Conservative and Non-Endoprosthetic Surgical Treatment Options for the Arthritic Ankle
3.1 Conservative Treatment

Conservative treatment options for the arthritic ankle consist of the following modalities: shoe adaptations like a rocker sole or a surgical shoe, ankle-foot orthoses, analgesic medication, physical therapy, walking aids, and intra-articular injections with corticosteroids or hyaluronic acid. Few reports exist on the efficacy of such treatment options in patients with ankle or hindfoot disease. Thompson et al. showed that foot orthoses were more effective than nonsteroidal anti-inflammatory drugs in the treatment of symptoms due to osteoarthritis of the ankle or foot. Huang et al. investigated the effect of different custom-made orthoses (an ankle-foot orthosis, a rigid and an articulated hindfoot orthosis) on the restriction of ankle-hindfoot motion in 13 patients with ankle osteoarthritis. They found that the rigid hindfoot orthosis allowed more forefoot motion and was as efficient as an ankle-hindfoot orthosis in restricting motion at the ankle-hindfoot complex. Woodburn et al., in a randomized trial, studied the effectiveness of early foot orthosis intervention for painful correctable valgus deformity of the hindfoot in rheumatoid arthritis. They found that foot orthoses used continuously resulted in a reduction in foot pain, foot disability and functional limitation. March et al., in a n-of-1 study comparing the efficacy of nonsteroidal anti-inflammatory drugs and paracetamol for the treatment of osteoarthritis, found that many patients may achieve adequate control with paracetamol alone. Intra-articular injection therapy with hyaluronic acid has been shown to be of value for the treatment of ankle arthritis in a double-blind randomized controlled trial.

3.2 Non-Endoprosthetic Surgical Procedures

Besides TAA, the following surgical treatment options are available: ankle joint distraction, debridement, realignment osteotomy and ankle arthrodesis.

Results with ankle joint distraction with use of an external fixator were first described in 1995 by van Valburg et al. Good results have been described in a prospective study in the majority of a population with end-stage ankle arthritis, and improvement appeared to continue over time. Currently however, few centers have applied this technique, and so it remains unclear whether distraction can safely be used on a wide scale for ankle arthritis.

Arthroscopic removal of osteophytes in the anterior compartment is usually successful if the osteoarthritic changes are localized, but less successful if generalized osteoarthritis is present.

Supramalleolar osteotomy, either as an isolated distal tibia procedure or as a procedure for both distal tibia and fibula for the treatment of pathologic entities of
Conservative and non-endoprosthetic surgical treatment options for the arthritic ankle

the adult distal tibia and foot and ankle is technically demanding and requires an extensive and careful preoperative planning. For varus deformities, a medial opening wedge osteotomy has the advantages of an easy-to-make bone cut and of no resultant leg-length discrepancy, but the potential disadvantages of graft morbidity, failure of graft incorporation, delayed healing of the osteotomy, necessity for greater fixation strength, and potentially increase in the medial joint load by tensioning of the medial extrinsic tendons. Lateral closing wedge osteotomies have the advantages of easy fixation, no graft requirement, a reliable and rapid healing, and no possibility of medial joint load increase. For instability arthritis combined with a pre-existing cavovarus foot, lateral ligament reconstruction and valgus calcaneal osteotomy (Dwyer type) has been recommended.

3.3 Ankle Arthrodesis

Ankle arthrodesis can be considered if the ankle joint shows severe cartilage loss and the patient experiences difficulties in performing normal activities of daily life. Many surgeons still consider fusion as the treatment of choice for the severely affected ankle joint. The optimum position for ankle fusion is considered to be: neutral in the sagittal plane, slight valgus (5 degrees) and slight external rotation of the hindfoot (5 to 10 degrees), and some retroposition of the talus with respect to the tibia. However, ankle arthrodesis is not an easy surgical procedure and therefore has not a predictably good result. In a recent systematic review of the literature on the intermediate to long-term outcome after ankle fusion (mean follow-up time 5.3 years, range 1.9-23) and total ankle arthroplasty (mean follow-up time 4.7 years, range 2.3-9), Haddad et al. reported a ten per cent nonunion rate (39 studies dealing with ankle fusion with a total of 1262 patients included; almost all studies were retrospective in nature). Revision of the arthrodesis was done in nine per cent, mainly for non-union or infection. Furthermore, five per cent of the patients eventually underwent a below-knee amputation. Reasons for the amputations were not specified in this meta-analysis. Posttraumatic arthritis was the primary indication for arthrodesis in 57 per cent. Mean AOFAS ankle score at follow-up was 75.6 (95% confidence interval 71.9 to 84.5) and according to patient assessment 74.1 per cent experienced an excellent or good result. Comparing these results with the pooled data from 10 studies on TAA, they concluded that the intermediate outcome of total ankle arthroplasty appears to be similar to that of ankle arthrodesis and that comparative studies are needed.

The following early complications are not infrequent after ankle fusion: infection, nonunion and malunion. An important late finding is the high radiographic incidence of hindfoot arthritis. Fortunately, hindfoot arthritis is not always clini-
cally symptomatic. When hindfoot symptoms build up after ankle fusion they can be
difficult to treat. Especially in the younger and more active patient a pantalar fusion
will then become necessary.

In summary, conservative treatment of the arthritic ankle by an ankle-foot
orthosis or corrective shoe wear can give acceptable results. If unsuccessful, for
patients with moderate disease and with symptoms from osseous impingement, an
arthroscopic debridement is probably the best treatment. In the event of deformity
in the frontal plane a corrective osteotomy should be considered. For the ankle with
end-stage arthritis two surgical treatment options are available: ankle arthrodesis
and total ankle arthroplasty. As both treatments have a somewhat similar outcome,
patient characteristics and their preferences should play an important role in deci-
sion making.

References

1. Thompson JA, Jennings MB, Hodge W. Orthotic therapy in the management of osteoar-
foot orthoses on ankle and foot kinematics in patient with ankle osteoarthritis. Arch Phys
3. Woodburn J, Barker S, Helliwell PS. A randomized controlled trial of foot orthoses in rheu-
4. March L, Irwig L, Schwarz J, Simpson J, Chock C, Brooks P. n of 1 trials comparing a non-
5. Salk RS, Chang TJ, D'Costa WF, Soomekh DJ, Grogan KA. Sodium hyaluronate in the
77:720–725.
7. Marijnissen AC, van Roermund PM, van Melkebeek FJ, et al. Clinical benefit of joint dis-
traction in the treatment of severe osteoarthritis of the ankle: proof of concept in an open
prospective study and in a randomized controlled study. Arthritis Rheum 2002;46:2893–
902.
9. Tol JL, Verheyen CPPM, van Dijk CN. Arthroscopic treatment of anterior impingement in
the ankle. A prospective study with a five- to eight-year follow-up. J Bone Joint Surg Br


