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Case Report

Forgotten intrauterine contraceptive device – A threat to total hip prosthesis: A case report with review of the literature

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ABSTRACT

Primary total hip replacement has become a routine procedure these days. With improvement in surgical techniques and implant designs, the survival rate of prosthesis has increased significantly but unfortunately, prosthetic infections though uncommon continue to be a threatening complication. We present a detailed review of the literature along with a case report of infected total hip prosthesis in a 36-year-old female who had been operated 6 years back. The causative organism was found to be *Actinomyces israelii* which was related to an infected intrauterine device used for contraception that had been forgotten after being implanted 8 years earlier.

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1. Introduction

Periprosthetic joint infection is a persistent risk factor for the patients after arthroplasty because the host–prosthesis interface presents as a self-perpetuating enlarging immunocompromised fibroinflammatory area that is more susceptible to bacterial infection.¹ The occurrence of periprosthetic joint infection with *Actinomyces*, a gram-positive, anaerobic bacteria is rare. Late haematogenous joint infections with *Actinomyces israelii* (*A. israelii*) have been described in literature but not reported in association to an unchecked forgotten intrauterine contraceptive device (IUCD) which prompted us to enlighten the diagnosticians as well as treating surgeons with this case

in which the infected IUCD was the source of prosthetic infection.

2. Case report

A 36-year-old illiterate female presented to outpatient department with left hip pain since 3 months. The past history revealed that she was operated for painful hip at a private centre 6 years back. Her available written records revealed that she had total hip replacement (THR) for avascular necrosis of the left hip. On physical examination, the patient was afebrile, and her systemic examination was unremarkable. There was localized pain in the left hip, with

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raised local temperature and reduced range of motion compared to right hip. Laboratory parameters showed total leucocyte count of 12,500/ml with neutrophilia, the erythrocyte sedimentation rate was 110 mm/h and c-reactive protein of 70 mg/l. Skiagrams of the left hip showed osteolysis around femoral and acetabular components. Fluid aspirated from the left hip joint was turbid and its microscopic analysis revealed a leucocyte count of 35,000/ml with 90% being neutrophils. On Giemsa stain, numerous basophilic colonies of filamentous organism were seen (Fig. 1) which on further Gram stain were seen as beaded, branched, filamentous gram positive rods (Fig. 2). These colonies were negative for acid fast stain. Based on the morphological features, actinomycotic infection was suspected. Anaerobic cultures grew numerous opaque white colonies of gram-positive, irregular bacilli. The organism was identified as *A. israelii*. Antibiotic susceptibility testing was done and revealed susceptibility to penicillin, cefotaxime, cefoxitin, metronidazole and clindamycin.

The case was again revisited. An attempt was made to look for the primary site of infection. The important risk factors for joint infection like diabetes, steroid intake, trauma, intravenous drug abuse and dental extraction were ruled out. The patient on further evaluation revealed history of irregular vaginal foul smelling discharge since last 2 years. She gave history of IUCD use which was kept 8 years back. The skiagrams were reviewed and it showed a metallic IUCD in the uterus which was missed earlier (Fig. 3). The patient was referred to obstetrics and gynaecology department for further examination. Her per vaginal examination revealed pockets of pus around the IUCD (copper T). The IUCD was removed, area was gently curetted, lavaged and the material was sent for histopathology and culture. Microscopically, sections of the

Fig. 1 – *Actinomyces israelii*, filamentous aggregate (Giemsa stain, 40X).

Fig. 2 – Branched, beaded, filamentous gram positive colony of *Actinomyces israelii* (Gram stain, 40X).

Fig. 3 – Skiagram revealing an intrauterine contraceptive device along with osteolysis around the prosthesis.

curettage showed thin filamentous aggregates of actinomycetes surrounded by few scattered neutrophils (Fig. 4) and the culture showed colonies of *A. israelii*. The patient was put on antibiotic (Penicillin G – 24 million U/d intravenous by continuous infusion). After 48 h, she showed some signs of improvement i.e. relief in local pain and a feeling of general well being. The patient was advised surgery for the hip in form

Fig. 4 – Photomicrograph showing characteristic colony of filamentous *Actinomyces israelii* with peripherally situated, radiating and hyaline eosinophilic material representing the 'Splendore Hoeppli' phenomenon. There is scant polymorphonuclear infiltration around the colony surrounded by chronic granulation tissue.

of debridement/removal of prosthesis. But the patient refused surgery and wanted to defer it. After 10 days of hospital stay, the patient left against medical advice and was lost to follow-up.

3. Discussion

Deep infection is the most serious complication of THR, with incidence in large series reported being up to 1.7% for primary

THR, leading to prosthesis removing and leaving the patient with a girdlestone type of pseudarthrosis.² Infection following THR can be classified based on the timing of infection: early is defined as occurring within 1 month of prosthesis implantation, delayed occurring between 1 month and 1 year and late infection occurring more than 1 year after implantation. Early and delayed infections are mainly regarded as the result of bacterial seeding in the perioperative period, whereas the source of a late infection is usually controversial, but a long delay with no previous evidence of infection suggests spread by the bloodstream from a distant endogenous focus.³ *Actinomyces* species (*A. israelii*) are prominent member of the normal flora of the oral cavity, lower gastrointestinal tract and female genital tract of the humans. The disease caused by these organisms is called actinomycosis which most commonly occurs in 3 body regions: cervicofacial (55% of patients), abdominopelvic (20%) and pulmonothoracic (15%). Involvement of other parts of the body is uncommon and usually secondary to a lesion in one or the other of the above sites.⁴ Musculoskeletal disease is usually secondary to the spread of adjacent soft tissue infection (in 75% of cases), trauma (in 19% of cases) and hematogenous spread of infection (in 3% of cases).⁵ Late prosthetic joint infections with *Actinomyces* species have been previously described.⁶⁻¹⁰ There are many risk factors for this infection like dental extraction, diabetes, use of immunosuppressants, intravenous drug abuse, primary infections including pharyngitis, otitis media, urinary tract infections, pneumonia, cholecystitis, urinary tract infections, cholecystitis and dental caries.⁴ Our patient did not have any of these risk factors prior or at the onset of symptoms.

A. israelii infection in THA is an extremely rare event. An extensive search of English literature through Pubmed and Medline was done. Five cases of *A. israelii* periprosthetic hip joint infection have been reported so far in the world literature which are reviewed in Table 1. The present case is the first to be reported from India and also the first reported case of late

Table 1 – Summary of cases of late prosthetic hip joint infection by *Actinomyces israelii*.

First author/s (Ref.)	Year	Case	Age (years)/sex	Years since implant in the hip	Source of infection	Treatment	Follow-up
Petrini and Welin-Berger ⁶	1978	1	74/F	1	Bacterial implantation at the time of surgery	Removal of prosthesis and Intravenous penicillin	Nonfunctioning joint due to super infection by staphylococcus aureus
Petrini et al. ⁷	1979	2	Not available	2	Not available	Not available	Not available
Strazzeri and Anzel ⁸	1986	3	61/F	10	Dental extraction without prophylaxis	Removal of prosthesis and Intravenous penicillin	Prosthetic reimplantation – 8 months later, further 6 months follow up was uneventful
Zaman et al. ⁹	2002	4	43/F	11	Intravenous drug abuse	Removal of prosthesis and Intravenous penicillin	Lost to follow up
Wu et al. ¹⁰	2011	5	71/M	9	Diabetes	Prosthesis removal and Intravenous penicillin	Reimplantation 3 months later, asymptomatic at 1 year postoperative follow up
Present case	2015	6	36/F	6	Unchecked IUCD	Removal of IUCD, Intravenous penicillin, Advised surgery	Lost to follow up

haematogenous spread of *A. israelii* to a total hip prosthesis in a reproductive age group patient due to unchecked intrauterine contraceptive device which acted as a threatening provoking risk factor.

Because of the rarity of actinomycosis infection nowadays, owing to the indiscriminate use of antibiotics, its diagnosis is often missed leading to substantial morbidity and mortality. The basis of management includes clinical examination, high index of suspicion, histopathology, isolation and culture of organism. It is difficult to diagnose it based on the typical clinical features; therefore, direct identification or isolation of the infecting organism from a clinical specimen (draining sinuses, deep needle aspirate, or biopsy specimens) with demonstration of sulfur granules is necessary for definitive diagnosis in most of the cases.⁴

A. israelii infection in THR is treated by both medical and surgical therapy. Drug of choice is Penicillin G. High-dose Penicillin G – 12–24 million U/d intravenous by continuous infusion or in divided doses is given followed by oral amoxicillin, ampicillin, or penicillin V which is administered over a prolonged period (6 months to 1 year). Alternative to penicillins, if the patient is hypersensitive to penicillin or the causative organisms are resistant to penicillin, are Ceftriaxone, Imipenem/Cilastatin, Clindamycin, Amoxycillin/Clavulanic acid, Doxycycline, Tetracycline, Lincomycin and Macrolides (erythromycin, Carbomycin, Spiramycin and Oleandomycin). But the sensitivity of these drugs should be laboratory-tested.¹¹

In all of the previous cases, the implant was removed surgically before the patient was commenced on high dose antibiotic therapy. In two cases, reimplantation surgery was done once the microorganism was eradicated from the affected hip. In the present case, the patient was put on high dose of intravenous penicillin and surgery in the form of debridement or removal of prosthesis was advised once the infection was controlled by antibiotics. But the patient refused for the surgery and was lost to follow-up.

4. Conclusion

Intrauterine devices used for contraception can be the source of local and distant infection in the body; therefore, regular checks for IUCD infection should be carried out, per vaginal

discharge, if any should be noted. If a female patient, especially in reproductive age group, is to undergo prosthetic replacement, she should be suggested some other means of contraception and if she is using IUCD, it should be removed before the THR, which is a elective surgery in most of the situations.

Conflicts of interest

The authors have none to declare.

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