**Visual Journal of Emergency Medicine**

**Early Recognition of Airway Compromise following a Retropharyngeal abscess in the Emergency Department**

--Manuscript Draft--

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<th>VISJ-D-21-00291R1</th>
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<td>Keywords:</td>
<td>Retropharyngeal abscess, retropharyngeal space, Adult, Airway, Emergency</td>
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| Response to Reviewers: | All images have been properly marked as suggested and noted in the figures and intext as well |
This is an excellent and very educational report. Thank you very much for submitting it. Kindly revise the manuscript by adding arrows or other markers to the images to point out the relevant pathology. In addition, please refer to the arrows/markers in the body of the text. These aspects make the article much more educational for less experienced readers (students, residents, etc.). Once these revisions have been accomplished, we will be happy to accept and publish this very educational submission.

Response – arrows have been added to point to pathology

Relevant reference has been made in the cody of the mansuscript

Many thanks

Dr Osonuga
The Visual Journal of Emergency Medicine

Submission Template

Overview

**Complete submission template and then save to your computer:** Make sure to address each prompt or your submission cannot be accepted.

**Upload** (1) the saved template and (2) at least one image or video into the submission system.
1. Article Title

Early Recognition of Airway Compromise following a Retropharyngeal abscess in the Emergency Department

2. Author(s)

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3. Keywords

Retropharyngeal space, Abscess, Adult airway

4. Discussion

Retropharyngeal abscesses are extremely rare in adults. When they occur, tuberculous infections are commonly implicated.

In terms of pathophysiology, suppurative inflammation involving the retropharyngeal space, result in an acute suppurative lymphadenitis which can track down leading to different complications. These abscesses are more common in infants and younger children; associated with acute upper respiratory tract infection or lymphadenitis. The reason for this is explained as follows - The retropharyngeal space extends vertically downwards from the base of the skull to the posterior mediastinum with prevertebral fascia being the posterior border and the posterior portion of the pre-tracheal fascia forming its anterior boundary.\(^4\).
As this potential space is made of loose connective tissue with abundant lymph nodes arranged in two rows during childhood, they receive lymphatic drainage from the neck, nasal cavity, paranasal sinuses, nasopharynx, and soft palate. Therefore, infections from the ear, nose, pharynx, and throat can potentially spread through the lymph nodes resulting in a retropharyngeal abscess.\textsuperscript{4,5} However, after the age of 5 years, the lymph nodes in this space degenerate and abscesses in this region become uncommon, almost nearly limited to tuberculous conditions.\textsuperscript{6,7}

Tuberculous aetiology was unlikely in our patient. It is more likely he developed the abscess from his underlying dental pathology. Moreover, CT findings did not suggest any on-going tuberculous process (Figure 2.1 and 2.2). Indeed, other researchers have implicated other non-mycobacterium species in the aetiology of retropharyngeal abscess including \textit{Staphylococcus aureus}\textsuperscript{5} and \textit{K. kristinae} especially in immunocompromised patients\textsuperscript{8}

Based on the local anatomy of the neck, potential complications that can occur following a retropharyngeal abscess include acute airway obstruction, jugular necrotizing fasciitis, mediastinitis, aspiration pneumonia, thrombosis of the jugular vein and carotid artery erosion. Patient mortality increases when the disease progresses or the diagnosis and treatment of subsequent sepsis is delayed. This has been reported in some severe cases.\textsuperscript{5,9}

Adult-onset retropharyngeal abscess is a rare finding in adult medical practice. As first responders, Emergency physicians and nurses should have a high index of suspicion for it so as to avert fatal consequences

5. \textbf{Visual Case Discussion}

A retropharyngeal abscess, although rare, is a potential life-threatening pathology which can result in airway compromise and eventual death if not recognised early.\textsuperscript{1,2} We present a case of retropharyngeal abscess in a middle-aged man following a dental pathology which required emergency surgery.

The 55-Year-old gentleman presented to the Emergency Department with difficulty in swallowing, sudden painful swelling in the left anterior/lateral triangle of the neck for 4 days and hoarseness of voice 24 hours prior to presentation. This was on the background of pain in his left lower 2\textsuperscript{nd} molar after the patient described cracking the tooth. Due to the Corona Virus disease 2019 (COVID-19) global pandemic the patient had been reviewed via telephone consultation by his dentist who prescribed Amoxicillin and Metronidazole. He subsequently developed progressive dysphagia, initially solids and then fluid which necessitated A&E attendance. On examination, he had a large left sided neck swelling with restricted head and neck movement with associated trismus. The swelling was extremely tender on palpation. Examination of the throat revealed swelling of the left soft palate and gums with uvula deviation to the right.
Initial observations were stable apart from a marked tachycardia (Temperature 37.3 degrees Celsius, Blood pressure 123/85mmHg, Respiratory Rate 19, Oxygen Saturations 98% and Heart rate 128). However, his blood investigations revealed raised inflammatory markers (C-Reactive Protein 446.4 mg/L and White cell Count 19.3 $10^9$/L, Neutrophils 17.1 $10^9$/L).

An X-ray of the soft tissue of the neck revealed a widened prevertebral soft tissue at the level of C3 (see figure 1.0; red arrow). Subsequent contrast enhanced CT neck and thorax revealed a large, left sided retropharyngeal abscess containing fluid and gas (see Fig 2.1; red and blue arrows respectively) extending from the temporomandibular joint up to the posterior aspect of the thyroid cartilage (see Fig 2.2; see red circle). There was significant mass effect and narrowing of the respiratory tract with a deformity at the level of the vocal cords. (Figure 2.1 & 2.2).

He was referred immediately to the Ear Nose and Throat (ENT) surgeons and underwent an urgent flexible nasoendoscopy which revealed a bulging lateral wall pharynx and inability to visualise the pyriform sinus due to extensive swelling. The patient underwent emergency surgery overnight for incision and drainage of the abscess.

Intra-Operative findings revealed a massive left oropharyngeal abscess and posterior pharyngeal wall oedema with 30mls of pus drained from the deep para-pharyngeal abscess with a corrugated drain inserted. The patient was initially taken to ICU for 5 days post operatively. On ITU the patient was reviewed by the Oral Maxillofacial surgeons who noted a distal fracture of the lower left 7th tooth which was extracted under local anaesthesia. The patient was stepped down to a ward and received 8 days of IV Cefuroxime and Metronidazole whilst inflammatory and infection markers continued to be assessed. He made remarkable post-op recovery and was discharge up with follow up planned by the surgeons.

We obtained written consent from the patient to write up this case for the purpose of learning.

6. Caption for Image(s) or Video(s)
   Upload image(s) and / or video(s) separate from submission template

- Figure 1.0: Xray of the soft tissue of the neck showing the widened prevertebral soft tissue at the level of C3 – suggesting the area of the abscess. This has been highlighted by a red arrow
- Figure 2.1: CT Neck and Thorax (Coronal view) showing a large left sided retropharyngeal abscess containing fluid and gas with substantial mass effect. These findings have been highlighted in “red” for fluid and “blue” for gas
- Figure 2.2 - CT neck and thorax (Sagittal view) showing large a swelling extending from the temporomandibular joint up to the posterior aspect of the thyroid cartilage (highlighted by the red circle) with concomitant narrowing of respiratory tract.
7. References


8. Questions and Answers with a Brief Rationale

True & false and / or multiple-choice questions

- **Tips:** The questions may address issues of etiology, clinical presentation, differential diagnosis, diagnostic testing, natural history of disease, risk factors, management / treatment, potential complications, patient disposition, or other subjects pertinent to pre-hospital and hospital-based emergency medicine healthcare providers. Additional question writing guidelines can be found here.

- **Note:** You will have an opportunity to review the questions and answers before submitting your completed article. The questions and answers will not be a part of the final author proof. The questions will appear alongside your article in a test format.

**Question 1**

*Question Type* (please choose one option) multiple choice
**Question Text** From the clinical case, following is NOT a common complication of retropharyngeal abscesses in adults

**Answer Options**

- a) Mediastinitis
- b) Airway obstruction
- c) Orbital cellulitis
- d) Venous thromboembolism
- e) Sepsis (max. 80 characters)

**Correct Answer = c**

We have listed some common complications of retropharyngeal abscesses in “discussion” above with in-text references. More can be found from Medscape - Retropharyngeal Abscess Follow-up: Further Inpatient Care, Transfer, Deterrence/Prevention. 2021 Oct 17 [cited 2021 Nov 2]; Available from: [https://emedicine.medscape.com/article/764421-followup#e5](https://emedicine.medscape.com/article/764421-followup#e5)

**Question 2**

**Question Type** (please choose one option) multiple choice

**Question Text** What clinical red flags did the patient ABOVE present (Mark T: True, F: False)

**Answer Options**

- a) Dysphagia
- b) Confusion
- c) Anterolateral neck swelling
- d) Hoarseness of voice
- e) Respiratory distress and stridor

**Correct Answer = a: T /b: F /c: T /d: T /e: F**

Confusion could be a sign of an underlying pathology but in the clinical case presentation, we did not report this in our patient (see case presentation). Also, Respiratory distress / stridor could be a possibility. However, it was only found on CT he had significant mass effect narrowing the respiratory tract and causing vocal cord deformity (see CT images). Clinicians should be aware that respiratory distress / stridor could be a late sign and clinical suspicion is key when dealing with suspected cases of retropharyngeal abscess.

**9. Conflict of Interest**

We declare no conflict of Interest
Figure 1: Xray of the soft tissue of the neck showing the widened prevertebral soft tissue at the level of C3 – suggesting the area of the abscess. This has been
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