

Case Report

Parapharyngeal Abscess: A Model of Continuity and Contiguity Deep-Neck Space Infections: A Diagnostic Dilemma!

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Abstract

The aims of the present case report were to review, computed tomography (CT) scans, clinical signs, treatment, and outcome of parapharyngeal space infections. These infections remain an important health problem with significant risks of morbidity and mortality. The term parapharyngeal abscess or infection is composed of two different disorders: infection located in the posterior part of the PPS with no invasion into the parapharyngeal fat and the second disorder is when the infection involving the parapharyngeal fat may be termed parapharyngeal abscess or deep neck abscess. Diffusion into the mediastinum and other severe complications are frequent. A 59 year old male, presented with three days history of intermittent high grade fever and left neck swelling which was rapidly increasing in size and associated with stridor, odynophagia and neck pain. The infection and accumulation of purulent discharge extend into the pharyngomaxillary space and inferiorly is located at the greater cornu of the hyoid bone. Temporary tracheostomy for respiratory assistance was performed. The frequent co-existence of parapharyngeal abscess and peritonsillar abscess favours careful consideration of addition of tracheostomy to lateral cervicotomy. Parapharyngeal abscess are deep neck abscesses that are common and thorough knowledge of their complex anatomy and aetiologies is essential in their treatment. Urgent surgical drainage is therefore mandatory.

INTRODUCTION

The term parapharyngeal abscess (PPA) is used in the present study to represent abscesses that are surgically recovered, laterally to the pharyngeal constrictor muscle, and well knowing that only a minority of the patients had an abscess radiologically localized to the parapharyngeal space. Hence, parapharyngeal abscess is used as a clinical surgical term and different to parapharyngeal space abscess as radiologic term. In the present study, the pharyngeal mucosa was believed to be the site of infectious origin in the vast majority of PPA patients, as 89% of PPA patients had signs of pharyngeal mucosa infection [1-3]. Moreover, 52 % of PPA patients had concomitant PTA, which stresses the common tonsillar origin of these infections. This association seems much higher in this study than previously documented [4-19]. The frequent co-existence of PPA and PTA is not only interesting in terms of the pathogenesis of PPA, but may also give rise to therapeutic considerations as both abscesses ought to be drained for optimal recovery. Parapharyngeal abscess is a collection of pus located between the tonsillar capsule and the pharyngeal constrictor muscle. It is considered a complication of acute tonsillitis and is the most prevalent deep neck infection cause of acute admission to ENT departments.

Complications Peritonsillar abscess (PTA) are relatively rare and include parapharyngeal abscess (PPA), upper airway obstruction, Lemierre's syndrome, necrotizing fasciitis, mediastinitis, erosion of the internal carotid artery, brain abscess, and streptococcal toxic shock syndrome. The treatment consists of abscess drainage and antimicrobial therapy. Group A streptococcus (GAS) is the only established pathogen in approximately 20% of patients, the pathogens in the remaining 80% are unknown. Culturing of PTA pus aspirates often yields a polymicrobial mixture of aerobes and anaerobes.

CASE PRESENTATION

A 59 year old male, presented with three days history of intermittent high grade fever and left neck swelling which was rapidly increasing in size and associated with stridor, odynophagia and neck pain. On examination, the patient looked diffuse swelling noted over the left neck measuring 6 cm. 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 abnormal. Abscess formation within the left oropharyngeal space pushing the left tonsil medially and tonsillar prolapse is present. Peritonsillar abscess involve the posterior pillar and the posterior pharyngeal wall. Her blood

were abnormal: white blood cells: 20,4 ($10^9/L$), neutrophil granulocytes:17,32 ($10^9/L$), C-reactive protein 281,3 (mg/L). The CT scan showed the involvement of the left lateral pharyngeal space (6x4,5x3 cm). Abscess formation within the left parapharyngeal space pushing the left tonsil medially and deep to ramus of mandible extending inferiorly to the hyoid bone with a longitudinal extension of 9 cm. Swelling of the lateral posterior pharyngeal wall is transmitted to the carotid space, resulting in a reduction in air space of 6 mm (Figures 1,2). A clinical diagnosis of left parapharyngeal abscess was made and surgical exploration was carried. The basis for adequate treatment is aggressive

intravenous antibiotics and surgical drainage by incision in the submaxillary fossa followed by finger dissection and elevation of the submaxillary gland, and by extensive dissection superiorly to the styloid process to drain pre- and post-styloid spaces. The infection and accumulation of purulent discharge extend into the pharyngomaxillary space and inferiorly is located at the greater cornu of the hyoid bone. Temporary tracheostomy for respiratory assistance was performed.

DISCUSSION

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. Knowledge of the cervical fasciae and related potential spaces is of the utmost importance for understanding the etiology, symptoms, complications and treatment of complications of infection in various region of the of the head, neck and chest. The superficial fascia, Deep Cervical fascia (superficial layer of the deep fascia, middle layer of the deep fascia: muscular division and visceral division (buccopharyngeal fascia); Deep layer of the deep fascia (prevertebral division and alar division). Characteristic signs and symptoms of a pharyngomaxillary space infection include trismus due to irritation of the pterygoid muscle, induration of the angle of the jaw, and displacement of the lateral pharyngeal wall and tonsil medially. In a posterior compartment infection, the muscle of mastication are not affected, and minimal trismus is experienced. Tonsillar prolapse is present. The potential spaces are located within the pharyngeal wall, deep to the buccopharyngeal fascia, because the pharyngeal muscles are covered by the buccopharyngeal fascia, a potential space is present between muscle and the fascia. The infection of this space may remain localized or break into the lateral or retropharyngeal spaces. Peritonsillar abscess do not generally involve the posterior pillar or the posterior pharyngeal wall. When the posterior pharyngeal wall is involved, the infection may extend into the pharyngomaxillary space. Infection in this category are characterized by more serious clinical signs and symptoms, including marked toxicity, upper pharyngeal wall swelling, and severe trismus. Peritonsillar infection may extend superiorly to the soft and hard palates, the opening of the Eustachian tube, or inferiorly into the piriform sinus. Pathways of spread include direct extension by continuity, thrombosis of the peritonsillar veins, lymphatic spread, or perivascular invasion. In some case, pharyngitis or tonsillitis may completely resolve before the pharyngomaxillary infection begins [20,21].

Deep neck infections many times are difficult to palpate and to visualize externally. Superficial tissues are intervened to gain 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



Figure 1 Coronal computed tomographic scan showing the involvement of the left lateral pharyngeal space.

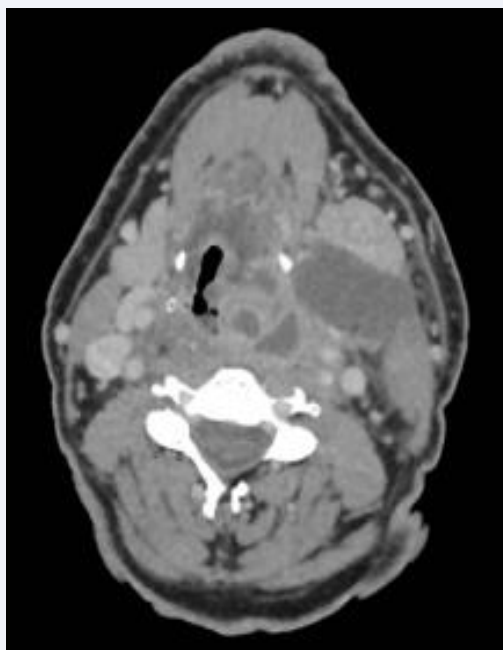


Figure 2 Axial computed tomographic scan showing the involvement of the left lateral pharyngeal space.

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 [22,23].

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 bone. 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 trismus. 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 muscle. 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 [24-26].

CONCLUSION

Incision of PPA seems to be a safe and efficient approach to these severe infections, but carries relatively frequent complications requiring close surveillance in the post-operative period. Of further note, a significant proportion of patients experience also pharyngeal edema and a need for intensive care in the days after surgery. This is especially true for PPA patients without PTA, who appear clinically to be more ill, and experience more frequent complications and a more frequent need for

intensive care, intubation, and tracheotomy, when compared to PPA patients with concurrent PTA. Clinicians should be aware of the rather frequent co-existence of PPA and PTA, and given the severity of the disease, also be aware that PPA can be accompanied by necrotizing fasciitis. This case report highlights the importance of their early diagnosis and early intervention. The severe airway compromise caused by them may make diagnosis difficult. The cervicotomy in combination with a narrow-spectrum intravenous penicillin plus metronidazole is a safe and efficient approach for managing parapharyngeal abscesses. This approach, however, carries a relatively high complication rate, requiring close surveillance in the early post-operative period. The patients require intensive care, intubation, and tracheotomy, than parapharyngeal abscess patients with concurrent peritonsillar abscess. The frequent co-existence of parapharyngeal abscess and peritonsillar abscess favours careful consideration of addition of tracheotomy to lateral cervicotomy.

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