Current Insights On Total Ankle Replacement With Concurrent Endoscopic Gastrocnemius Recession

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These authors discuss a total ankle replacement in a 63-year-old patient with unilateral post-traumatic ankle arthritis, reviewing keys to procedure selection and providing essential surgical pearls.

Two surgical treatments are available for post-traumatic ankle arthritis that has not responded to conservative care: ankle fusion and ankle replacement. While there are generalized indications and contraindications for each procedure, determining the proper procedure depends on the unique characteristics of each patient. Accordingly, we would like to discuss a case involving a total ankle replacement in a patient with unilateral post-traumatic ankle arthritis.

A local orthopedic surgeon referred a 63-year-old male patient to our clinic for chronic right ankle pain and possible ankle replacement. The patient had fallen from a roof in 1985 and underwent open reduction and internal fixation. For the past few years, the pain had become worse to the point that he could no longer perform his normal daily routine. For the past four months, the patient required crutches for ambulation. He had previously failed physical therapy, bracing and steroid injections. The patient denied tobacco or alcohol use.

The physical exam revealed a well-groomed male who appeared healthy. The vascular exam was significant for palpable pedal pulses, digital hair growth and normal capillary filling time to all digits. The neurological exam showed no deficits. The dermatological exam was unremarkable. The musculoskeletal exam was significant for decreased right ankle dorsiflexion to -19 degrees and pain with any ankle motion. Right subtalar joint motion was absent. Muscle strength was decreased to 4/5 in right ankle dorsiflexion.

Right ankle radiographs revealed decreased ankle joint space with ectopic bone formation and osteolysis throughout the anterior and medial ankle joint. Hardware visible on radiographs consisted of a single fully threaded screw in the medial malleolus and three pins in the talus, all from previous fixation.

In considering an ankle replacement, it is imperative to ascertain the structural integrity of the talus. If the talus structure is weakened, the patient is at a higher risk of subsidence of the talar component. One can evaluate the talus preoperatively with magnetic resonance imaging (MRI) or a computed tomography (CT) scan. In this case, due to the multiple pins and a screw in the area of concern, we ordered a CT scan, which showed that the talus was free of cystic degeneration and thus would support the talar component.

Key Factors To Consider With Procedure Selection

We considered multiple factors when deciding between ankle fusion and replacement. First, we prefer ankle replacement in any patient who is a viable candidate as motion allows a closer to normal gait and less arthritis in adjacent joints. Specifically, for this patient, radiographs showed subtalar joint arthritis. Clinical exams showed no subtalar joint range of motion. In cases of subtalar joint arthritis, an ankle joint replacement is preferable to preserve rearfoot motion. The patient had an aversion to ankle fusion due to opinions based on his own research. His occupation and lifestyle were also better suited to maintaining his ankle joint range of motion.

When performing an ankle arthroplasty, one can perform other procedures concurrently as well. While the patient had subtalar arthritis, his complete lack of range of motion made a subtalar joint fusion unnecessary. His lack of ankle joint dorsiflexion is an indication for concurrent gastrocnemius recession. The hardware in the medial malleolus and talus may require removal. In an attempt to maintain the strongest ankle joint construct, we decided to remove any talar pins we encountered but leave the medial malleolus screw in place. While the screw was composed of stainless steel and the implant is titanium, we are unaware of any cases of galvanic corrosion between a total ankle replacement and adjacent hardware.

A Closer Look At The Operative Course

We performed the procedure with the patient under general anesthesia with a thigh tourniquet. We placed an anterior incision between the tendons of tibialis anterior and extensor hallucis longus, from approximately 6 cm proximal to the ankle joint and extending to the talonavicular joint. Although we removed osteophytes in the anterior ankle joint, we left calcifications that we identified within the capsule in place to preserve capsular tissue. In the event of an incision dehiscence, the remaining capsule may be integral in preventing implant infection. Through a medial incision, we removed two retained talar pins prior to talar resection. Placing the implant alignment guide onto the anterior tibia, we used a saw to resect the tibial and talar bone.

The medial malleolar screw was then visible. Rather than removing the screw, potentially weakening the medial malleolus and predisposing the patient to a stress fracture, we filed the screw to allow implant placement. We determined the sizing of the implant components and inserted them.

Following implant insertion, we assessed the ankle range of motion. It was smooth but there was inadequate dorsiflexion. To increase dorsiflexion without weakening the Achilles tendon, we performed an endoscopic gastrocnemius recession. Performing this procedure endoscopically allows for visualization and protection of the sural nerve while minimizing wound and scar size. We then determined

ankle joint dorsiflexion to be adequate. Following tourniquet deflation, we confirmed appropriate positioning of the implant via fluoroscopy. We closed the anterior incision using 2-0 Vicryl subcutaneous sutures and running 4-0 Monocryl subcuticular sutures.

The patient wore Webril to prevent dressing abrasions and used a posterior splint. Following our standard protocol for pain control, the patient stayed in the hospital for two nights until he had pain control.

The postoperative course was uneventful with two weeks of non-weightbearing in a posterior splint followed by two weeks of non-weightbearing in a cast. At four weeks post-op, the patient transitioned into a controlled ankle motion (CAM) walker and initiated physical therapy. By the tenth week post-op, the patient was ambulating in an athletic shoe. He remains pain-free with 10 degrees of dorsiflexion 10 months following surgery.

In Conclusion

The decision between ankle fusion and ankle replacement is individual to each patient. Under the appropriate circumstances, ankle replacement can provide a satisfactory result while maintaining ankle joint range of motion.

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