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Case Report

Candida Krusei Prosthetic Joint Infection Following Fungaemia in a Patient with Total Hip Replacement

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Abstract

Fungal prosthetic joint infections are rare; with *Candida albicans* being the most frequently reported pathogen in English literature. Immunocompromised state, as well as extensive use of the newer triazole, fluconazole to suppress fungal infections has lead to an increase in fungaemia due to albicans and non-albicans candida. Here, we report a case of disseminated *Candida krusei*, in an immunocompromised patient with total hip replacement one month prior following fracture neck of left femur. Patient was deemed infection free following prosthetic joint removal, thorough debridement and antifungal therapy.

Key words: *Candida krusei*, Prosthetic Joint Infections, fungaemia , Biofilm

Introduction

Prosthetic replacement surgery for hip, knee, shoulder and elbow joints has become routine because of the magnificent success of these procedures in restoring function. Infection is the second most common cause of prosthetic joint failure. This is a devastating complication associated with additional surgery, antimicrobial treatment, prolonged rehabilitation as well as the possibility of renewed disability or even death. Emphasis must be laid on accurate, timely diagnosis and appropriate treatment of prosthetic joint infections (PJI). The actual incidence of fungal infections is not known, but is estimated to be about 1% of all PJI. *Candida albicans* is most commonly reported causing candidial fungal prosthetic joint infections. Conventional treatment of fungal PJI usually includes removal of prosthesis followed by a long term antifungal therapy.[1] No case of *Candida krusei* infection of prosthesis has been reported till date in literature. We report a case of total hip replacement infected with this emerging pathogen following fungaemia.

Case report

An 82 year old woman, who had undergone a total hip replacement one month earlier following fracture neck of left femur was admitted in our hospital with a 1 day history of fever(100.4^0 F) with chills, severe pain and limitation of movements of the left hip. There was no recent history of injury around the hip. Associate co-morbid conditions were Insulin Dependent Diabetes Mellitus, hypertension, hypothyroidism, anaemia, electrolyte imbalance and Ischemic Heart Disease.

On clinical examination pulse rate was 80 / min, blood pressure was 130/80 mm of Hg, and respiratory rate 20/min. A 4x4cm deep trophic ulcer extending up to a depth of 5 cm into the surgical

scar, with foul smelling discharge, present over the left greater trochanter and a 2x2cm superficial healing bed sore over the left gluteal region were noted. Erythematous plaques with whitish discharge and maceration present over the inner side of the thighs were diagnosed as candidial intertrigo and grew *C.krusei* on culture.

Laboratory investigations showed haemoglobin-10.4 gm%, Total Leucocyte Count of 19,700 cells/cu mm with N-86%, L-13% and E-1%. ESR was 40/hr. X-ray showed posterior dislocation of the Austin Moore Prosthesis into the acetabular cavity. Ultrasound abdomen showed right moderate hydronephrosis with cholecystolithiasis. ECHO showed an irregular rhythm (atrial fibrillation) with sclerotic aortic valve. Repeated urine cultures yielded *C.krusei* which was treated with fluconazole. Blood culture isolated *Candida krusei*.

The patient was posted for closed reduction which was unsuccessful and so an open reduction was done. However the reduction was unsuccessful and there was repeated posterior dislocation. The infected AMP implant was removed with thorough debridement of the infected tissue and evacuation of pus in the subcutaneous planes. Gentamicin impregnated cement was moulded onto a Steinman pin in the shape of prosthesis and placed in the acetabular cavity.

The infected tissue, pus and prosthesis was cultured and showed growth of *Candida krusei, Klebsiella ozaenae* and *Staphylococcus epidermidis.*

The patient was treated with Gatifloxacin 400mg OD for 2 weeks and Voriconazole 400mg BD loading dose followed by 200mg BD for 2 weeks. Escharotomy and daily dressings failed to heal the ulcers and Split Thickness Skin Graft was done. Patient was advised total hip replacement. But patient refused surgery and discharged against medical advice and lost for follow up.

Discussion

Candida infection of prosthetic joints is uncommon. Only 30 cases have been reported previously, *C. parapsilosis* and *C. albicans* being the two most common organisms[2].*Candida* infections of prosthetic joints mostly involves hip and knee prostheses than smaller joints due to the longer duration of surgery, low blood flow to cortical bone, and the formation of large haematoma around the devices. These haematomas can devascularise the tissue and prevent the entry of antibiotics [3].

Candida PJI infection is usually associated with prolonged antibiotic treatment, immunocompromised state, I.V drug abuse, prolonged indwelling catheter, rheumatoid arthritis, diabetes mellitus, obesity, poor nutrition and advanced age. [2, 3]The route by which *Candida* reaches the implanted joints cannot be determined in most cases. However in our patient, *C. krusei* isolated in the blood, urine and from the whitish discharge from the thigh indicates it could be haematogenous route. Several studies have found that about 70% of patients develop colonisation by C.krusei before the onset of infection. Gastrointestinal tract was the most frequent site of colonisation followed by respiratory tract.[4,5] This was observed in our case too, as we had isolated the C. krusei from urine and discharge from the inner side of the thigh for which patient received fluconazole. Fungaemia most often develops in immunocompromised patients who undergo antifungal prophylaxis with fluconazole [5, 6]

C.krusei has great ability to colonise inert surfaces such as implants and catheters by virtue of its cell surface hydrophobicity[7].This property may have the clinical implication on the course and treatment of infections linked to medical devices. Slow growth of organisms in biofilms accompanied by changes in cell surface composition affecting the host defence mechanism, restricted penetration of drugs through the matrix and unique biofilm-associated patterns of gene expression.[3] Polymethylemethacrylate cement appears to predispose toward infection by inhibiting phagocytosis and complement function and favours biofilm formation.[8,9]

Although the standard treatment of Candida prosthetic joint infection has not been established, it should include effective antifungal therapy, thorough debridement, and removal of the implants.Intravenous amphotericin B has been the mainstay of treatment for invasive candidiasis Treatment with amphotericin B is restricted by its toxicity. The ease of administration, availability in both oral and intravenous forms and the lack of toxicity have given fluconazole an edge over amphotericin B. However, the emerging non-albicans species, such as *C. krusei and C. glabrata* that are resistant to fluconazole, are susceptible to voriconazole and caspofungin [9].

Most of the prosthetic infections are caused by bacteria. Whenever there is no improvement with antibacterial one should look for fungal causes especially when patient is immunocompromised. An increased understanding of the epidemiology and

pathogenicity of *C. krusei* will aid us in prophylaxis and treatment of infections caused this yeast.

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