Ankle arthritis is a severe and debilitating problem with notable increasing prevalence in the United States. Approximately 50,000 new cases are reported each year\(^1\). A recent study showed ankle arthritis to be as debilitating as hip arthritis for patients\(^2\). These patients search for pain relief through initial conservative measures such as bracing and steroid injections, but ultimately, may require surgery to address the arthritis. Due to the volatile past history and limited success of the total ankle replacement, patients most commonly are offered ankle fusion\(^3\). However, with the further advancements in implant materials and machining combined with a more complete understanding of the ankle motion, the total ankle replacement has become a viable treatment option for certain patients struggling with ankle arthritis.

The decision for operative treatment of ankle arthritis requires a thorough assessment of the patients’ preoperative function and postoperative expectations. Both ankle arthroplasty and ankle fusion have risks and benefits that must be discussed clearly with the patient. Ankle arthrodesis is currently the most accepted treatment for end-stage ankle arthritis\(^1, 4, 5\). This salvage procedure eliminates the painful motion of the ankle. Ankle arthrodesis is predictable procedure that can endure the increased activity levels of the younger patient or heavy laborer. However, due to the immobility of the ankle joint following arthrodesis, the surrounding joints compensate and are exposed to increased stress\(^6\). Approximately 50% of patients will have x-ray evidence of arthritis in the joints surrounding the fusion by seven years. There are unfortunately very few surgical options available to address symptomatic adjacent joint arthritis aside from extending the fusion and creating a stiffer platform.

The use of total ankle arthroplasty in the treatment of end-stage ankle arthritis is continually evolving. The advancements in implant design as well as outcomes of long-term studies continue to tailor criteria for patient selection\(^7\). This is one of the most critical components of the total ankle replacement procedure. Generally accepted criteria include a patient with primary, post-traumatic, or inflammatory ankle arthritis and lower activity demands. These patients must have adequate alignment and stability of the ankle. This is important to note as the majority of ankle arthritis is post-traumatic and may be accompanied by deformity, ligament instability, or infection as a result.
of the initial injury\(^{(1)}\). Depending on the magnitude of deformity or ligament instability, often these issues can be addressed prior or concurrently with the total ankle replacement. Unfortunately, not all patients are good candidates for total ankle replacement. Aside from medical comorbidities that restrict major surgery, several additional clinical findings can increase the risk of failure or poor patient satisfaction. Isolated findings or those often associated with trauma, such as poor vascular status, inadequate bone or skin coverage, or previous infection, may eliminate eligibility for a total ankle replacement\(^{(1)}\). In addition, obesity may preclude patients from undergoing this procedure. Patient selection is paramount with total ankle arthroplasty, but the criteria fluctuate as outcomes are analyzed and the indications are expanded.

Early outcomes of the total ankle replacement reported failures as high as 72%\(^{(7)}\). This led to the reengineering and essentially reintroduction of the total ankle arthroplasty for treatment of ankle arthritis. It is difficult to compare the literature due to the variety of implant design and outcome focus. A recent systematic review yielded a reported 78% survival rate of the implant at five years while another yielded a 10% 5-year failure rate of the total ankle arthroplasty\(^{(4, 7, 8)}\). Subjective patient outcomes vary based on study design, but overall review showed a global consistent improvement of patient functional ankle scores\(^{(7)}\).

Total ankle arthroplasty is not without complications. Patients have can complaints of residual pain and are at higher risk for a major revision surgery within five years as compared to ankle arthrodesis\(^{(5)}\). The revision surgery is often a result of subsidence, loosening, or infection\(^{(3, 5, 8)}\). In addition, patients must be counseled to not expect a reliable gain in ankle motion but rather maintenance of current arc of motion with reduced discomfort and reduced stress to the joints surrounding the ankle\(^{(7)}\). The total ankle replacement as been shown to decrease the need for fusion due to symptomatic adjacent joint arthritis\(^{(5)}\). With the advancements of total ankle arthroplasty, the reported complications and early failures have decreased and patient satisfaction improved\(^{(3)}\).

In conclusion, total ankle arthroplasty is a viable option for treatment of end-stage ankle arthritis. Further studies are critical to guide the optimal indications for this procedure. However, in the appropriately selected patient, total ankle arthroplasty can maintain motion through the ankle, improve functional and subjective patient outcomes, and reduce the risk of adjacent joint arthritis. As with all surgical procedures and specifically joint replacements, there must be a thorough discussion focusing on the risks and benefits of this procedure as well as the current uncertainty regarding implant longevity and long-term outcome.

REFERENCES: