Original Article - Retrospective Study

Features of Prevertebral Disease in Patients Presenting to a Head and Neck Surgery Clinic with Neck Pain

Scharukh Jalisi, Osamu Sakai[1], Basem T. Jamal[2,3], Vartan Mardirossian[4]

Department of Otolaryngology Head and Neck Surgery, [1]Department of Radiology, Boston Medical Center, Boston, MA, USA, [2]Department of Oral & Maxillofacial Surgery, King AbdulAziz University, [3]International Medical Center, Jeddah, Saudi Arabia, [4]Department of Surgery, Florida Atlantic University, Boca Raton, Florida, USA

Abstract

Introduction: Untreated prevertebral space infections, which can be overlooked because of connections with surrounding spaces, may lead to spinal epidural accumulations that cause cord compression. The aim of this study was to analyze the epidemiologic and diagnostic features of cases of prevertebral disease encountered by head and neck specialists. **Materials and Methods:** The study was designed as a retrospective chart review of 11 patients with prevertebral disease who presented to a head and neck surgery specialist for consultation from 2004 to 2010. Epidemiologic characteristics, clinical signs, diagnostic modalities, time to diagnosis, treatment, and final outcome were analyzed. **Ethical Approval:** This article does not contain any studies with human participants or animals performed by any of the authors. **Results:** Seven patients were diagnosed with prevertebral abscess, two with prevertebral cellulitis, and two with calcific cervical tendonitis. The most common presenting signs were neck pain (100%), odynophagia (54%), dysphagia (36%), neck rigidity (36%), fever (27%), and back pain (9%). Five patients (45.5%) showed a bulge on the posterior pharyngeal wall. Four patients with prevertebral abscess showed epidural accumulations on magnetic resonance imaging. Patients with prevertebral abscess and cellulitis were treated with surgical drainage or intravenous antibiotics or both while patients with calcific cervical tendonitis were treated with anti-inflammatory and pain medications. Ten patients were cured, and one with multiple comorbidities succumbed to the disease. **Conclusion:** Clinicians should have a high index of suspicion of prevertebral abscess or cellulitis in patients presenting with neck pain, fever, dysphagia, and limited range of motion of the neck. Head and neck specialists may be the first to encounter and diagnose this highly morbid disease.

Keywords: Cellulitis, diagnostic features, epidemiology, neck pain, prevertebral disease

Introduction

Infections of the prevertebral space, including prevertebral abscess and cellulitis, may be caused by the following conditions:[1] upper respiratory tract, odontogenic, or skin infections that reach this space by local extension or hematogenous spread (in common with other deep neck space infections);[2] trauma, postoperative infection, or intravenous drug use;[3] anterior spread of spinal osteomyelitis; and[4] local inflammatory diseases such as discitis and tendonitis. Of note, local inflammatory diseases are the most common source of infection in this space.[1-3]

The risk of untreated prevertebral space infection is that it can lead to spinal epidural accumulations that cause cord compression, which can cause paralysis in 4%–22% of patients.[4,5]

Access this article online

Quick Response Code:

Website: www.amsjournal.com

DOI: 10.4103/ams.ams_54_17

Prevertebral diseases have a wide spectrum of clinical presentations. This, together with the anatomic and radiologic contiguity of the retropharyngeal, danger, and prevertebral spaces, can lead to significant delays in the localization of the infectious process, which in turn lead to delays in adequate and prompt treatment.[6]

Specialists in the head and neck surgery field need to be aware of this clinical entity to ensure appropriate treatment and if necessary, timely referral of patients who present with neck pain, because delays in the treatment of this condition may be devastating. This study was designed to analyze

Address for correspondence: Dr. Basem T. Jamal, King AbdulAziz University Hospital, Jeddah, Saudi Arabia. E-mail: bjamal@kau.edu.sa

How to cite this article: Jalisi S, Sakai O, Jamal BT, Mardirossian V. Features of prevertebral disease in patients presenting to a head and neck surgery clinic with neck pain. Ann Maxillofac Surg 2017;7:228-31.

the epidemiologic and diagnostic features of patients with prevertebral disease presenting to head and neck specialists.

Materials and Methods

A retrospective, chart review was carried out for 11 patients with prevertebral disease who presented to a head and neck surgery specialist for consultation from 2004 to 2010. The epidemiologic characteristics, clinical signs, diagnostic modalities, time to diagnosis, surgical or medical treatment, and final outcome were analyzed for each patient.

Results

Study population

The median age of the 11 patients was 52 (range 41–72) years. The duration of symptoms before presentation ranged from 1 to 10 days with an average of 5 days. The most common presenting signs in our group of patients were neck pain (100%), odynophagia (54%), dysphagia (36%), neck rigidity (36%), fever (27%), and back pain (9%).

Diagnosis

Seven patients were diagnosed with prevertebral abscess, two with prevertebral cellulitis, and two with calcific cervical tendonitis. In 10 patients, a specialist in head and neck surgery was consulted, and fiberoptic examination was carried out. On fiberoptic examination, a bulge on the posterior pharyngeal wall was seen in five patients (45%) and no abnormality was found in four patients. In two cases, the patient was already intubated at the time of evaluation of the head and neck. All patients underwent imaging studies according to clinical presentation; both computed tomography (CT) and magnetic resonance imaging (MRI) were performed in six patients and either CT or MRI was performed in five patients. Four of the patients with prevertebral abscess showed epidural accumulations on MRI, and one of these patients developed neurologic signs [Figure 1]. The two patients diagnosed with calcific cervical tendonitis showed characteristic calcification along the course of the longus colli muscle on CT [Figure 2].

Treatment and outcome

Six of the seven patients with prevertebral abscess underwent cervical incision and drainage followed by the administration of intravenous antibiotics. The mean total duration of parenteral antibiotic treatment was 2 months. The remaining patient with prevertebral abscess refused surgical treatment and was treated with antibiotics alone, after which the patient's condition improved. Bacterial culture of samples from the patients who underwent surgery yielded various microorganisms, including *Staphylococcus aureus,* Group A Streptococcus, and *Propionibacterium acnes*. Of the two patients with prevertebral cellulitis, one was treated with antibiotics alone, and the other underwent cervical laminectomy and fusion, because of the development of quadriplegia and urinary incontinence that was followed with intravenous antibiotics. The two patients with calcific cervical tendonitis were treated with nonsteroidal anti-inflammatory drugs and narcotic pain medications.

Ten patients were cured and one patient with multiple comorbidities who had prevertebral and epidural abscesses that were treated by incision and drainage followed by antibiotics succumbed to the disease after developing sepsis. In regard to posttreatment complications, one patient presented with a psoas muscle abscess, which was treated successfully, and none of the patients suffered permanent neurologic sequelae.

Discussion

The prevertebral space lies between the vertebral bodies and prevertebral fascia and extends from the base of the skull caudally to the coccyx. It is one of the four spaces that extend throughout the entire length of the neck.[7,8] While infectious processes of the deep neck spaces, such as the parapharyngeal and retropharyngeal spaces, have been widely reviewed, there are limited reports in the head and neck surgery literature concerning infectious and inflammatory diseases of the prevertebral and epidural spaces. This study investigated the epidemiologic and diagnostic features of patients with prevertebral space disease.

The presentation of cervical epidural and prevertebral infection has been described extensively in the neurosurgery literature.[9,10] However, systematic review and characterization

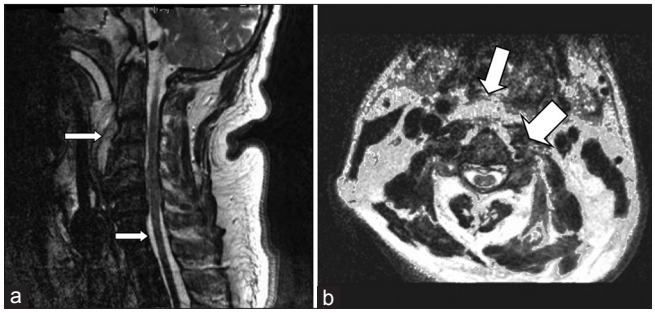

Figure 1: Prevertebral and epidural abscess on preoperative magnetic resonance imaging. (a) Sagittal view (b) Axial view

Figure 2: Computed tomographic image of cervical calcific tendinitis showing calcification along the course of the longus colli muscle

of cervical prevertebral abscess and cellulitis are largely missing from a head and neck standpoint. Patients with prevertebral disease present with nonspecific complaints, which may include neck, back, or shoulder pain that worsens with swallowing, limited range of motion of the neck, and dysphagia. Physical examination may be unremarkable or reveal a midline bulge in the oropharynx and hypopharynx.[3,6]

Calcific prevertebral tendinitis, which was diagnosed in two of our patients, is a benign inflammatory disorder caused by deposition of calcium hydroxyapatite in the fibers of the longus colli tendon. It is usually a self-resolving condition and presents with features similar to those of a prevertebral abscess, including neck pain, low-grade fever, dysphagia, and limited cervical motion, as demonstrated in both cases in our series. A clinical diagnosis is often missed, given the nonspecific presenting symptoms, which mimic other acute conditions including retropharyngeal or prevertebral abscess, pharyngitis, meningitis, epiglottitis, infectious spondylitis, and traumatic injury. A definitive diagnosis can be established using CT, which typically reveals prevertebral calcification anterior to C1 and C2, corresponding to the longus colli muscle, and prevertebral soft-tissue swelling between C1 and C4.[11] Medical management includes the administration of nonsteroidal anti-inflammatory drugs together with narcotic analgesics as needed, which was sufficient to relieve the symptoms of the two patients in our study.

Prevertebral space infection is relatively uncommon and occurs much less frequently than infection of the other deep neck spaces and accounts for 1%–3.8% of these infections.[12-14] Prevertebral abscess can be differentiated from a retropharyngeal abscess on MRI by carefully examining the displacement of the longus colli muscle, which is anterior in prevertebral abscess and posterior in retropharyngeal abscess [Figure 1].

Prevertebral abscess is difficult to identify; in one report, half of the cases were initially misdiagnosed.[15] Neck pain is a landmark symptom of prevertebral and epidural abscess and was present in all patients in our study, including those with prevertebral calcific tendonitis. However, other symptoms were also present in our study patients. Hence, the presence of associated symptoms such as dysphagia, intense odynophagia, and fever should raise suspicion for prevertebral or epidural infection and prompt a radiographic examination. Neurologic manifestations vary depending on the degree and level of spinal cord compression if present.

Treatment of prevertebral space infection with surgical drainage is controversial. However, it has been reported that a substantial proportion of patients undergoing conservative therapy with antibiotics alone eventually deteriorate and require surgical intervention.[16] Because of delayed treatment of infection, the risk of morbidity and mortality due to the condition may be greater in patients treated conservatively than in those receiving early surgical intervention.[17] It is the opinion of the authors that incision and drainage should be performed in all patients with prevertebral abscess and that conservative therapy be reserved for patients who refuse surgery. The single patient in our sample who refused surgery and was treated conservatively did ultimately recover from the disease. Older reports specify the patients in whom conservative therapy may be selected over surgical intervention, including those who are medically stable, those who have access to MRI, and those with no or minimal neurologic deficit.[18]

The current recommendation for antibiotic therapy for prevertebral infections is as follows: for uncomplicated prevertebral space infections without evidence of discitis or osteomyelitis, 2–3 weeks of therapy is adequate. We favor intravenous antibiotics for the entire duration of treatment. When adjacent osteomyelitis is present, at least 6–8 weeks of intravenous antibiotics is necessary.[19]

Distant abscess in the psoas muscle may develop as a complication in patients with epidural abscess because of the contiguity of the prevertebral space with the psoas muscle sheath. This condition has been reported previously and developed as a postoperative complication in one of our patients.[20]

Conclusion

Specialists in the head and neck field should have a high index of suspicion for prevertebral abscess or cellulitis in patients who present with neck pain, fever, dysphagia, and limited range of motion of the neck. This is of particular importance, because these specialists may be the first to encounter and diagnose this highly morbid disease process. Undiagnosed prevertebral or epidural abscess can lead to catastrophic neurologic sequelae. Treatment includes incision and drainage of the abscess followed by aggressive broad-spectrum antibiotic therapy. Cervical tendonitis can mimic prevertebral abscess but has a more benign course and requires anti-inflammatory treatment.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Reynolds SC, Chow AW. Life-threatening infections of the peripharyngeal and deep fascial spaces of the head and neck. Infect Dis Clin North Am 2007;21:557-76, viii.
2. Yellon RF. Head and neck space infections. In: Bluestone CD, Casselbrant ML, Stool SE, Dohar JE, Alper CM, Arjmand EM, *et al*, editors. Pediatric otolaryngology. Volume 2. 4th ed. Philadelphia: Saunders; 2003. p. 1681-701.
3. Davis WL, Harnsberger HR. CT and MRI of the normal and diseased perivertebral space. Neuroradiology 1995;37:388-94.
4. Reihsaus E, Waldbaur H, Seeling W. Spinal epidural abscess: A meta-analysis of 915 patients. Neurosurg Rev 2000;23:175-204.
5. Darouiche RO. Spinal epidural abscess. N Engl J Med 2006;355:2012-20.
6. Paonessa DF, Goldstein JC. Anatomy and physiology of head and neck infections (with emphasis on the fascia of the face and neck).

Otolaryngol Clin North Am 1976;9:561-80.
7. Skandalakis JE, Carlson GW, Colborn GL, Gray SW, Rowe JR. Chapter 1. Neck. In: Skandalakis surgical anatomy. Skandalakis JE, Colburn GL, Weidman TA, Foster RS, Kingsnorth RN, Skandalakis LJ, *et al*, editors. New York: McGraw-Hill; 2004.
8. Dhillon N. Anatomy. In: Lalwani AK, editor. Current Diagnosis and Treatment in Otolaryngology: Head & Neck Surgery. 3rd ed., Ch. 1. New York: McGraw-Hill; 2012.
9. Zafonte RD, Ricker JH, Hanks RA, Wood DL, Amin A, Lombard L, *et al.* Spinal epidural abscess: Study of early outcome. J Spinal Cord Med 2003;26:345-51.
10. Ruiz A, Post MJ, Sklar EM, Holz A. MR imaging of infections of the cervical spine. Magn Reson Imaging Clin N Am 2000;8:561-80.
11. Kanzaria H, Stein JC. A severe sore throat in a middle-aged man: Calcific tendonitis of the longus colli tendon. J Emerg Med 2011;41:151-3.
12. Larawin V, Naipao J, Dubey SP. Head and neck space infections. Otolaryngol Head Neck Surg 2006;135:889-93.
13. Brook I. Microbiology and management of peritonsillar, retropharyngeal, and parapharyngeal abscesses. J Oral Maxillofac Surg 2004;62:1545-50.
14. Ridder GJ, Technau-Ihling K, Sander A, Boedeker CC. Spectrum and management of deep neck space infections: An 8-year experience of 234 cases. Otolaryngol Head Neck Surg 2005;133:709-14.
15. Davis DP, Wold RM, Patel RJ, Tran AJ, Tokhi RN, Chan TC, *et al.* The clinical presentation and impact of diagnostic delays on emergency department patients with spinal epidural abscess. J Emerg Med 2004;26:285-91.
16. Patel AR, Alton TB, Bransford RJ, Lee MJ, Bellabarba CB, Chapman JR, *et al.* Spinal epidural abscesses: Risk factors, medical versus surgical management, a retrospective review of 128 cases. Spine J 2014;14:326-30.
17. Curry WT Jr., Hoh BL, Amin-Hanjani S, Eskandar EN. Spinal epidural abscess: Clinical presentation, management, and outcome. Surg Neurol 2005;63:364-71.
18. Hanigan WC, Asner NG, Elwood PW. Magnetic resonance imaging and the nonoperative treatment of spinal epidural abscess. Surg Neurol 1990;34:408-13.
19. Brook I. Microbiology and principles of antimicrobial therapy for head and neck infections. Infect Dis Clin North Am 2007;21:355-91, vi.
20. Mückley T, Schütz T, Kirschner M, Potulski M, Hofmann G, Bühren V, *et al.* Psoas abscess: The spine as a primary source of infection. Spine (Phila Pa 1976) 2003;28:E106-13.