

## Case Report

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# Cervical Spondylodiscitis Caused by *Candida Albicans* in Non-Immunocompromised Patient

Fungal infections of the spine are relatively uncommon. Moreover, cervical spondylodiscitis due to *Candida albicans* in non-immunocompromised patient is very rare. We report a case of *Candida* spondylodiscitis in a 64-year-old woman who complained of neck pain. The clinical feature and treatment option are presented with a review of pertinent literatures.

**KEY WORDS :** *Candida albicans* · Cervical spine · Spondylodiscitis.

## INTRODUCTION

*Candida* species are normal flora that inhabit the skin and mucous membrane of human host. Recently, the widespread use of antibiotics, central venous catheters, intravenous drug and immunosuppressive chemotherapy have been increased virulent infection by *Candida* species in immunocompromised individuals.

Spondylodiscitis due to *Candida* species have been rarely reported in the literatures to date<sup>1,7)</sup>. Moreover the involvement of cervical spine is even rarer condition<sup>2,5,9,12)</sup>.

We present a case of cervical spondylodiscitis in non-immunocompromised patient and discuss treatment option with a review of the literatures.

## CASE REPORT

A 64-year-old woman presented with nuchal pain one month before admission. She had a medical history of chronic gastritis and old pulmonary tuberculosis. She was afebrile. The peripheral white blood cell (WBC) count was 8,000/mm<sup>3</sup> and the erythrocyte sedimentation rate (ESR) was 103 mm/hr. The c-reactive protein (CRP) was 3.09 mg/dl. Cultures of the blood, urine and sputum were negative for *Candida* species and tuberculosis. Initial lateral cervical radiograph revealed diminution of the intervertebral space between C5 and C6, associated with a destructive process involving corresponding vertebral bodies (Fig. 1). Magnetic resonance (MR) imaging of the cervical spine was compatible with a diagnosis of infective spondylodiscitis at C5-6 with associated vertebral osteomyelitis and epidural abscess characterized by low signal intensity on T1-weighted image and high signal intensity on T2-weighted image, with well enhancement after gadolinium administration (Fig. 2). The surrounding epidural space, retropharyngeal space and paravertebral space of cervical spine were similar to MR images. A presumptive diagnosis was spondylodiscitis due to tuberculosis.

At surgery, the C4-5 intervertebral disc and C4 vertebral body were also found to be destroyed. Therefore, the patient underwent corpectomy of C4, C5, C6 vertebral bodies with radical resection of surrounding infectious tissues and anterior interbody

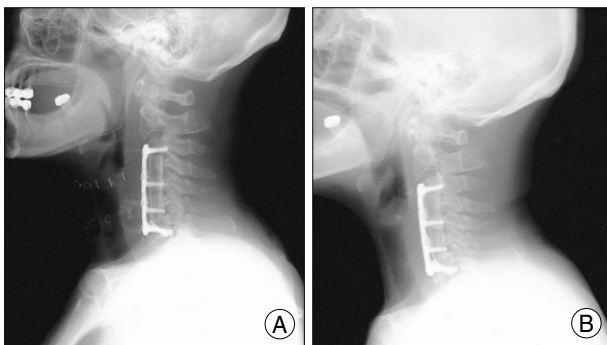


**Fig. 1.** Preoperative plain lateral cervical radiograph shows marked destructive change of C5, C6 vertebral bodies and kyphotic deformity.

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**Fig. 2.** Preoperative sagittal magnetic resonance image shows low signal intensity on T1-weighted (A), high signal intensity on T2-weighted (B), and well enhanced (C) lesion at C5, C6 vertebral bodies, intervertebral space, and surrounding structures.



**Fig. 3.** Postoperative plain lateral cervical radiograph shows the fibula bone graft and plate system and restoration of kyphotic deformity after 2 weeks (A) and 6 months (B).

fusion with fibula bone and metal plate (Fig. 3). The pathologic findings of the removed necrotic materials were consistent with chronic inflammation and calcification. Culture of biopsy specimen yielded *Candida albicans*. Postoperatively, antifungal treatment started with amphotericin B 25 mg daily intravenously for 14 days and fluconazole 200 mg daily orally for 2 months and then 100 mg daily for 4 months. After 6 months of antifungal treatment for *Candida albicans*, the ESR and CRP were normalized. The patient recovered and discharged uneventfully.

## DISCUSSION

*Candida* species are normally low virulent organisms. Despite of the increased incidence of *Candida* infections, spondylodiscitis due to *Candida* species is very rare. According to the report by Miller et al.<sup>7)</sup>, a total of 59 cases of spondylodiscitis caused by *Candida* species were reported from 1966 to 2000 and *Candida albicans* accounts for a third of these infections. Our brief review of published literatures from 2001 to 2006 revealed additional 23 cases. We did not find any literatures published by Journal of Korean Neurological Society concerning *Candida* spondylodiscitis of the cervical spine. Only one case of *Aspergillus* spondylitis was reported in 2005<sup>6)</sup>.

*Candida* spondylitis may occur by direct implantation of a contiguous infected site or by hematogenous route. Among them, hematogenous spread is thought to be the most important pathophysiological mechanism, owing to abundant vascular supply in and around vertebral body and intervertebral space<sup>11,12)</sup>. In our case, we speculate that malnutrition due to chronic gastritis may cause unknown opportunistic infection.

The diagnosis of *Candida* spondylodiscitis includes clinical features, laboratory results, radiological studies and microbiological tests. The clinical features are non-specific. The patient presented with vague nuchal or back pain. The only 32% to 43% of patients presented with fever at admission and about 20% of patients complained of the neurological deficits<sup>7,8)</sup>. Laboratory results frequently revealed elevated ESR and CRP, but a normal WBC count, in accordance with our case<sup>5,7)</sup>. Although plain radiograph frequently reveals erosive and destructive changes of the vertebral body, MR imaging is the diagnostic tool of choice for *Candida* spondylodiscitis<sup>10,14)</sup>. Williams et al.<sup>14)</sup> reported different MR imaging features, including absence of disc high signal intensity and preservation of the intranuclear cleft in T2-weighted images in the case of fungal spondylitis. Unfortunately, we could not find these findings in our case due to the collapse of affected intervertebral space. Because various clinical, laboratory and radiological features are non-specific, percutaneous or open biopsy and microbiological test should be performed to confirm the diagnosis.

The treatment options of *Candida* spondylodiscitis include conservative treatment with biopsy and medical therapy, and surgical intervention. There have been many debates about treatment regimen for *Candida* spondylodiscitis. Some authors reported that *Candida* spondylodiscitis could be successfully treated by the only antifungal therapy with amphotericin B and fluconazole<sup>1,4)</sup>. To the contrary, in the their review of published literatures, Hendrickx et al.<sup>3)</sup> advocated surgical debridement soon after diagnosis of *Candida* spondylodiscitis is established. Half of the patients underwent surgical treatment in the reported cases and 33% of the patients who initially had received only medical treatment subsequently required surgical intervention. However, surgical intervention is recommended in a patient with neurological compromise, spinal instability due to extensive collapse of the vertebral bodies, and medically refractory infection. In this report, we performed surgical treatment due to spinal instability with kyphotic deformity.

Although the optimal duration of therapy for *Candida* spondylodiscitis is not established, the current practice is to continue treatment until the resolution of clinical symptoms, recovery of laboratory data, and amelioration of radiological features.

## CONCLUSION

Although *Candida* infections of spine, especially cervical spine, are very rare, early diagnosis and radical surgery combined with antifungal chemotherapy are recommended to achieve good outcome in non-immunocompromised patient.

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