

Editorial

Is total replacement of the ankle an option?

There is increasing interest in total ankle replacement (TAR) as an alternative to arthrodesis in the treatment of end-stage ankle arthritis. Despite a lack of long-term data on the clinical outcomes associated with ankle implants, the use of TAR is expanding.

For decades, the painful ankle has been successfully treated with arthrodesis. The method is well documented in a number of reports, many of them just reporting the rate of radiographic and/or clinical healing, but some of these reports have also assessed the functional outcome. The surgical technique varies, from percutaneous in ankles with symmetrical bone loss (Lauge-Pedersen et al. 1998) to open with screw fixation (high rate of healing in non-rheumatic ankles) (Andersson et al. 2005a). External fixation still has some advocates, but retrograde intramedullary nailing seems to be one of the safest options (Andersson et al. 2005b). Radiographic osseous healing is not always achieved—but the more hardware that is used, the more probable it is that the patient will be relieved from pain in spite of that. Should symptomatic nonunion occur, it may be treated successfully by primary or repeated retrograde nailing. This implies sacrifice of the talocalcaneal joint, which is already arthritic in many patients and perhaps also a source of pain.

The advantage of ankle arthrodesis is that correction of deformity and relief of pain commonly result in improved walking ability, even in the presence of some arthritic joints in the hind- or midfoot. Pre-existing arthritic or degenerative lesions in the hind- and midfoot will, however, inevitably deteriorate after ankle fusion—and there is a definite risk of secondary osteoarthritis in the midfoot in the long run. The change in loading of the midfoot after tibiotalar fusion (in an experimental setting) is described by Suckel et al. (2007) in this issue

of *Acta Orthopaedica*. Arthrodesis of the subtalar joints in this situation results in a mechanically difficult situation. Another problem is the increased stress put on an ipsilateral disabled or replaced knee and/or hip caused by an immobile ankle joint. Correct positioning of the joint is important and—technically—sometimes difficult to obtain.

A unilaterally fused ankle in a patient with normal mid- and forefoot results in minimal loss of function. Bilateral ankle fusions, however, leave the patient with considerable walking difficulties and bad balance due to the need of rigid soles. It is also very difficult to rise from a chair with bilaterally fused ankles.

When there is a need for bilateral procedures, or the patient has severe loss of mobility or severe pain on weight bearing from the mid- and/or forefoot also, prosthetic replacement would theoretically offer a better solution. Another important argument for ankle replacement in the severely disabled rheumatoid patient is the much less demanding postoperative treatment, and the older the patient the more demanding is walking with a stiff ankle. The disadvantages of TAR are the risk of infection and prosthetic wear and loosening. The rates of infection do not, however, appear to be higher for replacements than for fusions.

There is an increasing demand for TAR from patients with disabling ankle pain, and the number of operations is steadily increasing (Fevang et al. 2007).

When there are complications, conversion to arthrodesis by intramedullary nailing seems to be a safe solution (Andersson et al. 2005c) and even exchange replacement is an option in the patient with a reasonably good bone stock.

More than 30 designs of prosthetic ankle joints have been introduced since 1970. Complication rates for the first-generation, mostly “ball and

socket” shaped ankles, were unacceptably high. The second-generation two-component, polyethylene-on-metal prostheses were better, and the results from the third-generation meniscal-bearing implants now suggest that TAR provides an acceptable benefit-risk ratio.

In this issue of *Acta Orthopaedica* there are 3 reports on short- to mid-term results of TAR. The paper by Hosman et al. (2007) is based on information from the New Zealand National Joint Registry. Review of data for 202 ankles (only 24 with RA) with 4 different implants took place on average 2 years after the primary procedure. The authors found an overall failure rate of 7%.

Fevang et al. (2007) report on 32 cemented and 212 cementless TARs from the Norwegian Joint Registry. The mean observation time was 3.6 years. Half of the patients had RA. The overall 5-year and 10-year survival was 89% and 76%. Age, sex, type of prosthesis, diagnosis, or year of operation had no significant influence on the risk of revision.

The third report is from the Swedish Ankle Joint Registry, on 531 three-component TARs (Henricson et al. 2007). 216 patients had inflammatory joint disease. The overall survival rate at 5 years was 0.78. Interestingly, a separate analysis showed the survival rate to be significantly higher once the first 30 cases had been performed by the 3 most experienced surgeons, which indicates a fairly long learning curve.

From these reports, it can be concluded that the results of TAR are still inferior to those of THR and TKR, and improvements in prosthetic design and surgical technique and careful indications all seem to be important. Due to the long learning curve, the procedure should only be performed in centers with experienced surgeons and where a reasonable number of procedures are performed annually.

Analysis of data from national registries gives the opportunity to collect a large number of patients, including the results of the average surgeon and disclosing changes in indications and choice of implants. Interestingly, there were considerable differences in diagnoses between the reports. In the Scandinavian countries, about half of the patients had inflammatory joint disease—compared to only one-tenth of the patients in New Zealand, where

the absolute majority of the patients had secondary osteoarthritis. The results in terms of prosthetic survival are, however, similar in both groups and it may be that the limited amount of stress put on the implant by patients with polyarticular disease compensates for the inferior bone quality of these patients.

TAR is now an established surgical procedure, and with more experience the long-term results will probably improve; but it should be remembered that TAR differs from THR and TKR in terms of indications, surgical difficulty, and prosthetic survival.

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