Osteochondritis Dissecans in an Adult

A 27-year-old student underwent surgical arthroscopy of the left knee with debridement and drilling of an osteochondritis dissecans lesion as a teenager. Approximately 1 year later, some symptoms returned. The intensity of pain was an 8 of 10 at worst and was associated with definite, unpredictable catching sensations. On physical examination, left knee range of motion was 0° to 135°. Point tenderness was localized to the distal aspect of the medial femoral condyle with the knee flexed to 90°. Moderate effusion was observed. Two magnetic resonance imaging (MRI) scans (Figure A, B) and 3 arthroscopy photographs (Figure C-E) are shown (arrow [E], cartilaginous loose fragment). What would you do?

James L. Carey, MD, MPH, is from the Department of Orthopaedics, University of Pennsylvania, Philadelphia, Pennsylvania.

Allen F. Anderson, MD, is from the Tennesse Orthopedic Alliance, St. Thomas Hospital, and the Lipscomb Foundation for Research and Education, Nashville, Tennessee.

Kevin G. Shea, MD, is from St Luke’s Sports Medicine, Luke’s Health System, Boise, Idaho, and the Department of Orthopedics, University of Utah, Salt Lake City, Utah.
Kevin G. Shea, MD: Magnetic resonance imaging and arthroscopy (Figure) reveal an unstable and detached lesion that is not salvageable. Thus, bone grafting and fixation of the fragment is not an option. Microfracture is a consideration, although several factors argue against this technique, such as the large size and the abnormality or defect in the subchondral bone. More complex options will be necessary, and a detailed conversation with the patient about these options is important. The risks, benefits, and complexity of each option should be thoroughly discussed with patients to engage them in the decision.

Assuming the patient’s lower-extremity alignment is normal, one could consider the following options:
- Osteochondral autograft transfer from the femoral condyle, although the potential for developing symptoms in the lateral compartment is a concern.
- A fairly large osteochondral allograft.
- Autologous cartilage augmentation with an amplification/culture approach. A challenge with this technique will be the loss of subchondral bone, and staged bone grafting or matrix/autologous cartilage transplantation may be necessary.

Counseling the patient about future activities, with an emphasis on low-impact activities and maintaining an ideal body weight, will be important. Considering the limited survivorship of joint replacement (unilateral or total) in this age group, this is not an ideal option but may be a future consideration.

Allen F. Anderson, MD: After obtaining a history and completing a physical examination, I would obtain anteroposterior, lateral, tunnel, and sunrise views of the knee. These radiographs would confirm the diagnosis of osteochondritis dissecans. The mechanical symptoms indicate that the lesion is unstable. At this point, I would perform a long-leg view to determine whether the patient had a lower-extremity malalignment, which is a critical factor in decision making. If significant malalignment exists, osteotomy may be indicated; if no malalignment exists, I would send the patient for an MRI of the knee. In this case, the MRI demonstrated a large lesion with high signal behind the progeny fragment and cystic changes, which are indicative of instability (Figure A, B).

At this point, I would begin a shared decision-making process with the patient by explaining that the lesion is probably unstable given the symptoms, and treatment will depend on the findings at arthroscopy. If the articular cartilage is salvageable, I would perform a miniarthrotomy to remove the fibrous tissue at the base of the lesion, improve blood flow by drilling the subchondral bone, and perform a local bone graft, if necessary, to restore congruency. The fragments would then be stabilized with the surgeon’s preferred technique. I would use 5-mm osteochondral autograft transfer system (OATS) plugs taken from the superior medial condyle.

If examination at arthroscopy demonstrated that the articular cartilage was completely degenerated, the options are autologous cartilage implantation or allograft OATS, either of which is a reasonable treatment method. If the bone defect was <6 mm deep, I would lean toward performing autologous cartilage implantation. If the bone defect was >6 mm deep, I would consider a large allograft OATS procedure. I would not perform a microfracture because the crater is large, unshouldered, and deep.

Arthroscopy demonstrated that the progeny fragment was deteriorated and loose articular cartilage flaps were removed (Figure C-E). The cystic areas of the underlying lesion were demonstrated on MRI. The treatment from this point would depend on shared decision making with a well-informed patient. The definitive procedure would be performed at a later date.

James L. Carey, MD, MPH: I agree with the considerations of Drs Shea and Anderson. In this case, arthroscopic evaluation of the medial femoral condyle revealed a 9-mm medial-tolateral × 22-mm anterior-to-posterior region of grade 4 chondral changes on extension surface (Figure D). Careful sizing and planning confirmed that this defect could be essentially replaced by a 6-mm OATS plug anteriorly, a 9-mm plug in the middle, and a 7-mm plug posteriorly.

The recipient site was meticulously prepared with curettes and a motorized shaver until the surrounding cartilage was stable and healthy appearing. The medial portal was extended proximally to the level of the inferomedial aspect of the patella and distally to the level of the medial meniscus. Similarly, the lateral portal was extended proximally to the level of the inferolateral aspect of the patella.

The donor sites were carefully selected on the far lateral aspect of the trochlea, immediately proximal to the sulcus terminalis. Care was taken to ensure that these sites did not become confluent. The osteochondral cores from the donor site were then transferred to the recipient site. Each osteochondral cylinder was advanced until it was entirely flush with the surrounding articular surface.

Drs Carey, Anderson, and Shea have no relevant financial relationships to disclose.

Correspondence should be addressed to: John D. Kelly IV, MD, Sports Medicine, University of Pennsylvania, 235 S 33rd St, Philadelphia, PA 19104 (johndkellyiv@aol.com).

doi: 10.3928/01477447-20120426-10