In-Season Management of a Displaced “Bucket Handle” Medial Meniscus Tear

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OSS OF KNEE EXTENSION, associated with a locked knee, is a known complication of a bucket-handle medial meniscus tear. Bucket-handle medial meniscus tears usually occur in conjunction with an ACL tear, but can also occur without a knee ligament injury. Displacement of the bucket-handle meniscal fragment can occur with the fragment becoming displaced into the intercondylar notch. Historically, a locked knee was often treated with manipulation under anesthesia, with or without subsequent surgical intervention for treatment of the intraarticular pathology associated with the “locking” of the knee. Current treatment strategies for the locked knee focus on identification of the intraarticular pathology, usually with the aid of magnetic resonance imaging (MRI) and arthroscopy.

This is a case report of a male basketball player who refused surgical intervention for a displaced bucket-handle medial meniscus tear that occurred during the season. He subsequently underwent several reductions of his knee, presumably unlocking the displaced medial meniscus fragment and allowing him to continue to play basketball. The decision-making process that guided this patient’s treatment and rehabilitation, which allowed him to continue to play, is presented.

Case Report

The patient was a 22-year-old male who was the starting point guard for the men’s basketball team at a Division I university. Prior to this injury, he had no history of injury to the involved knee, with the exception of occasional treatment for chronic patellar tendonitis.

On his way to the locker room at the conclusion of the first half of a basketball game, the patient informed the athletic trainer of left knee pain that was caused by a twisting injury to his left knee. He complained of stiffness and a locking sensation in his left knee. He indicated difficulty in fully extending his knee. He stated that the symptoms began around the middle of the first half, but he was able to finish playing the first half despite the knee discomfort.

Visual inspection of the involved knee during the half-time break revealed no edema, effusion, ecchymosis, and/or bony deformity. A mild gait abnormality was noted. Palpation elicited point tenderness over the medial tibial plateau and very mild point tenderness over the medial joint line. No other point tenderness was elicited and no crepitus was noted. Active and passive knee flexion were within normal limits, but active and passive knee extension were limited at approximately 5 degrees from full extension. Ligament tests failed to demonstrate any laxity of the knee. McMurray’s test was negative. During testing, the patient did feel a shifting and popping sensation in his knee and subsequent cessation of pain. Following this event, the athlete’s active and passive knee flexion and extension were restored to normal. At this point, the patient exhibited no pain or discomfort and wished to return to play. He was monitored during the second-half warm-up period and was cleared to play. He played until approximately six minutes remained in the game, when he experienced a recurrence of stiffness, locking, and pain with active and passive knee extension. Ice and compression were applied and he did not return to the game. Post-game treatment consisted of ice, compression, and NSAID.
The next morning, the patient complained of knee pain and stiffness. Visual inspection revealed no effusion, ecchymosis, and/or bony deformity. He was found to have point tenderness over the medial tibial condyle. In addition, he was unable to actively extend his knee. An MRI performed on the same day revealed a “bucket-handle” medial meniscus tear, with the fragment displaced into the intercondylar notch. The MRI findings were relayed to the athlete and immediate surgery was recommended as the best option. Following discussion that included the patient, his family, the athletic trainer, and the head coach, surgery was scheduled for the following day (arthroscopic medial meniscectomy or meniscus repair). On the morning of the scheduled surgery, the patient expressed a strong desire not to have the surgery performed and stated that he wanted to see if he would be able to play in a week. The athletic trainer, the orthopedic surgeon, and the head basketball coach tried to convince him that immediate surgery was his best option and the risks associated with delayed surgical intervention were discussed; however, the patient refused to undergo the surgical procedure, which was cancelled.

Several discussions were subsequently conducted with the patient and his family, which included consideration of the opinions of other orthopedic surgeons about the risks of nonoperative treatment in such a case. The patient clearly wanted to try to return to play and was fully informed about the risk of further knee injury.

After much discussion among the medical staff, the patient, his family, and the coaches, a decision was made to allow the patient to try to return to basketball and a rehabilitation plan was developed. The patient was advised that there was uncertainty about how soon he would be able to return to play or how long he would be able to play after returning to basketball participation.

The patient received treatments (e.g., edema and pain control) and performed rehabilitation exercises (e.g., quadriceps and hamstring musculature strengthening and flexibility) for three days, and he returned to functional activity at six days postinjury. A rigorous sport-specific workout was conducted by the head basketball coach, under the supervision of the athletic trainer. The patient was able to complete the workout without any apparent limitations. Postactivity visual inspection failed to reveal any increase in knee effusion. The patient returned later in the same day and engaged in additional sport-specific activity under the supervision of the team orthopedic surgeon and athletic trainer. Postactivity inspection failed to reveal any increase in effusion. After a discussion with the head coach, the patient was cleared by the team orthopedic surgeon to engage in activity as tolerated. Treatments for control of pain and effusion were continued.

In-Season Maintenance and Reduction

Following clearance for return to play, the patient was capable of full participation for twenty days, after which he aggravated his condition during the first half of a game. He indicated that the mechanism of injury was similar to his initial injury mechanism. The patient stated that he felt something was blocking full extension. He was found to have a 5- to 10-degree flexion contracture, which was believed to be due to mechanical impingement of the meniscus tear. The team physician was able to manually reduce the bucket-handle tear. The reduction was performed by placing the patient supine on a treatment table and having him relax his leg musculature. The knee was passively flexed to 90 degrees, externally rotated, and a valgus force was applied. With external rotation and valgus force application, the knee was passively moved into full extension. Near full extension, reduction of the meniscus tear was visually evident, and the patient immediately sensed that the knee felt “normal.” Following reduction, the athlete returned to the game with no apparent limitations. Post-game assessment failed to reveal any pain and/or effusion.

During the remainder of the season, successful manual reduction of the medial meniscus tear was performed seven times. Six of these reductions were performed during games and one was performed at a practice session. The reduction was more easily accomplished at each successive event, as the physicians learned how to position and manipulate the knee in a more effective manner. Following each reduction, the athlete immediately returned back to play without any obvious limitations. The majority of the incidents occurred as the patient performed a spinning maneuver in the process of taking a shot.

Surgery

After the conclusion of the basketball season, which was almost three months after the originally scheduled surgery, the athlete underwent arthroscopy. A bucket-handle tear of the medial meniscus was found that