

ARTHROSCOPIC ANKLE ARTHRODESIS

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Arthroscopy and its role in diagnostics and treatment of disorders of the ankle has been an increasingly utilized and studied field. Arthroscopic fusion of the ankle joint has been one of the uses which have been beneficial to both physicians and patients in the last twenty years. Although the indications for this procedure are narrow, the advantages over the open technique can have a significant effect on post-operative course. There are, of course, older and more studied techniques in performing and achieving arthrodesis of the ankle. However, the benefits of the arthroscopic technique are becoming more clear as further studies are being reported. Arthroscopic fusion is just another tool in the armamentarium of the podiatric surgeon dealing with severe degenerative joint disease of the ankle.

LITERATURE SEARCH

Arthroscopy was first described comprehensively by Drez, Guhl, and Gollehon in 1982. Heller and Vogler that same year were the first to describe it in the podiatric literature. The first to describe arthroscopic ankle arthrodesis was Schneider in 1983 who published as a case report in a video journal.

Jay in 2000, described a method using a hybrid unilateral external fixator as both a distractor and compressor of the ankle joint during the procedure. Also describes the use of a burr for resection of the cartilaginous surfaces and an oblique fibular osteotomy to prevent fracture during the compression phase.

Corso and Zimmer in 1995 performed a retrospective evaluation of 16 procedures between 1991 and 1993. They relate 100% radiographic fusion in all patients. Fourteen of sixteen reported complete relief of symptoms and return to daily activity. Average time to fusion was 9.5 weeks. Two patients had residual pain; one was a rheumatoid arthritic with general pain, the other had previous ORIF of an ankle fracture, pain was relieved with fixation removal.

In 1996, Glick et al. performed a prospective study of 35 procedures from 1983 to 1989. All procedures were done arthroscopically by 4 different surgeons. Average

follow up was 8 years. They report fusion rate of 97% with average time to fusion of 9 weeks. Eighty six percent had good or excellent functional results. No long term adverse sequelae were seen.

In 1999, O'Brien et al published a retrospective review of 36 patients; 19 with arthroscopic arthrodesis and 17 with traditional open technique. They found that the arthroscopic technique yielded comparable results to the open technique. However, the arthroscopic technique had significantly less morbidity, shorter operative times, shorter tourniquet times, less blood loss, and shorter hospital stays.

Crosby et al in 1996 published a prospective study of 42 arthroscopic ankle fusions utilizing bi-framed distraction and DBM slurry. They report an overall complication rate of 55% including minor and major complications. 85% of patients happy with final result. Most complications were minor and manageable. DBM slurry was not found to increase the fusion rate over the previously documented literature without bone graft.

In 2000, Cameron and Ullrich reported on 15 arthroscopic fusions retrospectively with a follow up range of 1-3 years. They report 100% fusion rate of the ankle with an average fusion time of 11.5 weeks. Five of the patients required further surgical treatment to correct complications ranging from infection, painful hardware, or subtalar arthritis.

In 1993, Harris et al. published a prospective study of nineteen patients selected because they had osteoarthritis with minimal or no deformity of the ankle. They reported ten radiographic fusions by the end of the second post-operative month, five by the end of the third, one by the end of the fifth and one by the end of the sixth. They also report two non-unions one of which was successfully treated with open technique arthrodesis. Results were one poor, two fair, four good, and twelve excellent by the Mazur scoring system.

Dent, Patil, and Fairclough in 1993 performed a study on 8 patients with arthrosis of the ankle with minimal deformity. Their results were classified as 100% pain free ankylosis in all patients (4 bony and 3 fibrous). They report a complication rate of zero with a 24-month

average follow up time. They also report removing the screws in 4 of eight but did not report patient complaint of painful fixation.

Myerson and Quill described and compared open and arthroscopic techniques in 1990. Arthroscopic procedures were performed in 17 patients and open technique in 16. Their results showed a mean arthrodesis time to be 8.7 weeks arthroscopically and 14.5 weeks in the open procedure. They suggest by these results that arthroscopy may be more appropriate for treating these patients.

INDICATIONS

All of the previous studies that included indications for the arthroscopic procedure, list the pertinent indications for the procedure. It is widely accepted to have many of the same indications as the open procedure; osteonecrosis, post-traumatic arthritis, osteoarthritis, rheumatoid arthritis, and inflammatory arthropathies. The procedure is very difficult to perform on patients that have significant varus or valgus deformities. Tasto reports that the open technique should be used with a varus or valgus deformity of more than 15 degrees. The other consideration is the amount of bone loss due to osteonecrosis, bony defect, or large cavitary lesions or cysts. Stroud reports that any of these lesions consisting of more than thirty percent of the area of the talus are best managed by the open approach. The soft tissue constraints of the arthroscopic technique, while they seem to decrease trauma and healing time, also limit the ability to correct for these deformities.

TECHNIQUE

The patient is placed on the operating table in the supine position. General anesthesia is used with paralysis for easy distraction of the joint. A thigh tourniquet is used on the operative extremity for hemostasis. A cloth ankle distractor is used after distention of the ankle joint with 10-60 cc of normal saline. Once the ankle is in position, a traditional anteromedial and anterolateral portal technique is used. Once the joint has been explored with

a 2.7mm arthroscope, a 4.0mm abrator is used to debride synovitic material. A large dermal or ring curette and small straight Lambotte osteotomes are then inserted and used to denude the cartilage from the tibial plafond and talar dome. Copious amounts of normal saline flush and egress systems are used to flush out denuded material. A burr is then utilized to finish the cartilage and subchondral bone resection. The joint is then flushed and explored with the arthroscope for complete resection of the joint.

Two 6.5 mm partially threaded cannulated screw guide pins are then percutaneously inserted. One is positioned medially and proximal to the medial malleolus aimed in a medial to lateral direction, the other is inserted posteriorly in the tibia aimed in a posteriolateral to anteromedial direction. The position of the pins are then confirmed in the joint with the arthroscope. The pins are then driven into the tibia and confirmed with fluoroscopy. Two 6.5mm cannulated screws are inserted over the guide pins and compressed with the ankle in optimal position of 90 degrees to the leg and in slight external rotation. Fluoroscopic confirmation of the screw length and position is noted. After closure of the four stab incisions, the patient is placed in a non-weightbearing Jones compression dressing with an eggshell cast.

Postoperatively, the patient is made non-weight-bearing in a cast or walker-boot until radiographic and clinical evidence of healing is achieved. The patient is then slowly acclimated into his normal daily activities as per the patient tolerance to these activities.

PURPOSE

Our goal is to retrospectively present our series of arthroscopic ankle fusions as performed according to the technique of the primary author. We will attempt to compare our results including healing time, return to activity, union rates, and overall post-operative course to the results obtained in the above literature search both in arthroscopic and open techniques. Also, to present the primary author's technique as an alternative that decreases operative and tourniquet time for the patient.

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