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Cervical Vertebral Osteomyelitis and Epidural Abscess Caused by Candida Albicans in a Patient with Chronic Renal Failure

Kronik Böbrek Yetmezlikli bir Hastada Candida Albicans'ın Etken Olduğu Servikal Vertebral Osteomyelit ve Epidural Abse

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ABSTRACT

Although rare, the diagnosis of candidal vertebral osteomyelitis of the cervical spine should be considered in cases of quadriparesia occurring in hemodialysis patients. This disease leads to vertebral destruction and spinal cord compression. Candidal vertebral osteomyelitis constitutes a diagnostic problem for all physicians. The insidious progression of disease, the non-specificity of the clinic and laboratory findings, and the failure to recognize candida as a potential pathogen may lead to a diagnostic delay. Early diagnosis and treatment are fundamental points for prognosis. In this report, we present the fifth case of cervical vertebral osteomyelitis caused by Candida species in the literature. Our case is the second case of candidal vertebral osteomyelitis associated with epidural abscess of the cervical spine.

KEY WORDS: Candida albicans, Cervical osteomyelitis, Cervical abscess, Chronic renal failure

ÖZ

Nadir olmasına rağmen, hemodializdeki bir hastada ortaya çıkan kuadriparezide, servikal candidal vertebral osteomyelit olabileceği düşünülmelidir. Bu hastalık, vertebral destrüksiyona ve spinal kord kompresyonuna yol açar. Candidal vertebral osteomyelit, tüm hekimler için tanıda bir problem teşkil etmektedir. Hastalığın sinsi yapısı, klinik ve laboratuvar bulguların spesifik olmaması, potansiyel patojen olarak candida üretmenin zorluğu; tanıda gecikmeye yol açabilir. Erken tanı ve tedavi, prognozdaki ana kuraldır. Bu makalede literatürde Candida türlerinin neden olduğu, beşinci servikal lokalizasyonlu vertebral osteomyelit vakasını sunduk. Bizim olgumuz, epidural absenin eşlik ettiği ikinci servikal candidal vertebral osteomyelit vakasıdır.

ANAHTAR SÖZCÜKLER: Candida albicans, Kronik böbrek yetmezliği, Servikal abse, Servikal osteomyelit

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INTRODUCTION

Vertebral osteomyelitis and epidural abscess in the cervical spine caused by Candida species is an extremely rare condition. It was first reported by O'Connell et al. (6) in 1973. The total number of reported candidal vertebral osteomyelitis cases of the cervical spine was 4 previously (2,4,6,9). In this report, we present the fifth case of cervical vertebral osteomyelitis caused by Candida species.

CASE REPORT

A 61-year-old male patient was admitted to our department because of weakness of bilateral upper and lower extremities. The complaints had started a month ago and gradually increased. He had been suffering from unexplained neck pain diagnosed as osteolysis for the last three months. His medical history was relevant for symptomatic chronic renal failure for the last 5 years and he had been undergoing hemodialysis three days a week. Neurological examination revealed 1-2/5 motor function at bilateral upper and lower extremities. A sensory deficit level was detected at C5-C6. Bilateral upper and lower extremities tendon reflexes were absent. He was afebrile. Laboratory investigation results were as follows: hemoglobin 12.5 g/dl, white blood cell 11.800/mm3, creatinine 4.8 mg/dl, blood urea nitrogen 67 mg/dl, erythrocyte sedimentation rate (ESR) 54 mm/h, C reactive protein (CRP) 17.5 mg/L. Magnetic resonance imaging (MRI) of the cervical spine showed a collapse of the C6-C7 vertebral bodies with spinal cord compression (Figure 1A,B,C). During surgery, corpectomy of the infected vertebra with epidural abscess drainage (C5, C6 and C7 corpectomy), iliac crest bone grafting and anterior cervical instrumentation between C4 and T1 were performed (Figure 2). Histological examination of the specimen revealed granulomatous inflammation with osseous destruction. Culture of the abscess material grew Candida albicans within 48 hours. Intravenous amphotericin B 0.5 mg/kg/day was started on the recommendation of the Infectious Disease and Nephrology Departments. The patient died on the postoperative eleventh day with decreasing renal function.

DISCUSSION

Candidiasis is on the increase in association with several factors such as a central venous catheter, administration of antibiotics and parenteral nutrition, hemodialysis, HIV infection, injectable drug use, surgery, immunosuppression, debilitating disease and neutropenia (5). However, candidal vertebral osteomyelitis is unusual. In 2001, Miller and Mejicano (5) reported a case of lumbar vertebral osteomyelitis caused by Candida albicans and reviewed 59 cases with vertebral osteomyelitis from the literature. Eight additional cases have been reported since then (1,3,4). A total of 67 cases of

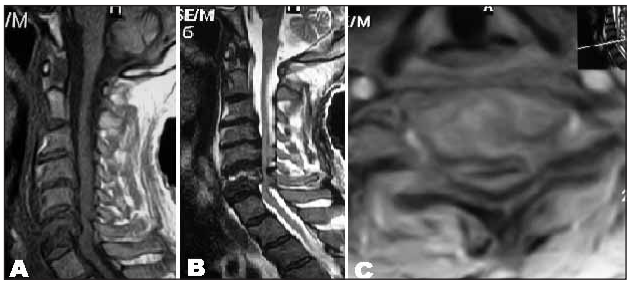

Figure 1: *T1-weighted sagittal (**A**), T2 weighted sagittal (**B**), and T1-weighted axial (**C**) MRI images. Vertebral collapse and significant compression of the spinal cord at C6-C7 are present.*

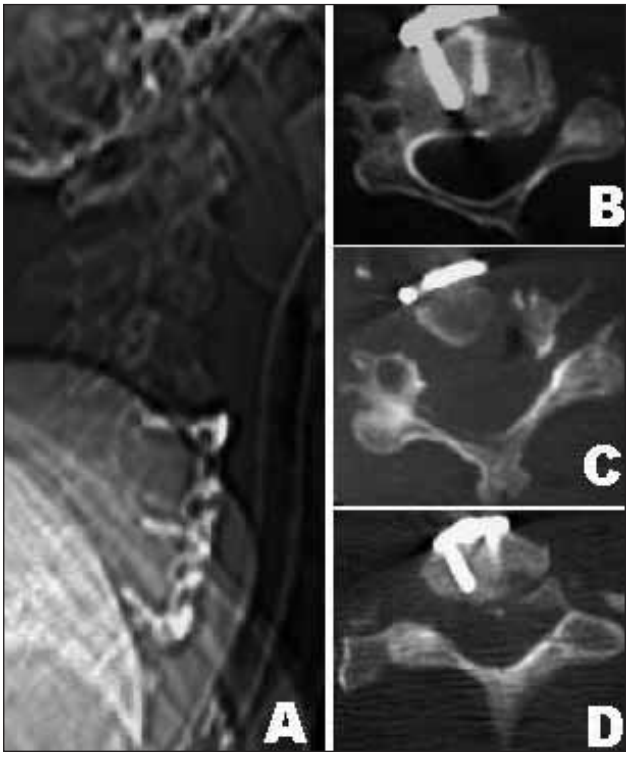

Figure 2: *(**A, B, C, D**) Postoperative computed tomography views. During surgery, corpectomy of the infected vertebra with epidural abscess drainage (C5, C6 and C7 corpectomy), iliac crest bone grafting and anterior cervical instrumentation in between C4-T1 were performed.*

vertebral osteomyelitis caused by Candida species have been reported in the literature, with Candida albicans being responsible for 63% of cases, and located in the lower thoracic and lumbar spine in 94% of them. Only four cases of cervical vertebral osteomyelitis caused by Candida species have been reported. We describe the fifth case of cervical vertebral osteomyelitis caused by Candida species. To our knowledge, this is the second case of documented epidural involvement in candidal vertebral osteomyelitis of the cervical spine. The details of these patients are summarized in (Table I).

Hematogenous spread is thought to be the most common mechanism of candidal vertebral osteomyelitis in adults (5, 8). However, direct implantation of candida has been described in some cases (7). The risk factors identified for candidal vertebral osteomyelitis were similar to those for candidemia and deep fungal infections (3). Several of these factors were present In our patient: immunosuppression due to chronic renal failure, hemodialysis, central venous catheter and prolonged parenteral therapy. As previously stated, all these favor candida systemic infection and vertebral osteomyelitis.

Candida affects the spinal segments, probably through hematogeneous dissemination and once a focus develops in the vertebral body (4). The low virulence of the Candida species and the poor vascularization of the disc space result in a slow inflammatory response and thus a delay in the diagnosis (8). The typical patient presents with back pain in the lower thoracic to lumbosacral spine. Only one-third deficit occurs in 20% of patients with candidal vertebral osteomyelitis (5). Laboratory findings are non-specific with elevation of ESR and CRP, and blood and urine cultures are rarely positive (8). ESR and CRP had increased and culture of the abscess material yielded Candida albicans in our case. Our case had suffered from neck pain for 3 months before the diagnosis. Unfortunately, spinal infection had not been suspected and no tests had been requested. Vertebral collapse, epidural abscess and quadriparesia became apparent within 2 months from the onset of symptoms in our case. The absence of fever does not rule out the diagnosis of candidal vertebral osteomyelitis, as our case shows.

There are no typical radiological findings in candidal vertebral osteomyelitis. MRI should be considered the imaging modality of choice for spinal osteomyelitis (5,8). Williams et al (10) reported several characteristic MRI findings (absence of disc hyperintensity, preservation of the internuclear cleft on T2 weighted images) in cases of fungal vertebral

Table I: Reported cases with candidal vertebral osteomyelitis of the cervical spine

Series (Ref. no)	Age/Sex	Location	Candida species identified	Risk factors	Treatment	Outcome
1) O'Connell CJ, et al. 1973 (6)	34, F	C6-7	C. quilliermondii	Back trauma, IDU	Surgery, AmB	Cured
2) Weber ML, et al. 1987 (9)	6, F	C1	C. albicans	Myeloperoxidase deficiency	AmB	Cured
3) Ferra C, et al. 1994 (2)	42, M	C4-5	C.tropicalis	Malignancy, BMT, CVC, PPT	Surgery, AmB	Died
4) Khazim RM, et al. 2006, (4)*	70, F	C6	C. albicans	None	Surgery, Fluconazole	Cured
5) Özdemir N, et al (present case)*	61, M	C5-6-7	C. albicans	CRF, CVC, hemodialysis, PPT	Surgery, AmB	Died

F, female; **M**, male; **AmB,** Amphotericin B; **BMT,** bone marrow transplantation; **CRF,** chronic renal failure; **CVC,** central venous catheter; **IDU,** injection drug use; **PPT,** prolonged parenteral therapy

* Epidural abscess in candidal vertebral osteomyelitis of the cervical spine.

osteomyelitis that distinguished those cases from bacterial vertebral osteomyelitis. Candidal vertebral osteomyelitis constitutes a diagnostic problem for all physicians. The insidious progression of disease, the non-specific clinical and laboratory findings, and the failure to recognize candida as a potential pathogen may lead to a diagnostic delay.

The treatment of candidal vertebral osteomyelitis in the literature has been with both surgical and medical alternatives. Treatment has to be considered according to the clinical findings of each individual case. The primary antifungal agents used to treat this disease are systemic amphotericin B (0.5-1 mg/kg/day) and/or fluconazole (6 mg/kg/day), if the isolated species are susceptible in vitro (1, 5, 8). Miller and Mejicano (5) suggested 4-6 weeks of systemic amphotericin B therapy, followed by 2-6 months of treatment with oral azole when susceptible organisms are isolated. Surgical treatment is commonly required in patients with a neurological deficit, in case of failure of the percutaneous biopsy to provide a diagnosis, failure of antifungal therapy to eradicate the infection or relapse, and spinal instability (4, 5, 8). Our patient was treated surgically because of the progressive neurological deficit and cervical cord compression due to collapse of the vertebrae.

The prognosis for patients with candidal vertebral osteomyelitis is good. The clinical cure rate of 85% in the literature (5). Unfortunately, the infection was not suspected until severely quadriparesia due to cervical cord compression occurred in our case. Surgical treatment and anti-fungal therapy were therefore delayed. This case illustrates the need for early diagnosis of spinal candidiasis in patients with chronic renal failure.

CONCLUSION

Candidal vertebral osteomyelitis is a rare disease, especially in the cervical spine. Clinicians must suspect this disease in patients with risk factors for disseminated candidiasis such as chronic renal failure, hemodialysis, central venous catheter, prolonged parenteral therapy and subacute or chronic neck pain. Without treatment, the disease is progressive and leads to vertebral destruction and spinal cord compression. The insidious progression of the disease, the non-specific clinical and laboratory findings, and the failure to recognize candida as a potential pathogen may lead to a diagnostic delay. Early diagnosis and treatment of candidal vertebral osteomyelitis of the cervical spine are very important for prognosis. This article illustrates the need for early diagnosis of candidal vertebral osteomyelitis in a cervical location

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