

Parapharyngeal and Retropharyngeal Abscess: Anatomical Complexity and Etiology

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SUMMARY

The differential diagnoses of an abscess deep in the neck are retropharyngeal abscess and parapharyngeal abscess. We report a case each of these deep neck space abscesses to highlight their difference with emphasis on its anatomy and possible etiologies.

KEY WORDS:

Deep neck abscess, Parapharyngeal, Retropharyngeal abscess

INTRODUCTION

For centuries, the diagnosis and treatment of deep neck space infections have been a dilemma to physicians and surgeons. The anatomical complexity of this region makes diagnosis and treatment of infections in this area difficult. These infections remain an important health problem with significant risks of morbidity and mortality. Parapharyngeal abscess and retropharyngeal abscess are deep neck abscesses that are common and thorough knowledge of their complex anatomy and aetiologies is essential in their treatment.

CASE REPORT 1

A 55 year old housewife presented with three days history of intermittent high grade fever and left neck swelling which was rapidly increasing in size and associated with neck pain. She had a history of Hypertension and Type II Diabetes Mellitus for more than 10 years on oral medication. Recently she was commenced on subcutaneous insulin for her diabetes.

On examination, the patient looked febrile with a diffuse swelling noted over the left neck measuring 6cm by 7cm. It was warm, firm and tender and situated over the upper half of left sternocleidomastoid with a normal overlying skin. The oral cavity and pharynx looked normal. Her blood glucose readings were abnormal.

The CT scan showed necrotic lymph nodes with abscess formation within the left parapharyngeal space pushing the left tonsil medially and deep to ramus of mandible extending inferiorly to the hyoid bone (Figure 1).

A clinical diagnosis of Left parapharyngeal abscess was made and surgical exploration was carried out in mid July 2004. Multiple necrotic lymph nodes with pus was seen within the

left parapharyngeal space and was evacuated. She was put on intravenous antibiotic and subcutaneous Insulin. The culture grew Klebsiella.

The postoperatively recovery was uneventful.

CASE REPORT 2

A 56 year old housewife presented with three days history of sore throat, hoarseness and stridor. She had a history of fish bone stuck in the throat few days prior to the illness, which she removed herself. She was noted to have a history of Hypertension and Type II Diabetes Mellitus for the past ten years.

On examination, she was afebrile with a normal looking neck. Indirect laryngoscopy revealed generalized oedema of the hypopharynx and larynx with pooling of saliva. There was no evidence of foreign body seen within the oral cavity and throat. Her blood glucose readings were abnormal.

CT scan showed an abscess with a foreign body within retropharyngeal space extending from the upper border of C4 to body of C6 vertebra (Figure 2).

A clinical diagnosis of retropharyngeal abscess was made and surgical exploration was carried out in late July 2004. Via a Collar incision and remaining anterior to sternocleidomastoid and lateral to thyroid and medial to the carotids, the superficial thyroid artery was identified and ligated for access to the retropharyngeal space. The accumulation of purulent discharge within the retropharyngeal space was evacuated. Intravenous antibiotics and subcutaneous Insulin was commenced. The culture grew Streptococcus group G. The postoperatively recovery was uneventful.

DISCUSSION

Infections of the deep neck spaces present a challenging problem for several reasons. The anatomy of the deep neck spaces is highly complex and can make precise localization of infections in this region difficult. Diagnosis of deep neck infections are difficult because they often are covered by a substantial amount of unaffected superficial soft tissue. Deep neck infections many times are difficult to palpate and to visualize externally. Superficial tissues are intervened to gain

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Table I: Highlighting differences between parapharyngeal and retropharyngeal abscess

	Parapharyngeal abscess	Retropharyngeal abscess
Presentation	Neck swelling. Immunocompromised eg diabetic. AIDS, renal failure etc	Stridor. Odynophagia. History of foreign body, neck trauma, etc healthy patient
Age of onset	Adult	Child.
Clinical feature	Tender neck swelling	Bulge in the posterior pharyngeal wall.
CT scan	Abscess lateral to pharynx	Behind pharynx.
Surgical approach	Neck exploration, anterior to sternocleidomastoid and inferior to parotid	Anterior to sternocleidomastoid. Between carotid laterally and pharynx medially.

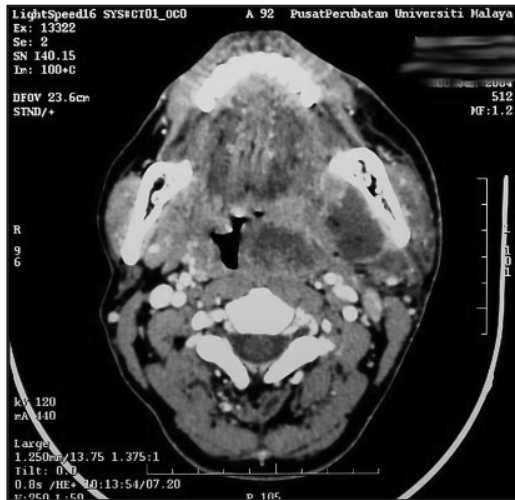


Fig. 1: An Axial CT scan showing evidence of left parapharyngeal collection.

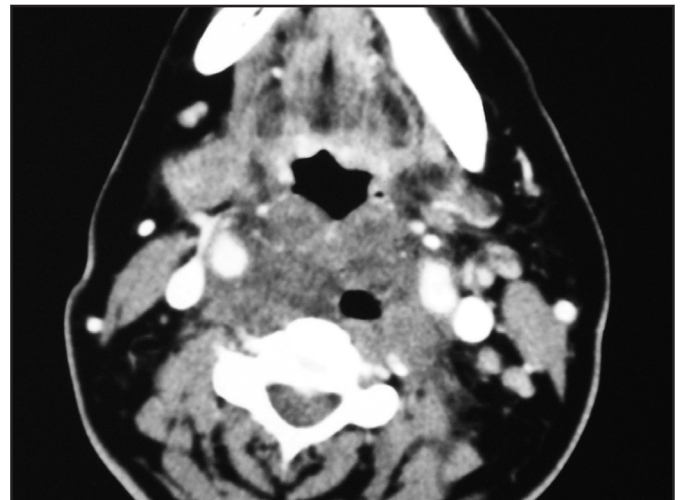


Fig. 2: An axial CT scan showing evidence of retropharyngeal collection.

surgical access to the deep neck spaces, placing all of the intervening neurovascular and soft tissue structures at risk of injury. The deep neck spaces are surrounded by a network of structures that may become involved in the inflammatory process. Neural dysfunction, vascular erosion or thrombosis, and osteomyelitis are just a few of the potential sequelae that can occur with involvement of surrounding nerves, vessels, bones, and other soft tissue. The parapharyngeal and retropharyngeal spaces have real and potential avenues of communication with each other. Infection in one space can spread to adjacent spaces, thus involving larger portions of the neck. In addition, certain deep neck spaces extend to involve other portions of the body (eg, mediastinum, coccyx), and placing them at a risk. Two main types of deep abscesses within the neck are parapharyngeal abscess which is infection and accumulation of purulent discharge within the parapharyngeal space and retropharyngeal abscess which is infection and accumulation of purulent discharge within the retropharyngeal space.

The parapharyngeal space is defined as an inverted pyramid, the base coinciding with the skull base and the apex located at the greater cornu of the hyoid bone¹. It is bounded anteriorly by the pterygomandibular raphe between the buccinator and superior pharyngeal constrictor muscles; medially by the superior pharyngeal constrictor muscle, the tonsil and the soft palate; laterally by the pterygoid muscles and ramus of the mandible anteriorly and the deep lobe of the parotid gland and posterior belly of the digastric muscle

posteriorly; and posteriorly by the vertebral column and paravertebral musculature. The parapharyngeal space can be subdivided into compartments by a line extending from the medial aspect of the medial pterygoid plate to the styloid process.

The internal maxillary artery, inferior alveolar nerve, lingual nerve, and auriculotemporal nerve comprise the anterior (ie, prestyloid) compartment. Infections in this compartment often give significant trismus². The posterior (ie, poststyloid) compartment contains the carotid sheath (ie, carotid artery, internal jugular vein, vagus nerve) and the glossopharyngeal and hypoglossal nerves, sympathetic chain, and lymphatics. It also contains the accessory nerve, which is somewhat protected from pathologic processes in this region by its position behind the sternocleidomastoid muscle³.

The parapharyngeal space connects posteromedially with the retropharyngeal space and inferiorly with the submandibular space. Laterally, it connects with the masticator space. The carotid sheath courses through this space into the chest. This space provides a central connection for all other deep neck spaces. It is directly involved by lateral extension of peritonsillar abscesses and was the most commonly affected space before the advent of modern antibiotics.

Infections can arise from the tonsils, pharynx, dentition, salivary glands, nasal infections, or Bezold abscess (ie, mastoid abscess).

Medial displacement of the lateral pharyngeal wall and tonsil is a hallmark of a parapharyngeal space infection. Trismus, drooling, dysphagia, and odynophagia also are observed commonly.

The retropharyngeal space lies between the visceral division of the middle layer of the deep cervical fascia around the pharyngeal constrictors and the alar division of the deep layer of deep cervical fascia posteriorly. It extends from the skull base to the tracheal bifurcation where the visceral and alar divisions fuse. It primarily contains retropharyngeal lymphatics⁴.

Infection may enter this space directly, as with traumatic perforations of the posterior pharyngeal wall or esophagus, or indirectly, from the parapharyngeal space. More than 60% of retropharyngeal abscesses in children are caused by URIs, whereas most infections in adults in this region are caused by trauma and foreign bodies. Other common sources of infection in the retropharyngeal space are the nose, adenoids, nasopharynx, and sinuses.

Infections of this space may drain into the prevertebral space and follow that space into the chest. Mediastinitis and empyema ensue. Abscess in the space may push forward, occluding the airway at the level of the pharynx. It may appear as anterior displacement of one or both sides of the posterior pharyngeal wall because of involvement of lymph nodes, which are distributed lateral to the midline fascial raphe. Retropharyngeal lymph nodes tend to regress by about age five years⁵, making infection in this space much more common in children than adults. Differences between this two neck abscesses is highlighted in Table I.

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