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Case Report: There's Always a Tomorrow and the Hope of Something New - Revision Aseptic Loosening Bipolar Hemiarthroplasty

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Abstract: ***Hip arthroplasty is one of the most promising orthopaedic procedures and has improved pain and improved hip function in patients worldwide. Despite the success of modern designs and bearing surfaces, around 10 % of hip arthroplasty still fail within 10 years. Improvements in surgical technique and prosthesis design have decreased the incidence of deep infection, dislocation and fracture, however aseptic loosening, the clinical end point of osteolysis, remains the most frequent complication. Prosthesis loosening results in pain and disability, requiring revision surgery. Revision hip arthroplasty is associated with a 3 to 8-fold greater in-hospital mortality, poorer functional outcome, longer hospital stay, and higher cost than primary surgery.***

Keywords: Aseptic loosening, bipolar hemiarthroplasty, revision total hip replacement

1. Introduction

Hip arthroplasty is one of the most promising orthopaedic procedures and has improved pain and improved hip function in patients worldwide. Despite the success of modern designs and bearing surfaces, around 10% of hip arthroplasty still fail within 10 years[3]. Improvements in surgical technique and prosthesis design have decreased the incidence of deep infection, dislocation and fracture, however aseptic loosening, the clinical end point of osteolysis, remains the most frequent complication. Prosthesis loosening results in pain and disability, requiring revision surgery. Revision hip arthroplasty is associated with a 3 to 8-fold greater in-hospital mortality, poorer functional outcome, longer hospital stay, and higher cost than primary surgery[4].

2. Case Report

Mr D 67 years old Indian gentleman presented with chief complaint of right hip pain for two years. Patient was previously well until 7 years ago when he slipped and fell in washroom at home. He sustained right neck of femur fracture. Patient underwent bipolar hemiarthroplasty. Post operatively patient ambulating with walking frame followed with crutches. One year after the bipolar hemiarthroplasty surgery patient had a fall again. Since the fall, patient complaining of right hip pain associated with limping and short limb. Patient had significant limb shortening and difficulty ambulating. On examination, patient is moderately build gentleman with right lower limb shortening of 2cm. Previous scar well healed with no foot drop and palpable distal pulses of right lower limb. Right hip range of movement is limited due to pain. Blood investigation showed CRP was 18, ESRwas 26, white cell count was 7 and D dimer was 0.49.

Radiological examination revealed loosening of bipolar hemiarthroplasty with tip of the implant impinging the lateral cortex of femur. There was also subsidence of the femur stem (Figure 1 and 2). Bone scan reported increase MDP avidity at the greater and lesser trochanteric region of right femur surrounding the prosthesis and distal end of right hip prosthesis is suggestive of loosening of right hip prosthesis.

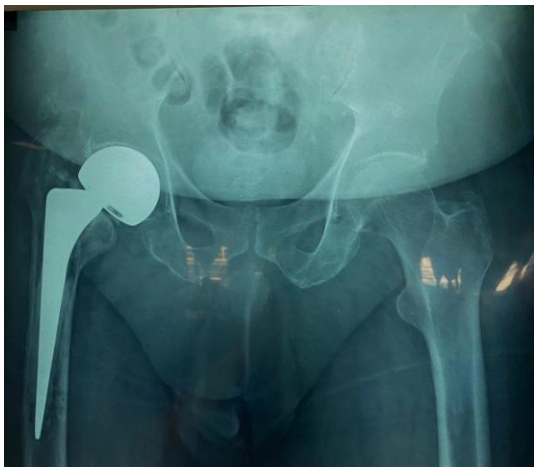

Figure 1

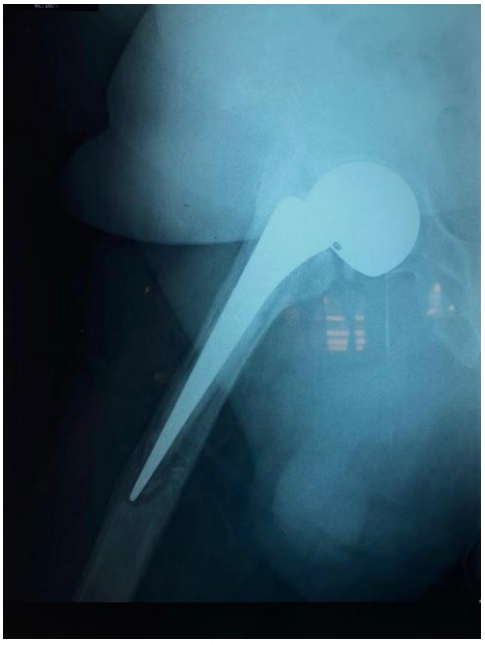

Figure 2

3. Method

Under general anaesthesia patient was put on lateral position. Regular skin prep was done and prophylactic antibiotic intravenous cefuroxime was given. Hip was approach via posterior approach. After skin incision the fascia latae was incised overlying the gluteus maximus and bluntly splits the muscle down to the short external rotators. The sciatic nerve is carefully protected as it travels immediately posterior to the short external rotators. After identification of the piriformis, the short external rotators and piriformis are thentenotomized at their insertion onto the greater trochanter. They are then tagged with a braided suture for identification and repair at the end of the procedure. This then expose the posterior joint capsule, which is incised to reveal the implant. Intraoperatively implant was loose and the femoral canal was cleared carefully. Following adequate debridement, acetabulum and femur was prepared. During implantation of femur stem, undisplaced fracture at the tip of previous stem was noted. Cable plate was use to stabilise the fracture(Figure 3 and 4). Post operatively patient was started on touch toe ambulation. On day 10 post revision surgery patient dressing was persistently soaked. Upon examination of the thigh, there was no discharge upon milking the thigh and non-tender on palpation. Ultrasound examination revealed 3 intramuscular hypoechoic collection over the thigh. In view of persistently the wound dressing being soaked, patient underwent evacuation of haematoma. Post operatively the wound was dry and healed at 3 weeks.

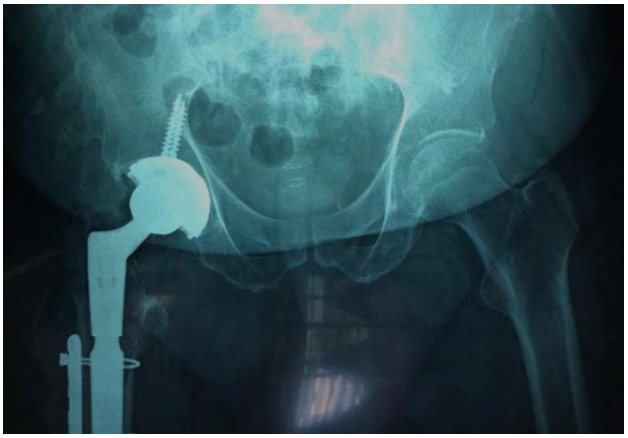

Figure 3

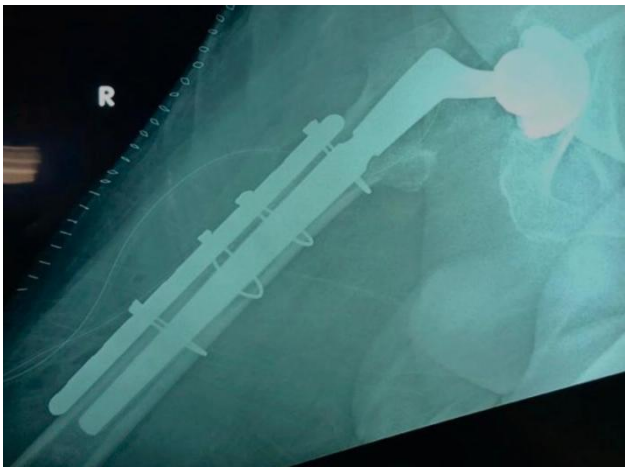

Figure 4

4. Discussion

Osteoporotic hip fractures consume substantial resources in developed healthcare systems; their prevalence continues to rise, and at the same time, overall life expectancy is increasing[1]. Many studies have found that approximately 25% of hip fracture patients will not survive beyond 1 year[2]; however, with improved awareness of the time critical nature of this injury, as well as advances in medical care, it is likely that this figure will fall. As a result, the need for long-term studies on pain and function after treatment of these injuries is readily apparent. The paper publishby Roth and colleagues is unusual in that it provides 20-year outcome data for the use of cemented bipolar hemiarthroplasty for unselected patients presenting with osteoporotic hip fractures. In their study, the authors show that this type of procedure or implant will outlive the vast majority of patients in this group (as they observed a cumulative revision rate of just 3.5% at 20 years). They also show a low incidence of acetabular erosion, despite this being one of the stated problems with hemiarthroplasty in younger or more active patients. The implants used were of older designs, and so perhaps even better results could be expected now.

Risk factor for aseptic loosening of implant can be divided broadly into patient factor, implant factor and surgical factor.

Table 1: Risk factor for aseptic loosening

Patient factor	Implant factor	Surgery factor
Preop diagnosis	Prosthesis design	Prosthesis stability
Genetic factor	Bearing couple	Prosthesis alignment
Activity level	Prosthesis manufacturer	Surgeon experience
Body mass index		Cementing technique

The diagnosis and treatment of persistent wound leakage is an important, debatable and poorly understood topic in the field of joint arthroplasty. Persistent wound leakage after hip arthroplasty is associated with a higher risk of developing periprosthetic joint infection. There is no uniformly accepted definition of wound leakage or when to call it persistent. The ICM statements define persistent wound leakage as a wound leaking >2 x 2cm for more than three days, arguing that this time frame would allow for earlier intervention and may limit the claimed adverse consequences[5]. The proposed classification of persistent wound drainage after total joint arthroplasty divides wound drainage into 4 categories based on the amount of drainage (Table 2.0). Wagenaar et al recommended early surgery within 7 days after index surgery even though their successful debridement antibiotic and implant retentions were performed at a mean of 14 days (range 4-32 days) after index surgery[7]. Based on these studies, the ICM formulated the statement that surgical treatment should be performed if wound drainage persists for longer than 5-7 days after index surgery[7]. Nonsurgical treatment of persistent wound drainage generally involves absorbent dressings, pressure bandages, and temporary joint immobilization. Present consensus discourages the use of antimicrobial treatment. Nutritional consultation and correction of anticoagulation and metabolic imbalances should be considered.

Table 2: Proposed Classification of Persistent Wound Drainage after Total Joint Arthroplasty

Category	Description
1 (Limited)	A stripe of blood in the wound dressing in the line of the wound or less than 2 2 cm in size
2 (Moderate)	More than 2x2 cm drainage in absorbent gauze or dressing but without the need for change in the wound dressing (ie, dressing is not soaked)
3 (Excessive)	One dressing change per day due to soaked absorbent gauze or dressing
4 (Massive)	Two or more daily dressing changes due to soaked absorbent gauzes or dressings

According to the 2013 International Consensus Meeting on Periprosthetic Joint Infection[6]

The incidence of femoral periprosthetic fractures is increasing as the volume of total hip arthroplasty and hemiarthroplasty increases in general orthopaedic practice. These fractures present significant surgical and economic challenges from increasing patient age, comorbidities, degree of femoral bone loss, and fracture complexity[8].They were the third most common indication for revision surgery in the Swedish Hip Registry in 2011 and only slightly less common in others, such as in the United Kingdom and Australia[9].The Vancouver classification system, published in 1995, has been the primary classification system for describing femoral periprosthetic fracture. It has been shown to have both high reliability and validity. More recently, the Unified Classification System has been proposed to provide a single classification system for all periprosthetic fracture[9]. A number of papers in recent years have looked to build upon this system by providing additional classification subgroups for a small number of different fracture patterns. Type A is a fracture of an apophysis or protuberance of bone, to which one or more soft-tissue structures are attached. Type B involves the bed supporting or adjacent to an implant. B1 The implant is still well fixed; B2 The implant is loose; B3 The implant is loose and the bone bed is of poor quality because of osteolysis, osteoporosis, or comminution. B1 treated by reduction and fixation using the principles of indirect reduction and minimally invasive plate osteosynthesis (MIPO). B2 treated with revision with a longer stem. B3 require complex reconstruction should be considered with extensive pre-operative planning.Type C involves a fracture which is in the bone containing the implant, but distant from the bed of the implant. If sufficiently distant from the bed of the implant, the implant can be ignored and the fundamental principles of management would follow those employed as if the implant was not present. But some specialised techniques may have to be used, as with the B1 subtype, if the hardware required for fixation will extend to the bed of the implant, such as cerclage cables and unicortical screws. Type D is a fracture affecting one bone which supports two replacements. In type D 'block out analysis' done. Type E involves two bones supporting one replacement and it is treated with 'block out analysis'. The Unified Classification System is based upon several factor. The fracture location may involve either the bone supporting the implant or distant to it, the stability of the components must be assessed to determine if the bone implant surface is stable prior to fracture and after fracture and lastly the adequacy of the bone stock and bone strength supporting the implant must be sufficient to support internal fixation or a revision without additional major reconstruction.

5. Conclusion

The revision arthroplasty surgery remains a vexing problem. Good clinical evaluation coupled with close clinical follow-up may be appropriate in select patients to help reduce the incidence of reoperation and the associated morbidity and cost.

References

[1] Johnell O, Kanis JA. An estimate ofthe worldwide prevalence, mortality and disability associated with hip fracture. Osteoporos Int. 2004; 15:897–902.
[2] Hu F, Jiang C, Shen J, Tang P, Wang Y. Preoperative predictors for mortality following hip fracture surgery: A systematic review and meta-analysis. Injury 2012;43(6):676–685.
[3] Kurtz SM, Ong KL, Schmier J, Mowat F, Saleh K, Dybvik E, et al. Future clinical and economic impact of revision total hip and knee arthroplasty. J Bone Joint Surg 2007 Oct;89-A Suppl 3:144-51.
[4] Mahomed NN, Barrett JA, Katz JN, Phillips CB, Losina E, Lew RA, et al. Rates and outcomes of primary and revision total hip replacement in the United States medicare population. J Bone Joint Surg 2003 Jan;85-A(1):27-32.
[5] Ghanem E, Heppert V, Spangehl M, et al. Wound management. J Orthop Res. 2014; 32: S108–19.
[6] Zmistowski B, Karam JA, Durinka JB, Casper DS, Parvizi J. Periprosthetic joint infection increases the risk of one-year mortality. J Bone Joint Surg Am 2013; 95:2177e84.
[7] Wagenaar FBM, Löwik CAM, Zahar A, Jutte PC, Gehrke T, Parvizi J. Persistent Wound Drainage After Total Joint Arthroplasty: A Narrative Review. J Arthroplasty. 2019 Jan;34(1):175-182.
[8] Fenelon C, Murphy EP, Baig MN, Kearns SR, Murphy CG, Curtin W. Breaking Bad: A Comparative Descriptive Analysis of Periprosthetic Fractures Around Cemented and Uncemented Femoral Stems. J Arthroplasty. 2019 Aug; 34 (8):1783-1786.
[9] Duncan CP, Haddad FS. The unified classification system (UCS): improving our understanding of periprosthetic fractures. Bone Joint J 2014;96-B:713e6.