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STAR total ankle

Case study: STAR total ankle replacement in the younger patient

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Introduction:

It is clear that the best indication for a total joint replacement is in an elderly individual with end-stage arthritis who will respond well to the replacement and be unlikely by survival analysis and life expectancy ever to need another procedure. The use of prosthetic joint replacements in younger individuals is primarily reserved for those patients with early-onset inflammatory arthritis, e.g. juvenile-onset rheumatoid arthritis where multiple joints are affected, creating severe debilitation at a young age.[4] However, there are certain circumstances where an educated individual of younger age may elect to choose a total ankle replacement rather than an ankle fusion in spite of the risks inherent in such a choice. This raises several philosophical questions that will be entertained following this case presentation.

Case presentation:

A 41-year-old female chiropractor presented with persistent and progressive left ankle pain that had become very severe over the prior year and a half. She had a history of a left tibial pilon fracture caused by falling down stairs 13 years prior to her office visit. At the time, she was treated with open reduction and internal fixation and later, hardware removal. She reported that the ankle was never pain-free following the initial injury.

She experienced constant, sharp pain that worsened with activity and mild pain relief with rest and anti-inflammatory medication. She also reported catching, grinding, and limited ankle motion. On a scale of 0-10, she rated her pain as level 6 at rest and level "10+" at its worst. She was taking anti-inflammatory medication daily, restricted her activity significantly, and had tried physical therapy, acupuncture, ice, and surgical debridement without substantial relief. There was no history of other medical problems or surgical interventions.

She had an antalgic gait with painful left ankle motion (10 degrees dorsiflexion, 35 degrees plantar flexion). Her subtalar and midfoot motion were painless and normal. The ankle was diffusely tender to palpation and had moderate swelling. She had a normal neurovascular examination other than slight numbness in her left great toe and no clinical signs or history of infection or wound healing problems.

Patient discussion and informed consent:

A lengthy discussion was held with the patient and her husband regarding her ankle problem and the various treatment op-

Figure 1: Radiographs

Standing lateral, AP, and oblique radiographs of the left ankle. The x-rays demonstrate marked post-traumatic arthritis of her ankle with joint space narrowing and osteophyte formation, but normal overall alignment. A malunion of a previous fibula fracture is also noted, and the subtalar and transverse tarsal joints show no arthritic change.

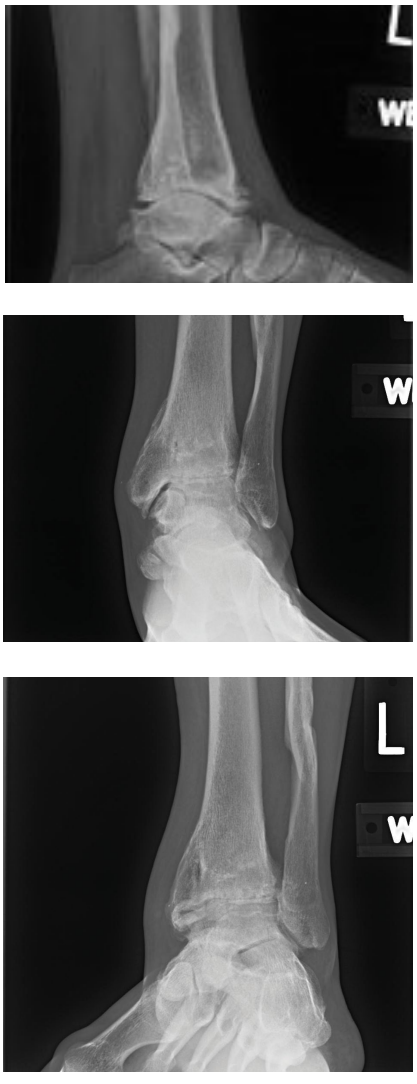
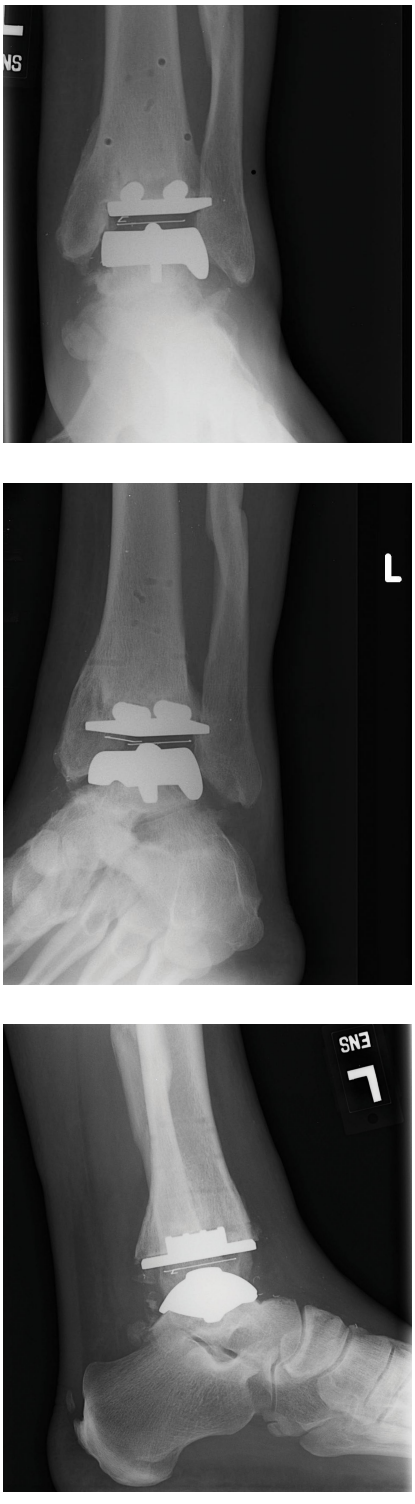


Figure 2

Standing AP, oblique, and lateral views of the left ankle following STAR ankle replacement.



tions. This included conservative management with bracing and anti-inflammatory medications, and the surgical options of ankle arthrodesis, distraction arthroplasty, or total ankle arthroplasty. She had already determined that non-operative management of her ankle arthritis had failed and wanted to pursue surgery. Based on her personal review of the literature and her training as a chiropractor, the patient believed the possibility of adjacent joint degeneration following ankle arthrodesis to be unacceptable and felt that her gait pattern would be better with an arthroplasty. She was well-aware of the restrictions imposed by a total ankle replacement and the probability of a revision or fusion in her future.

Given her young age, she was counseled that her risk of revision surgery was likely higher than it would be in an older patient, although some data suggest the revision rate may be similar in patients younger than 50 years at mean five-year follow-up.[1] The patient was given ankle replacement literature and a copy of the STAR clinical trial paper to review as aids in her decision-making process. She was carefully informed that her activity would be restricted to prohibit running, jumping, and any other high impact activities in order to maximize the life of the prosthesis. No decision was made at this initial clinical examination in order to give the patient adequate time to digest all the information and to consider her options along with their respective advantages and disadvantages.

Surgical technique and follow-up:

The patient ultimately made the decision to proceed with the STAR total ankle replacement. The surgery proceeded in a standard fashion with intraoperative confirmation of significant arthritic changes. She was treated with a small talar implant, a large tibial implant, and a 6mm mobile bearing.[5] Her post-operative course was uneventful.

At 3.5 months following the surgery, she reported continued improvement in her pain and better function than she had preoperatively. She is now 2 years following her surgery and is functioning at a high level in daily activities with no complaint of pain. Postoperative radiographs demonstrate satisfactory alignment of the prosthesis and no evidence of short-term failure. Her long-term course remains to be seen.

Discussion:

With enhancements in total ankle arthroplasty design, materials, and instrumentation along with greater familiarity with the surgical technique, it is anticipated (and shown in short and mid-term studies) that improved results and better survivability are achievable goals.[2] In all cases of ankle arthritis that have failed non-operative treatment, it is imperative to provide the patient with a thorough informed consent regarding his/her options. A detailed and lengthy preoperative discussion is critical in order to provide a thorough understanding of the risks and benefits of each option to the degree that the medical literature supports. In this process,

the surgeon must consider such things as the patient's culture and educational level as well as his/her own biases so that an u derstandable and balanced picture is presented to the patient. This is particularly true when an arthroplasty is being considered for a younger patient.[1] While pain relief may be a common benefit, the patient must not get the mistaken impression that he/she will have an improvement in his/her range- motion or be able to engage in vigorous sports activities. The patient should also be presented with the survival analysis data on total ankle arthroplasty that suggests a 54-95% survival at 5-12 years.[2] Furthermore in recently published long-term studies of US STAR patients have shown implant survival rates to be 94.4% at 12.6 years follow-up.[3] Since few studies exist that evaluate the longevity of total ankles in younger patients, it becomes somewhat of a philosophical question whether to insert an implant with a high probability that it will have to be revised or converted to a fusion.

1. Kofoed H, Lundberg-Jensen A. Ankle arthroplasty in patients younger and older than 50 years: a prospective series with long-term follow-up. Foot Ankle Int. 1999;20:501-506.
2. Park JS, Mroczek KJ. Total ankle arthroplasty. Bull NYU Hosp Joint Dis. 2011;69:27-35.
3. Jastifer, J, Coughlin, M, Long-Term Follow-Up of Mobile Bearing Total Ankle Arthroplasty in the United States, FAI, 2015, Feb;36(2):143-50.
4. Stryker STAR IFU V15165
5. Stryker STAR Op Tech STAR-ST-2, 09-2015

STAR-CS-51, 02-2016