

Fungal Periprosthetic Joint Infection By Candida Glabrata – Two Stage Revision Is A Good Option.

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Abstract:

Introduction: *Candida glabrata* (*Torulopsis glabrata*) is considered to be the second most virulent yeast after *Candida albicans*. The incidence of Peri-prosthetic knee joint infection by *Candida glabrata* is very rare and very few studies have been reported in literature, Hitherto.

Case Presentation: A 54 yr old non immunocompromised female presented with *Candida glabrata* infection of her right knee joint. She underwent Implant extraction, debridement, irrigation and placement of articulating cement spacer in-situ and supplemented with a course of intravenous and oral anti mycotic drugs and two staged Revision Arthroplasty.

Conclusion : A timely diagnosis of fungal Peri-prosthetic knee joint infection would save the life of the patient and motion of the limb, " A stitch in time saves nine ". Fungal examination should be a part of microbiological examination in every peri prosthetic joint infections. The interval between the two stages of mycotic periprosthetic joint infection can be reduced with proper antifungal cement spacer and antifungal drugs.

Keywords: *Candida glabrata*, *Torulopsis glabrata*, Peri-prosthetic fungal infection, cement spacer, Antifungal therapy, Revision Total Knee Replacement, Two stage Revision.

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Consent: Written informal valid consent was taken from the patient and was approved by the Ethical committee of the Hospital Board.

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I. Introduction

Prosthetic joint infections by candida species are extremely rare with only few reported cases in literature(1). *Candida glabrata* (*Torulopsis glabrata*) is considered to be the second most virulent yeast after *Candida albicans*. It resides in the human gastrointestinal tract, skin and vagina. The absence of evidence of disseminated candidiasis, the lack of any predisposing factors other than the prosthesis in elderly alone are highly suggestive of candidal periprosthetic joint infection. The diagnosis is difficult and often delayed due to lack of systemic manifestations during the initial stage and due to the false positive cultures due to contaminants. Direct intraoperative inoculation of mycotic organism or an unrecognized transient candidemia remains the common possibility to trigger the fungal periprosthetic joint infection. The role of prosthesis, human factors such as fibronectin and the candidal adhesins to biofilm are yet to be clearly defined[2-4].

II. Case Report

A 54 year old immune-competent female underwent total knee replacement in both her knee joints over a two month interval period for primary osteoarthritis. Six months after surgery, she developed pain and mild swelling over her right knee joint. She was treated symptomatically with short course of antibiotic therapy for which she responded for a while. She still had pain over her right knee joint for which she undertook native treatment. She was admitted to our hospital with fever, pain, moderate swelling and decreased range of motion and was almost bed bound, one year following surgery. She had no history of diabetes mellitus, prolonged antibiotic therapy or any surgical intervention for other medical disorders.

Her haematological examination revealed elevated Erythrocyte Sedimentation Rate (ESR) of 73mm/one hour (normal value : 20mm/one hour) and C Reactive Protein (CRP) of 33 mg/L (normal value : < 6 mg/L) levels with normal white blood count (Total Count 7900 and Differential count: 53Neutrophils, 41Lymphocytes, 5Eosinophils, 1Monocytes, 0Basophils). X-ray of the knee reveal any osteolytic lesions, bone destruction around the prosthesis suggestive of septic loosening. The joint fluid was aspirated under aseptic precautions. Gram and AFB stains were negative. Fungal stain showed a few yeast cells. Fungal culture grew *Candida glabrata*, identified by means of Vitek 2 (yeast ID card). Antifungal susceptibility testing with CLIA document M27-A showed that the isolate was susceptible to fluconazole. Three subsequent culture samples taken during the stage I procedure also grew *Candida glabrata*. Histopathologic examination of the periprosthetic membrane from the stage 1 procedure showed subacute to chronic inflammation of synovium with abundant fibrin and necrotic bone suggestive of osteoarthritis.

Stage I revision surgery included implant extraction, debridement, irrigation and placement of static antifungal cement spacer. The static cement spacer included 3 grams of vancomycin with 80 grams of Palacos G cement. The patient was started on intravenous fluconazole 800 mg once daily for one week followed with oral fluconazole 200 mg twice daily for a period of six weeks. The ESR, CRP, CBC was repeated once in every two weeks. The patient was free of antifungal drugs for a period of two weeks. There was significant improvement in the general condition with a decrease in ESR and CRP levels at the end of 10 week interval period. A standard stage II Total Knee Revision (Legion – Smith Nephew) was done. The exposure was facilitated rectus snip, distal femur had bone defect of AORI type IIb (AORI – Anderson orthopaedic Research Institute) and the proximal tibia had bone defect of AORI type IIb. Aguments were used on both femoral and tibial sides as per the bone defect. The patella looked normal and was left undisturbed with proper patellar tracking. The cultures taken during the stage II revision did not grow any yeast or bacteria. The patient had a programmed physiotherapy rehabilitation protocol. She was allowed complete knee range of motion exercise and weight bearing from day one. At the end of 2 year follow up, the patient presents with pain free knee joint and a range of motion of 0* - 100* with no evidence of any recurrence.

II. Discussion

Infection is the most common and dreadful complication of total knee replacement inspite of all advancements. Pain and swelling in and around the knee is the commonest presentation of fungal peri prosthetic joint infection. The ESR, CRP and WBC are found to be elevated in most cases and are used to assess the prognosis of antifungal treatment. The X-ray sometimes shows osteolytic lesions around the prosthesis. Candida species grow on standard fungal media and are identified and susceptibility determined using standard methods such as VITEK 2(AST –YS01, AST –YS02, AST –YS05, AST –YS06 yeast ID card) and Id-32C test (Biomerie'ux, France) [1-4].

Amphotericin B, fluconazole, voriconazole and echinocandins are some of the commonly used antifungal drugs both parenterally and orally as per the culture sensitivity. In almost all patients with Candida PJI, implant removal, resection arthroplasty, debridement and anti fungal therapy is the management of choice. Arthrodesis and suppressive treatment are considered in patients with poor general condition. Two stage Revision arthroplasty is considered in selective patients. One stage exchange procedures have also been reported in candidal periprosthetic joint infection. Sometimes the salvage of the limb may be a difficult task and end up in amputation due to uncontrolled infection or severe joint laxity [1-7].

Açikgöz et al (2002) reported a periprosthetic knee joint infection by candida glabrata which was missed initially. The empiricial antibiotic therapy followed with a revision joint replacement ultimately failed. later the patient had a resection arthroplasty and antifungal treatment. The patient had an arthrodesis done and had no signs of reinfection at end of 30 weeks(1). Fabry K et al (2005) reported Periprosthetic knee joint infection by candida glabratta with a pretibial collection. Due to cardiac insufficiency revision arthroplasty was withheld. The patient underwent debridement with retained prosthesis with 10 weeks of oral voriconazole till the ESR and CRP values turned normal [3]. Gaston et al (2004) reported C.glabrata knee PJI who underwent resection arthroplasty and antifungal treatment. The infection remained uncontrolled and so Amputataion was done. The patient had no signs of reinfection at the end of six months followup[4].

Simonian PT et al (1997) reported a Candida glabrata periprosthetic knee joint infection treated with suppressive treatment including parenteral and oral antifungal drugs alone without any surgical intervention. The patient had a one stage exchange and had no signs of reinfection at the end of 4 year follow-up [6]. Yang SH et al (2001) reported Candia parapsilosis periprosthetic knee joint infection which was treated with implant extraction, debridement as stage I procedure, 6 weeks parenteral administration of fluconazole followed with 4 weeks of oral fluconazole and revision arthroplasty after 3 months as stage II procedure [7]. Klatte et al (2014) concluded that one stage exchange was found effective in treating fungal periprosthetic infections with proper pre, intra and post operative treatment plan. The success of one stage revision procedure has been already reported in other candidal periprosthetic joint infection [5].

IV. Conclusion

The possibility of a fungal etiology should always be considered and not to be missed out in all peri-prosthetic joint infections. Two Stage Revision is good for treating Periprosthetic Knee Joint Infection by Candida glabrata.

V. Clinical message

A timely diagnosis of fungal Peri-prosthetic knee joint infection would save the life of the patient and motion of the limb, “ A stitch in time saves nine ” . Fungal examination should be a part of microbiological examination in every peri prosthetic joint infections. The interval between the two stages of mycotic periprosthetic joint infection can be reduced with proper antifungal cement spacer and antifungal drugs.

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Preparation Of Figures



Figure 1: (A)infected TKR prosthesis, (B) cement spacer insitu (stage I procedure), (C)Revision TKR (stage II procedure)

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