



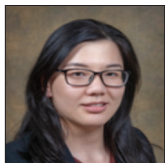
Case Report

# Cervical spondylodiscitis caused by *Candida albicans* in a non-immunocompromised patient: A case report and review of literature

Shiwei Huang<sup>1</sup>, Ari D. Kappel<sup>1</sup>, Catherine Peterson<sup>1</sup>, Parthasarathi Chamiraju<sup>1</sup>, Gary B. Rajah<sup>1</sup>, Marc D. Moisi<sup>1,2</sup>

<sup>1</sup>Department of Neurosurgery, Detroit Medical Center/Wayne State University School of Medicine, Detroit, Michigan, <sup>2</sup>Seattle Science Foundation, Seattle, Washington, USA.

E-mail: \*Shiwei Huang - shihuang@med.wayne.edu; Ari D. Kappel - gs6111@wayne.edu; Catherine Peterson - catherine.peterson@wayne.edu; Parthasarathi Chamiraju - pchamira@med.wayne.edu; Gary B. Rajah - grajah@med.wayne.edu; Marc D. Moisi - mmoisi@wayne.edu



**\*Corresponding author:**

Shiwei Huang,  
Department of Neurosurgery,  
Detroit Medical Center/Wayne  
State University School of Medicine,  
4201 St. Antoine Suite 6E, Detroit,  
Michigan 48201, USA.

shihuang@med.wayne.edu

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## ABSTRACT

**Background:** Fungal cervical spondylodiscitis is rare and accounts for <1% of all cervical, thoracic, and lumbar vertebral osteomyelitis and discitis.

**Case Description:** A 32-year-old non-immunocompromised male presented with persistent neck pain and paresthesias. The magnetic resonance imaging of the cervical spine demonstrated a contrast-enhancing erosive lesion involving the cervical C6 and C7 vertebral bodies accompanied by epidural phlegmon. Blood culture was negative. The patient underwent a C6 and C7 anterior corpectomy with instrumented fusion (e.g., expandable cage C5 to T1). Intraoperatively, frank pus was noted within the C6-C7 disc space and was accompanied by thick prevertebral and epidural phlegmon extending from C5 to T1. Intraoperative cultures grew *Candida albicans*. Three days later, a C6-C7 laminectomy with C4-T2 posterior instrumented fusion was performed; the cultures again grew *C. albicans*. The patient was treated with intravenous micafungin for 14 days followed by 6–12 months of 400 mg oral fluconazole daily.

**Conclusion:** There are few cases in literature where non-immunocompromised patients developed fungal cervical spondylodiscitis. Prompt diagnosis and appropriate management are critical to effectively treat these patients. Surgical intervention may warrant corpectomy, discectomy, and operative debridement followed by long-term targeted antifungal therapy.

**Keywords:** *Candida albicans*, Cervical spine, Discitis, Osteomyelitis, Spondylodiscitis

## INTRODUCTION

Osteomyelitis of the spine accounts for 2%–7% of all bony infections. Only 10% of spondylodiscitis cases involve the cervical spine.<sup>[2,8]</sup> Cervical spine *Candida* infections are extremely rare and typically occur in only immunocompromised patients,<sup>[7,8]</sup> or those on prolonged antibiotics, or with central venous catheters.<sup>[2,3]</sup> Here, we present a case of cervical *Candida* spondylodiscitis in a non-immunocompromised male at the C6-C7 level, along literature review.

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## CASE DESCRIPTION

### History and physical examination

A 32-year-old male with a history of intravenous drug use and hepatitis B and C presented with a 2-month history of progressive limited cervical range of motion, neck pain, bilateral upper extremity weakness, and paresthesias. His examination revealed mild 4/5 bilateral upper extremity weakness, right greater than left, with mild bilateral hyperreflexia, and significant kyphosis.

### Diagnostic workup

#### Computed tomography and magnetic resonance studies

The computed tomography (CT) scan demonstrated severe bony erosion of the C6-C7 vertebral bodies with kyphosis and retropulsion of bone into the central canal, resulting in marked cord/root compression [Figure 1a]. The magnetic resonance imaging (MRI) demonstrated extensive prevertebral swelling, while contrast enhancement showed erosive lesions involving the C6 and C7 vertebral bodies with epidural phlegmon extending from C4 to C7-T1 [Figure 1b-d].

#### Laboratory studies

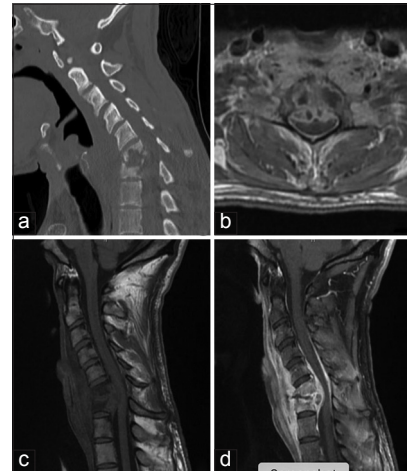
Laboratory studies demonstrated nonspecific markers of inflammation (e.g., erythrocyte sedimentation rate [ESR] of 24 mm/h, and C-reactive protein [CRP] of 23.1 mg/L). Blood cultures before antibiotic or antifungal therapy were negative. The patient tested negative for human immunodeficiency virus and tuberculosis.

### Hospital course

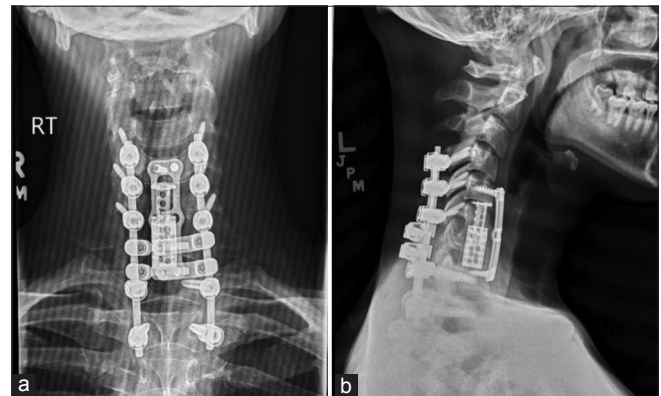
The patient underwent a C6 and C7 anterior corpectomy with instrumented fusion (e.g., placement of an expandable cervical cage and C5 to thoracic [T] 1 anteriorly). Intraoperatively, frank pus was noted within the C6-C7 disc space and was accompanied by thick prevertebral and epidural phlegmon extending from C5 to T1. Three days later, a C6-C7 laminectomy with C4-T2 posterior instrumented fusion was performed [Figure 2]. Intraoperative cultures again grew only *Candida albicans*. He was treated with intravenous micafungin followed by 6–12 months of 400 mg fluconazole. Three months postoperatively, the patient is doing well without complication but is continuing his oral antifungal therapy along with physical therapy.

## DISCUSSION

The most common pathogen involved in spondylodiscitis is *Staphylococcus aureus*. With the current increase of broad-spectrum antibiotics and central venous catheter use, the incidence of fungal spondylodiscitis is on the rise. The



**Figure 1:** Sagittal (a) computed tomography without contrast, axial T1 magnetic resonance imaging w/contrast (b) and sagittal T1 magnetic resonance imaging without (c) and with (d) contrast demonstrate an enhancing erosive lesion involving the C6 and C7 vertebral bodies with peripherally enhancing fluid collection within the intervertebral disc space and a large fluid collection along the posterior aspect of the vertebral bodies with compression of the ventral spinal cord at C6-C7. There is also extensive prevertebral swelling with anterior and posterior epidural enhancement extending from C4 to T1.



**Figure 2:** Postoperative cervical X-rays anterior-posterior (a) and lateral (b) show placement of C6-C7 expandable cervical cage and C5 to T1 anterior discectomy with instrumentation and fusion, as well as posterior C4 to T2 instrumentation and fusion with C6 and C7 laminectomy. There is restoration of normal anatomic height with interval improvement in alignment of the cervical spine and reduction of the preoperative kyphotic deformity.

involvement of *Candida* species is rare and only occurs in 0.3%–2% cases of spondylodiscitis.<sup>[1,3,7]</sup> The most prevalent species in *Candida* spondylodiscitis is *C. albicans* followed by *Candida glabrata* and *Candida tropicalis*.

### Risk factors

Risk factors for *C. albicans* spondylodiscitis include long courses of broad-spectrum antibiotics, central venous

catheter use, intravenous drug use, poorly controlled diabetes, immunosuppressive therapies, and spinal surgeries.<sup>[1-3]</sup> Here, the patient presented with a history of intravenous drug use, but no immunosuppression.

### Laboratory studies for *Candida* spondylodiscitis

*Candida* spondylodiscitis can occur either as a result of a contiguous infection, direct inoculation (through lumbar puncture, spinal anesthesia, or spinal surgery), or hematogenous spread after prolonged candidemia. The classical time interval between the initial candidemia and onset of spondylodiscitis is several months.<sup>[3,4,6]</sup> The laboratory markers for inflammation such as white blood cell count, ESR, and CRP are often equivocal.

### XR, magnetic resonance, and computed tomography of *Candida* spondylodiscitis

MRI is the best imaging modality for spondylodiscitis; it delineates early erosive bony changes consisting of hypointensities in the vertebral bodies on T1-weighted images, the absence of disc hyperintensity, and preservation of the intranuclear cleft in the disc on T2-weighted images.<sup>[3,5,6]</sup> Plain radiographs and CT spinal images may later detect vertebral abnormalities in conjunction with *Candida* spondylodiscitis. The definitive diagnosis typically requires image-guided biopsy, surgery, and/or direct documentation with fungal studies.<sup>[4,5]</sup>

### Treatment of *Candida* spondylodiscitis

*Candida* osteomyelitis can be treated nonoperatively with a prolonged course of fluconazole or a lipid formulation of amphotericin B. Where applicable, optimizing risk factors such as tight glycemic control (e.g., in diabetics) or prompt removal of central venous catheters are often advocated. Surgical intervention may be necessary, particularly where nonsurgical measures fail. Critically, any evidence of new/progressive neurological deficits or radiological findings of significant spinal cord compression/instability may warrant surgical decompression with/without fusion.<sup>[1,4]</sup>

### CONCLUSION

Cervical spondylodiscitis caused by *C. albicans* is rare, especially in non-immunocompromised patients. For those who present with progressive neurological deterioration, MR followed by CT findings of compressive/erosive/osteomyelitis pathology warrants surgical intervention to avoid long-term sequelae.

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### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

### Conflicts of interest

Dr. Moisi is a consultant for Synpative Medical.

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