Rebound® Cartilage Case Study

47-year-old male, symptomatic articular cartilage injury

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INDICATION

This is a 47-year-old male who has a symptomatic medial femoral condyle cartilage defect in the setting of varus alignment.

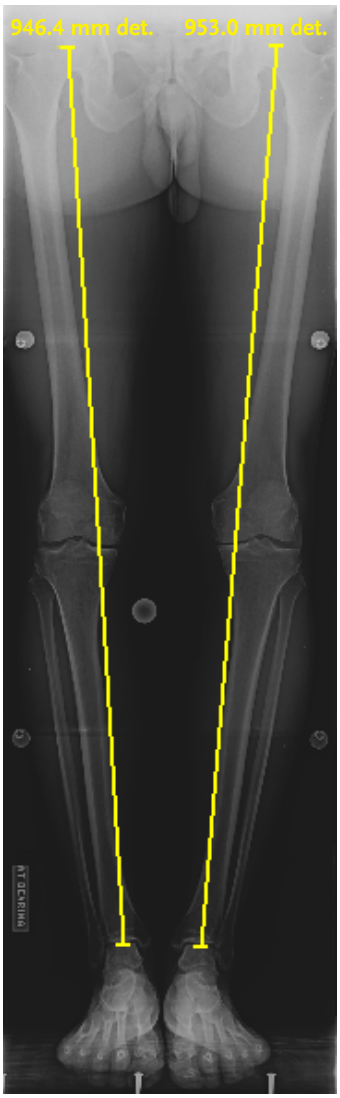
This gentleman is a very active patient who plays multiple club sports including, soccer, lacrosse, and downhill skiing. His symptomatic pain and swelling limits his activities, especially a half mile into a run and 10-15 min into a club soccer match.

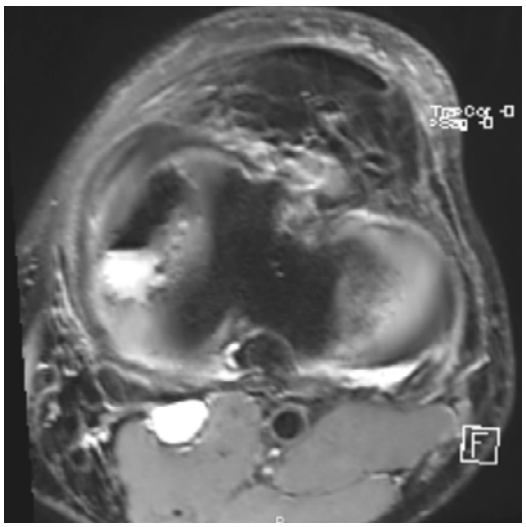
DIAGNOSTICS

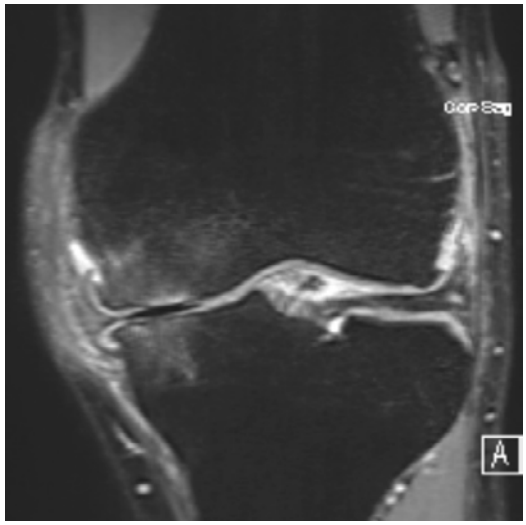
His examination demonstrated full knee range of motion, but a mild to moderate effusion. There was slight inflammation and warmth to the joint, but no signs of infection. All of the ligaments were stable including the ACL, PCL, MCL, LCL. His standing alignment demonstrated no varus thrust. He had slight varus, left greater than right, alignment.

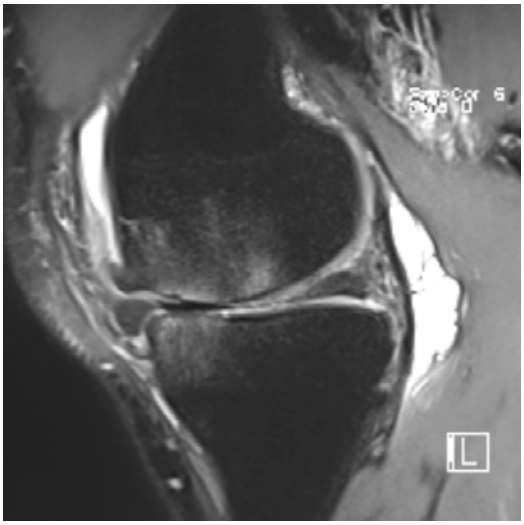
Plain radiographs demonstrated no degenerative changes, some medial sided joint space narrowing, lateral joint space was normal, and the patellofemoral joint was normal. His hip to ankle alignment demonstrated that he had varus alignment, left greater than right. On the left side he had approximately a 20% weight bearing axis, meaning that the center weight bearing portion came down on the medial side of his medial compartment.

Magnetic resonance imaging demonstrated a grade 4, 17 x 25-mm oval, full-thickness defect to the medial femoral condyle with associate edema. He had grade 1 findings in the medial tibial plateau. The remainder of the knee was normal.









TREATMENT OVERVIEW / TREATMENT GOAL

The overall goal of the treatment was to restore the patient's function to a high level, to initiate early knee range motion, and to protect his cartilage repair as well as the osteotomy. The high tibial osteotomy and medial femoral condyle osteochondral allograft, when done together, provide additional cartilage protective effect. However, the post-operative bracing is important to reinforce this effect.

The patient initially started with the Rebound® Cartilage Brace as he had varus alignment in the setting of a symptomatic medial femoral condyle defect. This provided him significant relief and stated that his knee was approximately 70% better while wearing the brace, however he desired additional stability, as he was still able to feel crepitus inside of his knee.

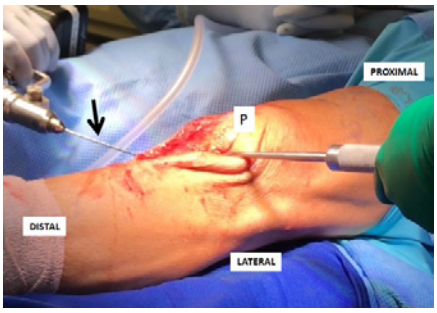
The goal of the surgical treatment was to restore alignment, as well as the cartilage, and this treatment was augmented by also adequately protecting the construct post-operatively. Given that the patient had an excellent response to Rebound Cartilage bracing pre-operatively, it was felt that a combination high tibial osteotomy, as well as fresh osteochondral allograft to the medial femoral condyle would be the most favorable treatment option for returning to a high level of activity.

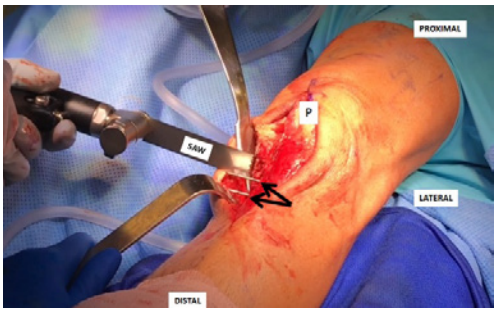
SURGICAL TREATMENT

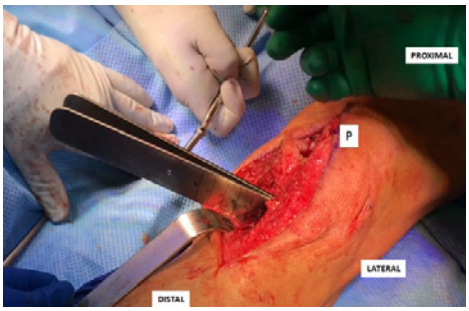
The surgical procedure consisted of a high tibial osteotomy, as well as a fresh osteochondral allograft to the medial femoral condyle. This was a oval defect and a workstation and oblong cutter were used to fashion the graft from an allograft donor condyle according to the dimensions of the recipient defect.

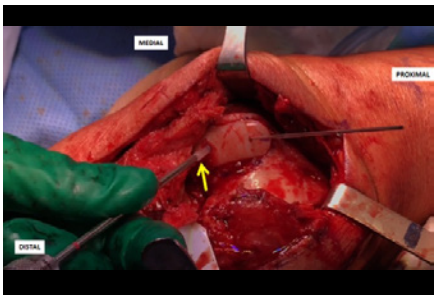
The high tibial osteotomy was completed with an 12.5-mm trapeziodal plate, which was placed in order to preserve the slope of the knee and overall kinematics. The high tibial osteotomy was bone grafted with a combination of osteoinductive donated bone putty, as well as allograft cancellous bone chips.

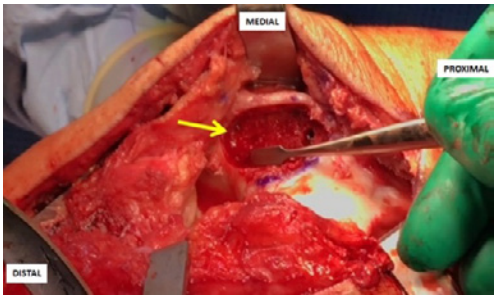
After the high tibial osteotomy, a medial femoral condyle fresh osteochondral allograft was performed using a 17 x 20 x 7-mm single oval graft utilizing a press-fit technique. Since a press fit technique was used, we wanted to make sure to protect this adequately post-operative. The patient was placed in a range of motion brace at the conclusion of the procedure.

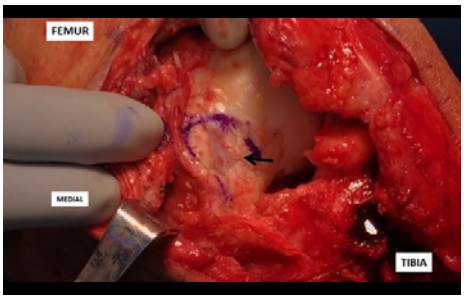












POST-SURGICAL REHABILITATION

The patient initiated physical therapy on postoperative day one. He started with early flexion, as well as continuous passive motion given his cartilage procedure. In order to protect his medial side, we reinstituted the use of his Rebound® Cartilage Brace and unloaded the medial side. With proper fit he was able to use this brace not only with the continuous passive motion machine, but also with touch-down weight bearing for the first 6 weeks. After 6 weeks, the patient still maintained Rebound Cartilage Brace use and increased to full motion, as he started strengthening and full weight bearing. After 12 weeks, the patient demonstrated continued incorporation of the allograft, as well as healing of the high tibial osteotomy. By 4 months the patient was released to full light jogging and light impact activities. The patient was instructed to wear the Rebound Cartilage Brace during all of his activities. At 5.5 months, he was released to full activities, again using the Rebound Cartilage Brace.

REASONS TO USE THE REBOUND® CARTILAGE BRACE

The use of the Rebound Cartilage brace after OCA/OATS and a high tibial osteotomy supports regeneration of the knee cartilage by maintaining joint unloading in flexion for protection of the cartilage during the healing process. It also unloads the affected knee compartment to facilitate osteotomy healing. In other words, the load on the affected knee compartment is mediated by distracting the involved compartment via external valgus force applied to the knee. Thus, tibiofemoral alignment and kinematics are improved, and load is shifted off the reconstructed compartment. Too much load may have a negative effect on the repair tissue development, which has been shown to impede healing after surgery. Cartilage, particularly, is the slowest tissue to repair and use of early post-operative application of the Rebound Cartilage Brace facilitates an early improvement of knee motion.

CLINICAL OUTCOME

Overall the patient had an excellent outcome. He had full restoration of knee motion. The patient had near resolution of his knee symptoms and rates his knee, on a scale of 0 to 100, a 95, a significant improvement from his baseline rating of 40. He was able to return to full activities at 5.5 months including, all farming/ranching, impact activities, club soccer, and downhill skiing.

CONCLUSION

Patients with symptomatic knee articular cartilage injuries can be restored back to high levels of activity with modern anatomic-based osteochondral graft reconstructions. It is important address the overall alignment, and given the patient's varus knee at 20% of overall alignment, the use of a high tibial osteotomy greatly facilitates the overall outcome. Finally, it is extremely important to protect the knee post-operatively and unload the knee further to allow for full cartilage, as well as high tibial osteotomy, integration. The Rebound Cartilage Brace is an ideal solution for this post-operative case.

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