Mosaicplasty for the Treatment of the Osteochondral Lesion in the Femoral Head

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Abstract

Osteochondral defects of the femoral head are rare and principles of treatment include anatomic reduction, rigid fixation, enhancement of blood supply, and restoration of articular congruity. In this report, we present a case where the defect of the femoral head was treated with surgical dislocation of hip anteriorly and mosaicplasty. At 3-year follow-up, the patient was symptom free with near complete incorporation of the graft radiographically. Our observations in this case suggest that mosaicplasty with an open approach is an alternative treatment in the osteochondral defects of the femoral head.

Most outcome studies on treatment of cartilage defects are from the knee literature, and osteochondral defects of the femoral head are rare. Osteochondral defects of the hip may be acute, chronic, or degenerative and can be partial thickness or full thickness. Nowadays, full-thickness chondral lesions in the hip are being recognized more frequently as the result of advancements in magnetic resonance imaging (MRI) technology and hip arthroscopy.

The etiology of these lesions can arise from a multitude of causes, including trauma, developmental dysplasia, femoroacetabular impingement, Legg-Calve-Perthes disease, slipped capital femoral epiphysis, and osteonecrosis. Hip arthroscopy is being used more frequently to treat labral tears and femoroacetabular impingement with increased success; however, it is well recognized that patients with chondral damage have poorer outcomes than patients with intact articular surfaces after these types of procedures. The indications for treatment of an osteochondral defect of the hip are similar to the knee, but the optimal surgical treatment method for young patients with a focal chondral defect in the hip is not clear and remains controversial. Treatment options include redirectional osteotomy, arthroscopic and open debridement and microfracture, mosaicplasty, biological resurfacing with periosteum or autologous chondrocyte implantation and, finally, prosthetic resurfacing and total hip arthroplasty.

Case Report

A 22-year-old male patient presented to our clinic with the complaint of right hip pain that increased with activity. He had mechanical symptoms of the affected hip, including catching and locking related to activities. On clinical exami-
nation, the patient had antalgic gait and right hip was painful with passive internal rotation and abduction with restricted range of motion. His past medical history revealed Perthes disease that was treated conservatively. His Harris hip score before the surgery was 43 points. The radiographs displayed a chondral defect in the superolateral aspect of the femoral head, and his MRI revealed a loose body in hip joint.

**Surgical Technique**

We used Smith Peterson approach to dislocate the femoral head anteriorly, thereby avoiding injury to medial femoral circumflex artery and its branches. The loose body was excised and three pieces of osteochondral autograft (8 mm x 18 mm) were harvested from the same side knee by mini open lateral incision. We had made mosaicplasty into defect of the femoral head. Hip reduction was done, and all the layers were closed anatomically.

**Postoperative Course**

Postoperative first day, patient was mobilized, and the patient walked with crutches and gave half of his weight to the right extremity for the following 12 weeks followed by full weightbearing. The patient’s postoperative Harris hip score was 96 points 24 weeks after surgery.

**Discussion**

Osteochondritis dissecans of the hip most often involve the weightbearing dome. Its natural history is poor with relatively limited treatment options. Although the indications for treatment of an osteochondral defect of the hip are similar to the knee, the optimal surgical treatment method for young patients with a focal chondral defect in the hip is not clear and remains controversial. Treatment options include redirectional osteotomy, arthroscopic and open debridement and microfracture, mosaicplasty, biological resurfacing with periosteeum or autologous chondrocyte implantation and, finally, prosthetic resurfacing and total hip arthroplasty.

Although joint arthroplasty is considered the gold standard for pain relief and restoration of function, the concern in young, active patients is reduced implant longevity. A rotational osteotomy is another viable option because it is a joint-preserving procedure and delays the need for a potential joint arthroplasty until a later age, similar to osteochondral allograft transplantation. However, a major disadvantage is its limited success in the treatment of conditions affecting the weightbearing surface of the femoral head in young patients, and the additional challenges of conversion to a THA.

Mosaicplasty is disadvantageous for its higher surgical morbidity and limited amount of harvested graft material. Gole and colleagues reported load-bearing of an osteochondral graft has positive effects on cell viability, suggesting grafts placed in weightbearing regions will perform better than those in other locations.

Byrd and coworkers reported on microfracture during hip arthroscopy on 21 patients with an average follow-up of 32 months. Using the Harris hip score, they found that the average improvement was 23.9 points, and the investigators noted that there was no correlation between clinical results and improvement.
and preoperative imaging, associated pathology, including grade of chondral injury, or any other patient-related factors. For the mosaicplasty surgeries, age factor may affect clinical results. In this context, better results were reported among the young.\textsuperscript{9-11}

According to the evaluation of the results of mosaicplasty of 831 diartrodial joints, Hangody and coworkers figured that over 45 years of age the results are less dramatic, and 50 years of age may be the upper limit.\textsuperscript{12}

Ellender and associates used autologous osteochondral mosaicplasty in their case, and the patient remained symptom free for 2 years postoperatively.\textsuperscript{13}

Hangody and Fules reported on 831 mosaicplasties involving weightbearing joints of which only six involved the hip (femoral head) with overall good-to-excellent results of 79 to 94%; however, isolated results for the femoral head procedures were not reported.\textsuperscript{14}

In our case, we used Smith Peterson approach instead of the safe dislocation of hip described by Ganz and colleagues in order to decrease surgical morbidity.

**Conclusion**

At a 3-year follow-up, the patient was symptom free with near complete incorporation of the graft radiographically. Our observations in this case suggest that mosaicplasty with an open approach is an alternative treatment in the osteochondral defects of the femoral head.

**Disclosure Statement**

None of the authors have a financial or proprietary interest in the subject matter or materials discussed, including, but not limited to, employment, consultancies, stock ownership, honoraria, and paid expert testimony.

**References**