Arthroscopic Ankle Arthrodesis: An Update

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KEYWORDS

• Ankle • Arthrodesis • Arthroscopy • Fusion • Arthritis

KEY POINTS

- Arthroscopic ankle arthrodesis provides the foot and ankle surgeon with an alternative to traditional open techniques.
- Arthroscopic ankle arthrodesis has demonstrated faster rates of union, fewer complications, reduced postoperative pain, and shorter hospital stays.
- Adherence to sound surgical techniques, particularly with regard to joint preparation, is critical for success.
- Comorbidities such as increased body mass index, history of smoking, malalignment, and posttraumatic arthritis, should be considered carefully when contemplating arthroscopic ankle arthrodesis.
- Although total ankle replacement continues to grow in popularity, arthroscopic ankle arthrodesis remains a viable alternative for management of the end-stage arthritic ankle.

Ankle arthrodesis remains the gold standard for the treatment of end-stage ankle arthritis despite the increasing popularity and utilization of total ankle replacement.[1,2] High complication rates have been noted with total ankle replacement procedures at both intermediate and long-term follow-up.[3,4] Historically, open techniques have been used for ankle arthrodesis. There have been numerous approaches described including transfibular, anterior, medial, and miniarthrotomy.[5–19] Inherent disadvantages to these open techniques include postoperative pain, delayed union or nonunion, wound complications, shortening of the operative extremity, prolonged healing times, and prolonged hospital stays.[20–22]

Arthroscopic ankle arthrodesis provides the foot and ankle surgeon with an alternative to the traditional open techniques. Compared with open techniques, arthroscopic

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ankle arthrodesis has demonstrated faster union rates, fewer complications, reduced postoperative pain, and shorter hospital stays.[5,22–31] Although once considered technically demanding, advancements in techniques and instrumentation have shortened the learning curve once encountered with the arthroscopic technique.

Schneider[32] first reported arthroscopic ankle arthrodesis in 1983 and reported faster time to union, earlier mobilization, and reduced patient morbidity. More recent studies have demonstrated similar results with faster union rates, fewer complications, and shorter hospital stays with union rates comparable to more recent open techniques.[5,23–25,31] This article explores the indications, techniques, and complications associated with arthroscopic ankle arthrodesis.

INDICATIONS AND CONTRAINDICATIONS

Arthroscopic ankle arthrodesis may be indicated in patients with end-stage arthritis owing to a variety of etiologies, including rheumatoid arthritis, posttraumatic arthritis, arthrogryphosis, septic arthritis, inflammatory arthritis, avascular necrosis of the talus, idiopathic osteoarthritis, and chronic ankle instability. The most frequently encountered etiology remains posttraumatic arthritis, however.[23]

The primary indication for ankle arthrodesis is persistent pain that has not responded to conservative treatments including analgesics, nonsteroidal antiinflammatory drugs, corticosteroid injections, and orthoses or bracing.[5,24,30] Although not currently approved by the US Food and Drug Administration for the ankle joint, hyaluronase injections may also be considered before proceeding with arthrodesis or replacement.

Limitations of arthroscopic ankle arthrodesis are typically related to deformity or malalignment about the ankle joint. Various studies have indicated that malalignment greater than 10° to 15° will make reduction of the ankle joint and deformity difficult.[25,33] Ferkel and Hewitt[29] indicated that patients with significant ankle deformity, either significant varus or valgus, are better suited for an open technique and those that require arthrodesis in situ are better suited for the arthroscopic technique. Tang and colleagues[34] stated that arthroscopy should not be advised when a large ankle deformity is present. A study done in 2007 by Gougoulias and colleagues[28] showed that patients with marked deformity of greater than 10° to 15° of varus or valgus can be treated effectively using arthroscopy, depending on surgeon experience.

In addition to significant malalignment, Collman and colleagues[24] noted that contraindications of arthroscopic ankle arthrodesis include excessive bone loss, neuropathic joints, active infections, and poor bone stock. Avascular necrosis of the talus may also be a contraindication.

SURGICAL TECHNIQUE

Arthroscopic ankle arthrodesis is performed under general or spinal anesthesia. A thigh tourniquet is typically used for hemostasis and the leg is prepped to the tibial tuberosity. A bump under the ipsilateral hip is used to slightly internally rotate the leg.

Standard anteromedial and anterolateral portals are used. A 2.7-mm, 30° arthroscope is introduced into the ankle joint. The authors prefer to use large joint power shavers and burrs while using a 2.7-mm arthroscope rather than the 4.0 mm arthroscope. Arthroscopic instrumentation such as picks, osteotomes, and awls may also be helpful in tight areas. This allows access into the tibiotalar space to view the posterior half of the talar dome. A noninvasive ankle distractor is applied to the ankle to allow for complete visualization from anterior to posterior, as well as both the medial and lateral gutters (**Fig. 1**).