Hip Fractures in the Elderly: On the Acetabular Side

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The average age of the population is growing with the >65-year-old age group representing the fastest growing segment of the population. As the elderly generation is maintaining an active lifestyle, the incidence of trauma in this population is becoming more common. Elderly patients with acetabular fractures may soon be the most typical age group to present with this fracture.1

ACETABULAR FRACTURES

Displaced acetabular fractures in this age group present a significant therapeutic challenge. Nonoperative treatment often leads to poor outcome but surgical repair yields only marginally better results. The problem of gaining secure fixation in the osteoporotic pelvic bone in this patient population is extreme.2 Several authors, most notably Mears and Velyvis,3 recommend primary total hip arthroplasty (THA) for the geriatric acetabular fracture, particularly if associated with comminution, impaction, or abrasive cartilage loss. Good to excellent results were achieved in >80% of their series with maintenance of that result for 10-year follow-up.3

Anglen et al4 demonstrated the value of the “Gull Sign” in identifying acetabular fractures with a poor prognosis for acceptable hip function after open reduction and internal fixation, but this subject suffers from a lack of comparative studies and guidelines on which to base treatment recommendations. It seems prudent to attempt open reduction and internal fixation of simple fracture patterns in the elderly, but comminuted, displaced, and impacted fractures are best treated by combined open reduction and internal fixation of the acetabular columns with THA for joint restoration.

SURGICAL APPROACH

The challenge of performing THA in acute acetabular fractures lies in achieving stable fixation of the acetabular component. Restoration of the stability of the acetabular columns is required. The resulting defects in the joint surface can be addressed using the principles outlined by Gross et al4 for revision of acetabular components with bone loss. In other words, open reduction of the acetabular columns provides the basic stability needed to fix the acetabular component, but absolute anatomic reduction is not required because of the planned arthroplasty. Additional bone grafting using the excised femoral head may be needed to fill resulting contained defects, ensuring adequate acetabular cup fixation.

Preoperative planning for these procedures demands radiographic analysis of the fracture including computed tomography. Accurate diagnosis of the fracture is needed to plan the operative approach.
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Figure 2: Preoperative pelvic radiograph of a 75-year-old man who suffered a column acetabular fracture after falling from a tree (A). Postoperative pelvic radiograph after open reduction and internal fixation of the columns with implantation of a multi-holed acetabular component and femoral head graft (B).

for columnar restoration and to anticipate the need for special revision components. Acetabular components with multiple holes for screw fixation and reinforcement rings should be available.

The posterior approach usually is adequate for exposure of the fracture. Excision of the femoral head provides direct exposure of the anterior and posterior walls and the posterior column and superior acetabular area (Figure 1). Direct exposure of high anterior column components of the fracture would require an intra-pelvic approach but for the purposes of gaining stability and not perfect reduction, the posterior approach allows for indirect reduction and fixation of the anterior column with screws directed from back to front.

Once column stability is achieved, the excised femoral head can be fashioned as a structural graft to bridge contained defects. Acetabular components with multi-holed shells can be used as internal fixation devices as they allow screws to be directed in multiple planes gaining adequate fixation of the cup and fracture. This strategy is illustrated in Figure 2. A 75-year-old man presented with this typical column fracture evidenced by the spur sign. This fracture was exposed through a posterior approach. After removal of the femoral head, the anterior and posterior columns were reduced into a stable position and fixed with a posterior column plate and posterior to anteriorly directed lag screws. The femoral head was used as a structural graft to fill a contained superior and quadrilateral surface defect. A multi-holed acetabular shell was implanted and fixed with several screws aimed to reinforce the fracture fixation and to fix the cup (Figure 2). Excellent stability was achieved and the patient recovered excellent hip function with stable results as of 2-year follow-up.

If adequate column stability cannot be restored or in very elderly, osteoporotic patients, use of reinforcement rings with cemented cup fixation is advised. A fracture pattern commonly seen in the older, patient with osteoporosis consists of a central fracture/dislocation with associated anterior or wall or column fracture (Figure 3A). It is technically difficult to achieve stable anterior column and wall stability in this fracture except with an intra-pelvic exposure. An alternate tactic is to extract the dislocated femoral head from the medial wall defect. It is denuded of cartilage and replaced in the medial defect as a structural graft. A reinforcement ring is implanted to reconstruct the anterior wall defect and an all-poly cup is cemented directly into the ring, achieving a stable acetabular reconstruction (Figure 3B). This 88-year-old woman was allowed to weight bear as tolerated immediately and is doing well 1 year after reconstruction (Figure 3C).

In a series of 57 patients with 8- to 10-year follow-up, Mears and Velyvis reported 80% good to excellent Harris hip ratings and no patient required revision for loosening or mechanical failure. The authors advise routine use of prophylaxis for heterotopic ossification as it can occur even in these elderly patients.

REFERENCES