

From a Suspicion of Meningitis to the Diagnosis of Cervical Spondylodiscitis: A Case Report

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Abstract

Cervical spondylodiscitis or vertebral osteomyelitis is a rare condition, the incidence of which is probably often underestimated due to a lack of knowledge on the part of the medical community. The clinical presentation (neck pain and fever) often remains nonspecific. In the case, the patient was hospitalised under suspicion for bacterial meningitis. Subsequently, the first diagnosis was reconsidered given the negative results of the CSF cultures, the persistence of neck pain and the context of several surgical cures of a recurrent ENT neoplasia. A cervical spondylodiscitis was then suggested and confirmed by cervical CT-scan and brain MRI.

Keywords: Spondylodiscitis • Vertebral osteomyelitis • Meningitis

Introduction

Vertebral osteomyelitis is primarily a disease of adults; most cases occur in patients >50 years old [1,2]. The incidence increases with age. Men are affected approximately twice as often as women in most case series; the reason for this is not fully understood. Risk factors for vertebral osteomyelitis include injection drug use, infective endocarditis, degenerative spine disease, prior spinal surgery, diabetes mellitus, corticosteroid therapy, or other immunocompromised state. The annual incidence of hospitalization for vertebral osteomyelitis in the United States between 1998 and 2013 rose from 2.9 to 5.4 per 100,000 [3,4]. Reasons for the increase in incidence include:

- Increasing rates of bacteremia due to intravascular devices and other forms of instrumentation; an increasing proportion of vertebral osteomyelitis is health care related and/or post-procedural (up to one-third of new cases) [4-6].
- Increasing age of the population
- Increasing number of patients on renal replacement therapy
- Increasing number of patients on immunosuppressive medications..

Case Report

A 58 year old patient was admitted to the emergency room with pyrexia at 39.1° of two days duration, neck pain caused by stiff neck and occipital headaches. The neck stiffness has been present for about twenty days following ENT surgery (pharyngeal lesion with diagnosis of recurrent carcinoma little differentiated squamous cell invasive in the superficial part of the surgical specimen). The patient is not suffering from nausea or vomiting, no presence of photo- and phonophobia, no other cardio-respiratory complaints. In the emergency room, a brain CT without injection was performed and ruled out a mass effect or any acute expansive lesion.

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The diagnosis of meningitis had been mentioned, the puncture lumbar spine performed revealed 19 Wbc (predominance of lymphocytes at 83%), 20 red blood cells including 4 crenate, a glycorachia 0.45 g/L. Subsequently the cultures of the CSF returned negative. The patient was put on Ceftriaxone and Pentrexyl empirically. However, after 5 days, due to the persistence of neck pain despite a week of treatment and the negative results of the Culture of cerebrospinal fluid, the diagnosis of spondylodiscitis was suggested. Cervical CT scan injected during hospitalisation revealed a spondylodiscitis C5-C6 (with posterior collection and meningeal enhancement marked with level C6-C7 (Figure 1), later confirmed by cervical MRI (Figure 2).

Neurosurgeons did not recommend any intervention given the absence of neurological deficit or cervical neck brace due to the absence of lytic bone lesion. The infectious disease specialists recommended the continuation of treatment with ceftriaxone and Ampicillin in IV. Following the onset of skin rash on 11/17, treatment with Ampicillin stopped and switched to Clindamycin. No germ could be identified but the evolution was favourable 3 weeks after starting a treatment with Moxifloxacin.

Discussion

Vertebral osteomyelitis is an infection of a spinal disc and adjacent vertebral

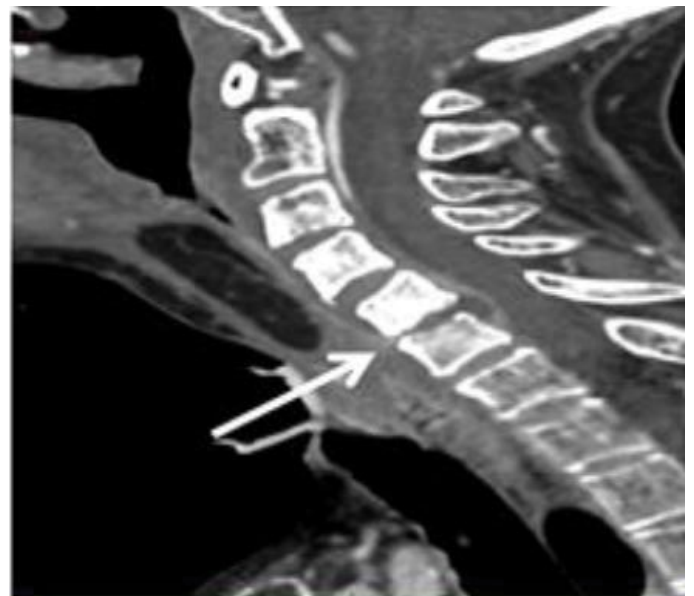


Figure 1. Spondylodiscitis at C5-C6.

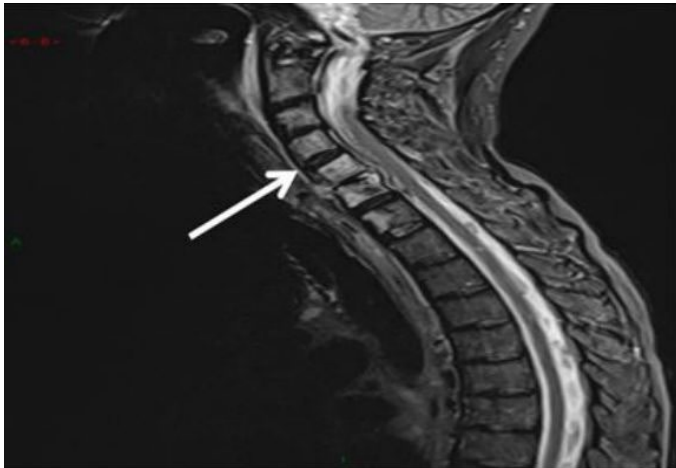


Figure 2. Spondylodiscitis confirmed by cervical MRI.

bodies, resulting in osteolysis. We define three mechanisms pathogenic [1]:

Hematogenous spread

The main mechanism of vertebral osteomyelitis. The course of this pathology extends from several days to and can also progress to chronic infection [2].

Contiguous spread of the infection

It can occur from adjacent tissues to the spine, such as the aorta, oesophagus or the intestine. In such cases, the spread of the infection is facilitated by the absence of a circumferential cartilage plate or a layer of compact subchondral bone [7].

The spread of the infection can then lead to an epidural abscess, a subdural abscess or meningitis. The spread of the infection anteriorly or laterally can lead to paravertebral, retropharyngeal, mediastinal, subphrenic or retroperitoneal abscess depending on the affected area. Thoracic spinal infections can extend into the pleural space to produce an empyema [8]. The development of an epidural or paravertebral abscess is more common in cases of Gram-positive infection than in case of Gram-negative infection [9].

Direct inoculation

Following trauma, invasive diagnostic procedures of the spine or spine surgery.

In this clinical case, contiguity propagation remains the most probable hypothesis given the numerous surgical cures for ENT neoplasia. Clinically, the main manifestation of cervical spondylodiscitis is pain; this is usually localized next to the infected disc and is exacerbated by physical activity or percussion of the affected area. Spinal pain usually starts insidiously and gradually gets worse over several weeks to several months.

In a series of 64 patients with osteomyelitis hematogenous spinal cord, the average duration of symptoms was 48 ± 40 days [10]. The pain is often intensified at night. Initially, it may be relieved by bed rest. It must be emphasised that the pain may be absent in patients with paraplegia. 6 Patients whose infections spread posteriorly into the epidural space may have clinical features of an epidural abscess; it is often severe and localised spinal pain, followed by radiculopathy, then motor weakness, sensory changes and possibly paralysis. The fever is inconstant.

One review noted a frequency of 52 percent; lower rates have been noted in other studies [10]. Local tenderness to soft spinal percussion is the most useful clinical sign but is not very specific. The pain may be accompanied by reduced mobility and/or spasm of the neighbouring muscles

The peculiarity of this clinical case lies in its misleading clinical expression which is mimicking a table of infectious meningitis. Indeed, in front of a feverish neck pain with a stiffness of neck and headaches, the diagnostic and therapeutic emergency remains infectious meningitis. This will require (unless

contraindicated) to perform lumbar puncture (PL) and initiate empiric antibiotic treatment which had been done.

With the persistence of neck pain, the negative results of the CSF culture and considering the patient's surgical history, the diagnosis of spondylodiscitis was established. Cervical MRI confirmed the diagnosis. Blood cultures remained negative. CT-scan guided biopsies of the affected vertebra and/or the disc space were not performed to demonstrate the causative pathogen of spondylodiscitis.

The under-diagnosis of this syndrome by the medical profession could be explained by the rarity of this ailment. Treatment of spondylodiscitis consists of antibiotic therapy and percutaneous drainage of the paravertebral abscesses if present. The choice of antibiotic should be based on the results of the biopsy or the blood culture. If possible, antibiotics should be discontinued until a microbiological diagnosis is confirmed. Empirical antibiotic therapy is only justified in the context of neurological deficit and sepsis [10]. In a retrospective study including 92 patients with spondylodiscitis, administration of antibiotics prior to biopsy did not decrease the yield of blood culture results [10]. If the blood culture and biopsies are negative and the clinical suspicion of spondylodiscitis is evident based on clinical and radiographic findings, the initiation of empirical treatment is then justified.

In general, most cases of spondylodiscitis can be managed successfully only under antibiotic treatment. Surgical treatment is generally reserved for patients with neurological deficits, chronic incessant pain, uncontrolled infection (i.e., clinically significant abscesses), which is not the case with our patient.

In this presentation, the antibiotic treatment initiated in connection with the suspicion of meningitis was maintained due to clinical improvement even though the diagnosis was unfortunately not refined with the CT-guided biopsy in order to track down the implicated microorganism.

Conclusion

Cervical spondylodiscitis remains difficult to diagnose. It must be suspected in front of a picture of worsening neck pain associated with fever and/or new symptoms peripheral neurological disease, or a recent episode of *S. aureus* bacteremia, or a previous spinal surgery.

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