Summary and Conclusions

Ankle arthritis is generally seen as a sequela of one of the following conditions: trauma, osteoarthritis, and rheumatoid arthritis. Since the turn of the 20th century, ankle arthrodesis has been considered the definitive treatment for this disorder when all other treatment modalities failed. . Total ankle arthroplasty has been utilized in the past to overcome the limitations of ankle fusion, but early implant designs resulted in high rates of failure.Explorations into joint replacement surgery for end-stage disease began in the 1970s, with most early prostheses meeting failure from subsidence, wear, and loosening within a few years following implantation. Rates of loosening with these cemented designs ranged from 25% to 75% within 3 years. Poor results lead most surgeons to abandon implant arthroplasty and return to ankle arthrodesis as their treatment of choice for the severely arthritic ankle.

Recently, several new implant designs have been introduced, and studies have demonstrated promising short and medium-term results with the use of those devices. On the basis of these reports, there has been a renewed interest in total ankle arthroplasty as an alternative to ankle fusion.

There are two separate design rationales as second-generation prostheses. One such design incorporates a

fusion of the syndesmosis to share the load between the distal tibia and fibula. The second design principle is a three-component, mobile-bearing implant. Both have shown survivorship rates of 93%, rejuvenating interest in this treatment modality.

There is no defined age where total ankle arthroplasty is considered appropriate for an individual, though most surgeons use the age of 50 years as a benchmark for implantation. However, there are many circumstances (ie, severe rheumatoid disease) where ankle arthroplasty may be appropriate in a younger patient, though it is incumbent upon the surgeon to educate the individual about potential future surgeries. Accepted contraindications for this procedure are active infection, avascular necrosis of the talus or tibia (affecting bone ingrowth), and a Charcot neuropathic ankle joint.

Every patient preoperatively should be studied with a noninvasive arterial Doppler test to ensure the blood flow is adequate to the ankle. In addition, the incision is approximated with a running monofilament suture to evenly distribute suture tension and avoid concentration of tension at the knots of an interrupted suture.

Rehabilitation following total ankle arthroplasty is tempered by wound healing. One of the more frequent complications with either prosthesis is marginal or full-thickness necrosis of the surgical incisions. The tenuous

nature of the blood supply to the anterior ankle coupled with the lack of adipose and subcutaneous tissue surrounding the deep structures creates a potential for wound complication.

Most often, a compromised surgical incision can be treated by moist dressing changes and local wound care. Occasionally, however, free muscle transfer is required. Thus, this author delays aggressive controlled range of motion of the prosthetic ankle for two to two-and-a-half weeks following the procedure (motion is begun only when the wound is considered free of necrosis). The ankle is rigidly splinted until that time, and the extremity is kept elevated to decrease swelling and lessen the tension on the suture line.

Avariety of reoperations were performed after primary total ankle arthroplasty, in slightly more than one-fourth of the patients. The types of procedures that were performed were dictated by the indications. The most common procedure was joint debridement for osseous impingement; the next most common procedures were extra-articular procedures for axial malalignment and component replacements (usually involving the talar component). These three types of procedures accounted for 77% of the total procedures performed and were roughly fourfold more common than all reoperations for syndesmotic nonunions, infection, talar fractures, and

wound-healing problems combined. In contrast with the high rate of wound-healing complications requiring operative intervention that is associated with first-generation devices, only one wound-healing problem that required surgical treatment was incurred in our patient population.

Component failure involving migration or subsidence nearly always involved the talar component. Osseous over-growth often was associated with a loose talar component and was discovered at the time of gutter debridement or, occasionally, at a later date. The component often was found to have subtle signs of loosening rather than gross loosening. In these cases, the component was not well bonded to the talus, allowing a thin elevator to be inserted in the interface and the component to be detached without difficulty. This sort of loosening was not recognized in many of the early debridements but was noted later in some patients who underwent multiple debridements. It may have been missed initially, or it may not have developed until a later date. If it was missed and the osseous overgrowth was a consequence of a loose talar component, then perhaps an early exchange of the component would have avoided further débridements for overgrowth. Few problems were encountered with the tibial component.