling in neck.

## Discussion

The presented case had some predisposing factors [as mentioned in the literature] like comorbidity of DM, elderly [age] and a history of palatal trauma which occurred when the patient tried to remove a suspected fish bone from her throat. On the day of admission, the CT scan showed a retropharyngeal abscess and a right-side peritonsillar abscess. An aspiration of the peritonsillar abscess revealed 0.5 cc pus and this gave the patient some relief of her pain and dysphagia. The patient decided to wait and this resulted in delayed drainage of RPA. With the conservative treatment the swelling on ipsilateral side [Right.] of neck was kept under control but on 4<sup>th</sup> day the patient developed severe odynophagia, high fever and signs of its spread to other [Left] side of neck. At this moment the patient consented for surgery. The RPA was incised by a vertical incision [2 cm long] *via* an intraoral route [through laryngoscope], just above the level of cricopharynx and the slough with thick pus was removed from the retropharyngeal space. This slough might have been the result of a persistent RPA for 4 to 5 days. Though the drained pus was sent for C&S the result was negative for any pathological organisms. The delay in evacuation of the RPA led to its extension firstly in ipsilateral Para pharyngeal space [Right] with suppurative lymphadenitis and cellulitis of soft tissues and later to other side [Left] of neck. The cellulitis of right side of neck responded to conservative treatment but left side did not and resulted in suppurative lymphadenitis, cellulitis and subcutaneous abscesses with one of these rupturing spontaneously. The other abscesses had to be incised to drain. The patient was on continuous broad-spectrum antibiotics throughout her treatment. After I&D the retropharyngeal swelling was found to have gradually reduced (as per X-rays) with improved swallowing. Once the thick pus and slough from the RP space was evacuated and left side subcutaneous neck abscesses were drained, the wound healed faster. On the 10<sup>th</sup> day of the RPA's drainage, she was almost normal and was discharged with oral antibiotic for next 14 days.

## Summary

An intra-oral drainage of the RPA with conservative treatment of neck cellulitis was done along with drainage of suppurative lymph nodes. No extension of inflammation was noticed in mediastinum. A delay in drainage of RPA led to spread of the RPA to para pharyngeal space, lymphadenitis and cellulitis, first on ipsilateral and later on contralateral side of neck. The RPA abscess spreading to other side of neck, in spite of continued broad-spectrum antibiotics, might have been the result of a resistant infection as the antibiotics were not prescribed as per culture and sensitivity [report was negative]. The long-standing collection of RPA led to a necrotic slough in retropharyngeal space with cellulitis which resulted in a prolonged morbidity. Once a large RPA is confirmed it has to be evacuated early and as complete as possible to avoid its spreading and causing complications including fatal Mediastinitis.

## Acknowledgement

We offer sincere thanks to the institution for allowing us to use the records and permission to publish it.

## References

1. Maran AGD. Neck space infections. In: Logan Turner's diseases of the

- nose, throat and ear. Wright, London. 1988;104-8.
2. Angajala V, Hur K, Jacobson L, Hochstim C. Geographic health disparities in the Los Angeles pediatric neck abscess population. *Int J Pediatr Otorhinolaryngol.* 2018;113:134-9.
  3. Mu-Kuan C, Yung-Sung W, Cheng-Chuan C, Mei-Tang H, Hsin-Chang H. Predisposing factors of life threatening deep neck infection: Logistic regression analysis of 214 cases. *J Otolaryngol.* 1998;27:141-4.
  4. Behari S, Nayak SR, Bhargava V, Banerji D, Chhabra DK, Jain VK. Craniocervical tuberculosis: Protocol of surgical management. *Neurosurgery.* 2003;52(1):72-80; discussion 80-1.
  5. Coticchia JM, Getnick GS, Yun BD, Arnold JE. Age-, Site and Time-specific differences in pediatric deep neck abscesses. *Arch Otolaryngol Head Neck Surg.* 2004;130:201-7.
  6. Chen XH, Lin GB, Lin C, She DJ, Lin X, Chen ZH, et al. The diagnosis and treatment strategy for patients with severe multi-space abscesses in neck. *Lin Chung Er Bi Yan Hou Tou Jing Wai Ke Za Zhi.* 2016;30(17):1388-93.
  7. Munoz A, Castillo M, Melchor MA, Gutierrez R. Acute neck infections: Prospective comparison between CT and MRI in 47 patients. *J Comput Assist Tomogr.* 2001;25:733-41.
  8. Gidley PW, Ghorayeb BY, Stiernberg CM. Contemporary management of deep neck space infections. *Otolaryngol Head Neck Surg.* 1997;116:16-22.
  9. Tom MB, Rice DH. Presentation and management of neck abscess: A retrospective analysis. *Laryngoscope.* 1988;98:877-80.
  10. Joshua J, Scholten E, Schaerer D, Mafee MF, Alexander TH, Crotty Alexander LE. Otolaryngology in critical care. *Ann Am Thorac Soc.* 2018;15(6):643-54.
  11. Mazita A, Hazim MYS, Shiraz MMAR, Putra SHAP. Neck abscess: Five year retrospective review of Hospital University Kebangsaan Malaysia experience. *Med J Malaysia.* 2006;61(2):151-6.
  12. Yeow K, Liao C, Hao S. US-guided needle aspiration and catheter drainage as an alternative to open surgical drainage for uniloculated neck abscesses. *J Vasc Interv Radiol.* 2001;12:589-94.
  13. Argintaru N, Carr D. Retropharyngeal abscess: A subtle presentation of a deep space neck infection. *J Emerg Med.* 2017;53(4):568-9.