

A Pain in the Neck - A review of Deep Space Neck Infections in the Emergency Department

Abstract:

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Abstract

We report a case of prevertebral abscess in a 37-year-old male, presenting with a 2-day history of neck pain radiating to the right shoulder. We also review the current literature relating to the presentation and the emergency management of deep neck space infections.

Introduction

Neck pain is a common presentation to the Emergency Department. Although most cases are musculoskeletal in origin, it is important to consider deep neck space infection (DNSI) in this cohort of patients. DNSIs pose a diagnostic challenge as they traverse complex anatomy and are often clinically impossible to localise as overlying tissue and structures are often unaffected. These patients may develop devastating complications if the diagnosis is not made early. We report a case of prevertebral abscess; and discuss the anatomy, aetiology, diagnosis and emergent management of DNSI.

Case Report

A 37-year-old male presented with a 2-day history of acute neck pain, radiating to the right shoulder, with no limb weakness or paraesthesia. The patient had no significant medical history, or predisposing risk factors. Examination revealed cervical spine tenderness from C2 to C4, and a significantly reduced range of motion. Oropharyngeal examination was normal. There were no neurological deficits or fever. Haematological studies revealed a raised white cell count of $17.3 \times 10^9/L$, an ESR of 4mm/hr and a CRP of 7.9mg/L. Our differential diagnosis at this point was acute cervical disc herniation, discitis, tuberculosis of the cervical spine, or DSNI. Plain radiography of cervical spine revealed no acute abnormality. MRI was subsequently performed to outrule an acute cervical disc herniation (Figure 1). This revealed a prevertebral collection extending from C2 to the level of C5-C6. This finding was subsequently confirmed by CT (Figure 2), showing a prevertebral linear collection from level of soft palate to level of upper oesophagus.

The patient was admitted by the Ear, Nose and Throat (ENT) surgeons, and was commenced on a course of intravenous cefuroxime and metronidazole. He made an uneventful recovery and was discharged after 14 days. Abscess resolution was confirmed by repeat CT prior to discharge.

Figure 1: MRI of Cervical Spine showing prevertebral abscess

Figure 2: CT of Neck demonstrating collection from level of soft palate to level of upper oesophagus

Discussion

Deep space neck infections (DNSI) are defined as infections that spread along the fascial planes and spaces of the neck. The three major affected anatomical spaces are Retropharyngeal space, Prevertebral space, and Parapharyngeal space. The retropharyngeal space is bounded by the buccopharyngeal fascia posteriorly and the alar fascia anteriorly. It extends from the skull base to the superior mediastinum. The prevertebral space is enclosed by the prevertebral fascia anteriorly and vertebral bodies posteriorly. It extends from the skull base to the coccyx. The parapharyngeal space is shaped like an inverted pyramid, with the skull base superiorly, and the hyoid bone the apex, inferiorly. Medially lies the pharynx. Anteriorly is the pterygomandibular raphe. Posteriorly lies the carotid sheath. Laterally lies the ramus of the mandible, the parotid gland, the medial pterygoid muscle, and the fascia of the posterior belly of digastric muscle.

Causes of DNSIs in adults include dental infection, peritonsillar abscess, recent spinal surgery, intravenous drug abuse, immunosuppression, diabetes, and trauma. In children, the most encountered causes are acute tonsillitis and pharyngitis. Up to 50% have no identifiable cause. Common clinical symptoms are odynophagia (80%), dysphagia (70%), neck swelling (45%), and trismus (14%). Common clinical signs are pyrexia, neck asymmetry, palpable mass, leukocytosis, and focal neurological deficits.

Lateral neck radiography may reveal soft tissue swelling in the prevertebral region, however, contrast-enhanced CT scanning is the gold standard radiologic evaluation. It has a sensitivity ranging from 95 to 100% in identifying and characterizing DSNI. Streptococci, Anaerobes and Staphylococcus aureus are the organisms most commonly cultured from DNSIs. Optimal medical treatment includes penicillinase-stable antibiotics, eg. a cephalosporin, in combination with an anti-anaerobic drug, eg. metronidazole. Recent reviews indicate that 50% of DSNI can be managed nonsurgically in patients with small collections and no respiratory compromise. Other studies support the option of primary nonsurgical management for selected DSNI, reserving surgical drainage for patients who do not improve within 48 hours of initiation of broad-spectrum antibiotics. Life-threatening complications such as airway compromise, jugular vein

thrombosis, mediastinitis, pericarditis, and arterial erosion may develop due to delays in diagnosis of DNSI. Priorities in the emergent management of DNSI should be; Control of the airway, via endotracheal tube intubation or tracheotomy if necessary, as loss of the airway is the most common early cause of death in patients with complicated DNSI, early administration of appropriate intravenous antibiotics, and prompt referral to an ENT service for potential surgical drainage. In conclusion, DNSI is a challenging diagnosis to make owing to complex overlying anatomy. However, with appropriate early radiological imaging, airway support, adequate antimicrobial therapy, and timely surgical drainage, morbidity and mortality from DNSI can be minimized.

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