Cartilage "Blister" of the Lateral Femoral Condyle with a Proximal Tibiofibular Sprain in a College Basketball Athlete

Jennifer Gentry, Shawn D. Felton, James Allen Willoughby, Jason C. Craddock

Florida Gulf Coast University, Department of Rehabilitation Sciences, Fort Myers, FL USA

Abstract

Background: Athlete was an 18 year-old male collegiate basketball athlete. Athlete's prior medical history included a bone contusion of the lateral femoral epicondyle of the left knee. In December 2016 the athlete was coming down from a dunk and landed on his left leg a little weird. He had MRIs and X-rays taken. He was then diagnosed with a bone contusion on the lateral epicondyle of the left knee. In July 2016, athlete reported to the athletic trainer complaining of lateral left knee pain. Athlete stated he previously had a bone bruise and was in a controlled ankle motion walking boot and NWB for 6 weeks. He had completed rehabilitation, but continued to have pain which worsened with the participation in basketball practices. Initial evaluation revealed no obvious deformities or signs of trauma. Athlete had pain with jumping, squatting, jogging, cutting, pivoting and completing some military tasks. Athlete was point tender over and around the fibular head. Full Active ROM and strength with knee flexion and extension. Athlete's proximal fibular glide demonstrated instability. **Differential Diagnosis:** Proximal tibiofibular joint sprain of the left knee. After rehab for this injury failed to reduce his pain he was seen by two physicians who ordered more X-rays and MRIs. He was then diagnosed with cartilage damage on the lateral epicondyle of the left femur. **Treatment:** After an initial two months of rehabilitation, the athlete continued to have knee pain. The team physician recommended a steroid injection. The athlete stated that the injection helped decrease his pain the rest of that same day and that night. However, when he woke up the next morning his pain had returned to normal. The doctor was hopeful that addressing the cartilage damage with surgery would remove the athlete's pain. Athlete was then scheduled for surgery to assess cartilage damage. During the surgery, it was found that the cartilage on the athlete's femur had "blistered" or "bubbled" away from the bone. There were no lesions in the cartilage, but it was no longer in contact with the underlying bone. The surgery performed will hopefully allow the cartilage to remain in contact with the underlying bone. Athlete is currently 7 weeks out and has begun a rehabilitation plan. **Uniqueness:** While osteochondral lesions in the knee are not uncommon, this athlete's case was. When the surgeon assessed the cartilage damage, he discovered that the athlete's cartilage had no lesions. However, an 8x18 mm chunk was blistered away from the bone with fluid between the cartilage and the femur. Another unique aspect of this case is the surgery that the doctor performed. He cut a chunk out of the blistered cartilage, drained the fluid and injected platelet rich plasma to help improve healing. He then performed a micro fracture surgery with the hope that it would be enough to fix the cartilage as well as remove the athlete's pain. **Conclusions:** This case highlighted the diagnosis and treatment of an athlete suffering from blistered cartilage of the lateral femoral condyle with a proximal tibiofibular sprain of the left knee. This case further highlighted an attempted surgery on an extremely rare and unique case. As the athlete's treatment, care, and rehabilitation continue we will discover if the initial surgery was enough or if he will need to undergo another surgery.

Introduction

A variety of treatment strategies for osteochondral lesions include debridement surgery, microfracture surgery, autograft transplantation surgery, or immobilization and restricted weight bearing. The microfracture surgery requires the surgeon to use a tool to make tiny holes in the bone underlying the affected cartilage. These microfractures release bone marrow which is supposed to promote healing and build new cartilage. No matter the treatment option, this is a very difficult injury to treat. This poster will include the mechanism of injury, clinical evaluations, radiographic findings, diagnosis, and treatments of this athlete's unique injury.

Purpose

This case report highlights a very unique injury. An18 year old male college basketball player was diagnosed with a proximal tibiofibular sprain in addition to blistered cartilage of the femur of the left knee. While ostechondral lesions of the knee are not uncommon, a blister or "bubbling" of the cartilage is. This athlete's cartilage had peeled away from the underlying bone but had no lesions. The purpose of this case report is to find insight on the treatment of a very unique injury.

Case Report

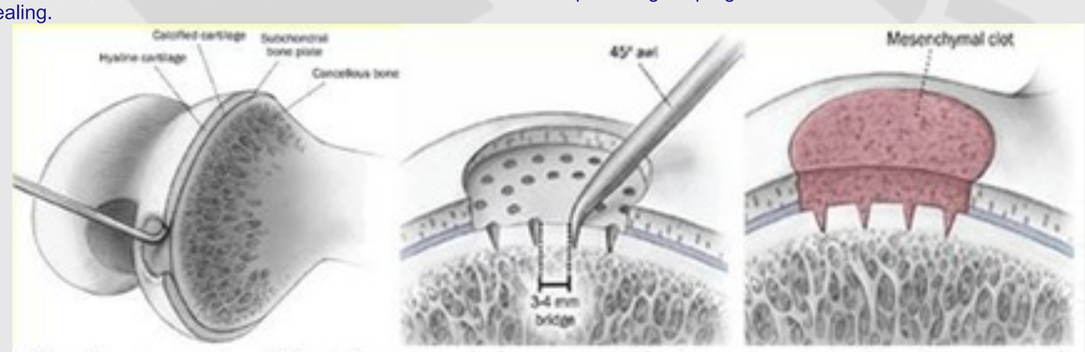
Patient: An 18 year old male college basketball player who sprained his proximal tibiofibular joint. In addition to this injury, the athlete's cartilage on his left lateral femoral condyle was blistered off of the underlying bone. The space between the bone and the cartilage was filled with fluid and the team doctor believed this is what was causing his pain.

Mechanism of Injury: In December 2016 the athlete was coming down form a dunk in a game and landed awkwardly on his left leg. He was diagnosed with a bone contusion and put in a non weight bearing boot for 6 weeks but continued to have pain. 18 months later he began to develop lateral knee pain during basic military training. He was then diagnosed with a stress fracture and was restricted in his training for a few days. This did not help and he continued to have pain. The athlete stated that his pain worsened upon participation in basketball practice one day during a sprint.

Clinical Examination: Upon re-evaluation swelling was noted and it was found that the athlete had pain with squatting, jumping and cutting. Athlete had full active and passive range of motion with pain at end range flexion. Manual muscle testing resulted in a 5/5 for knee extension and a 4/5 due to pain for knee flexion. He was tender to palpation over and around the fibular head. Valgus stress test, McMurray's, and Ober's tests were all negative. A proximal fibular glide demonstrated significant instability.

Radiographic Findings: The athlete had an MRI done which was read by the team physician. He confirmed the proximal tibiofibular sprain and recommended a steroid injection. The athlete stated that the injection only helped overnight and that his pain had returned the following morning. After having another MRI, the team physician noticed some edema around the lateral femoral condyle. This caused him to suspect a cartilage pathology which he believed was the main source of the athlete's pain.

Treatment: After completing months of rehabilitation before his final MRI was taken, the athlete continued to have pain. The team physician suggested surgery to assess and address the cartilage damage of the athlete's left knee. He believed that this would relieve most, if not all, of his pain and if it did not, they would then discuss a second surgery to address the tibiofibular sprain. At the time of surgery, the physician did not know the extent of the cartilage damage. When he went in to address the damage, he saw that an 8mm by18mm chunk of cartilage on the athletes femur was pulled off of the underlying bone with no lesions in the cartilage. The space between the cartilage and the bone was filled with fluid which is what the physician believes is what was seen on the MRI. To address this cartilage "blister" the physician made an incision in the cartilage to drain the fluids. Once this was done, he said that the cartilage almost wanted to lay back down onto the bone. He performed a microfracture surgery to help the cartilage stick to the underlying bone and injected platelet rich plasma to promote healing.



Microfracture - The defect is scraped clean. Small holes are punched in the exposed bone. Clot forms in the defect and matures into new joint lining.

Rehabilitation

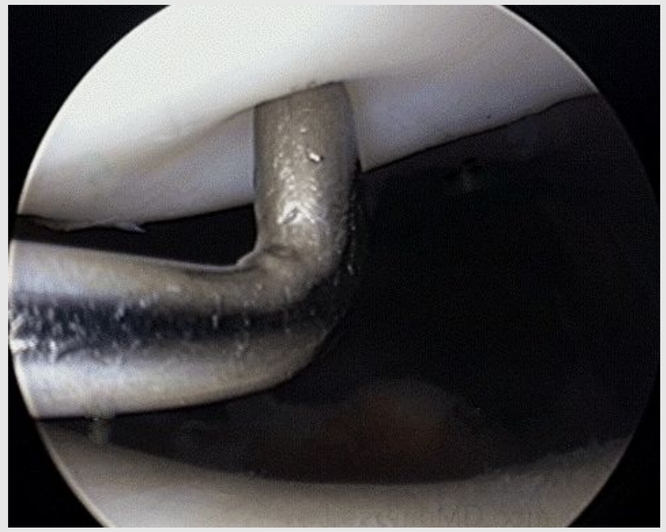
Following surgery, the athlete was non weight bearing for 6 weeks. During this time he was able to begin phase 1 of the rehabilitation protocol created for him by the team physician. This protocol consisted of phases that would eventually lead to jogging after 4-5 months and jumping, squatting and cutting after 6 months of rehabilitation. Phase 1 included Russian stimulation in order to help decrease and prevent further atrophy of the quadriceps muscle group. The goal of phase I was to diminish pain and inflammation, restore range of motion and maintain muscular strength and flexibility of involved and uninvolved muscle groups. About a week after surgery he was able to add in some non-intensive exercises such as straight leg raises and quad sets. As he progressed with these hamstring curls and heel slides were added to address range of motion as well as some other non weight bearing exercises as tolerated. After 6 weeks on crutches he was able to start phase 2 to restore pain-free range of motion, progress to full weight bearing with normal gait, and progressively increase muscle strength and endurance. In order to move on to phase III, he needed minimal pain during phase II, full pain free range of motion, and normalized full weight bearing gait. Phase III goals consisted of restoring muscular and cardiovascular endurance, and optimized neuromuscular control. Once this was complete he would move on to phase IV where he would start jogging and then 6 months post surgery start jumping, squatting and cutting drills.

Discussion and Summary

Osteochondral lesions are not uncommon in sport. A cartilage blister in a healthy 18 year old is. This was a very unique injury. The treatment used by the team physician was also unique in the fact that he did not know what exactly he was treating before he began the surgery or what treatment would be needed. Because this injury was so unique, the physician had to make a judgement call during surgery on how to treat the pathology. He chose to perform a microfracture surgery and inject platelet rich plasma to promote healing. If the athlete continued to have pain after rehabilitation for this injury, they would discuss options to address the tibiofibular sprain.

Conclusion

This case highlighted the process of diagnosing a cartilage "blister" of the lateral femoral condyle. In addition to the diagnosis, it examined the treatment chosen to address the diagnosis. This entire case was very unique and it is very unfortunate that we are unable to follow up with the athlete about his post-surgical progress.



References

Asik, M., Ciftci, F., Sen, C., Erdil, M., & Atalar, A. (2008). The microfracture technique for the treatment of full-thickness articular cartilage lesions of the knee: Midterm results. Arthroscopy: The Journal of Arthroscopic & Related Surgery, 24(11), 1214-1220. doi:10.1016/j.arthro.2008.06.015

Assche, D. V., Staes, F., Caspel, D. V., Vanlauwe, J., Bellemans, J., Saris, D. B., & Luyten, F. P. (2010). Autologous chondrocyte implantation versus microfracture for knee cartilage injury: A prospective randomized trial, with 2-year follow-up. Knee Surgery, Sports Traumatology, Arthroscopy, 18(4), 486–495. https://doi.org/10.1007/s00167-009-0955-1

Bekkers, J. E. J., Inklaar, M., Saris, D. B. F. (2017). Treatment selection in articular cartilage lesions of the knee: A systematic review. The American Journal of Sports Medicine 37(1), 148-155. https://doi.org/10.1177/0363546509351143

Ferretti, M., Viola, D. C. M., Filho, R. J. G. (2009). Treatment of osteochondral defects of the knee. Medical Developments 7, 245-247.

Gobbi, A., Karnatzikos, G., & Kumar, A. (2014). Long-term results after microfracture treatment for full-thickness knee chondral lesions in athletes. Knee Surgery, Sports Traumatology, Arthroscopy, 22(9), 1986–1996. https://doi.org/10.1007/s00167-013-2676-8.

Gudas, R., Gudaitė, A., Pocius, A., Gudienė, A., Čekanauskas, E., Monastyreckienė, E., Basevičius, A. (2012). Ten-year follow-up of a prospective, randomized clinical study of mosaic osteochondral autologous transplantation versus microfracture for the treatment of osteochondral defects in the knee joint of athletes. The American Journal of Sports Medicine 40(11), 2499-2508. https://doi.org/10.1177/0363546512458763

Guney, A., Akar, M., Karaman, I., Oner, M., & Guney, B. (2015). Clinical outcomes of platelet rich plasma (PRP) as an adjunct to microfracture surgery in osteochondral lesions of the talus. Knee Surgery, Sports Traumatology, Arthroscopy, 23, 2384–2389. https://doi.org/10.1007/s00167-013-2784-5

Knutsen, G., Drogset, J. O., Engebretsen, L., Grøntvedt, T., Isaksen, V., Ludvigsen, T. C., Roberts, S., Solheim, E., Strand, T., & Johansen, O., (2007). A randomized trial comparing autologous chondrocyte implantation with microfracture: findings at five years. Journal of Bone & Joint Surgery, 89(10), 2105-2122. 10.2106/JBJS.G.00003.

Mithoefer, K., McAdams, T., Williams, R. J., Kreuz, P. C., & Mandelbaum, B. R. (2009). Clinical efficacy of the microfracture technique for articular cartilage repair in the knee. The American Journal of Sports Medicine, 37, 2053 – 2063. 10.1177/0363546508328414.

Vanlauwe, J., Saris, D. B. F., Victor, J., Almqvist, K. F., Bellemans, J., & Luyten, F. P. (2011). Five-year outcome of characterized chondrocyte implantation versus microfracture for symptomatic cartilage defects of the knee. The American Journal of Sports Medicine, 39(12), 2566-2574. https://doi.org/10.1177/0363546511422220.