Total hip replacement (THR) in the management of the dysplastic hip can be problematic. On the acetabular side, the surgeon needs to decide the proper location for acetabular placement and whether bone graft will be required. On the femoral side, a narrow femoral canal with exaggerated proximal anteverision makes it difficult to insert a monoblock stem either with or without cement.

Surgical approach is also controversial. Traditionally, THR in acetabular dysplasia is performed through a transtrochanteric approach. More recently, however, others have suggested performing the operation through a posterior approach, direct lateral approach, or a combination of the two. In addition, in some situations, it may be desirable to perform a subtrochanteric shortening derotational osteotomy to relocate the femur and acetabulum into the anatomically correct position. This method could add to the complexities of an already difficult surgical procedure.

Bulk femoral head allograft is recommended by some surgeons to improve coverage of the acetabular component. As well, it may assist the surgeon in a revision at some future point, if necessary. Several publications have noted the efficacy of bulk femoral head allografts for acetabular reconstruction in developmental dysplasia of the hip (DDH). These authors pointed out that bulk femoral head allograft provided reliable acetabular fixation with restoration of acetabular bone stock and recommended its use. McQueary and Johnston noted that large acetabular bone graft was rarely necessary in the management of coxarthrosis with congenital dysplasia. More recently, Ito et al reported the results of hybrid THR for the treatment of dysplastic hips and noted that structural allograft was only necessary in 15%. They concluded that in the majority of patients, the dysplastic hip can be managed without a structural allograft.

This article reports the results of THR for osteoarthritis in patients with acetabular dysplasia.

**Materials and Methods**

Between 1987 and 2001, 180 THRs (148 women and 32 men) for osteoarthritis secondary to acetabular dysplasia were performed at our institution. Average patient age was 46 years, and average follow-up was 8.5 years. Average patient weight at the index operation was 71 kg.

Of the 180 patients undergoing THR for osteoarthritis secondary to acetabular dysplasia, all acetabular components were inserted without cement. On the femoral side, 141 stems were inserted cementless whereas 39 were inserted with cement. Using the Hartofilakidis classification of congenital dislocating hip, 140 patients were classified as type I (dysplasia), 17 were type II (low dislocation), and 23 were type III (high dislocation). The treatment method was THR in 157 patients (types I and II) or THR with femoral shortening osteotomy in 23 patients (type III). A direct lateral surgical approach was used for 157 patients and a combined approach for 23.

**Results**

All sockets were relocated to the true acetabulum. Structural allograft was used in 10 patients, 3 in type I and 7 in type II. No structural allografts were used in type III patients. Harris Hip scores, pre- and postoperatively and at most recent follow-up (average 8.5 years) were in the good to excellent range. Similar comments can be made with regard to Short Form 12.

Complications at surgery occurred in 7 patients—a intraoperative femoral cracks and 2 shaft perforations. To date, 21 patients have required reoperation. The reasons for reoperation included aseptic loosening in 14, at an average of 9.6 years from the index...
operation; poly wear in 5, at an average of 8.4 years from the index operation; and nonunion of a subtrochanteric osteotomy occurred in 2 patients at an average of 1.5 years from the index operation. An analysis of the complications requiring revision was performed according to the DDH classification. Most complications occurred in type I and type II patients. The nonunions occurred in type III patients.

The Figure demonstrates the accumulative survival of 36 cemented stems and 144 cementless stems performed for DDH. It is important to point out, however, that all 36 cemented stems were done using precoat. This may have contributed to the unsatisfactory results in this group.

**DISCUSSION**

These data demonstrate that THR in the management of osteoarthritis in patients with DDH can be problematic. The results, however, on the femoral side, are superior with cementless stems. A 97% survivorship of cementless stems was an excellent result. Most, but not all, of these stems were bi-body stems, which have the ability to compensate for changes in anteversion and posterior position of the greater trochanter. Bi-body stems can also be helpful if subtrochanteric femoral shortening is required. This allows the surgeon to achieve excellent fixation proximally and distally. However, in subtrochanteric femoral shortening, the authors recommend using a strut allograft to further enhance torsional stability. Aseptic loosening of cemented stems is a well-known problem. In this particular series, because of the universal use of precoat, the incidence of stem loosening was somewhat higher than most reported series and should be considered in that light.

The management of the acetabulum in DDH is perhaps less controversial. These data demonstrate that an attempt should be made to relocate the acetabulum to the true acetabulum where maximum bone stock is located. If the acetabulum migrates proximally and a high hip center is chosen, the bone stock is not as predictable, and in addition, the hip center tends to be lateralized.

In type I or type II DDH, the anatomic acetabulum will be dysplastic and shallow. It is possible to ream the true acetabulum in its anatomic location and medialize it in such a manner as to obtain good fixation of a cementless cup without the necessity of a bulk allograft. Occasionally, however, a bulk allograft is necessary and if coverage is <50% or if it is necessary for the surgeon to insert the cup in a vertical position to achieve coverage, the authors recommend that bulk allograft be used. If required, it is a simple matter to use the femoral head and screw it to the side of the pelvis. In the long term, it may be helpful if a revision were needed in the future.

In patients with type III DDH, the true acetabulum is always present in its anatomic location. It can sometimes be difficult to find the true acetabulum at surgery; however, if the ligamentum teres is followed carefully, it will lead to the depths of the true acetabulum. Special cementless acetabulum components are required in type III. It is not unusual to require a 36- or 40-mm component in the management of these patients, thereby necessitating the use of 22-mm heads on the femoral side.

**REFERENCES**


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**Figure:** Accumulative Kaplan-Meier survival of 36 cemented stems (A) and 144 cementless stems (B) performed for DDH.