Arthroscopic Internal Fixation of Osteochondritis Dissecans of the Femoral Head

DEAN K. MATSU DA, MD; MARC R. SAFRAN, MD

abstract

Full article available online at Healio.com/Orthopedics. Search: 20130426-37

Osteochondritis dissecans of the femoral head is an uncommon problem. Limited literature reports the incidence of osteochondritis dissecans and its treatment. The surgical technique used and outcomes for a 40-year-old man with symptomatic femoral head osteochondritis dissecans who was treated 11 years previously with retrograde drilling and hip arthroscopy are discussed.

Despite temporary symptomatic improvement without subchondral collapse after his index procedure, increasing pain a decade later was thought to be caused by a large apical osteochondritic fragment and chondrolabral dysfunction from femoroacetabular impingement. Acetabuloplasty of acetabular overcoverage permitted arthroscopic internal fixation of the bone fragment by improving screw trajectory. Labral refixation and femoroplasty were subsequently performed. At 18-month follow-up, his nonarthritic hip score improved from 53 to 76 and his osteochondritic lesion had healed radiographically.

Although clinical improvement with radiographic union has been reported following open screw fixation of femoral head osteochondritis dissecans, to the authors’ knowledge this is the first published case with a similar outcome using arthroscopic techniques. Clinical improvement and union of even long-standing osteochondritis dissecans of the femoral head may occur with arthroscopic fragment fixation. Hip arthroscopy may play significant therapeutic and diagnostic roles in the treatment of this condition while offering a less invasive alternative to open osteosynthesis.

The authors are from the Department of Orthopedic Surgery (DKM), Kaiser West Los Angeles Medical Center, Los Angeles; and the Department of Orthopedic Surgery (MRS), Stanford University, Redwood City, California.

The authors have no relevant financial relationships to disclose.

Correspondence should be addressed to: Dean K. Matsuda, MD, Department of Orthopedic Surgery, Kaiser West Los Angeles Medical Center, 6941 Cadillac Ave, Los Angeles, CA 90034 (dean.k.matsuda@kp.org).

doi: 10.3928/01477447-20130426-37
Osteochondritis dissecans of the femoral head is a relatively rare condition that can cause pain and mechanical symptoms, such as locking, and degenerative progression. As a possible form of avascular necrosis, when conservative measures, such as activity modification (including sports and impact avoidance), nonsteroidal anti-inflammatory drugs, and protected weight bearing, fail, surgical options have been performed with varying degrees of success. The natural history of femoral head osteochondritis dissecans is typically poor. Options include, but are not limited to, drilling or excision of the osteochondritic fragments, microfracture, chondroplasty, autologous chondrocyte implantation, autograft or allograft tissue transplantation, intertrochanteric osteotomy, and hip arthroplasty. Recently, screw fixation of femoral head osteochondritis dissecans via open surgical dislocation of the hip has been successful in a small series with clinical improvement and radiographic union of the osteochondritic fragment. Review of the English literature did not identify previously reported cases of arthroscopic fixation of femoral head osteochondritis dissecans. The current article reports the treatment and outcomes of osteochondritis dissecans of the femoral head using arthroscopic screw fixation.

**Case Report**

A 40-year-old man was referred to the senior author (D.K.M.) for evaluation of a painful right hip. He had presented to the other author (M.R.S.) 11 years previously with a history of deep anterior groin pain beginning at age 18 years. At that time, radiographic and magnetic resonance imaging revealed osteochondritis dissecans of the femoral head without osteoarthrosis. Due to symptoms that had persisted for more than a decade, he underwent retrograde drilling of the osteochondritic fragment and arthroscopic removal of chondral debris. This index procedure resulted in several years of improved symptoms. Eleven years postoperatively, the patient heard a loud pop in the hip and felt pain rated an 8 (on a scale of 1-10, with 10 being the worst, unbearable pain), which prompted him to seek evaluation and treatment.

At presentation, the patient had decreased hip range of motion, with 105° of hip flexion and 10° of internal rotation with the anterior impingement test and asymmetric decreased external rotation on flexion abduction-external rotation testing, all with pain at terminal range. Radiographs revealed a large oval subchondral lesion in the anterior apical region of the right femoral head surrounded by a classic radiolucent line, an adjacent cyst, and mild lateral joint narrowing with evidence of combined type femoro-acetabular impingement on radiographs (Figure 1). Magnetic resonance imaging confirmed an apical right femoral head oval bone lesion consistent with an avascular process without subchondral collapse. The adjacent intraarticular cyst was also seen.

Outpatient supine hip arthroscopy was performed with arthroscopic visualization via the anterolateral portal and instrumentation via the modified midanterior portal. The articular cartilage was soft over the area of the fragment, but no detectable crevice or fraying was observed. Probe manipulation did not demonstrate movement of the in situ osteochondral lesion. Arthroscopic acetabuloplasty of acetabular overcoverage and labral takedown using a previously described technique permitted an improved path for subsequent screw fixation. Using fluoroscopic confirmation, 2 percutaneous guide pins were arthroscopically passed between the trimmed acetabular rim and the detached labrum (Figure 2A) to engage the osteochondral lesion. Arthroscopic drilling to a depth of 30 mm was performed with the cannulated drill, followed by the insertion of 2 headless metallic compression screws (Acumed, Hillsboro, Oregon) (Figure 2B). Screws were seated under fluoroscopic and arthroscopic guidance and buried below the chondral surface while engaging subchondral bone with excellent purchase. Arthroscopic labral resection and femoroplasty were then performed without incident (Figure 2C).

Postoperatively, the patient was allowed early hip range of motion using an exercise bicycle, and the lesion was protected with 6 weeks of partial weight bearing with crutches. No intra- or postoperative complications were observed. At last follow-up 18 months postoperatively, the patient’s nonarthritic hip score improved to 76 (from 53 points preoperatively), and he was highly satisfied with the outcome. Radiographs showed no decrement in joint width, no change in cyst size, seated metallic screws, postoperative recontouring of the acetabular rim and proximal femur, and union of the osteochondritic fragment (Figure 3).
DISCUSSION

To the authors’ knowledge, arthroscopic internal fixation has not been previously reported for the treatment of femoral head osteochondritis dissecans. Matsuda described the techniques of arthroscopic internal fixation of femoral head fractures\textsuperscript{12} and adjunctive acetabuloplasty,\textsuperscript{13} permitting that procedure in patients with acetabular overcoverage.

Siebenrock et al\textsuperscript{8} reported clinical improvement with radiographic union of osteochondritic femoral head lesions using open surgical hip dislocation. Of the 7 patients in that series, the 2 patients treated without fragment internal fixation failed to unite, whereas the 5 patients treated with screw fixation demonstrated healing at an average 4.3-year follow-up without osteoarthritic progression.\textsuperscript{9} The current case further supports the beneficial effect of fragment fixation.

Although the etiology and source of pain of femoral head osteochondritis dissecans is unknown, it seems reasonable that the healing response may be due to 2 factors: fragment stabilization of the in situ fragment and tunnel access to the underlying vascularized cancellous bone. Although gross movement of the osteochondral fragment was not detected arthroscopically with probing, it is conceivable that undetected micro-motion may have prevented bony union. A decade of symptomatic improvement after retrograde drilling and arthroscopic removal of chondral debris is significant. However, retrograde drilling without fragment fixation did not achieve union and suggests that drilling alone was insufficient in this patient. That an osteochondritic fragment present for 2 decades was able to heal with internal fixation supports fragment fixation as a critical procedure, regardless whether it was performed in an open or arthroscopic manner.

Other surgical options could have been performed and merit discussion. Excision of the fragment, whether performed openly or arthroscopically, has been reported to improve symptoms;\textsuperscript{3} however, it is the authors’ belief that unless given a reason otherwise, preservation and healing of a major weight-bearing segment of the femoral head should be attempted. Certainly, experience from 3 joints where osteochondritis dissecans is common—the elbow (which is a nonweight-bearing joint) and the knee and ankle—have shown that removal of the osteochondritis dissecans lesion of any of these joints results in degenerative arthritis at long-term follow-up. There is no reason to think that similar outcomes might not occur in the hip. Thus, maintenance of joint congruity by maintaining the osteochondritis dissecans fragment makes logical sense.

Intertrochanteric osteotomy may move the pathologic region into a more favorable, less weight-bearing location; however, union does not seem to occur and the procedure is relatively invasive with commensurately longer rehabilitation and greater morbidity. Total hip arthroplasty and resurfacing hip arthroplasty are options for those patients with more advanced coxarthrosis, with the latter perhaps a less favorable choice in the presence of the femoral head cyst.

Clinical improvement and union of even long-standing osteochondritis dissecans of the femoral head may occur with arthroscopic fragment fixation. Hip arthroscopy may play significant therapeutic and diagnostic roles in the treatment of this
While offering a less invasive alternative to open osteosynthesis.

**REFERENCES**


