

A Rare Case of *Candida Tropicalis* Infection of a Total Hip Arthroplasty: A Case Report and Review of Literature

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ABSTRACT

Fungal prosthetic joint infection is rare with *Candida albicans* being the most frequently reported pathogen in medical literature. We report here a rare case of *Candida tropicalis* infection affecting a total hip arthroplasty in a 73y male that failed to heal with initial treatment antibiotics and was eventually successfully treated with serial debridement, removal of prosthesis and antifungal medications. Revision of the total hip arthroplasty was performed four months after the patient was deemed infection free. In most cases, removal of implants, thorough debridement, and effective antifungal therapy are necessary for the eradication of infection. Reimplantation of the prosthesis can then be performed successfully in a staged surgical procedure. Orthopaedic surgeons should consider the possibility of a fungal infection in prosthetic joints especially in immune compromised patients especially if the infection is persistent or does not follow the expected course after treatment.

Key Words:

Candida tropicalis, Prosthetic joint infection, Antifungal therapy

INTRODUCTION

Infection is the second most common cause of prosthetic joint failure¹. The potential for the morbidity and cost associated with repeat surgery, prolonged medical treatment and joint immobilization render importance to the accurate, timely diagnosis, and appropriate treatment of prosthetic joint infection (PJI). The actual incidence of fungal infection is not known, but is estimated to be about 1% of all PJI²⁻³. *Candida albicans* is the most commonly reported *Candida* fungal prosthetic joint infections. Conventional treatment of fungal prosthetic joint infection usually includes surgery followed by a long period of antifungal medication. Only two cases of *Candida Tropicalis* prosthetic joint infection have been mentioned in the literature to date³. We report here a case of total hip replacement infected with this rare

organism that was successfully treated with antifungal pharmacotherapy and excision arthroplasty.

CASE REPORT

A 73-year-old man, who had a bilateral total hip replacement nine years earlier, was admitted to our hospital with a one-day history of fever and severe pain in his right hip. There was no recent history of injury around the hip and the only other significant clinical finding was a diabetic ulcer on the right great toe. Associated co-morbidities were insulin dependent diabetes and chronic renal failure. The patient's condition deteriorated very quickly over the next two days and he was transferred to an intensive care unit when he became septic. Upon transfer to the ICU, the patient had a very high white cell count (20.4x10⁹/litre) and CRP was 307. He was started on intravenous vancomycin (1 gm once daily) for the sepsis along with adrenaline support. At that time, an ultrasound scan of the right hip was negative for any effusion, and a CT scan of abdomen, pelvis and hips was also normal. Two days later, a bone scan was requested which showed no signs of sepsis in the pelvis and hips but was positive in the area of the right great toe. On the third day, debridement of the right great toe was performed. At that time, right hip was aspirated and revealed frank pus (approximately 20 ml) and that was followed by proper hip wash out. The right hip wound swab grew gram negative bacilli and gram positive cocci, and on extended culture, mixed coliform and proteus were isolated. The antibiotics were changed to intravenous piperacillin/tazobactam (4.5 gm twice daily) and oral rifampicin (450 mg twice daily), as per sensitivities identified by the staff microbiologist.

Patient had to undergo five further debridements of the right hip and toe. The right toe was eventually amputated due to development of gangrene. In spite of repeated debridements of hip, the wound failed to heal. Histology was then suggestive of PJI. Further culture of the right hip capsule and acetabular membrane grew *Candida tropicalis* that showed sensitivity to caspofungin and fluconazole. The



Fig. 1: Plain anterolateral radiograph of pelvis with both hips at the time of admission, showing loosening of the hip prosthesis on the right side



Fig. 2: X-ray pelvis with both hips AP view taken after insertion of Palacos cement spacer that followed removal of right total hip prosthesis

patient was therefore started on caspofungin, which was changed to fluconazole after one week. Six weeks later, the prosthesis was removed and a Palacos cement spacer was inserted. After eight weeks of fluconazole treatment the wound healed well without no signs of infection and further cultures were sterile. Inflammatory markers also improved. Four months later as the patient was still infection free, a second stage revision of right hip was performed through an incision over the previous scar (using an S-ROM prosthesis). A tissue sample at the time of revision surgery were sent for microbiology and showed no growth. The patient was discharged one week following surgery and remained symptom free with no signs of local or systemic infection at twelve months follow-up.

DISCUSSION

Prosthetic joint infections are extremely difficult to treat, and in most of cases, removal of infected prosthesis is required to eradicate the infection⁴. Diagnosis of prosthetic-joint infection (PJI) is difficult, because the infecting agent would probably not be present in synovial fluid samples due to its exclusive presence as a device-associated biofilm⁵. Resistance to natural host defence mechanisms and to most antibiotics further complicates treatment⁵.

Darouiche *et al.*³ reviewed 10 cases of Candidal prosthetic joint infections and found that *Candida albicans* was the offending organism in four patients, *Candida Parapsilosis* in three, *Candida Tropicalis* in two, and *Candida (torulopsis) glabrata* in one. All patients were treated with removal of the prosthesis and antifungal therapy. Replacement with a new prosthetic joint was attempted in only two cases and successful in only one. Phelan *et al.*² described that delayed

reimplantation arthroplasty for Candidal prosthetic joint infection is possible after completion of appropriate antifungal therapy.

In most cases, removal of infected prosthesis is required; in fact, Tattavin *et al.*⁶ reviewed 69 cases of hip and knee prosthetic infection and found that only 13 cases that had symptoms of shorter duration that did not require further surgical debridement. They concluded that debridement with retention of prosthesis is rarely sufficient prosthetic to fully eradicate the joint infection and this therapeutic approach should be considered only when the duration of symptoms is very short.

Prenzel *et al.*⁷ described a case of prosthetic joint infection, initially treated with antibiotics and surgical debridement without any success. Cultures later revealed *Staphylococcus aureus*, *Enterococcus*, and *Candida parapsilosis*. After removal of the prosthesis, cement spacer insertion and fluconazole treatment, the infection was controlled. Our case was quite similar in that it did not respond to antibiotic therapy and serial debridement but quickly responded to antifungal treatment at which time the wound healed nicely.

Due to the limited number of reported cases, firm recommendations for optimal treatment of Candidal joint infections are not yet available, although fluconazole has been widely used. Penk *et al.*⁸ reviewed the use of fluconazole in 32 patients and found that the mean duration of therapy was 6 months (maximum, 2 years) with an average dose of 200-400 mg/day (maximum, 800 mg/day). They concluded that fluconazole was effective and safe in acute therapy alone or in combination with surgery as well as in long term suppression therapy.

Girdlestone arthroplasty has been considered the standard surgical treatment of the prosthetic joint infections². After resection arthroplasty, delayed reimplantation is usually performed with favourable results⁹. Indeed, we treated our patient successfully with fluconazole, removal of prosthesis and insertion of a Palacos cement spacer, followed by second stage revision. The microbiologist and pharmacist initially advised caspofungin because the patient was on rifampicin and, concurrent administration of rifampicin reduces the effect of fluconazole. After the rifampicin was stopped, the patient was switched over to Fluconazole. Caspofungin is considered a restricted drug and wherever possible fluconazole should be used for initial empirical therapy.

Fungal aetiology, although quite uncommon, should be considered in the differential diagnosis of PJIs especially in those not responding to conventional antimicrobials. Awareness of the extremely rare type of fungal PJI reported here is prudent. Removal of prosthesis remains a time proven decision in most of the cases, and should be accompanied by appropriate antifungal therapy. The need for a debridement should be assessed in each individual case. Late recurrence is common in bone and joint infection and a too early assumption of nonrecurrence of the infection is a therapeutic pitfall. A long infection free period is of utmost importance before embarking upon reimplantation. A staged arthroplasty and long term antifungal treatment seem to be most appropriate to reduce the risk of infection recurrence.

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