Acetabular Distraction Technique for the Treatment of Chronic Pelvic Discontinuity: A Multicenter Study with Minimum 2-Year Radiographic Follow Up

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INTRODUCTION: Revision total hip arthroplasty (THA) is often complex and clinically challenging. Even more so, these surgeries become more difficult in the setting of chronic pelvic discontinuity, where the severe acetabular bone loss leads to disruption of the structural continuity of the acetabulum, eventually causing separation of the superior and inferior aspects of the acetabulum. Several options are currently available to address this clinical scenario with varying outcomes. One promising surgical technique is acetabular distraction, which peripherally or laterally distracts the acetabulum while creating central or medial compression across the discontinuity. Once the acetabular shell is placed, either with or without construct stability support or supplemental fixation through the use of modular porous augments, the distractor is removed, and the subsequent elastic recoil of the acetabulum provides initial mechanical stability of the acetabular shell while the cup achieves biologic fixation. Thus, this study reports 2-year radiographic outcomes following acetabular distraction for the treatment of chronic pelvic discontinuity.

METHODS:

Patients undergoing acetabular distraction performed by five surgeons from 2002 to 2021 were identified across five institutions. Demographic, surgical, and postoperative outcomes, including radiographic component stability, were recorded. Weight-bearing status was assessed through postoperative clinical follow up. Acetabular defects were classified using the Paprosky classification system, and the use and placement of modular porous augments to assess these defects were recorded. Failure was defined as a subsequent revision of the acetabular construct.

RESULTS:

There were 44 of 91 (48.4%) patients (five deceased, 42 lost to follow up) consisting of two Paprosky IIC (4.5%), eight Paprosky IIIA (18.2%), and 34 Paprosky IIIB (77.3%) defects meeting inclusion criteria. The mean follow-up time was 5.1 years (range, 2-13.5 years). Modular porous augments were used in 25 (56.8%) cases. Postoperatively, most patients were toe touch weight-bearing (36 patients, 81.8%) for an average time of 10.3 weeks (range, 5-33 weeks) before advancing in weight-bearing tolerance. There were four (9%) postoperative dislocations, three ultimately requiring a constrained liner. Other indications for reoperation included hematoma evacuation (one patient), periprosthetic joint infection (three patients consisting of one irrigation and debridement, one two-stage exchange, and one Girdlestone procedure), aseptic loosening (two patients), cup migration (1 patient), and metallosis (one patient) leading to an overall cup survivorship of 88.6%. Of the remaining 39 patients, 37 (94.9%) demonstrated radiographic stability and healing of their discontinuity at the time of final follow up.

DISCUSSION AND CONCLUSION: In the largest series to date, acetabular distraction has proven to be a viable treatment for acetabular bone loss with a chronic pelvic discontinuity, with excellent early survivorship and radiographic outcomes. Future studies with longer follow ups are needed to further monitor the efficacy of this technique.