Current Concepts in Acetabular Cup Revision

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Most acetabular revisions are performed for aseptic acetabular component loosening, poly-ethylene wear and/or pelvic osteolysis, recurrent hip dislocation, and infection. A wide variety of different methods and implants have been used to revise the failed acetabular component of a total hip arthroplasty (THA). These include hemispheric porous-coated uncemented sockets, cemented components, cemented components with impacted bone graft, bipolar implants, antiprotrusio rings and cages, custom, or specially shaped nonhemispheric porous-coated devices, and augments composed of porous tantalum (trabecular metal).

Use of porous-coated uncemented hemispheric cups has become the most common method of acetabular revision. In case with more severe bone loss, a jumbo cup or a high hip center can be employed to position the cup against sufficient host bone. To prevent pelvic fracture and dislocation is important in use of cementless cup for acetabular revision. Avoiding excessive mismatch between cup diameter and the last reamer and avoiding excessive impaction force during cup insertion may reduce the risk.

Bone graft, particulate or bulk bone grafts, can be performed in conjunction with acetabular reconstruction with an uncemented socket. The use of structural allografts in revision arthroplasty of the acetabulum remains controversial because of technical difficulties, complications related to allografts, and long-term results.

In case with the most severe bone loss, alternative treatment methods may be considered, including antiprotrusio rings and cages, impaction bone grafting of the acetabulum with cement, custom porous-coated triflange implants, and augments composed of porous tantalum (trabecular metal).

Impaction allografting with cement is one of the methods for treatment of bone stock deficiencies in acetabular revision. Acetabular segmental defects are closed with corticocancellous slices or with flexible metal wire meshes. The contained acetabulum was tightly packed with morselized allograft chips. The cup is inserted after pressurizing the cement directly onto the graft.

The Oblong cup and the Triflange cup were designed to accommodate the bone loss, achieving intimate bone-implant apposition by matching the shape of the acetabular defect and bringing the implant to the remaining acetabular rim. The major goals of these devices are achieving stable implant fixation on host bone, reapproximating anatomic load bearing, restoring or maintaining a more normal hip center, and allowing the potential for biologic fixation.

Augments composed of porous tantalum(trabecular metal) in a modular fashion can be used for the large variety of acetabular bone defects encountered during revision surgery. Multiple shapes and sizes of these augments were designed to accommodate the bone defects for the various sizes of hemispheric acetabular components. Cup-cage construct can be used in inadequate host bone for obtaining mechanical stability. The indications are analogous to those for antiprotrusio cages, bilobed cups, and triflanged cups.

Revision surgery is most common causative factor of dislocation after total hip arthroplasty. Extra