CASE REPORT

Hip prosthesis infection related to an unchecked intrauterine contraceptive device: A case report

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Summary  Intrauterine devices (IUD) used for contraception can be the source of local infections or can migrate, which justifies regular checking recommendations and limitations around the implantation period. To our knowledge, bone and joint infections related to an infected IUD have not been described in the scientific literature. This paper reports on a case of the repeated infection of a total hip prosthesis related to an infected IUD that had been forgotten after being implanted 34 years previously. The arthroplasty infection revealed itself through dislocation of a dual mobility cup. Commensal bacteria that colonize the female genital tract (Streptococcus agalactiae) were identified at the site of hip arthroplasty. This led to the discovery of the IUD that was infected by the same bacterium. Despite lavage of the non-loosened arthroplasty, removal of the IUD and 2 months of antibiotic treatment, the dislocation recurred and the prosthesis was again infected with the same microorganism 4 months later. This recurrence of the infection, with persistence of a uterine abscess containing the same bacterium, was treated with repeated lavage of the joint, total hysterectomy and antibiotics treatment. The infection had resolved when followed-up 3 years later. The occurrence of a bone and joint infection with this type of bacterium should trigger the evaluation of a possible IUD infection.

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Introduction

Intrauterine devices (IUD) have been widely used as a contraceptive method since 1970 [1]. Many cases of local infection or migration of these devices have been described in published reports, justifying the monitoring recommendations and limitations on life span [2–5]. To our knowledge, the infection of bone and joints or orthopaedic implants secondary to an IUD infection has not been described in the scientific literature up to now.

Observations

The patient was a 68-year-old woman with rheumatoid arthritis who was undergoing immunosuppressant treatment (methotrexate) since 1998. She was referred to our facility to treat the instability of a total hip arthroplasty (THA) in her left leg, which had been implanted 6 years earlier. She reported having 15 episodes of instability, which led to five stabilisation procedures (to change the acetabular and/or femoral components, lengthen the femoral neck, restore proper muscle tension) being performed over a 6-year period. None of these procedures were complicated by an infection and none of the microbiological samples taken during these revision procedures were positive. We performed a femoral and acetabular revision using a distal locking stem and a dual mobility cup cemented into a reconstruction cage (Fig. 1). The samples collected during this last revision were all negative. During the next 4 years, the patient had no episodes of instability or infection. She then presented to the emergency ward for a posterior THA dislocation (Fig. 1). The patient had experienced pain in the left inguinal area for a few days without having a fever. A closed reduction was performed under general anaesthesia and fluoroscopy-guided joint aspiration was performed to collect samples for microbiological analysis; the fluid was positive for Streptococcus agalactiae. Although the patient had no pain symptoms, the gynaecological examination identified endometritis with purulent discharge from the IUD that had been left in place for 34 years, without clinical consequences. The IUD was removed and the same bacterium was identified when the device was placed in culture. The involved joint was treated by synovectomy and lavage, by changing the femoral head and polyethylene insert without removing the implant (since not loosened), and was immediately followed by empirical dual antibiotic treatment (vancomycin, cefotaxime). This antibiotic regimen was then adjusted based on microbiological findings of the same bacterium (rifampicin and sulfamethoxazole/trimethoprim) and continued for 2 months. The infection seemed to be under control, but 2 months later the posterior dislocation occurred again, which required emergency reduction. A new joint aspiration revealed the presence of the same microorganism with the same sensitivity. A CT-scan of the abdomen revealed a uterine abscess, which led to a hysterectomy. A new irrigation-lavage procedure was performed given the lack of implant loosening, followed by a 3-month treatment with the same dual antibiotic therapy, since the same bacterium was identified in the fluids collected intraoperatively. Three years later, the patient is pain-free and has had no recurrence of the instability.

Discussion

To our knowledge, this is the first reported case of a hip arthroplasty infection related to endometritis secondary to a neglected intrauterine contraceptive device. Most of the complications related to IUDs are infectious: change to the commensal vaginal flora, endometritis, local abscess and more rarely manifestations in other locations, such as an epidural abscess [2,3]. Mechanical complications such as IUD migration through the uterus wall have also been described [4,5]. In this case, the infection was due to Gram positive cocci commensal to the cervical and vaginal flora [6]. Five to 16% of women are healthy carriers of S. agalactiae, which causes post-partum infection or infections in newborn children [7–9]. Osteomyelitis due to S. agalactiae (group B beta-haemolytic streptococcus) has been described in newborns. The infection occurs during the post-partum period, with contamination when the baby passes through the genital tract during childbirth. Treatment consists of surgical debridement and antibiotic administration [10]. In adults, S. agalactiae infections are related to risk factors such as cancer and liver failure [11].

For the current case, the repeated procedures could have provided a portal of entry for the microorganism. However we hypothesized that a secondary infection related to the IUD infection was present given that 4 years had elapsed since the last procedure, all the samples collected during the previous procedures were negative and especially because of the endometritis and the fact that the same bacterium (S. agalactiae) was isolated on the IUD and in the joint fluid. The diffusion route was most likely blood-borne, although no blood cultures were done (these are not routinely performed when no fever or chills are present).

There is currently no consensus as to maximum time an IUD can be worn. Nevertheless, French Health Authority recommendations on copper devices places their activity period at 3 years, after which no more copper is released [12]. The persistent uterine infection despite the IUD removal was responsible for the recurrence of the prosthesis infection. As a consequence, a hysterectomy was absolutely essential, as this was the only way to ensure the endometrial infection was completely resolved and to remove the assumed portal of entry for the prosthesis infection. The recurrence of the prosthesis infection may also have been due to the continued presence of bacteria in the biofilm formed on orthopaedic implants [13]. It has been reported recently that joint prosthesis infections due to S. agalactiae recur most often than infections with other microorganisms [14]. However, given the lack of selection for mutant rifampicin-resistant strains to following the first treatment sequence and the progression towards extended remission when the second treatment sequence was comparable in all aspects to that of the first (except for treatment of the uterine infection), we favoured the hypothesis of reinfection via the uterine route of entry, which had not been sterilized despite the IUD removal and antibiotics therapy. It is not very likely that the recurrence of the prosthesis infection could have led to a secondary infection of the endometrium.

Because dual mobility cups rarely dislocate, other predisposing factors must be considered [15]. In our experience, the sheer number of procedures could be brought up as
the main factor, but the incident-free period since the last dislocation episode could suggest a new triggering factor, notably an infection due to the prolonged immunosuppressant treatment. The discovery of a prosthetic being infected by a microorganism from the vaginal microbiome should lead the surgeon to look for an infection secondary to a neglected IUD. Only consistent results in the collected samples (with or without positive blood cultures) can provide definite proof of the IUD being responsible for the infection. If this is the case, other than removing the IUD, performing a surgical revision of the prosthetic and providing appropriate antibiotic treatment, the gynaecological infection should be monitored so that a hysterectomy can be performed right away if the infection does not progress favourably. Bone and joint infections related to an IUD infection can be added to the list of potential complications of having an IUD in place for an extended period of time.

Disclosure of interest

Julien Girard, Henri Migaud and Gilles Pasquier have limited research and educational consulting engagements with Zimmer. Julien Girard is a consultant for Wright Medical. Henri Migaud is a consultant for Tornier. Eric Senneville is a consultant for Novartis, Sanofi-Aventis, Astra-Zeneca and Pfizer. Gildas Ducharme has no conflicts of interest to declare.

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