Complex Total Ankle Arthroplasty with the use of Patient Specific Instrumentation for the treatment of Ankle Osteoarthritis

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Ankle osteoarthritis is a degenerative disease of the tibiotalar joint, that is most commonly post-traumatic in nature. Nonanatomic fracture healing alters the joint contact forces in the ankle, changing the load bearing mechanics which may result in a varus or valgus deformity. Historically, ankle arthrodesis has been the gold standard treatment option for end stage ankle arthritis due to the poor outcomes associated with 1st and 2nd generation total ankle arthroplasty (TAA) implants. However, newer generation implants rectified the litany of issues associated with early implants, and have reported over 90% survivorship at 10-15 year follow-up in prospective studies. Proper implant positioning and alignment are crucial for achieving satisfactory results following TAA. Patient specific instrumentation (PSI) provides custom-made cutting guides that are tailored with respect to each patient's anatomy based on preoperative CT scans, in an effort to optimise implant positioning Early results have demonstrated satisfactory levels of postoperative alignment together with accurate prediction of tibial and talar component sizing.

Purpose:

This video overview and case presentation demonstrates a complex TAA with the use of PSI for the treatment of ankle osteoarthritis with a cavovarus foot malalignment.

Methods:

The anatomy, examination, diagnosis, and treatment options for ankle osteoarthritis are reviewed. A case of a 57-year-old male with end stage ankle osteoarthritis with a cavovarus hindfoot malalignment is presented. This injury occurred while playing handball and prevented him from continued play. After failure of non-operative treatment and a thorough discussion of risks, benefits and prognosis, the patient elected to proceed with a complex TAA with the use of PSI to improve his functional status.

Results:

The prosthesis was successfully implanted into the ankle and the hindfoot malalignment was corrected via calcaneal osteotomy, 1st metatarsal osteotomy and lateral ankle ligament complex construction. Post-operative clinical outcome showed good restoration of range of motion and stability.

Conclusion:

Complex TAA with PSI is viable for ankle osteoarthritis with cavovarus foot. Proper patient selection and strict post-op rehab are essential for optimal outcomes.