

Aspergillosis Causing Delayed Implant Loosening in a Case of Total Hip Arthroplasty: A Case Report with Review of Literature

Roumina Hasan¹, Sandeep Kumar², Mary Mathew³, Archana Shivamurthy⁴, Bhavna Nayal⁵

¹Assistant Professor, Department of Pathology, Melaka Manipal Medical College, Manipal University, Manipal, Karnataka, India, ²Assistant Professor, Department of Radiodiagnosis, Kasturba Medical College, Manipal University, Manipal, Karnataka, India, ³Professor, Department of Pathology, Kasturba Medical College, Manipal University, Manipal, Karnataka, India, ⁴Assistant Professor, Department of Pathology, Melaka Manipal Medical College, Manipal University, Manipal, Karnataka, India, ⁵Assistant Professor, Department of Pathology, Kasturba Medical College, Manipal University, Manipal, Karnataka, India.

Abstract

Aspergillus is an ubiquitous opportunistic saprophytic fungus which exists as spores and hyphae. In an immunocompromised host, the inhaled spores primarily affect the respiratory system resulting in superficial or invasive disease forms. Other less commonly affected sites include skin, brain and eye. Fungal prosthetic joint infection (PJI) after total hip arthroplasty is a very rare, but serious complication warranting prolonged medical and surgical care. We describe a case of PJI by aspergillus in a diabetic patient who presented with limb length shortening and pain in the affected joint, diagnosed on histopathology. This is only the second documented case of aspergillus infection after total hip arthroplasty.

Keywords: Aspergillus, Hip pain, Prosthetic joint infection, Total hip arthroplasty

INTRODUCTION

With the ever expanding advancement in medical science related to joint replacement surgeries, the associated comorbidities have been steadily rising. One of the most debilitating complication of arthroplasty is prosthetic joint infection (PJI). The incidence of PJI for primary hip or knee replacements and after revision surgeries varies around 1-2.5% and 2.1-5.8%, respectively.^{1,2} The most common pathogens implicated in PJI are coagulase negative *Staphylococci* and *Staphylococcus aureus*, accounting for up to 65% of all the cases.³ Fungal PJIs are rare, constituting only approximately 1% of all the PJIs, with candida being the most common offender.¹ In the last 22 years, there have been total of four case reports documenting aspergillus as the offending organism in PJI after total knee arthroplasty.⁴

However, only a single documented case of hip prosthesis infection has been attributed to aspergillosis.⁵ To the best of our knowledge, this is only the second case of aspergillus causing PJI after total hip arthroplasty (THA).

CASE REPORT

A 45-year-old male patient, known case of diabetes and hypertension since 4 years, who had a total hip replacement done 12 years back for avascular necrosis and revision arthroplasty 3 years back, presented to our hospital's outpatient department with pain in the left hip since 4 months and was walking with crutch support. On examination, there was mild shortening of left lower limb with restriction of movements at left hip joint. There was no obvious soft tissue swelling or local rise of temperature. No redness or discharging sinus was seen. Modified teleoroentgenogram revealed limb length discrepancy with shortening of left femoral length by 1.5 cm with Ficat Arlet Stage II Avascular necrosis of right femoral head (Figure 1). Laboratory investigations were within normal limits except for mildly elevated C-reactive protein (3.4 mg/l) and erythrocyte sedimentation rate (23 mm/h). Repeated arthrocentesis for cultures did not yield any growth even after 48 h.

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Corresponding Author: Dr. Sandeep Kumar, 179, 'B' Type KMC Quarters, KMC Campus, Manipal, Karnataka, India.
 Phone: +91 7760190610. E-mail: drsandeepkumarradiologist@gmail.com



Figure 1: Modified teleoroentgenogram revealed limb length discrepancy with shortening of left femoral height

Based on clinicroadiological findings of implant loosening, left hip revision arthroplasty was undertaken and debrided tissue was sent for histology. The patient tolerated the procedure well and was ambulated on day 4 and subsequently discharged under antibiotic cover.

Histopathology of the debrided tissue showed shards of devitalized bone with granulomatous inflammation and enmeshed septate, dichotomous branching hyphae morphologically consistent with aspergillus (Figure 2a and b). As the diagnosis was not suspected during the surgery, no specimen was submitted for fungal culture.

In the light of histopathology report, the patient was counseled for two-stage revision surgery, which he refused because of the involved complexities and also because he was pain-free, instead he opted for prolonged systemic antifungal therapy. On 3 months follow-up, the patient is pain-free and has started walking without crutch support.

DISCUSSION

PJI is a rare but devastating complication of arthroplasty fraught with grave consequences as it is difficult to diagnose and equally difficult to treat. Among the rare cases of PJI caused by *Fungal organisms*, *Candida albicans* accounts for the

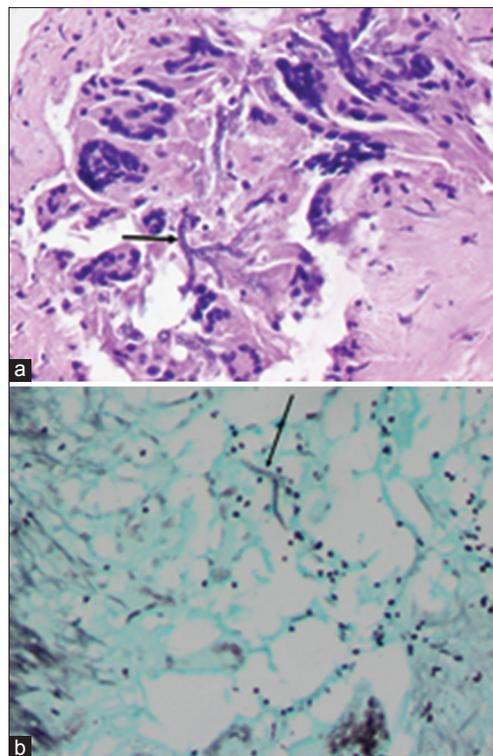


Figure 2: Septate fungal hyphae of Aspergillus (black arrow). (a) H and E (×400) and (b) methenamine silver (×400)

majority, with other rarely reported entities being *Aspergillus fumigatus*, *Pichia anomala*, and *Rhodotorula minuta*.^{1,6}

Aspergillus is a ubiquitous opportunistic saprophytic fungus which develops hyphae only in the pathogenic state. The risk factors usually associated with fungal infections are immunosuppressed states, rheumatoid arthritis, diabetes mellitus, malignancy, tuberculosis, malnutrition, prior native joint infections, and renal impairment.^{1,3}

The presentation of fungal PJIs closely resembles that of chronic bacterial infection, having an indolent course with local swelling and pain without any other inflammatory features. Radiographic spectrum for fungal PJIs ranges from being normal to frank bony destruction. Serial radiographs with comparative analysis for features like radiolucency >2 mm at bone-implant interface and component migration helps diagnose implant loosening, with the limb length shortening being the most reliable criteria for prosthesis loosening. Presence of femoral periosteal reaction and associated soft tissue may help favor a diagnosis of infective over aseptic joint loosening.⁷ However, no specific radiographic feature has been described to differentiate fungal from bacterial PJIs.

Diagnosis of fungal PJI is essentially made by histopathological examination and culture in concert

with clinical and radiological findings.^{8,9} It is postulated that in samples obtained for PJI, any cultured fungal species should be considered pathogenic, and not as contaminant.¹

Newer diagnostic techniques which can also be employed for diagnosis of fungal PJIs include the sonication of the removed implant and polymerase chain reaction, which are supposed to increase the diagnostic yield.^{1,8}

Most effective treatment for fungal PJI is two-staged procedure with delayed reimplantation arthroplasty after adequate systemic antifungal therapy ranging from 6 weeks to 3 months depending on the patients' clinical profile.^{1,6}

CONCLUSION

High index of suspicion is warranted for fungal etiology in the setting of PJI, as a delayed diagnosis can be catastrophic for both the patient and the treating surgeon. Clinical examination and radiological investigations play an important albeit ancillary role in the management of fungal

PJIs, whereas histopathology and culture remains the gold standard for diagnosis.

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