CASE STUDY

Bilateral Vocal Fold Paralysis Secondary to Staphylococcal Cervical Spondylodiscitis

Parálisis bilateral de cuerdas vocales secundaria a espondilodiscitis cervical estafilocócica

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Introduction

Spondylodiscitis is a rare disease with an incidence of 0.2–2 cases/100,000 inhabitants/year. It affects men more than women (3:1). Its predisposing factors are: diabetes mellitus (DM), advanced age, malnutrition, immunodeficiency (HIV, chronic use of steroids), substance abuse (drugs, alcohol), septicemia, chronic anaemia and kidney failure. Cervical location is the third most frequent after lumbar and thoracic locations. It may be primary (spontaneous) or secondary to trauma, surgery. The initial symptoms are non-specific: local pain, stiffness, fever and constitutional symptoms. Criteria for severity are neurological deficits, more frequent in cervical and thoracic spondylodiscitis. This disease may be fatal.

Staphylococcus aureus is the germ most commonly isolated. The second causal germ in terms of frequency is Mycobacterium tuberculosis or Streptococcus viridans, depending on the series. Magnetic resonance (MR) is the diagnostic test of choice, offering 96% sensitivity and 94% specificity. Treatment is conservative with the use of an immobilizing corset and neck brace and parenteral antibiotic therapy. Surgery is reserved for those cases responding poorly to conservative treatment or if there is peripheral neurological deficit, medullary compression, progressive vertebral instability/deformity or paravertebral abscesses.

We report here the case of cervical spondylodiscitis (CS) that progressed well with conservative treatment despite presenting a prevertebral abscess and peripheral neurological involvement.

Case Report

Male, 85 years of age, with a history of severe chronic obstructive pulmonary disease, steroid-induced diabetes, ischemic cardiopathy, HBP and chronic anaemia. He attended an emergency room suffering from dyspnoea and fever. The Internal Medicine Department decided to admit him to hospital with a diagnosis of pulmonary super-infection...
and initiated empirical antibiotic treatment parenterally with ceftazidime 2 g/12 h at the same time as cultures were grown of sputum and haemoculture. Despite treatment, the patient’s dyspnoea worsened over the next few days with the onset of laryngeal stridor and neck pain. They then consulted with the Otorhinolaryngology Department, which performed a fibrolaryngoscopic examination and observed medial paralysis of the left vocal fold (LVF) and paramedial paralysis of the right vocal fold (RVF), causing a greatly reduced passage of glottic air. It was decided to perform an emergency tracheotomy.

The result of the culture was positive for multi-resistant *S. aureus* (MRSA). A culture of nasal secretions and tracheostoma was ordered, also resulting positive for MRSA. Treatment with endovenous vancomycin was instituted.

On the 13th day after admission, a computed tomography (CT) was taken of the chest and neck without any tumourations of the significant alterations being observed in the bones structures of the vertebrae.

The patient’s decline continued with considerable neck pain and fever, as well as the appearance of prerenal kidney failure, disorientation with regard to time and space, and worsening anaemia that required a blood transfusion. An MR scan of the neck was ordered 10 days after the CT. The image showed a C4–C5 spondylodiscitis with minimal epidural component, without any medullary compromise and with the presence of a prevertebral abscess (Fig. 1). This abscess seems to cover both recurrent laryngeal nerves. In view of the high surgical risk of draining the abscess in a patient with such a poor general status, it was decided to opt for conservative treatment. Broad-spectrum antibiotic therapy was continued intravenously (vancomycin+ciprofloxacin) and a neck brace was applied to immobilize the area. His clinical evolution was slowly favourable with the gradual disappearance of pain and fever. The patient was discharged 10 weeks after admission, following the start of oral antibiotics with linezolid 600 mg/12 h, and with negative MRSA cultures of the nasal swabs and haemoculture.

The cannula was removed from the patient in the fifth month after admission, following the total recovery of mobility in the RVF and partial recovery in the LVF and also following MRI confirmation of the complete resolution of the CS. The fusion of his C4–C5 vertebrae remains as a sequela (Fig. 2).

**Discussion**

CS is a serious illness with a mortality rate of 2%–20%, especially in cases of non-tuberculous CS. It fundamentally affects men with a predisposing pathology. Our patient is a male with a number of pathological aspects in his history known to be of risk for spondylodiscitis: advanced age, steroid-induced diabetes, chronic anaemia and HBP. Diabetes mellitus is the most important risk factor and spontaneous CS without predisposing factors is very rare (10%–20%).

The initial symptoms of spondylodiscitis are non-specific. The most constant symptom is vertebral pain, followed by fever. Diagnosis is more difficult if the spondylodiscitis is spontaneous. Our patient came to the emergency room due to fever and an increase in his usual dyspnoea. Only the patient’s deterioration, together with the appearance of paralysis in his vocal folds, caused the initial diagnosis to be reconsidered. Neurological deficits can however develop over a matter of hours although they may also occur months after the onset of the clinical condition and this may entail a considerable delay in reaching a diagnosis.

The exact mechanism whereby a prevertebral abscess causes neurological harm is not clear. It may be due to a direct compression effect or ischaemia. There is no direct correlation between the size of the abscess or medullary compression and neurological clinical signs in spondylodiscitis.
CT scan, the cervical imaging technique most commonly used in ENT, is insufficient for the correct observation of the medullary canal of neurological structures, essential for the diagnosis of spondylodiscitis. Cervical MRI has been confirmed as being of key importance for the diagnosis of vertebral infectious pathology, whether diffuse or phlegmonous or when there is an abscess. It has a sensitivity of 96% and a specificity of 92%, making it the gold standard in the diagnosis of this pathology.

The infection route in spontaneous spondylodiscitis is normally haematogenous. There is no clear mechanism through which germs infect the epidural space although it is believed to be through the arteries. For this reason, the aetiological agent can be identified usinghaemoculture. It can also be isolated through percutaneous biopsy (guided by CT scan) or culture of surgical drainage. The causal germ most frequently isolated is *S. aureus*. In our patient, it was methicillin-resistant *S. aureus*, less common in spondylodiscitis, and implies a worse therapeutic response. In this case, the key is the antibiotic susceptibility study.

The bilateral paralysis of vocal folds and prevertebral abscess are criteria for surgery according to the therapeutic guidelines contained in the literature. Nonetheless, we ruled out surgery due to the patient’s general deterioration. We initiated conservative treatment based on certain published articles. We opted for intravenous antibiotic therapy based on cultures and an antibiotic susceptibility study, together with the immobilization of the neck area and the exhaustive monitoring of the patient to observe any sign or symptom professional worsening. This conservative action was sufficient for the resolution of the CS and the improvement of the neurological deficits with minimal sequelae.

There is no consensus on the duration of the antibiotic treatment for spondylodiscitis but it seems that antibiotic therapy must be administered parenterally and over a long time; for 6–8 weeks according to some authors and up to 18 weeks according to others. Most authors accept the use of an immobilizing corset and neck brace for 6–10 weeks.

In conclusion, CS is a potentially lethal illness in which a suspected diagnosis is not easy in view of the non-specific nature of its clinical presentation. Since there is no unanimity on the treatment of choice, we propose an individualized therapy. Factors such as the presence of paravertebral abscesses or neurological deficits should not lead us to rule out conservative treatment. If this option is chosen, antibiotic treatment must be administered parenterally for not less than six weeks and based on bacteriological cultures. The immobilization of the area affected is also fundamental.

**Conflict of Interest**

The authors declare no conflict of interest.

**References**