

Two-stage hip resurfacing arthroplasty in a young patient with an infected hip following internal fixation of a complex acetabular fracture

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Citation

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Abstract

The two-stage total hip arthroplasty (THA), with or without the use of a cement spacer, is a well described technique that may be employed in the treatment of septic arthritis of the native hip joint or infected hip arthroplasty. A case is presented in which a two-stage hip resurfacing arthroplasty was performed for a case of septic arthritis following internal fixation for a complex acetabular fracture.

CASE REPORT

A 26-year-old university student sustained an associated both column fracture of his left acetabulum whilst snowboarding in France. Skeletal traction was applied and six days after injury the patient was repatriated to a regional pelvic trauma centre. The fracture was treated with open reduction and internal fixation via a Kocher-Langenbeck approach ten days after injury. This procedure was complicated by a blood transfusion reaction that produced severe cardio-pulmonary compromise requiring intensive care support. As a result of this intra operative deterioration it was not appropriate to proceed to additional anterior plating as had been originally planned.

Ten days after surgery, the patient was making a good recovery and was being nursed on the orthopaedic trauma ward. The patient did, however, display persistent pyrexias which prompted a washout of his left hip and deep tissue sampling. These samples grew both Methicillin resistant and Methicillin sensitive *Staphylococcus Aureus*, and *Pseudomonas aeruginosa*. On Microbiologist's advice, a six-week course of intravenous antibiotics (Meropenem and Teicoplanin) was commenced and completed at home. This was followed by a year of oral antibiotics (Rifampicin and Doxycycline).

Two years after the initial injury the patient was suffering with significant pain in the left hip. At this point the patient was referred to our institution. Plain radiographs revealed post-traumatic arthritis of the hip (Figure 1).

Figure 1: Pre-operative AP Pelvis Xray

Figure 1



The significant probability of persistent infection was also considered. An ultrasound scan revealed findings consistent with significant osteoarthritis and chronic synovitis. Inflammatory markers (CRP <2, white cell count 4.7m, ESR 2) were not raised making infection less likely, but not excluding the presence of ongoing deep infection.

The patient underwent debridement of the left hip with removal of all metalwork. Care was taken to dissect out the sciatic nerve before removing the posterior plate. Tissue was sent for frozen section, which revealed features suspicious

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for infection. This reinforced the plan to perform a two-stage procedure. As part of the debridement the femoral head was prepared using resurfacing arthroplasty instrumentation. A small cement cap was fashioned and positioned to cover the femoral head, which was then reduced into the joint (Figures 2 and 3).

Figure 2: Intraoperative photo of 1st stage procedure with cement cap in situ

Figure 2

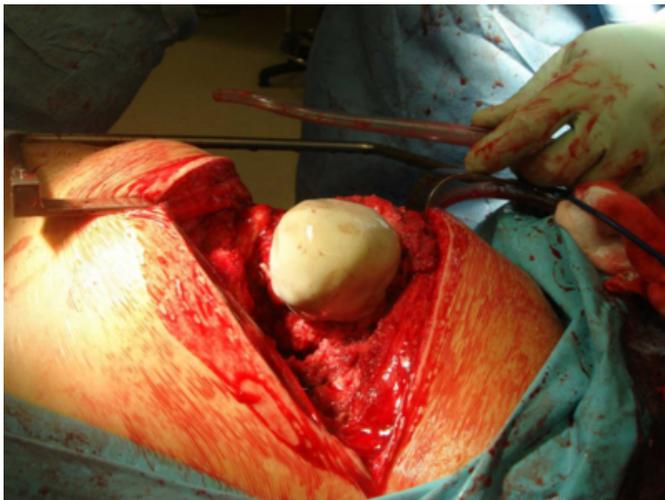


Figure 3: AP Hip Xray after 1st stage procedure

Figure 3



Multiple operative samples were sent for histology and microbiology and did not subsequently demonstrate microorganism growth. On Microbiologist's advice, a six-week course of intravenous antibiotics were commenced and completed.

Following a two-month interval the patient underwent the second stage of his left hip Metal on Metal resurfacing arthroplasty (MoMHRA) (Biomet UK Ltd, Bridgend, South Wales, UK). The cement cap was removed and the residual femoral head was noted generally to be in a good condition with good vascularity, except for a small patch of avascular necrosis in the antero-superior part of the head, accompanying less than 10% of the surface area. The femoral head was re-prepared to the size down to ensure a good bone cement interface (Figure 4). Operative samples (frozen section) again revealed no microbiological growth.

Figure 4: AP Hip Xray following 2nd stage procedure

Figure 4



After six weeks of graduated partial weight bearing the patient began to walk without support. At one year the patient was satisfied with the outcome and reported good hip function. At this stage an Harris Hip Score of 98 was recorded. There was no evidence of infection and no other complications were encountered.

DISCUSSION

Total hip arthroplasty is a common treatment for post-traumatic arthritis of the hip. Around 8.5% of patients with surgically treated displaced fractures of the acetabulum will progress to treatment with a hip arthroplasty¹. MoMHRA is bone conserving with reduced wear rate and reduced dislocation rate as compared to conventional total hip replacement. For this reason, in the younger patient who is likely to require future revision procedures, resurfacing is potentially advantageous. Hip resurfacing arthroplasty has also been shown to be an effective treatment of osteoarthritis in the young active patient². The presence of osteonecrosis in the femoral head should not be seen as a contraindication to resurfacing, in fact good results have been achieved in treating osteonecrosis of the femoral head with hip

resurfacing³.

The decision to opt for hip resurfacing arthroplasty would have been easier if there was no suspicion of infection, thereby allowing a one-stage procedure. The history of a culture positive septic arthritis of the hip raised concern that a one-stage procedure could have resulted in an infected arthroplasty. One-stage procedures for infected arthroplasty have shown a higher re-infection rate than two-stage procedures^{4,5}. This is the case particularly when no organism has been identified pre-operatively. The two stage procedure has the advantage of allowing an extra opportunity for thorough debridement; it is imperative to remove all foreign and avascular material, otherwise the chances of eradicating the infection are significantly reduced.

Two-stage total hip arthroplasties are a common surgical solution for both primary septic arthritis of the hip⁶ and infected hip arthroplasty⁷. This is, however, the first time that a two-stage hip resurfacing using a cement spacer has been described for the treatment of an infected post-traumatic hip. The cement spacer enabled the patient to comfortably ambulate between the first and second-stage procedures, while it also protected the femoral head from further damage that may have been sustained when articulating directly with the rough acetabular surface.

References

1. Giannoudis, PV, Grotz, MRW, Papakostidis C, Dinopoulos H. Operative treatment of displaced fractures of the acetabulum: A META-ANALYSIS *J Bone Joint Surg (Br)* 2005 87-B: 2-9.
2. Pollard TCB, Baker RP, Eastaugh-Waring SJ, and Bannister GC. Treatment of the young active patient with osteoarthritis of the hip: A FIVE- TO SEVEN-YEAR COMPARISON OF HYBRID TOTAL HIP ARTHROPLASTY AND METAL-ON-METAL RESURFACING. *J Bone Joint Surg (Br)*, May 2006; 88-B: 592 - 600.
3. Hungerford MW et al. Surface replacement hemiarthroplasty for the treatment of osteonecrosis of the femoral head. *J Bone Joint Surg (Am)*. 1998 Nov;80(11):1656-64.
4. Masterson EL, Masri BA, Duncan CP. Treatment of infection at the site of total hip replacement. *Instr Course Lect*. 1998;47:297-306.
5. Garvin KL, Hanssen AD. Infection after total hip arthroplasty. Past, present, and future. *J Bone Joint Surg Am*. 1995 Oct;77(10):1576-88.
6. Chen CE, Wang JW, Juhn RJ. Total hip arthroplasty for primary septic arthritis of the hip in adults. *Int Orthop*. 2008 Oct;32(5):573-80.
7. McDonald DJ, Fitzgerald RH, Ilstrup DM. Two-stage reconstruction of a total hip arthroplasty because of infection. *J Bone Joint Surg Am*. 1989 Jul;71(6):828-34.

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