

Neglected Acetabular Fractures treated with Primary Total Hip Arthroplasty - A Report of Three Cases, with Short Term Follow-up.

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Abstract : Acetabular fractures occur in young/middle aged patients due to high energy trauma. Best results have been obtained by Total Hip Arthroplasty (THA) compared to other forms of treatment. Total Hip Replacement (THR) requires acetabular reconstruction and bone grafting. Limb length discrepancy needs to be addressed-due to proximal femoral migration & protrusio acetabulum. The purpose of this study was to focus on the outcome of impacted bulk or morselized cancellous grafts with cementless hemispherical components in the presence of cavitory acetabular defects in primary total hip arthroplasties. Three cases of neglected acetabulum fractures who presented to us in the state of non union have been treated with primary cementless total hip arthroplasty with autograft substitution and followed up for outcome for a period of 6 months. Results have been outlined using modified harris hip score. Uncemented THR preferred as most patients are young. Cavitory acetabular defects requires placement of bulk or morselized cancellous graft harvested from resected patient's own femoral head. Greater than two-thirds rim fit of the cup to host bone was obtained in all cases. Additional screw augmentation done in all three cases. The average hip score was increased from preoperative mean of 40 to a postoperative mean of 86. All three patients are functionally doing well without pain and disability during the period of follow-up study. **Conclusion:** THAs in post-traumatic acetabular defects is often more difficult than routine THAs. Cavitory defects can be managed successfully by using bulk or morselized cancellous autograft. When gross LLD is present, THR is the procedure of choice. Cementless cups are generally accepted to be a viable option for primary as well as revision hip arthroplasties specially in young patients.

INTRODUCTION

Acetabular fractures occur in young and middle aged patients due to high energy trauma. Neglected fracture of acetabulum is common in developing countries due to various factors like extremely high tolerance to pain, decreased cognitive ability to recognize or verbalise pain & treatment by native bone setters. Sometimes neglected fractures may present with malunited or non united fractures of acetabulum with or without fracture head of femur. Best results have been obtained by total hip arthroplasty compared to other forms of treatment. THR requires acetabular reconstruction and bone grafting. Limb length discrepancy needs to be addressed-due to proximal femoral migration, protrusio acetabulum and proximal femoral bone loss. Limb length discrepancy on acetabular side with protrusio acetabulum is possible to correct alone by autograft, allograft, synthetic bone substitutes or metal.

Three (3) cases of neglected acetabulum fractures presented to us in the state of non union were treated with primary cementless total hip arthroplasty with autograft substitution and followed up for outcome for a period of 6 months. Results have been outlined using modified Harris hip score.

CASE 1

- 30 year old female with h/o RTA presented with 10 months old non union transverse fracture acetabulum with protrusio acetabulum right side.
- Treated with acetabulum reconstruction with allograft & uncemented total hip replacement.

CASE -2

- 36 year old male patient with h/o RTA presented with 5 months old non union transverse

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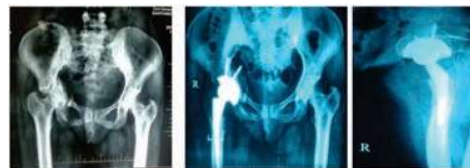


Fig. 1a : Pre operative x ray
Fig. 1b & 1c: Post operative x rays

- fracture acetabulum with fracture head of femur right side.
- Treated with acetabular reconstruction & uncemented total hip replacement.

CASE - 3

- 50 year old female patient with h/o RTA presented with 8 months old non union fracture acetabulum right side.
- Treated with uncemented total hip replacement and acetabular reconstruction.



Fig. 1d & 1e : Six months follow up x-ray

Fig 1f : Clinical Photo of patient



Fig. 2a & 2b: Pre operative x- ray



Fig 2c & 2d: Six months follow up x ray

Fig 2e: Clinical Photo of patient



Fig 3a : Pre operative x ray Fig 3b: Six months follow up x ray Fig 3c: Clinical Photo of patient

Operative Technique & Post-Operative Course

All three patients had been operated through lateral approach (Hardinge). Intra operatively after resection of femoral head the same was used as bulk autograft to fill the cavitory defect. Cartilage over the head was removed and reshaped to fit the defect and light hammer blows given to impact the graft. Acetabulum was under-reamed for 1mm-2mm and a larger cup than the size estimated in preoperative template was used for press fit. Cups were augmented with screws for better stability. Cavitory defects were addressed by bulk autograft incorporation and larger cup. Immediate postoperative period was uneventful. Physiotherapy started from third post operative day. Strict non weight bearing was advised to all three patients for a period of six weeks. Followed by partial weight bearing for another one month with crutches. All patients received physiotherapy and mobilization exercises. Weight bearing with cane support started from second month. AP and lateral views of both the hips were taken at regular intervals and observed for graft incorporation.

Clinical Outcome

Total hip arthroplasty is a standard procedure for neglected acetabular fractures^{1,2,3}. Uncemented total hip arthroplasty preferred as most patients are young. Uncemented cups and stems were used in all three cases. In planning of acetabular reconstruction, the major goal is to establish normal anatomic center of rotation. Inclination of the cups was within desired range. Cavitory acetabular defect requires placement of bulk cancellous graft or morselised cancellous graft harvested from resected patient's own femoral head. Greater than two-thirds rim fit of the cup to host bone was obtained in all cases. Additional screw augmentation was done in all three cases. The mean operative time was 120 minutes. Immediate and final follow-up radiographs were evaluated. All grafts appeared to be well incorporated at the time of final radiographic follow-up. All grafts showed a characteristic increase and then decrease in density with subsequent trabecular pattern by six months. Two cases presented with shortening of the affected extremity within one inch limit which was compensated in the foot wear. The average hip score was increased from preoperative mean of 40 to a postoperative mean of 86. All three patients were functionally doing well without pain and disability during the period of follow-up study.

DISCUSSION

In the first patient the resected femoral head (autograft) was used as bone strut graft to fill the medial cavitory defect. Cartilage covering the head was removed, reshaped and kept in the defect and was reamed to reform the acetabular cup. Three holed, 52 size cup was used and screw augmentation done for better stability. In second patient because of presence of cysts in resected patient's femoral head, it was not used as strut graft as it may leads to

further graft subsidence. Instead it was morselised, and used to fill the superomedial bone defect and reverse reamed⁸. A press fitting 54 Size cup was used with two screws for further augmentation. And in third patient as the graft taken from resected femoral head was not solid enough to hold the hammer blows, cup was placed more horizontal intentionally due to poor local bone stock and instability of the hip. Additional screw augmentation was done in all three cases with the large sized cup. Follow-up in this case series was short-term. However Long term follow-up is needed to monitor cup loosening and other complications. Stauffer (1982) reviewed 231 total hip arthroplasties at 10 years and found radiographic loosening in 36.8% and revision of 8.2%. Broadman and Charnely⁹ reported 10 complications, including 3 deaths in a study of 66 patients. Rogan et al¹⁰ reported 9 complications after 39 operations and Waddell¹¹ reported 8 complications after 34 operations. The complications in those series included dislocation, infection, formation of heterotrophic bone, deep vein thrombosis

CONCLUSION

Total hip arthroplasty in post-traumatic acetabular defects is often more difficult to perform than routine total hip arthroplasties. Cavitory defects can be managed successfully by using bulk cancellous or morselised cancellous autograft. There is no difference in final functional outcome between patients where bulk cancellous autograft and morselised cancellous autograft were used respectively. When gross LLD is present, THR is the procedure of choice. Cementless cups are generally accepted to be a viable option for primary as well as revision hip arthroplasties specially in young patients. In a recent study by Valle⁶, there was a 98% survival in 308 hips with a cementless porous-coated cups for primary hip replacements in the intermediate term in terms of aseptic loosening. Cementless components are contraindicated in a group with less than 50% host bone contact where 100% failure rate is expected⁶. Longer follow-up is necessary as component loosening and failure in patients undergoing total hip arthroplasty after an acetabular fracture are very much higher than the rates for routine arthroplasty for arthritis.

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