

Case Report

Restoring stability in a neglected acetabular fracture with dual mobility total hip arthroplasty: a case report

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Received: 29 May 2019

Accepted: 05 July 2019

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ABSTRACT

Neglected acetabular fractures present with varied degrees of soft tissue and bone loss and distorted anatomy resulting in high hip centres. The basic principles of achieving stability and restoring motion are to augment the acetabular bone loss, prevent protrusion in the long term and use a prosthesis that prevents dislocation. We report a case of a 22 year old neglected acetabular fracture managed successfully with a femoral head autograft, anti protrusion cage and dual mobility total hip arthroplasty.

Keywords: Acetabular fracture, Acetabular defect, Dual mobility, Femur head autograft, Total hip arthroplasty

INTRODUCTION

Neglected acetabular fractures pose a surgical challenge in the eventuality of secondary hip arthritis warranting total hip arthroplasty (THA).¹ Various issues like bone defects, non-union, poor bone quality, protrusion must be assessed pre operatively.¹ More so, these cases have a higher chance of post-operative dislocation, heterotrophic ossification and higher revision rates.¹⁻³ Computed tomography (CT scan) and 3D reconstruction plays a big role in preoperative analysing and planning of the acetabular and peri acetabular bony defects.⁴ The advent of dual mobility (DM) THA has provided a new design which biomechanically reduces dislocation rates, especially so with compromised bony and/ or soft tissue conditions.^{5,6} We report a cases of neglected (21 years old) acetabulum fracture with posterior bone loss managed with posterior wall reconstruction with femoral head autograft, acetabular cage and cemented DM THA managed at a tertiary care centre.

CASE REPORT

A sixty seven year old male presented to us with pain and tenderness in the right hip joint since 4 years. He had a history of sustaining an acetabular fracture following a road traffic accident in 1997, which was treated conservatively with longitudinal traction. He had a painful gait since the injury. In 2009, he sustained a subtrochanteric femur fracture which was managed with Open Reduction and Internal Fixation with a cephalomedullary nail and cerclage wiring. The implants were removed in 2015. On examination, the hip rotations were severely restricted with flexion up to 70 degrees. The affected side was 2 cms shorter. Preoperative anteroposterior (AP) and lateral radiographs showed osteoarthritis of right hip joint with superolateral migration (Figures 1 and 2). Computed tomography (CT) with 3D reconstruction delineated the bone anatomy highlighting the posterior wall deficiency (Figures 3 to 6). The defect was classified as Type 3A based on the classification proposed by Paprosky et al.^{7,8} DM THA

was planned with reconstruction of the posterior wall and a stainless steel acetabular cage (Evolutis™).



Figure 1: Pre-operative AP radiograph.



Figure 2: Pre-operative lateral radiograph.



Figure 3: Superior wall on CT scan.



Figure 4: Medial wall on CT scan.



Figure 5: Deficient posterior wall on CT scan.



Figure 6: Deficient posterior wall on 3D CT scan.

Surgical technique

Patient was operated in the lateral position on a radiolucent table. Incision was taken over the previous surgical. Head was dislocated using a posterior approach to the hip joint. Femoral neck was cut, head size measured. The head revealed large impaction injury with focal cartilage loss. The acetabular margins were clearly exposed to reveal posterior defect. The defect was restored by fashioning a wedge of femoral head autograft along the posterior margin after removing the remnant cartilage (Figure 7). The graft was secured onto the acetabulum with help of three 4.5 mm cancellous screws, such that the screws were in the direction of forces (Figure 8). The graft and acetabulum was then gently reamed with sequentially increasing sizes of acetabular reamer to create an even, cancellous bleeding bed on which to cement the cup. Stainless steel acetabular cage (Evolutis™) size 47 was fixed over the autograft and acetabular margins with two screws. DM acetabular shell (Evolutis™) size 45 mm was cemented within the cage. Polyethylene liner size 22 mm was fit within the cup. Femoral canal was then prepared and cementless femoral stem (HA coated) size 14 was inserted (Evolutis™). Head

size 22 was impacted over the stem, reduced and stability confirmed (Figure 9).

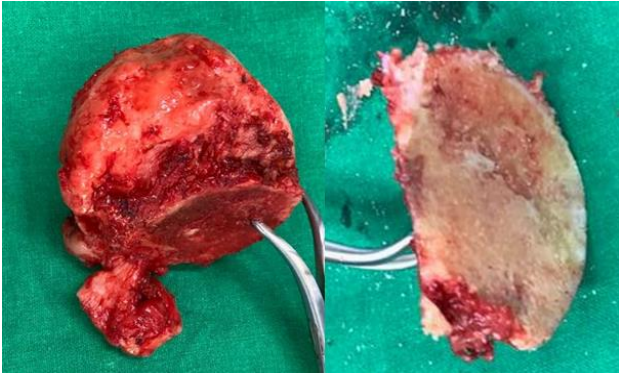


Figure 7: Femoral head autograft.

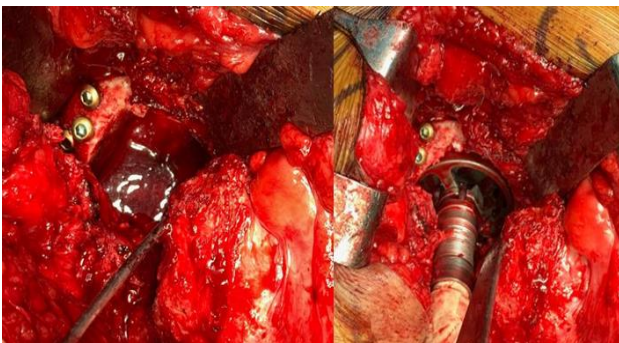


Figure 8: Femoral head autograft fixed with screws and reamed.

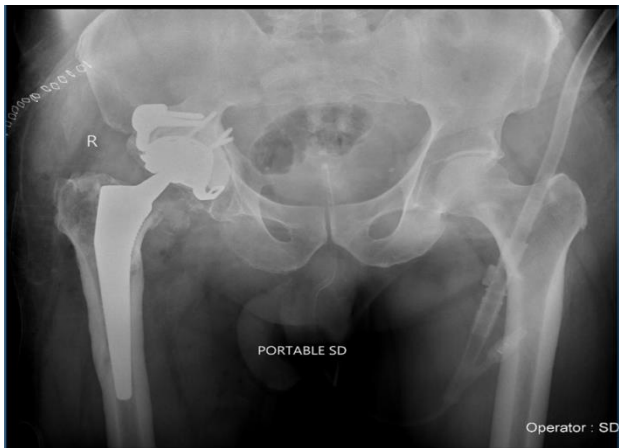


Figure 9: Post-operative radiograph.

Patient was mobilised partial weight bearing with a walker.

DISCUSSION

Neglected acetabular fractures leading to secondary arthritis of the hip joint are known to pose significant surgical challenges due to soft tissue contractures, bone loss, distorted anatomy and altered hip centre.¹ Functional

outcomes have significantly improved with cemented and uncemented THA over the years with good 10 and 15 year survival rates.⁹⁻¹² Use of femoral head autografts or allografts to replace the deficient bone, anti-protrusion cages are well described in literature with good long term outcomes.^{8,10}

A similar case report by Avtar et al, highlights the use of femoral head autograft fixed with screws and an uncemented THA following a neglected acetabular fracture.³ We managed our case with the same principles of recreating the deficient bone and providing additional stability using a cage and a DM THA. DM THA has been shown to be specifically indicated in cases with loss of abductor mechanism, compromised soft tissues, bone loss; whereby it reduces the dislocation rates by increasing the jump distance and thus leads to additional stability.^{5,6} The cage provides a buttress to the autograft and ensures load sharing across the bone architecture, thus enhancing incorporation.^{2,7,8}

CONCLUSION

Neglected acetabular fractures can be managed effectively by good preoperative imaging and planning, ensuring recreation of acetabular anatomy, providing additional support with an autograft and/ or cage and reducing dislocation rates with a dual mobility THA system.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

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Cite this article as: Agarwala S, Mehmood M, Menon A. Restoring stability in a neglected acetabular fracture with dual mobility total hip arthroplasty: a case report. *Int J Res Orthop* 2019;5:965-8.