Stable fixation and successful bone graft integration in uncemented acetabular revisions.

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Background

Acetabular revision surgery using large amounts of bone graft remains controversial because of concerns regarding bone graft integration and implant stability. The primary aim of this study was to evaluate bone graft integration and implant migration in patients undergoing uncemented cup revision combined with bone grafting.

Method

Between April 2018 and May 2020, 16 patients underwent a bone grafting procedure of the acetabulum. Of these, 12 patients underwent acetabular revision surgery with bone graft (Table 1), and four patients received bone graft to treat peri-implant osteolysis during liner exchange. Bone mineral density (BMD) and implant motion was assessed using dual-energy CT postoperatively and at 6, 12 and 24 months.

Results

On average 73 cm3 (SD 48 cm3) bone graft was used in cup revisions and 69 cm3 (SD 50 cm3) in bone grafting for osteolysis. The BMD in the graft increased from 349 mg/cm3 postoperatively to 464 mg/cm3 at 24 months, p= 0.008, while BMD in host-bone ileum remained unchanged, 94 mg/cm3, and 109 mg/cm3, p= 0.24. Median total translation of the revised cups was 1.6 mm. Cups with >50 cm3 bone graft migrated more in the proximal direction, median 1.5 mm than those with < 50 cm3, median 0.3 mm, p= 0.03. Cups with bone grating for osteolysis did not migrate (Figure 1). No cup was revised during follow-up.

Conclusions

Extensive bone grafting in acetabular revisions (Figure 2) yields a stable implant with median migration below the recommended 2 mm threshold and bone graft density increases over time.