Arthroscopic Ankle Arthrodesis Minimal Invasive Arthrodesis

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Abstract

Ankle arthrodesis is used to treat patients with joint destructive processes that are not responsive to nonoperative measures. The procedure has traditionally been performed using open techniques. Recently, arthroscopic techniques have been applied to successfully fuse the ankle joint. This paper describes the indications for the procedure, the operative technique, and post operative care. Arthroscopic ankle arthrodesis is a minimally invasive procedure that reliably results in high rate of fusion with a low incidence of complications.

Keywords: arthrodesis; ankle; arthroscopic techniques

1. Introduction

An Ankle Arthrodesis (fusion) is a special orthopaedic procedure used to treat a painful ankle disorder or injury that fails to respond to physiotherapy, medication or other non-surgical treatment. Typically, this procedure is viewed as a 'last resort' to relieve pain and preserve some mobility in a longstanding problematic ankle joint.

Why is an Ankle Arthrodesis performed?

An Ankle Arthrodesis is a traditional surgical technique used to relieve persistent ankle pain, swelling, clicking, catching or instability of a joint. The most common reason of this operation is performed is to relieve the chronic symptoms of arthritic pain, particularly in the elderly.

Why Arthroscopic?

- The **advantages** of an arthroscopic arthrodesis:

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- Reduced morbidity
- Shorter hospital stay
- Faster fusion rate
- Better cosmetic
- And lower complication rates.

❖ ***Contra indication:***

- A previously failed arthrodesis
- The presence of infection,
- And a Charcot joint.

Figure 1. Percaenius arthrodesis picture

2. Procedure

Mann showed that the best fusion position is with the ankle in neutral, avoiding >15 degrees plantar-flexion and with the os-calcis in 5 degrees valgus [1,5,6]. Also the 'Mann' position results in the best gait. You do, however, lose 70% of the total motion arc with an ankle fusion, and tarsal hypermobility is increased 85% [14].

The arthroscopic technique is to have the standard arthroscopic set up with either invasive or non-invasive distraction. Remove all articular cartilage initially from the talar dome and plafond, then the gutters to expose bleeding underlying bone and finally the anterior osteophytes needs removal as this would otherwise resist talar reduction. Then the fusion is secured with parallel cannulated screws. Screw positioning is arthroscopically assisted and the length of the screws can be image intensifier assisted.

Patients then spend 3 weeks non weight bearing followed by 4-6 weeks partial weight bearing. The screws can be removed later if they are causing pain. A range of 3-12 months has been reported for standard open fusion to occur (118-120), this compares unfavorably with the arthroscopic technique.

3. Case Presentation

History:

52 y. Female patient

1998 was involved in RTA, resulted contusion to the right ankle, pelvic fracture treated conservatively. She develops bed sore.

Several years she develops secondary osteoarthritis right ankle

No more responds to medical treatment.

Joint pain persists after receiving local steroid injections several times.

Figure 2. Clinical preoperative picture

On examination:

Very restricted tibio-talar joint movement,

Good movement in tarso-metatarsal joint.

Operative procedure:

Minimal invasive: 2 portals for arthroscopy done on each side in front of ankle joint.

3 snap incisions for canulated screws

Internal fixation with 3 cross canulated screws

Assisted with image intensifier

Figure 3. x- ray of ankle arthrodesis Ankle arthrodesis picture

Follow up:

Below Knee cast applied for 6 weeks, just to help in protecting the fixation because the patient is not cooperative and does not follow the medical instructions carefully.

Partial starts weight bearing after cast removal.

Screws removed after 5 months.

Protect below knee cast applied for 2 weeks.

After removal of cast the patient is walking without pain.

Physiotherapy is starting, to train the patient about walking.

4. Discussion

In order to perform an arthroscopic ankle arthrodesis, the surgeon must be an experienced ankle arthroscopist with the ability to change technique to an open fusion if necessary. The potential advantages of the arthroscopic technique have been well described [1,2]. Initially arthroscopic ankle arthrodesis was felt to be an *in situ* fusion and no, or only minimal deformity could be corrected. With greater experience, increasing deformities

have been attempted and currently an upper limit of 10° to 15° deformity is accepted [1,5,6].

Most reports of arthroscopic ankle arthrodesis have recommended preparation of both tibial and fibular articular surfaces and the use of two crossed transmalleolar screws [1,8,9,13]. There is a decreased time to union. This is probably because periosteal stripping was not necessary and therefore the local circulation is intact [1,7,12].
It has been suggested that compensatory increase in movement of the surrounding joints of the foot occurs after ankle fusion [14].

The results of total ankle replacement continue to improve but still suggest that survivorship falls below that of hip or knee replacement. With the high incidence of soft-tissue problems and the young age of onset of post-traumatic arthritis, arthrodesis will remain the treatment of choice in many cases [2,3,9,10].

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