



PATHOLOGY

Osteochondritis dissecans of the medial femoral condyle with documented long-term natural history

TREATMENT

Nonoperative treatment

SUBMITTED BY

Brian J. Cole, MD, MBA, Rush Cartilage Restoration Center, Rush University Medical Center, Chicago, Illinois, USA

CHIEF COMPLAINT AND HISTORY OF PRESENT ILLNESS

The patient is currently a 39-year-old male orthopedic surgeon who was diagnosed with symptomatic osteochondritis dissecans of his medial femoral condyle of his left knee at the age of 14. At that time, he complained of weight-bearing pain and discomfort on the medial aspect of his left knee with activity-related swelling. When initially diagnosed as having osteochondritis dissecans, he was treated with 8 weeks of nonweight bearing with crutches and asked to refrain from sports or impact activities thereafter. He remained asymptomatic, but was followed up regularly for radiographic evaluation to assess for evidence of instability.

PHYSICAL EXAMINATION

He ambulates with a nonantalgic gait and stands in symmetric physiologic varus. He has no effusion and full range of motion. He has no tenderness over his medial femoral condyle. His entire knee examination is normal.

RADIOGRAPHIC EVALUATION

A series of radiographs obtained from the age of 14 to the present demonstrate persistence of the osteochondritis dissecans lesion with no progression or evidence of instability.

Radiographs demonstrate a lesion of osteochondritis dissecans of the medial femoral condyle of his left knee (Figures C1.1 through C1.3).

FOLLOW-UP

The patient remains completely asymptomatic and active in several high-level sports including skiing and running. Serial radiographs demonstrate persistence of the lesion.

DECISION-MAKING FACTORS

1. Diagnosed early at a time when growth plates remained open.
2. Initial attempt at nonoperative treatment with protected weight bearing was successful in rendering him asymptomatic.
3. Despite persistence of the lesion demonstrated on plain radiographs and magnetic resonance imaging (MRI), he remains asymptomatic and highly active.
4. An identified target lesion that can be reliably followed clinically and radiographically for evidence of progression or instability.



FIGURE C1.1 Initial radiographs of a 14-year-old male with symptomatic osteochondritis dissecans of the left knee. Anteroposterior (**A**) and lateral (**B**) radiographs demonstrate an in situ lesion of osteochondritis dissecans of the medial femoral condyle.



FIGURE C1.2 Radiographs obtained 24 years later. Anteroposterior (A) and lateral (B) radiographs demonstrate no evidence of fragmentation or collapse. (C) Coronal MRI demonstrates no fragmentation or evidence of significant instability.



FIGURE C1.3 Radiographs obtained 29 years later. Anteroposterior (A) and lateral (B) radiographs demonstrate no evidence of fragmentation or collapse. (C) Coronal MRI demonstrates no fragmentation or evidence of significant instability. No significant interval change is seen compared to Figure C1.2.



PATHOLOGY

Avascular necrosis

PROCEDURE

Total knee replacement

SUBMITTED BY

Tom Minas, MD, and Tim Bryant, RN, Cartilage Repair Center, Brigham and Women's Hospital, Boston, Massachusetts, USA

CHIEF COMPLAINT AND HISTORY OF PRESENT ILLNESS

The patient is a 55-year-old man with a long-standing history of ulcerative colitis. His acute episodes have been treated with high-dose steroids. Recently, he has developed severe right knee weight-bearing discomfort. He also has pain at rest and at night. The joint pain is confined to his right knee only. He denies generalized malaise, fever, or erythema of the knee joint. Antiinflammatory medications and corticosteroid injections have not helped. He is unable to walk without the use of a cane.

PHYSICAL EXAMINATION

Height, 5 ft, 11 in.; weight, 185 lb. Clinical examination demonstrates a severe antalgic gait without the use of a cane. He has a large joint effusion that limits his range of motion to 95 degrees of flexion. He has a 30-degree fixed flexion deformity. Tricompartmental crepitus is present with generalized tenderness. Ligament examination is unremarkable.

RADIOGRAPHIC EVALUATION

Plain radiographs demonstrate diffuse patchy osteopenia of the distal femur, patella, and proximal tibia with well-maintained joint spaces and some early flattening to the medial femoral condyle consistent with multifocal avascular necrosis (Figure C2.1). A magnetic resonance imaging (MRI) scan demonstrates diffuse distal femoral avascular necrosis (not shown), with an osteochondral fragment of the medial femoral condyle.

SURGICAL INTERVENTION

A cruciate-retaining total knee arthroplasty was performed (Figure C2.2). Aggressive physical therapy was required to restore full extension that was obtained at the time of surgery. A Dyasplint™ was utilized to assist in regaining

extension and for stretching of the hamstrings and joint capsule.

FOLLOW-UP

Three months postoperatively, the patient regained 0 to 110 degrees of flexion. He walks with no gait disturbance and is



FIGURE C2.1 Standing anteroposterior radiograph demonstrates normal tibiofemoral joint space, osteochondral defect of medial femoral condyle, early peripheral lateral osteophytes, and patchy sclerosis and lucency of the distal femur compatible with avascular necrosis.

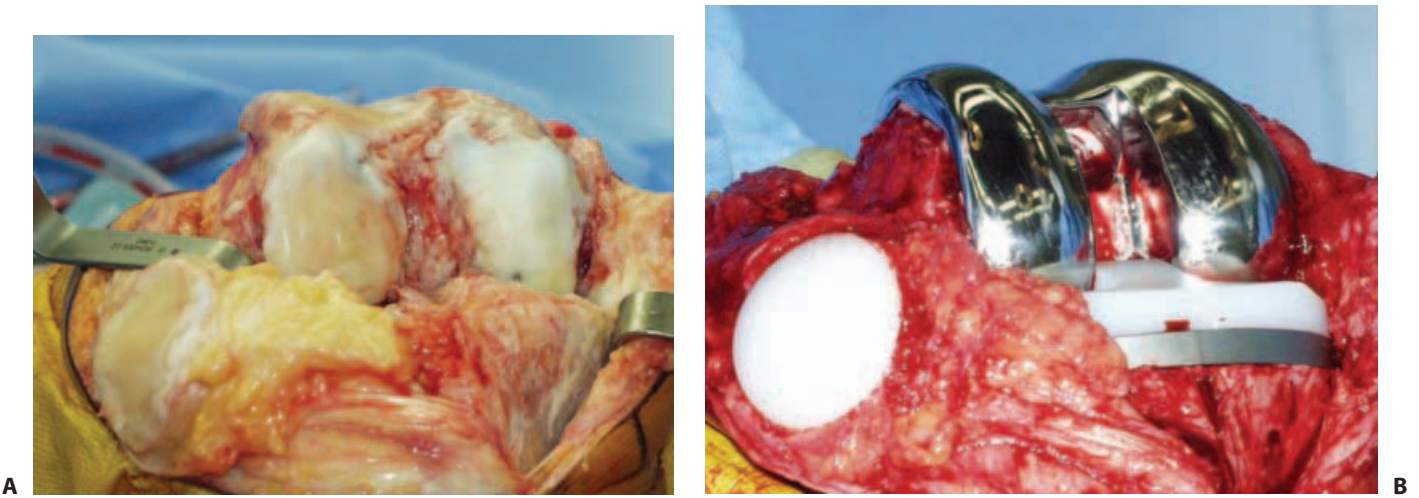


FIGURE C2.2 (A) Clinical photograph at the time of arthrotomy reveals discolored articular cartilage that is easily peeled off the distal femur. (B) Intraoperative appearance of total knee prosthesis.

painfree. Two years postoperatively his result remains excellent.

DECISION-MAKING FACTORS

1. Low-demand, 55-year-old male with severely symptomatic multifocal avascular necrosis.
2. Ongoing use of oral steroids.
3. Global nature of avascular necrosis and ongoing steroid insult contraindicates the implementation of cartilage restoration.



PATHOLOGY

Unstable in situ osteochondritis dissecans of the medial femoral condyle

TREATMENT

Arthroscopic fixation of osteochondral fragment followed by hardware removal

SUBMITTED BY

Brian J. Cole, MD, MBA, Rush Cartilage Restoration Center, Rush University Medical Center, Chicago, Illinois, USA

CHIEF COMPLAINT AND HISTORY OF PRESENT ILLNESS

The patient is a 14-year-old girl with a 1-year history of weight-bearing pain and discomfort on the medial aspect of her right knee with activity-related swelling and mechanical symptoms. When initially diagnosed as having osteochondritis dissecans, she was treated with 8 weeks of nonweight bearing with crutches and asked to refrain from sports or impact activities thereafter. Despite these efforts, she remained symptomatic and was referred for definitive treatment.

PHYSICAL EXAMINATION

Height, 5 ft, 3 in.; weight, 115 lb. She ambulates with a slightly antalgic gait and stands in symmetric physiologic valgus. Her right knee has a moderate-sized effusion. Her range of motion is 0 to 130 degrees. She is tender to palpation over the medial femoral condyle. Meniscal findings are absent. Her patellofemoral joint demonstrates normal tracking with no evidence of crepitus or apprehension. Her ligament examination is within normal limits.

RADIOGRAPHIC EVALUATION

Radiographs demonstrate an unstable lesion of osteochondritis dissecans of the medial femoral condyle of her right knee (Figure C3.1).

SURGICAL INTERVENTION

Because of persistent symptoms, she was indicated for arthroscopic reduction and internal fixation using a headless titanium screw. At arthroscopy, a lesion approximately 20

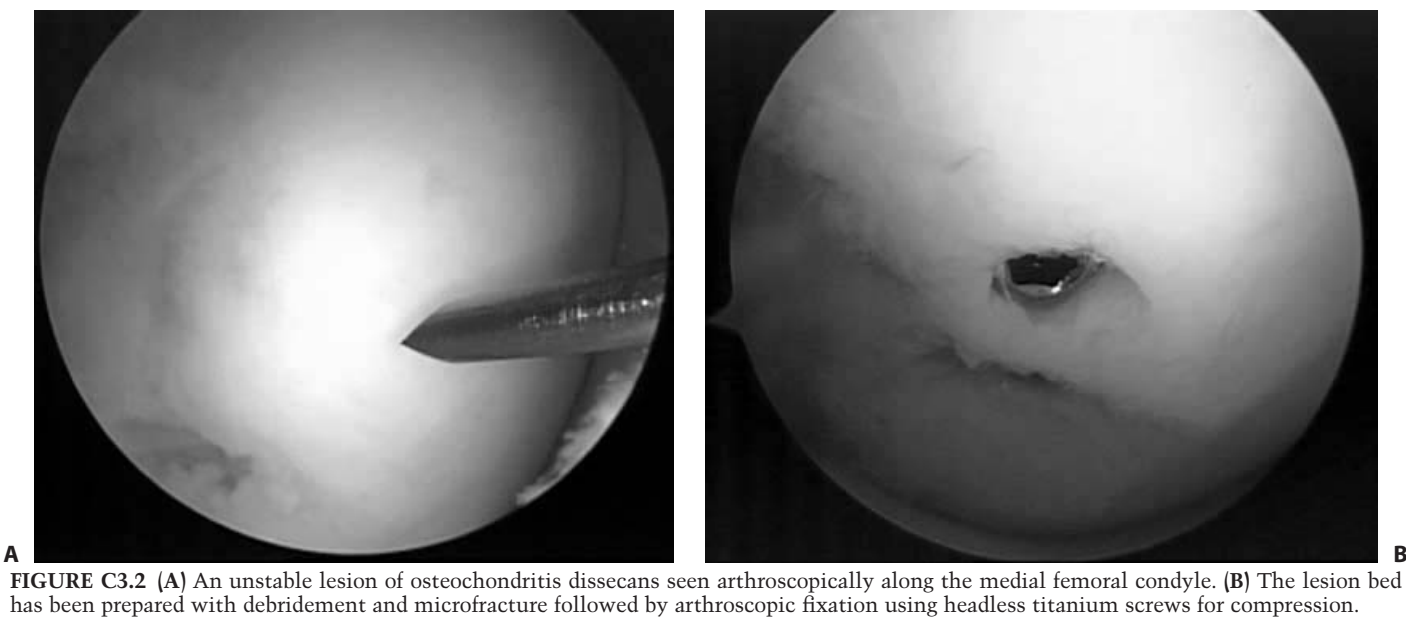
mm by 20 mm was found to be in situ, but unstable, with two palpably loose fragments. The fragments were elevated from the bed while leaving it hinged on an intact portion of the articular cartilage, and the base was debrided and microfractured. The fragments were repaired with two titanium headless screws (Acutrak, Mansfield, MA, USA) (Figure C3.2). Postoperatively, the patient was made nonweight bearing for approximately 8 weeks and utilized a continuous passive motion machine. At 8 weeks, she returned for hardware removal whereby the defect was believed to be stable and fully healed (Figures C3.3, C3.4). She was permitted to return to all activities at 4 months following her hardware removal.

FOLLOW-UP

At the patient's 6-month follow-up visit, she had no symptoms and had returned to all activities. Radiographs demonstrate a healed osteochondritis dissecans lesion of the medial femoral condyle (Figure C3.5).

DECISION-MAKING FACTORS

1. Young patient with symptomatic lesion of osteochondritis dissecans.
2. Persistent symptoms despite initial treatment with non-operative protocol.
3. In situ, but unstable, lesion without significant fragmentation and clinically viable osteochondral fragment large enough to be repaired with screws.
4. Despite need for hardware removal, compression fixation used to maximize chances for healing.



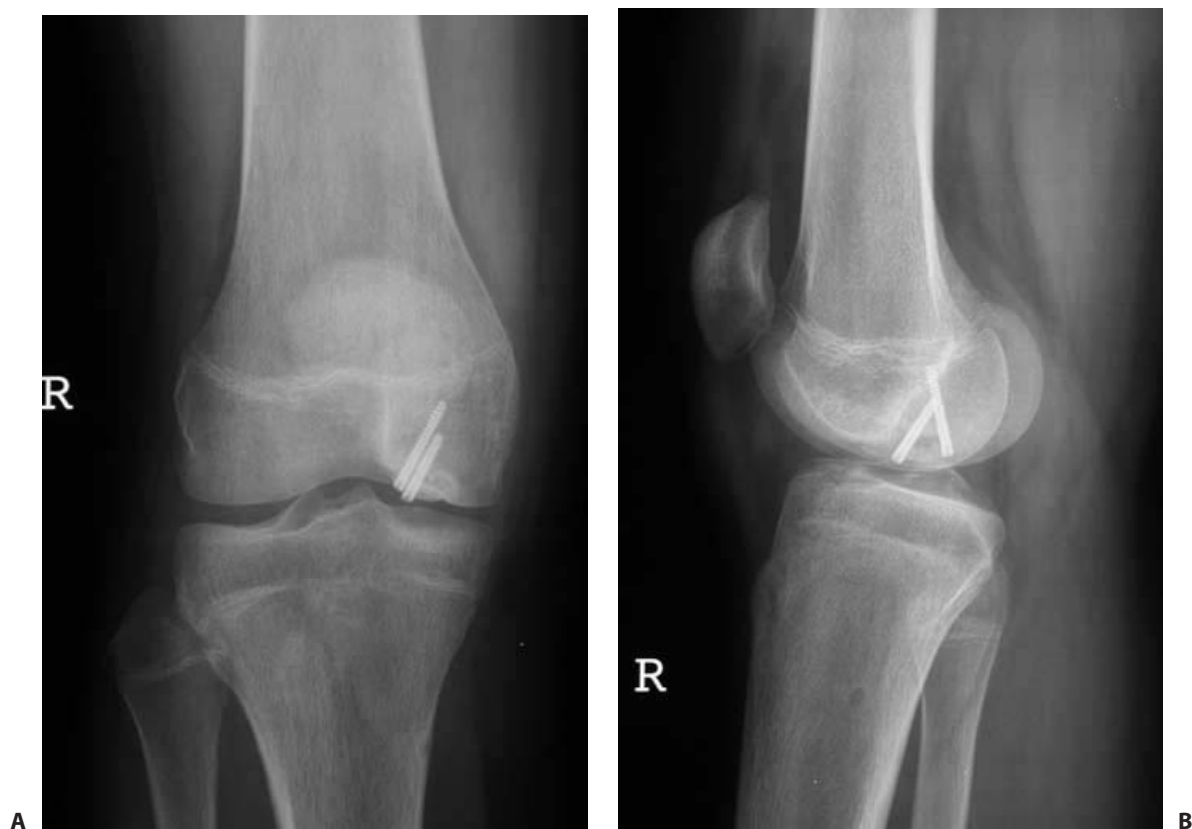


FIGURE C3.3 Anteroposterior (A) and lateral (B) radiographs obtained 8 weeks postoperatively demonstrate excellent healing of the fragment with no evidence of displacement.

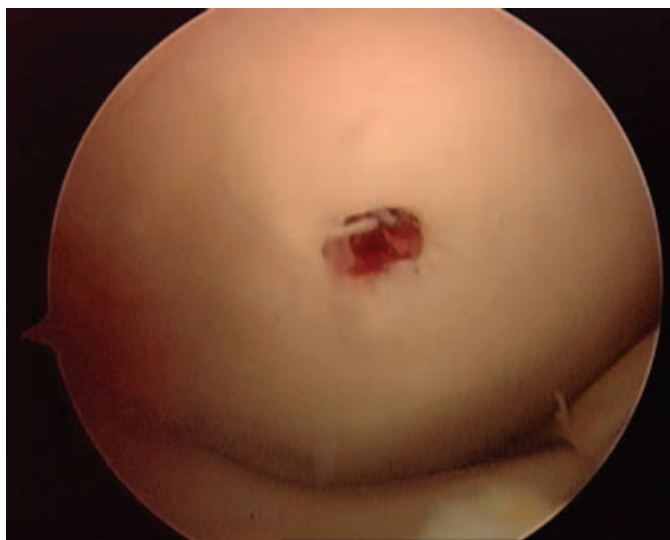


FIGURE C3.4 Eight-week arthroscopic view immediately following screw removal demonstrates clinical evidence of union of the osteochondral fragment.

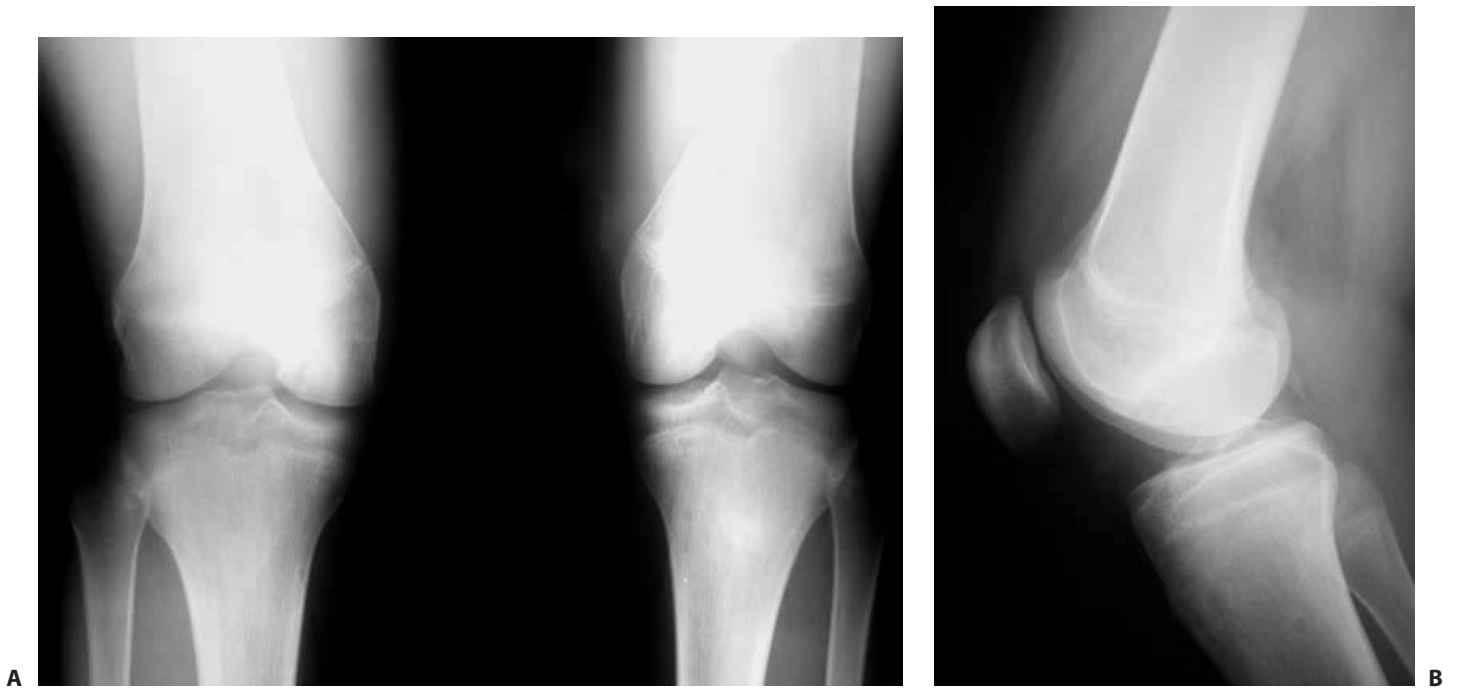


FIGURE C3.5 Six-month postoperative anteroposterior (**A**) and lateral (**B**) radiographs demonstrate integration of the fragment with no evidence of further fragmentation.

PATHOLOGY

Unstable in situ osteochondritis dissecans of the medial femoral condyle

TREATMENT

Arthroscopic fixation of osteochondral fragment followed by loose body removal

SUBMITTED BY

Brian J. Cole, MD, MBA, Rush Cartilage Restoration Center, Rush University Medical Center, Chicago, Illinois, USA

CHIEF COMPLAINT AND HISTORY OF PRESENT ILLNESS

The patient is an active 35-year-old woman who had no previous history of knee problems until the insidious onset of medial-sided right knee pain, swelling, and weight-bearing discomfort that began 6 months before presentation. She denied any trauma and was actively participating in snow skiing, running, and aerobics before the onset of these symptoms. She does not ever recall knee symptoms as a child or adolescent. She was referred for treatment of an unstable lesion of osteochondritis dissecans (OCD).

PHYSICAL EXAMINATION

Height, 5 ft, 5 in.; weight, 135 lb. She ambulates with a non-antalgic gait. She stands in symmetric physiologic valgus. Her right knee has a moderate-sized effusion. Her range of motion is 0 to 130 degrees. She is tender to palpation over the medial femoral condyle and has crepitus along the medial side of her knee with range of motion. Meniscal findings are absent. Her ligament examination is within normal limits.

RADIOGRAPHIC EVALUATION

Preoperative radiographs demonstrate a fragmented lesion of OCD along the medial femoral condyle in the right knee (Figure C4.1).

SURGICAL INTERVENTION

Because of the nature of her symptoms and the radiographic findings, she was indicated for an initial attempt at arthroscopic reduction and fixation of the OCD lesion. At the time of arthroscopy, an unstable lesion measuring approximately 2 cm by 3 cm by 1 cm (depth) was found in situ. A single major fragment was appreciated with a smaller minor fragment. This entire lesion was elevated from its bed, and the base was debrided and microfractured to promote healing. The major

fragment was reduced and repaired with a single headless titanium screw (Acutrak, Mansfield, MA). The minor fragment was too small for screw fixation, and a single bioabsorbable pin was used (Orthosorb Pin; Johnson and Johnson, Canton, MA) (Figure C4.2). Postoperatively, the patient was made nonweight bearing for approximately 8 weeks and utilized continuous passive motion at 6 h/day. Thereafter, she was allowed to gradually return to higher-level activities.

FOLLOW-UP

The patient did exceptionally well until she presented again 1 year later with complaints of mechanical locking. However, the weight-bearing pain along the medial aspect of her knee was completely eliminated. Postoperative radiographs taken at 1 year demonstrated a loose body within the suprapatellar pouch, seen best on the lateral radiograph (Figure C4.3). She was indicated for arthroscopy for removal of the loose body. The defect was inspected and found to be entirely intact with no identifiable source for the loose body, although it was suspected that the minor fragment had displaced and its bed had filled with fibrocartilage (Figure C4.4). The headless screw was deep within the subchondral bone and completely overgrown with fibrocartilage and was, therefore, not removed. The patient returned to all activities, and radiographs taken at 2 years postoperatively demonstrated no evidence of further fragmentation with osseous integration of the major fragment (Figure C4.5).

DECISION-MAKING FACTORS

1. In situ defect with a viable plate of subchondral bone attached to the defect.
2. The ability to achieve anatomic fixation within the defect bed and a strong desire to avoid future treatment required for cartilage restoration should the fragment otherwise be removed.
3. Compression fixation used despite potential need for hardware removal to maximize chances for healing.

**A****B**

FIGURE C4.1 Preoperative anteroposterior (A) and lateral (B) radiographs demonstrate a fragmented lesion of osteochondritis dissecans (OCD) along the medial femoral condyle of the right knee.

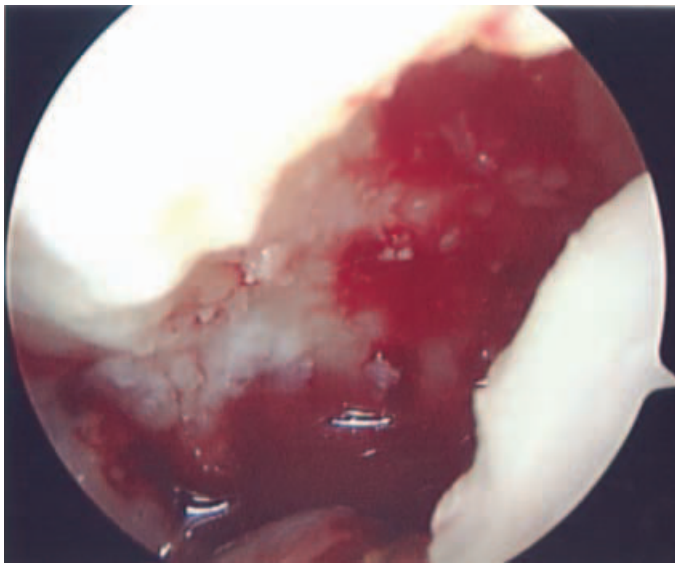
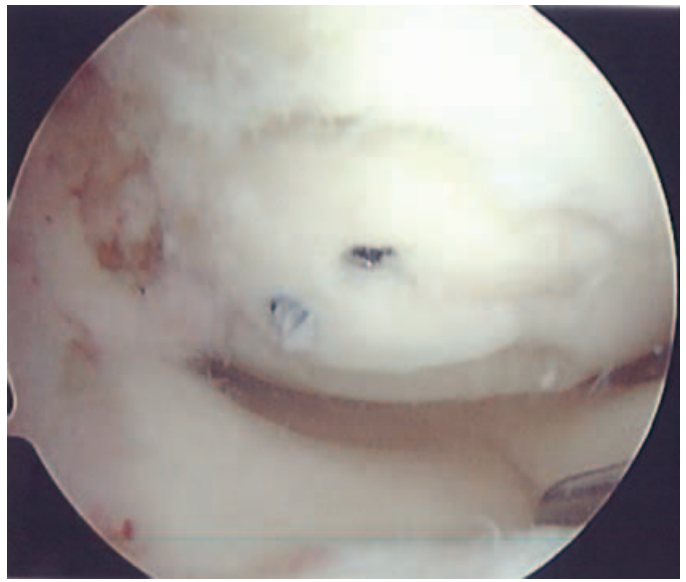
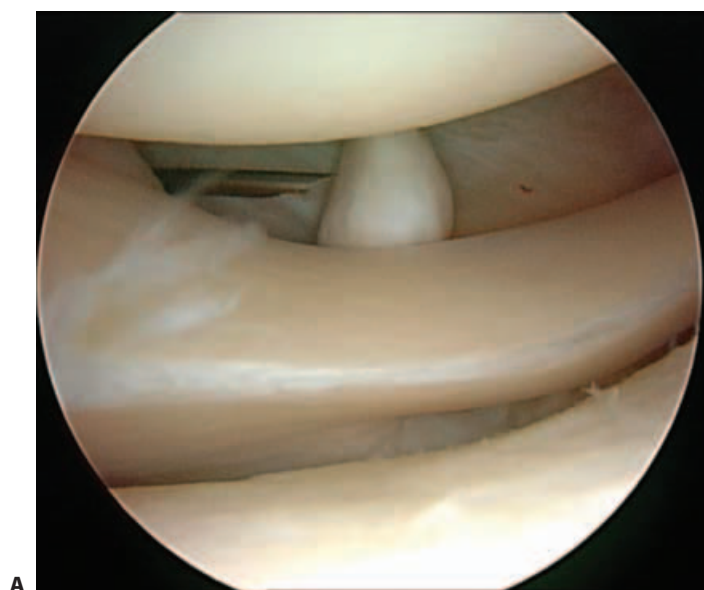
**A****B**

FIGURE C4.2 (A) An unstable lesion of OCD is seen arthroscopically along the medial femoral condyle with the lesion hinged open on intact articular cartilage. The base is debrided and microfractured to

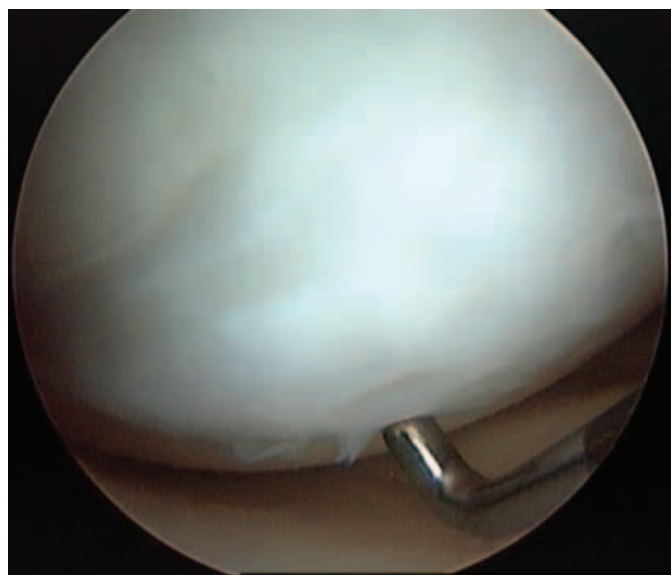
promote healing. (B) Arthroscopic fixation achieved with a headless titanium screw (Acutrak, Mansfield, MA) and a single bioabsorbable pin (Orthosorb Pin, Johnson and Johnson, Canton, MA).



FIGURE C4.3 Lateral radiographs obtained at 1 year demonstrate a loose body within the suprapatellar pouch. Otherwise, the main fragment appears intact with the hardware still in place.



A **FIGURE C4.4** (A) Arthroscopic view of the loose body within the posterior aspect of the lateral compartment near the popliteal tendon. (B) Arthroscopic view of the defect without any obvious source of the



B loose body. The defect is stable to palpation and the areas are covered with fibrocartilage.



FIGURE C4.5 Two-year postoperative anteroposterior (**A**) and lateral (**B**) radiographs demonstrate osseous integration of the main fragment and no evidence of further fragmentation.



PATHOLOGY

Concomitant medial meniscus tear and focal chondral defect of the medial femoral condyle

TREATMENT

Medial meniscectomy and microfracture medial femoral condyle

SUBMITTED BY

Brian J. Cole, MD, MBA, Rush Cartilage Restoration Center, Rush University Medical Center, Chicago, Illinois, USA

CHIEF COMPLAINT AND HISTORY OF PRESENT ILLNESS

This 40-year-old woman had no preexisting knee problems until a twisting event occurred while attempting to squat. She noted the sudden onset of right knee pain and locking along the medial aspect of her knee. Her pain did not remit despite the passage of approximately 12 weeks time, and she continued to complain of locking. Because of her clinical symptoms, she was indicated for arthroscopy with a presumed diagnosis of medial meniscus tear.

PHYSICAL EXAMINATION

Height, 5 ft, 4 in.; weight, 130 lb. She ambulated with a slight antalgic gait. She stood in slight symmetric physiologic valgus. Her right knee has a small effusion. She is tender to palpation over the medial joint line. She has a positive flexion McMurray's test. Her range of motion is 0 to 120 degrees, with pain upon further attempt at flexion. Ligamentous testing is within normal limits.

RADIOGRAPHIC EVALUATION

Plain radiographs were within normal limits. No magnetic resonance image (MRI) was obtained.

SURGICAL INTERVENTION

At the time of the arthroscopy, she was noted to have a posterior horn medial meniscus tear with an irreparable

parrot-beak configuration. The patient underwent a partial arthroscopic meniscectomy with debridement to a stable rim (Figure C5.1). Additionally, an incidental grade IV chondral lesion of the medial femoral condyle measuring approximately 15 mm by 15 mm was noted, which was questionably contributing to her symptoms. In part because the lesion was present in the ipsilateral symptomatic compartment, a formal microfracture technique was performed (Figure C5.2). Postoperatively, the patient was made nonweight bearing for 6 weeks and placed on continuous passive motion. Thereafter, she gradually progressed to activities as tolerated.

FOLLOW-UP

At 2 years of follow-up, she has continued to do well with the absence of any activity-related effusions, swelling, or ongoing discomfort.

DECISION-MAKING FACTORS

1. Simple irreparable meniscus tear that should predictably respond favorably to meniscectomy.
2. An incidental chondral lesion of the medial femoral condyle that could or might be a cause of persistent symptoms if left untreated.
3. A chondral lesion of relatively small size (i.e., less than 2–3 cm²) in an otherwise low activity level and low physical demand patient.
4. Anticipated willingness of the patient to comply with the early-phase rehabilitation requirements to optimize the results following a marrow-stimulating technique.

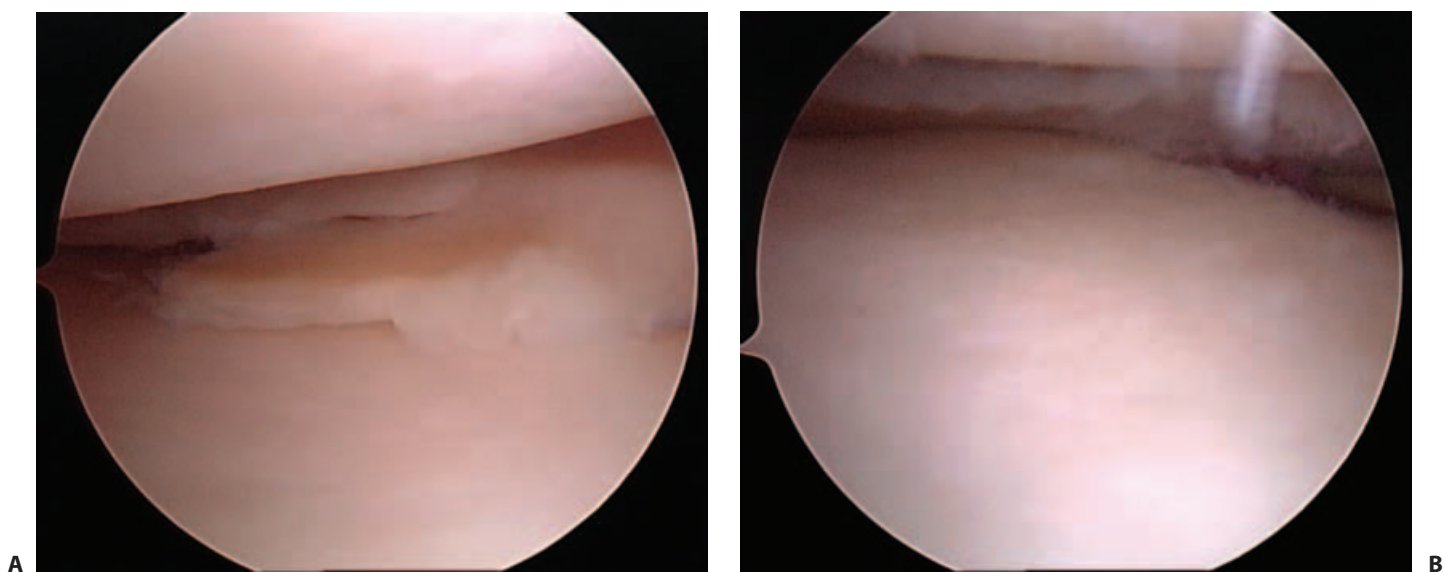


FIGURE C5.1 Arthroscopic photographs demonstrating an irreparable, parrot-beak configuration tear of the posterior horn of the medial meniscus before (A) and after (B) partial meniscectomy back to a stable rim.

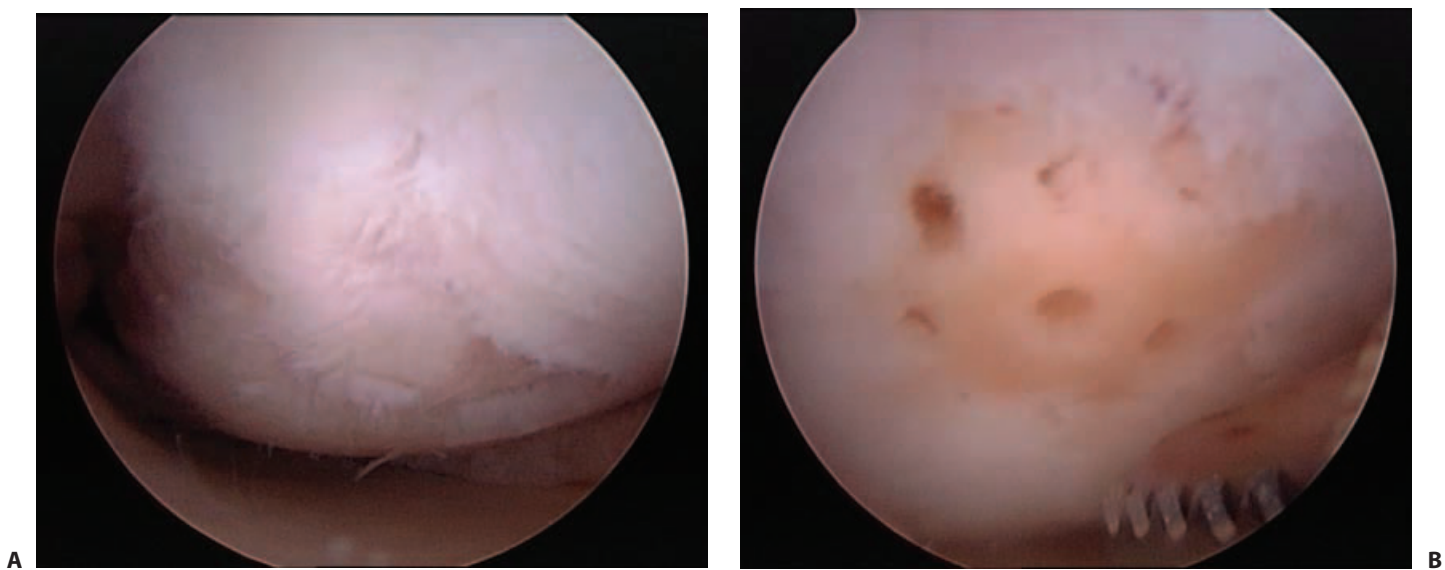


FIGURE C5.2 Photographs of grade III/IV chondral lesion of the medial femoral condyle measuring approximately 15 mm by 15 mm before (A) and after (B) formal microfracture technique was performed.



PATHOLOGY

Isolated focal chondral defect of the medial femoral condyle

TREATMENT

Microfracture

SUBMITTED BY

Tom Minas, MD and Tim Bryant, RN, Cartilage Repair Center, Brigham and Women's Hospital, Boston, Massachusetts, USA

CHIEF COMPLAINT AND HISTORY OF PRESENT ILLNESS

The patient is a 48-year-old woman who sustained an injury to the medial femoral condyle of her right knee. This lesion was treated with arthroscopic debridement alone for a grade II, partial-thickness chondral defect. This intervention alleviated her catching symptoms; however, her medial-sided weight-bearing pain persisted. She had significant limitations of her activities of daily living. She was not a particularly athletic or active individual, but desired pain relief with activities of daily living.

PHYSICAL EXAMINATION

Height, 5 ft, 3 in.; weight, 125 lb. Clinical examination demonstrated a slim woman with neutrally aligned lower extremities. She had no gait disturbance. Her range of motion was full and symmetric. There was no effusion. She had tenderness over the weight-bearing portion of her medial femoral condyle. Her ligament and meniscal examinations were normal.

RADIOGRAPHIC EVALUATION

Plain films were unremarkable and were without evidence of joint space narrowing or degenerative changes.

SURGICAL INTERVENTION

At arthroscopy, a small 10 mm by 10 mm grade III lesion of the medial femoral condyle was identified. A formal microfracture technique was performed, including removal

and curettage of damaged repair tissue and cartilage back to stable intact normal articular cartilage; this involved removal of the tidemark. A sharp microfracture awl was used peripherally around the defect and then centrally at intervals of 3 to 5 mm without connecting or destabilizing the subchondral plate (Figure C6.1). Postoperatively, the patient was made protected weight bearing for 6 weeks and used continuous passive motion.

FOLLOW-UP

The patient was full weight bearing by 3 months and returned to sporting activities by 6 months. She is presently 1 year after her surgery and is pain-free (Figure C6.2).

DECISION-MAKING FACTORS

1. Low-demand patient with small focal chondral defect which represented a relatively large area of the entire width of the medial femoral condyle.
2. Failure of previous arthroscopic debridement.
3. Osteochondral autograft was not chosen due to concerns for donor site morbidity given relatively small size of the trochlea.
4. Willingness to remain compliant with postoperative rehabilitation required to achieve successful result following microfracture.
5. Patient understanding that excessive activity levels, despite fibrocartilage fill, may lead to recurrent symptoms and further treatment attempts.

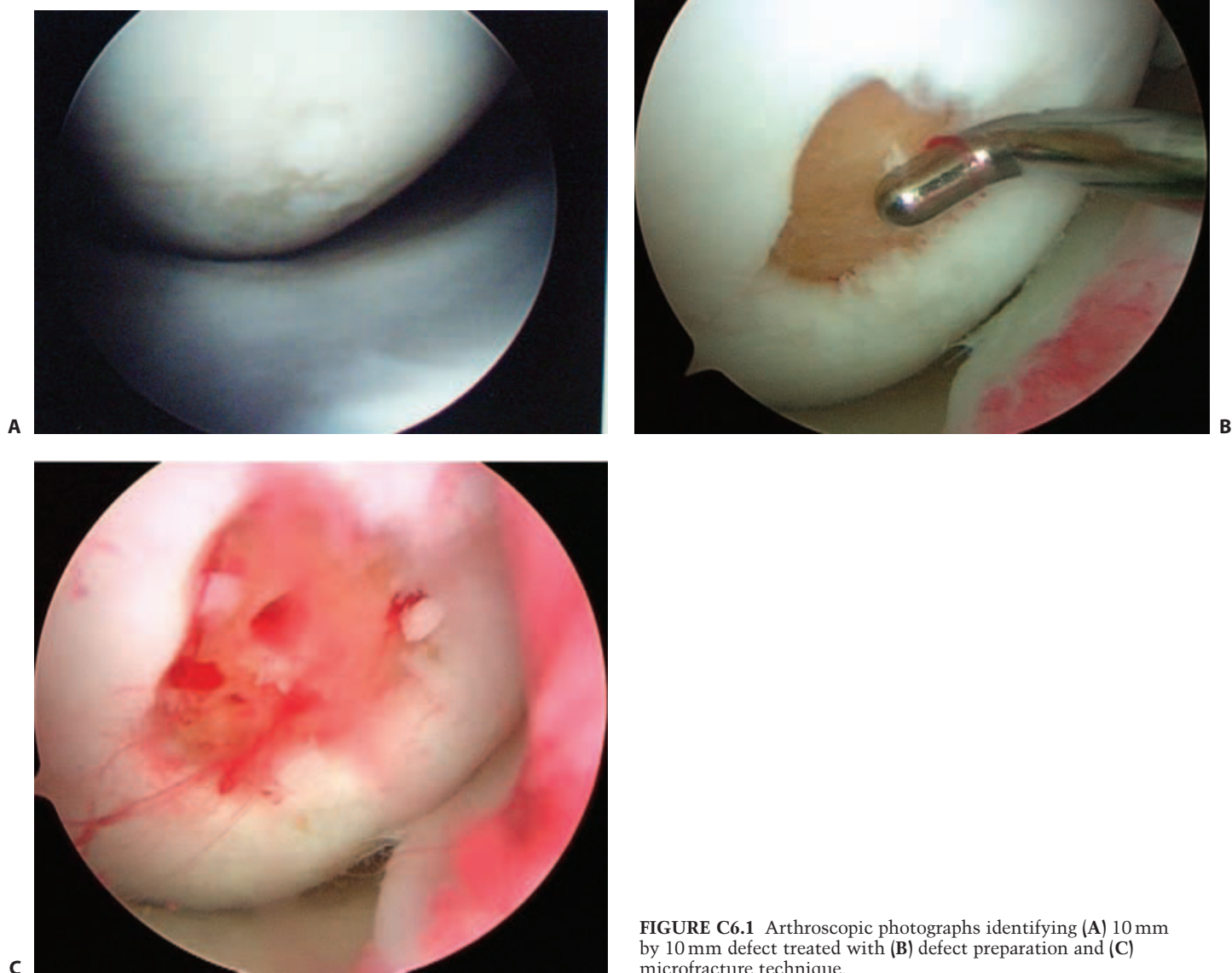


FIGURE C6.1 Arthroscopic photographs identifying (A) 10 mm by 10 mm defect treated with (B) defect preparation and (C) microfracture technique.

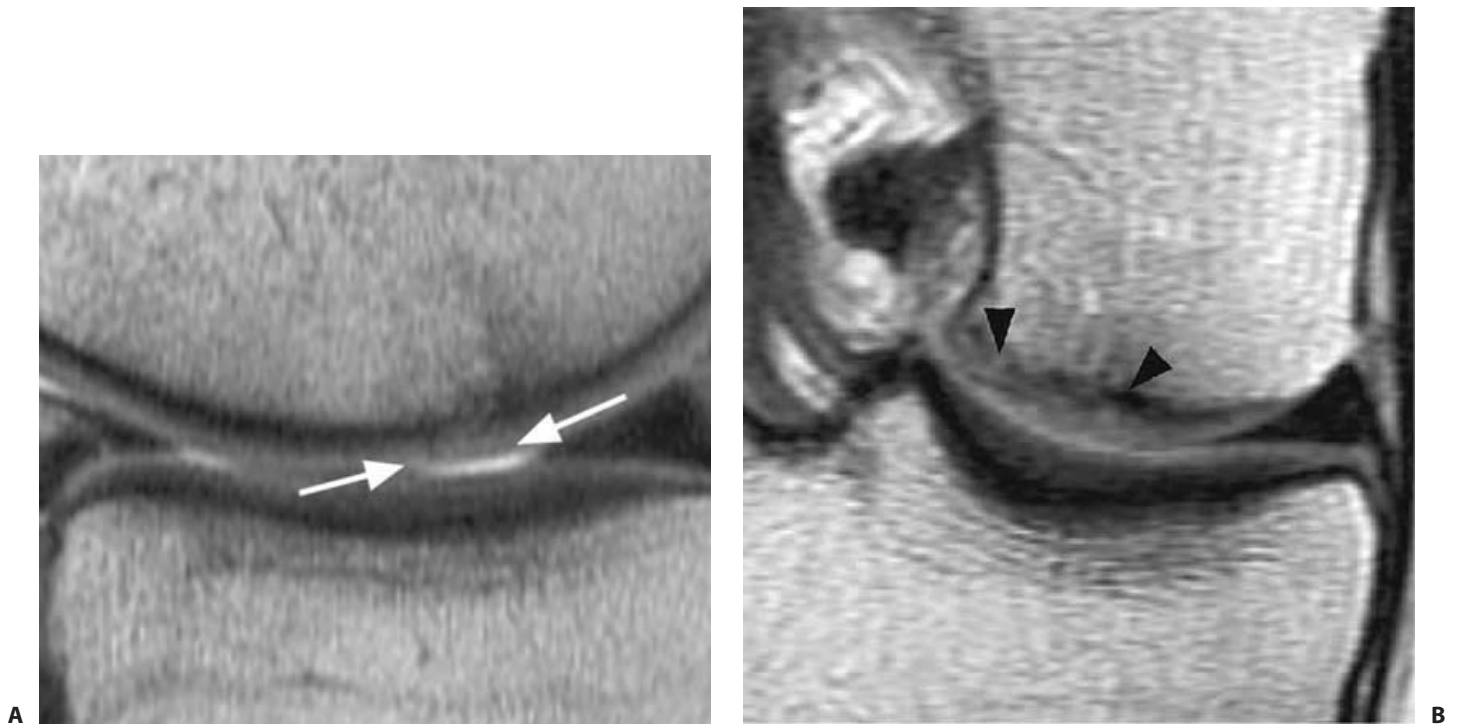


FIGURE C6.2 One-year postoperative magnetic resonance imaging (MRI) demonstrates on sagittal (**A**) and coronal (**B**) images that repair tissue is filling the defect area, where former microfracture was performed (*arrows*).



PATHOLOGY

Symptomatic focal chondral defect of lateral femoral condyle

TREATMENT

Microfracture of lateral femoral condyle with biopsy for possible future autologous chondrocyte implantation

SUBMITTED BY

Brian J. Cole, MD, MBA, Rush Cartilage Restoration Center, Rush University Medical Center, Chicago, Illinois, USA

CHIEF COMPLAINT AND HISTORY OF PRESENT ILLNESS

This patient is a 39-year-old, very active architect who had a hyperextension injury to his left knee while playing basketball. He had immediate onset of swelling and weight-bearing pain along the lateral aspect of his left knee. He failed to respond to conservative care. Because of his persistent symptoms that remained unresponsive to relative rest, a magnetic resonance image (MRI) was obtained; based upon this information, he was indicated for arthroscopy.

PHYSICAL EXAMINATION

Height, 5 ft, 10 in.; weight, 180 lb. The patient ambulates with a slightly antalgic gait. He stands in symmetric neutral alignment. His left knee has a moderate-sized effusion. His range of motion is from 0 to 130 degrees. He is tender to palpation over the lateral femoral condyle. Meniscal findings are absent. Patellofemoral joint demonstrates good tracking with no evidence of crepitus. His ligamentous examination is within normal limits.

RADIOGRAPHIC EVALUATION

Plain radiographs were evaluated and found to be within normal limits (Figure C7.1). MRI showed subchondral edema and violation of the chondral surface of the lateral femoral condyle (Figure C7.2).

SURGICAL INTERVENTION

At the time of arthroscopy, a full-thickness 10 mm by 16 mm chondral injury of the lateral femoral condyle within the weight-bearing zone in extension was identified (Figure C7.3). A formal microfracture procedure was performed (Figure

C7.4). Because of the patient's relatively active lifestyle, the location of the lesion, and the possibility for fibrocartilage breakdown in the future, a concomitant biopsy of 200 to 300 mg cartilaginous tissue was obtained from the intercondylar notch (Figure C7.5). [The author of this case (B.J.C.) currently does not routinely biopsy a patient unless there is an explicit intention to treat a defect with autologous chondrocyte implantation in the near future.] Postoperatively, the patient was made nonweight bearing for approximately 6 weeks. He was placed on continuous passive motion, which he performed for 6 weeks at 6 h/day.

FOLLOW-UP

The patient continues to do well nearly 2 years after his microfracture and has returned to all sports without any symptoms of weight-bearing pain, activity-related swelling, or discomfort. There is no intention in the near future to perform any further management of his defect unless he were to become symptomatic again.

DECISION-MAKING FACTORS

1. Relatively young active male with acute onset of symptoms related to a symptomatic femoral condyle chondral lesion.
2. Microfracture indicated as a first-time treatment for a relatively small chondral defect. Alternative treatment could also include primary osteochondral autograft transplantation.
3. Potential for failure of a marrow-stimulating technique in an otherwise active male, leading to the concomitant biopsy during this procedure.
4. Ability and willingness to be compliant with the postoperative rehabilitation required of a microfracture technique.

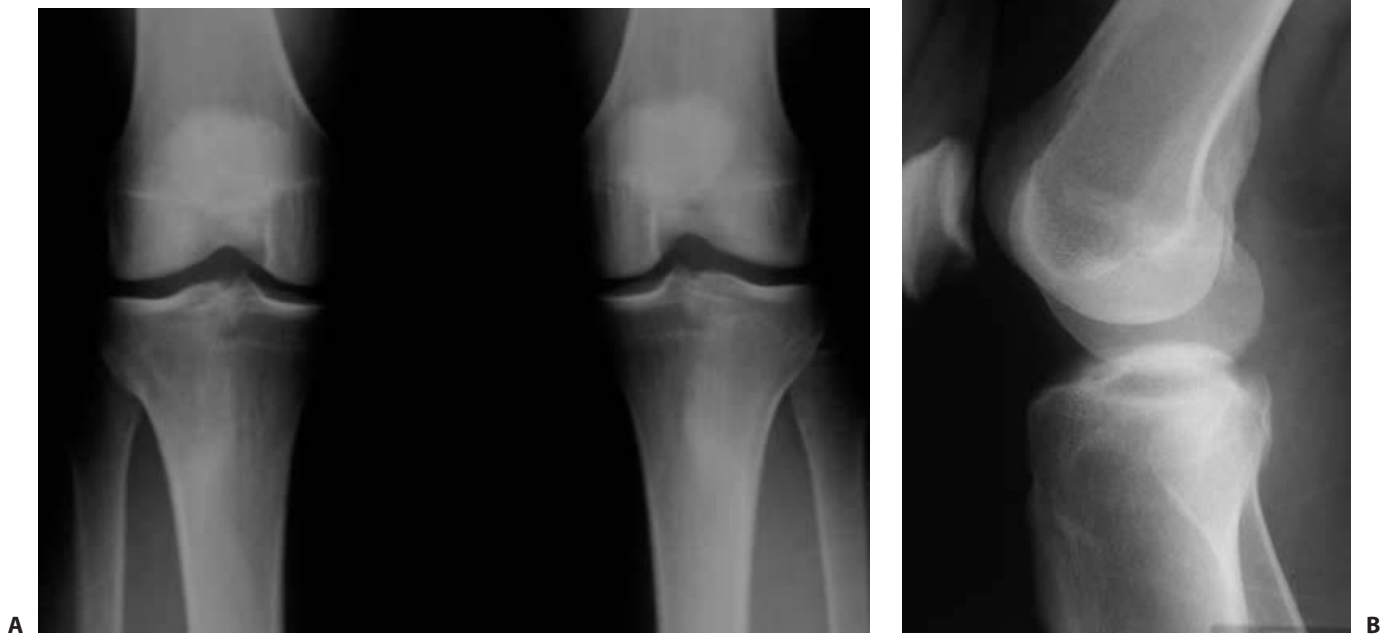


FIGURE C7.1 Forty-five-degree flexion weight-bearing posteroanterior (A) and lateral (B) radiographs demonstrate no abnormalities.

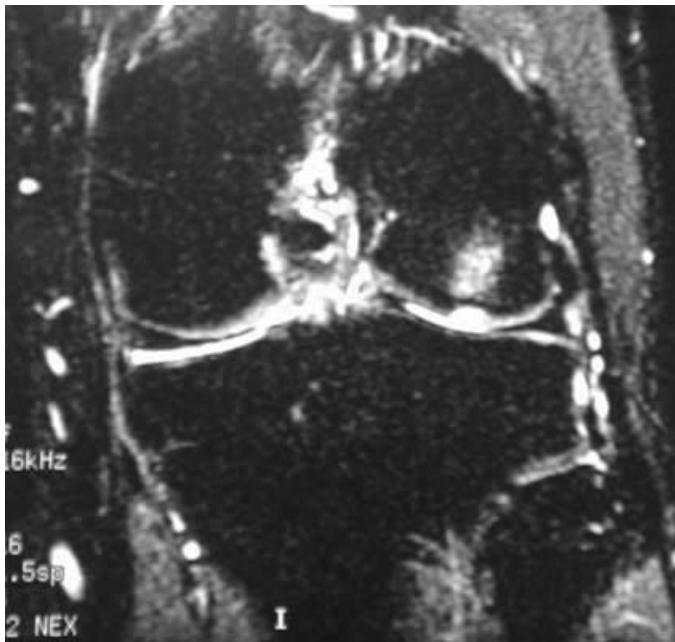


FIGURE C7.2 Coronal MRI demonstrates subchondral edema as well as violation of the chondral surface of the lateral femoral condyle.

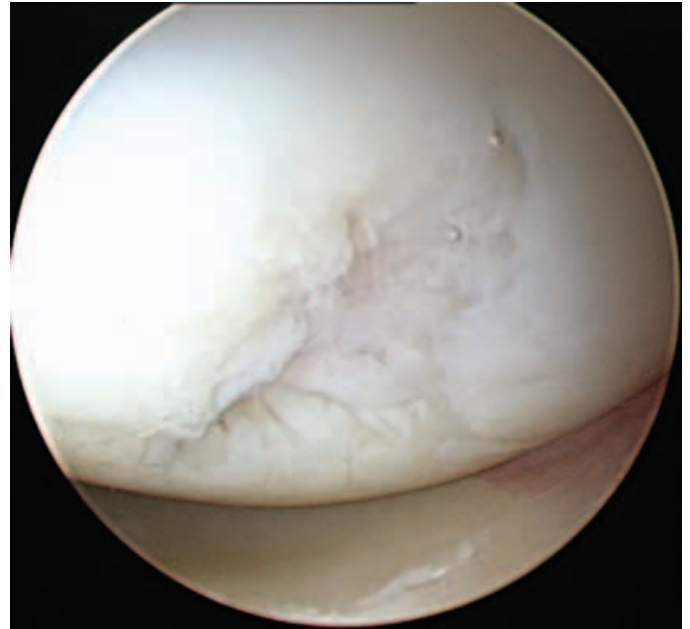


FIGURE C7.3 Arthroscopic photograph reveals a 10 mm by 16 mm full-thickness chondral defect of the lateral femoral condyle within the weight-bearing zone.

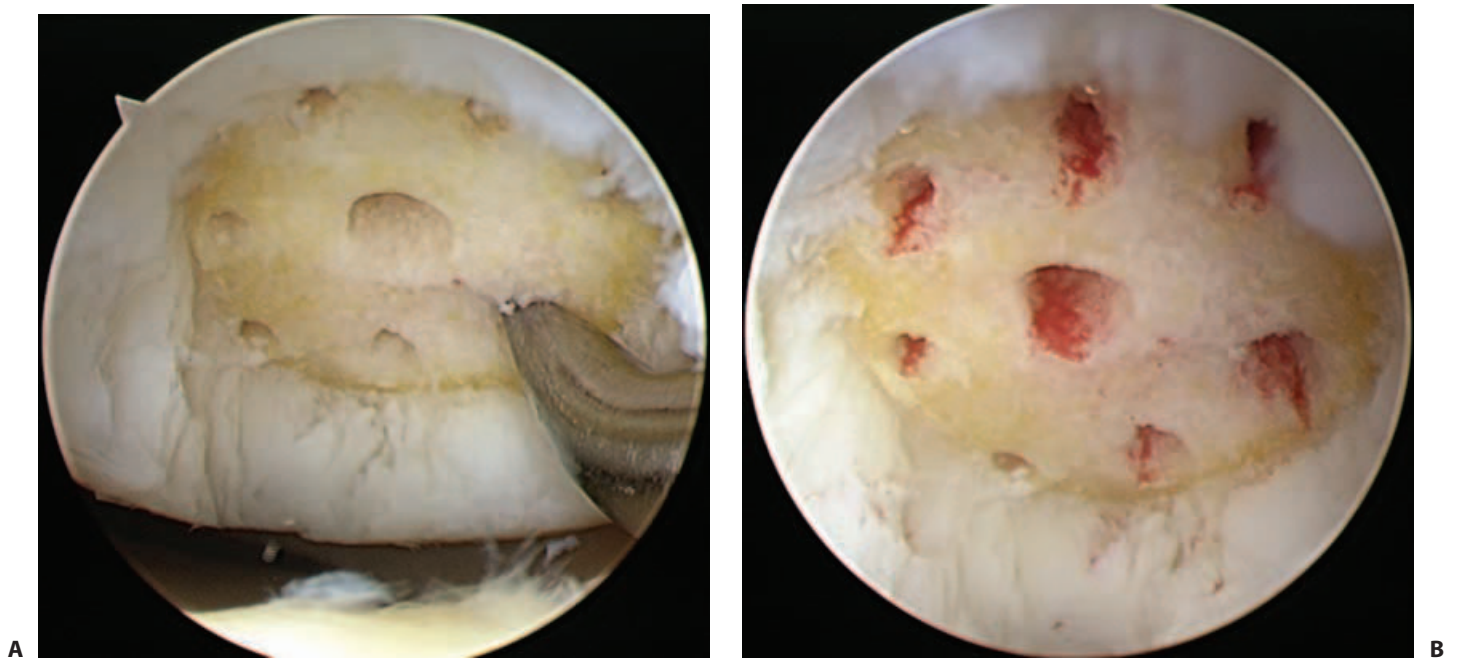


FIGURE C7.4 Arthroscopic views of the microfracture technique being performed. (A) Bloody return is shown from the holes penetrating the subchondral bone (B).



FIGURE C7.5 Arthroscopic view of biopsy of 200 to 300 mg cartilaginous tissue obtained from the intercondylar notch for potential future autologous chondrocyte implantation should the need arise.



PATHOLOGY

Isolated small grade IV medial femoral condyle chondral lesion

TREATMENT

Primary osteochondral autograft transplantation

SUBMITTED BY

Brian J. Cole, MD, MBA, Rush Cartilage Restoration Center, Rush University Medical Center, Chicago, Illinois, USA

CHIEF COMPLAINT AND HISTORY OF PRESENT ILLNESS

This patient is a 31-year-old man who sustained a single, giving-way episode of his left knee, after a misstep approximately 4 months before evaluation. Since his initial injury, he has had several hyperextension-type giving-way episodes. He complains of activity-related swelling and medial knee pain with weight bearing. He is unable to participate in any impact-type activities.

PHYSICAL EXAMINATION

Height, 6 ft, 2 in.; weight, 188 lb. He ambulates with a non-antalgic gait. He stands in neutral alignment. His left knee has a moderate effusion. His range of motion is 0 to 130 degrees. He is tender to palpation over the medial femoral condyle. Meniscal findings are absent. His ligament examination is within normal limits.

RADIOGRAPHIC EVALUATION

Plain radiographs and magnetic resonance imaging (MRI) are within normal limits.

SURGICAL INTERVENTION

Because of his persistent symptoms, he was indicated for a diagnostic arthroscopy and evaluation for possible chondral injury. At the time of arthroscopy, he was noted to have a 10 mm by 10 mm grade IV lesion along the weight-bearing portion of his medial femoral condyle (Figure C8.1). It was elected to proceed with primary osteochondral autograft transplantation (Figure C8.2). Postoperatively, the patient was made partial weight bearing for approximately 4 to 6 weeks and placed on continuous passive motion for 6 weeks at approximately 6 h/day. Thereafter, he progressed to activities as tolerated.

FOLLOW-UP

At his 2-year follow-up, the patient complains of no pain. He has full range of motion and enjoys all sports without any symptoms such as swelling, locking, or weight-bearing discomfort.

DECISION-MAKING FACTORS

1. Defect less than 2 cm² in the weight-bearing zone of the femoral condyle.

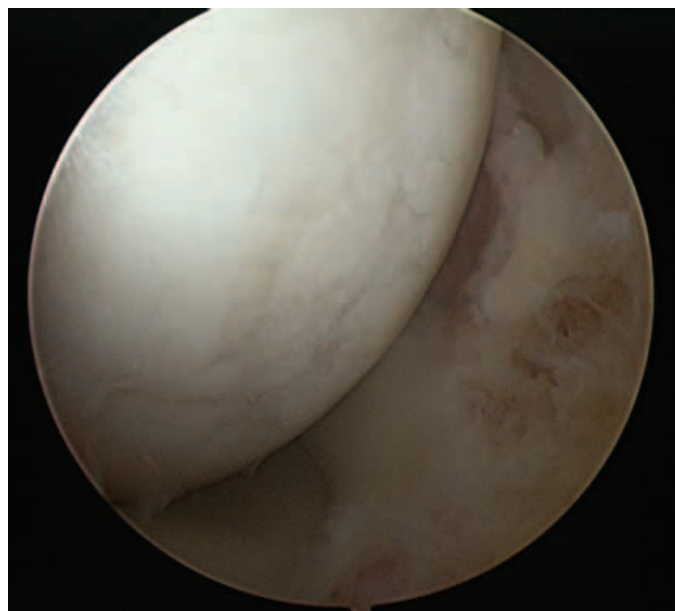


FIGURE C8.1 Arthroscopic photograph of the 10 mm by 10 mm lesion along the weight-bearing portion of his medial femoral condyle.

2. Isolated pathology in a young, active male with expectations and activity levels likely to exceed any benefit that microfracture might provide.
3. First-line treatment aimed at cartilage restoration because his activity level and the defect characteristics warranted this relatively higher level of treatment.

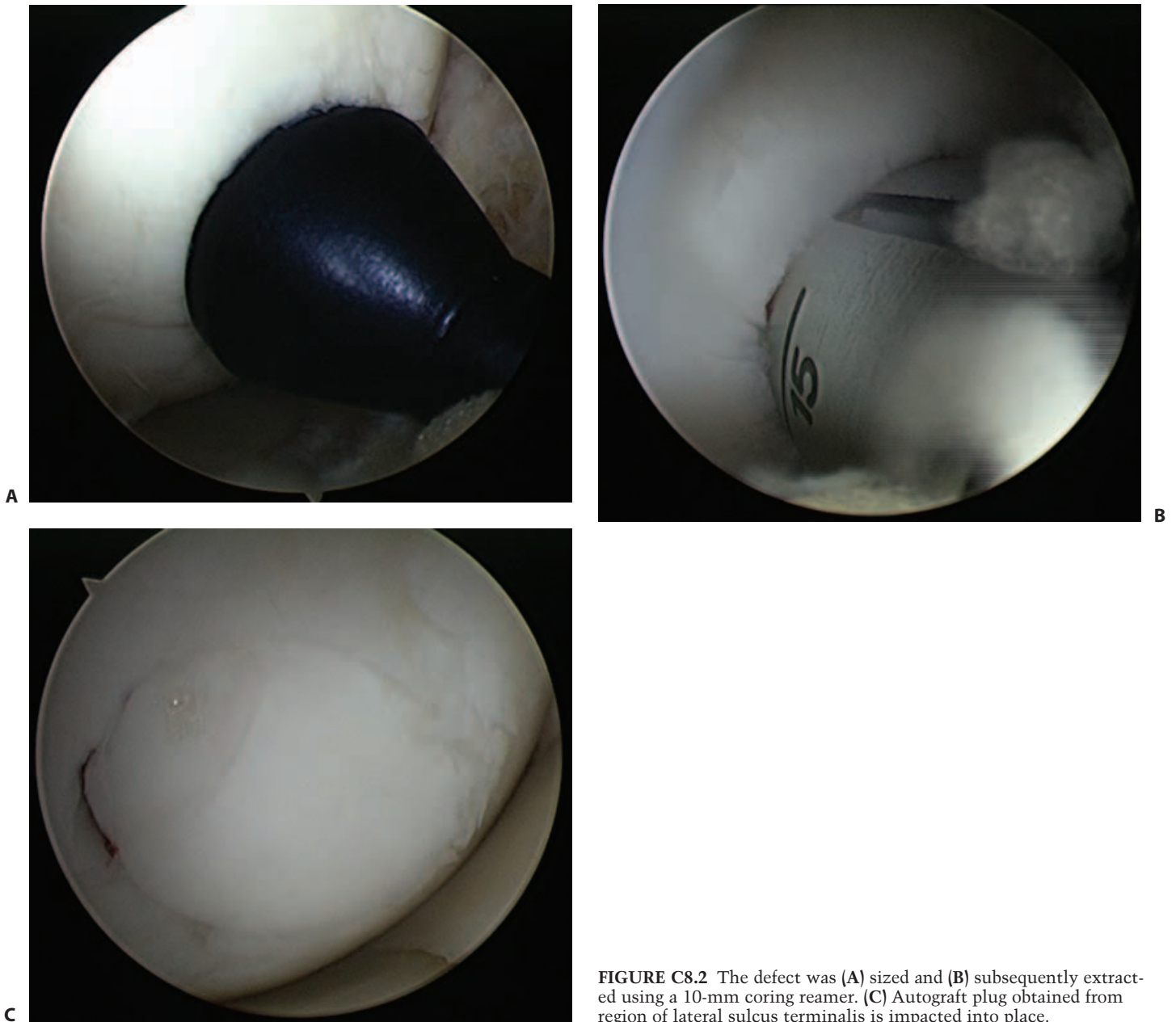


FIGURE C8.2 The defect was (A) sized and (B) subsequently extracted using a 10-mm coring reamer. (C) Autograft plug obtained from region of lateral sulcus terminalis is impacted into place.

**PATHOLOGY**

Isolated medial compartment osteoarthritis

TREATMENT

Unicompartmental knee replacement

SUBMITTED BY

Tom Minas, MD, and Tim Bryant, RN, Cartilage Repair Center, Brigham and Women's Hospital, Boston, Massachusetts, USA

CHIEF COMPLAINT AND HISTORY OF PRESENT ILLNESS

The patient is a 60-year-old man with severe left knee medial joint line pain with weight bearing. He has difficulty walking even short distances. He also has difficulty with stairs. He has severe limitations with activities of daily living, and wishes to have pain relief with these activities as well as with nonimpact recreational sports. He has failed attempts at treatment with corticosteroid injections, unloader bracing, antiinflammatories, and physical therapy.

PHYSICAL EXAMINATION

Height, 5 ft, 11 in.; weight, 185 lb. The patient is a slender 60-year-old man who appears physiologically younger than his chronologic age. He has mild symmetric varus alignment of both lower extremities. He walks with an antalgic gait on the left side only. His range of motion is 0 to 125 degrees of flexion. He has medial joint line tenderness and medial tibiofemoral crepitus. There is no effusion and no patellofemoral or lateral compartment crepitus or tenderness. There are palpable medial osteophytes, and his alignment corrects almost to neutral with a valgus-producing force. There is a good medial endpoint. His ligament examination is within normal limits.

RADIOGRAPHIC EVALUATION

Plain radiographs demonstrate complete loss of the medial joint space, and a healthy lateral and patellofemoral joint compartment without evidence of tibiofemoral subluxation (Figure C9.1).

SURGICAL INTERVENTION

Because of his age, low-demand activities, and need to return to work in a short period of time, it was decided to pursue surgical reconstruction by medial unicompartmental arthroplasty (Figure C9.2). Postoperatively, the patient was advanced to weight bearing and range of motion as tolerated. He progressed to activities as tolerated by 16 weeks (Figure C9.2).

FOLLOW-UP

Within a few weeks postoperatively his pain was completely resolved allowing early return to work. He returned to golf within 3 months and to recreational skiing within 9 months after reconstruction (Figure C9.3). His range of motion was comparable to his preoperative condition.

DECISION-MAKING FACTORS

1. An otherwise healthy, 60-year-old male with end-stage bipolar medial compartment osteoarthritis and slight varus alignment.
2. Goals: to return to low-demand activities and work within a few weeks of surgery.
3. No evidence of significant patellofemoral or lateral tibiofemoral symptoms by history, radiographs, or physical examination.



FIGURE C9.1 Preoperative (A) standing anteroposterior, (B) lateral, and (C) skyline radiographs demonstrate nearly complete loss of medial joint space with healthy lateral and patellofemoral compartments without evidence of tibiofemoral subluxation.

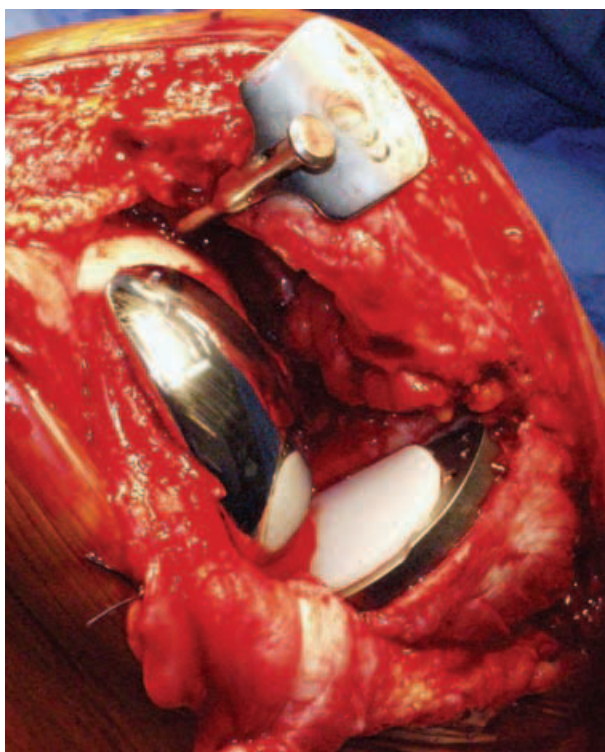


FIGURE C9.2 Intraoperative photograph of implanted tibiofemoral unicompartmental prosthesis through a minimally invasive incision without a quadriceps split.

**A****B**

FIGURE C9.3 Postoperative anteroposterior (A) and lateral (B) radiographs of well-functioning medial unicompartmental prosthesis.

PATHOLOGY

Unicompartmental bipolar disease

TREATMENT

Unispacer

SUBMITTED BY

Jack Farr, MD, Cartilage Restoration Center of Indiana, OrthoIndy, Indianapolis, Indiana, USA.

CHIEF COMPLAINT AND HISTORY OF PRESENT ILLNESS

This male patient is a 44-year-old, large-machine mechanic with progressive, left greater than right, medial-sided knee pain. The quality is sharp with twisting and turning activities and at other times deep, dull aching. The severity is intense and the timing is per weight-bearing activity, although he does have some aching at rest. The patient has unsuccessfully worn an unloader knee brace for the past 2 years. He reports a history of an open meniscectomy and arthroscopy of his right knee performed more than 20 years previously. He smokes 1 to 2 packs per day and has for the past 20 years.

PHYSICAL EXAMINATION

Height, 5 ft, 9 in.; weight, 150 lb; BMI (body mass index), 22.5. The patient ambulates with an antalgic gait. He stands in slight symmetric varus. Bilateral range of motion is from 5 to 130 degrees of flexion. He has a mild effusion on the right knee and moderate effusion on the left knee. He has bilateral focal medial joint line tenderness. There is no increased ligamentous laxity.

RADIOGRAPHIC EVALUATION

Anteroposterior and lateral radiographs demonstrate medial compartment joint space narrowing (Figure C10.1). The Merchant view shows a central patella with maintenance of joint space. The posteroanterior standing notch view shows significant joint space loss in the right medial compartment and moderate narrowing in the left medial compartment. The long-leg alignment view shows 4 to 5 degrees varus on the right and 3 to 4 degrees varus on the left.

SURGICAL INTERVENTION

The arthroscopy revealed minimal chondrosis except medially where both the femoral condyle and tibial plateau had extensive grade III and early IV chondrosis. The meniscus was relatively absent. The anterior cruciate ligament was intact. Following arthroscopic preparation of the joint surfaces, a unispacer was inserted through a miniarthrotomy (Figure C10.2). Postoperatively, the patient was immediately allowed weight bearing and range of motion as tolerated. Advance to unrestricted activities was permitted after 3 months.

FOLLOW-UP

At 3 months, radiographs demonstrate good placement of the unispacer (Figure C10.3). The patient has returned to work and, at 6 months, he is now limited by his nonoperative knee. He still has some minor complaints of residual discomfort along the medial side of his right knee, albeit less than he had preoperatively.

DECISION-MAKING FACTORS

1. Relatively advanced unicompartmental bipolar disease of the medial compartment in a young patient who is unwilling to take time off work to allow the healing required of a high tibial osteotomy.
2. A heavy smoker with a relative contraindication to osteotomy.
3. Considered to be relatively young for unicompartmental knee replacement.
4. Unispacer should allow successful revision, if necessary, to unicompartmental or total knee arthroplasty, without compromising the result of those procedures.

**A****B**

FIGURE 10.1 Preoperative anteroposterior (**A**) and lateral (**B**) radiographs show narrowing of medial joint space with slight varus deformity.

**A****B**

FIGURE 10.2 Intraoperative anteroposterior (**A**) and lateral (**B**) radiographs show proper placement of the unispacer.



FIGURE 10.3 Three-month postoperative anteroposterior (A) and lateral (B) radiographs of unispacer in satisfactory position.

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