Infected hip prosthesis in patient with suspected Covid-19 infection

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Case Report

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Abstract

Background: Infections following arthroplasty are one of the major risks during this type of surgery.

Case presentation: Four and half years after right hip arthroplasty surgery, the patient came back to our attention with pain at the same hip. The instrumental examinations showed signs of cup detachment and therefore, after carefully analyzing the case, we decided to perform a sterile aspiration of the hip in the operating room under C-arm fluoroscopy. Microbiological examinations showed positivity for E.Coli. The patient underwent to surgery to remove the prosthesis and implant a spacer. A therapy with Cefotaxim 2g 1-1-1 for 6 weeks was then set, after which a total arthroplasty was implanted. During this period, the Covid-19 pandemic occurred and therefore the patient performed two nasal-throat swabs, both negative. However, one week after the final surgery, respiratory conditions worsened and we performed a chest X-ray and CT scan, with suggestive images of ground-glass opacification patterns (GGO). Due to the clinic and the characteristic images of the instrumental examinations, the patient was transferred to the observation ward, waiting for the response of two additional swabs, also negative. The patient was then transferred to the ward for patients with typical symptoms of Covid-19 but with negative swabs for two weeks and subsequently discharged at home.

Conclusion: Despite the concomitant Covid-19 pandemic, the guidelines in case of periprosthetic hip infection further confirm the correct management of the patient.

Background

Knee and hip replacements are two of the most commonly performed elective operations. For the majority of patients, joint replacement surgery relieves pain and helps them to live fuller, more active lives. No surgical procedure is without risks, however. A small percentage of patients undergoing hip or knee replacement (roughly about 1 in 100) may develop an infection after the operation. Joint replacement infections may occur in the wound or deep around the artificial implants.

Case Presentation

The patient presented himself in our orthopedic clinic 4 years after the implantation of a right hip total prosthesis. The patient was 78 years old, with a history of Stage IIIA B cell Lymphoma in remission. He has been limping with severe pain for about 2 months, walking with crutches, about two cm difference in the lower limbs. X-rays and CT scans showed signs of loosening of the prosthesis towards the pelvis. Pic 1

Before performing a revision, we decided to make a sterile puncture in the operating room under C-arm fluoroscopic control. While waiting for the result of the antibiogram, the patient was treated with an empirical antibiotic therapy and then, after finding the presence of E. Coli, with Cefotaxim 2g three times per day.

Therefore, after adequate antibiotic therapy, we decided to remove the implanted prosthesis and to substitute with Antibiotic Impregnated Cement Spacers (Gentamycin and Vancomycin). The femoral stem, the acetabular component and swabs of the muscular fascia and synovial joint fluid were sent to microbiological further analysis that did not show the growth of any germ. For this reason, after an adequate monitorization of the patient's general condition, he was discharged with an oral antibiotic therapy and full weight bearing, as tolerated by pain. Pic 2

According to guidelines, the patient should have had the implantation of the final prosthesis after 6 weeks. However, during the same period, the Covid-19 pandemic occurred and therefore, in order to plan the definitive operation, it was necessary to contact the hospital's Task Force, which allowed it only nine weeks after the spacer. ^(3, 6, 8)

After the implantation of the final prosthesis (Acetabular Component 62, Delta TT Company Lima Corporate and two screws 6.5, Stem 12 LCU Company Link, small head 36mm Ceramic), the postoperative course was normal, the patient was always asymptomatic, except for a mild anemia, treated with Ferric sodium gluconate for one week. The postoperative prophylaxis of the infection included a double antibiotic with Cefotaxim 2g three times per day and Rifampicin 600mg once in the evening for the following 8 weeks. Pic 3

During his second hospitalization, there were performed two pharyngeal swabs for Covid-19, both negative. The patient was asymptomatic throughout the following week. However, after a sudden worsening of the respiratory symptoms with low saturation (SpO_2 87%) and severe respiratory distress, it was performed an urgent chest X-ray and then a CT scan, without evidence of pulmonary embolism but with multiple areas of ground-glass opacification patterns Pic 4. We decided to perform a Covid-19 rapid test, that resulted positive for the Covid-19 IgM and therefore the patient was transferred to the Covid observation ward, waiting for further swabs. The next two swabs were negative and therefore the patient was transferred to the Covid ward reserved for patients with negative swabs but with clinical symptoms for further treatment and one week later, after the resolution of the pulmonary symptoms, discharged at home.

Subsequent check-ups were carried out at six and ten weeks after surgery, the first one also with X-rays. In both examinations, the patient did not refer pain, the wound was dry and clean, the mobility was good and the radiography demonstrated an excellent position of the prosthesis without signs of detachment. Blood tests were always normal with regularization of CRP values.

Discussion

In order to reach the final diagnosis, all the steps required by the literature ⁽⁷⁾ have been performed: from the pre-operative anamnestic and laboratory evaluation, to the arthrocentesis up to the two-step revision and antibiotic therapy for 6 weeks, adapted according to antibiogram. ⁽⁴⁾

Treatment depends on the stage of infection and is based on the classification system published by Coventry in 1975 with the modification of Tsukayama⁽²⁾: Stage I infections occurring acutely within six weeks of implantation; Stage II infections being delayed chronic presentations; Stage III infections occurring in a previously well-functioning joint replacement; Stage IV being unexpected positive culture results in what was thought to be an aseptic revision.

According to the guidelines, the therapeutic scheme in periprosthetic infections provides for the removal of the implant and the subsequent definitive prosthesis to be performed in one or two steps: the last one is considered the gold standard with an eradication rate greater than 90%. ^(1, 9)

Conclusion

Despite the concomitant Covid 19 pandemic, which delayed the implantation of the definitive prosthesis for a further 3 weeks and the patient's acute pulmonary distress, the periprosthetic infection was eradicated, complying with the guidelines in terms of both medical and surgical diagnosis and therapy and the patient was able to resume his normal daily activity.

Declarations

Ethics approval and consent to participate

Not applicable

Consent for publication

The patient subscribed the consent for publication

Availability of data and materials

The datasets during and/or analysed during the current study available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests

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Authors' contributions

All the Authors have made substantial contributions to the conception, have approved the submitted version, agreed both to be personally accountable for the author's own contributions and to ensure that questions related to the accuracy or integrity of any part of the work

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Figures

Figure 1

A-P X-Ray and CT-Scans showed the loosening of the prosthesis

Figure 2

Removal of the prosthesis and implant of the spacer

Figure 3

Definitive Prosthesis after 9 weeks

Figure 4

Thorax CT-Scan showed multiple areas of ground-glass opacification patterns