Salvage of failed Salto Talaris Total Ankle Replacement with anterior translation of the talus without replacing tibial component. DREXEL UNIVERSITY COLLEGE OF MEDICINE Hahnemann University HOSPITAL Richard Kaufman DPM¹, Alyssa Piccillo DPM², Steven Boc DPM⁵ FACFAS, FACFAOM ¹PGY3 Podiatric Surgery Resident, Hahnemann University Hospital / DUCOM, Philadelphia, PA ²PGY3 Podiatric Surgery Resident, Hahnemann University Hospital / DUCOM, Philadelphia, PA ³Attending Podiatric Surgeon and Director of Podiatric Surgery Residency Program, Hahnemann University Hospital / DUCOM, Philadelphia PA

Purpose and literature review

For cases of end-stage ankle arthritis, total ankle replacement (TAR), once considered a technique which produced low-satisfactory results, has now become a very useful tool at the disposal of the foot and ankle surgeon.⁴ With the development of new prosthesis design and improvement in surgical technique, the survival rate and more importantly patient satisfaction of TAR has improved in recent years.² However, complications such as aseptic loosening, nonunion, implant failure, subsidence and technical error occasionally necessitate revisional surgery.³ The literature currently provides minimal descriptions of revisional TAR, as there are a limited number of surgeons who have performed enough to make significant contribution. One of the more common complications which can occur to the talar component is anterior translation.³ When revising, in cases of anterior talar translation, if it is in proper alignment, the tibial component should optimally be left in the patient due to potential complications which could arise by removing it.¹ This case study presents a novel technique for revising anteriorly translated Salto Talaris implants, allowing for reinsertion of the polyethyelene component and replacement of the talar component without removal of the tibial component.

Case Study

We present a 57 yo female with idiopathic degenerative osteoarthritis of her left ankle who elected to undergo primary left TAR at our facility. Due to the patient's height and weight, a size 0 Integra Salto Talaris[®] implant was chosen for the patient. The primary TAR was uneventful, with no technical complications noted intraoperatively. Immediately, on post-op day 1, the patient began ambulating AMA and exhibiting significant signs of non compliance. After discharge from our hospital, two weeks post-operatively she fell down a flight of stairs, landing on her left lower extremity. The trauma to the ankle joint caused anterior displacement of the talar component leading to a Hawkins I talar neck fracture.

Three weeks following, closed reduction and percutaneous fixation was performed on the talar neck utilizing a 4.0 cannulated screw in order to maintain anatomic reduction of the bone and reduce the potential of avascular necrosis of the talus. Twelve weeks following,

Figures 1a, 1b





Figures 2a, 2b



Case Study continued

while the patient no longer experienced pain upon palpation of the talar neck, significant crepitus and clicking was noted at the ankle joint, along with lateral tinting and edema of her skin at the ankle joint. Her neurovascular status was intact. She related significant pain upon ambulation and palpation of the ankle joint and was temporarily placed in a CAM boot / soft cast to reduce swelling. Revisional TAR was decided upon, however due to poor follow up by patient, revisional surgery was not able to occur until 11 months post primary TAR.

Freatment and Course

Unlike the original Salto TAR, the Salto Talaris TAR is a fixed bearing implant.⁴ In the operative procedure, once it is time to place the final implants, the talar component is placed first, and impacted with the talar impacter. Following this, utilizing a proprietary assembly clamp, the polyethelene (PE) component is clamped into the tibial component, then inserted into the tibia utilizing the tibial impactor. Once the tibial + PE final component is seated properly in the tibia, removing and reinserting the PE (necessary in order to remodel the talus for revision of anterior translation) becomes increasingly difficult without removing the tibial component. Removing the tibial component could lead to additional bone loss (making it challenging to place a new tibial component) along with medial / lateral malleolar fracture.²

The standard anterior approach was utilized for TAR, going through the previous surgical incision in the interval between the TA and EHL tendons. The incision was made in a layered fashion, making sure that all vital neurovascular structures were retracted. The ankle joint capsule was opened with a linear capsulotomy. Retraction was held, and significant osseous overgrowth was noted on both the tibial and talar components. A rongeur was utilized and all osseous overgrowth was removed without issues or complications. The talar component was seen and noted to be significantly anteriorly displaced, so much so that it was able to be removed from the talus by plantarflexing the

foot and grabbing it with a kocher without removing the PE. Utilizing the provided implant extractor and an straight osteotome, the PE component was able to be removed from the tibial component without any issues or complications. Following this, the tibial alignment guide was placed, and utilizing the standard operative technique, the talus, which was found to still have good bone stock with only minor defects, was recut and resurfaced in the typical fashion to allow for a new talar component to be placed. Special care was made to ensure that the posterior cut was taken at slightly more acute angle to reduce potential future anterior translation. Following this, the talus was chamfed and drilled in the typical fashion. The trial talar implant was inserted and was found once again to be size 0. The trial PE was inserted and was found to be 9mm.

It was decided at this point to insert the PE component before the talar trial, in order to optimize the available space there was to work with in the open joint. The talar component of the Salto Talaris comes with two parallel grooves on the inferior surface from which the PE component slides in on utilizing the Integra[®] clamping system. The clamping system provides compression and stability to the PE component. In situ however, the clamping system is not able to be utilized and as is such, makes it incredibly complicated to successfully adhere the PE component. Simply sliding the PE component on will not work as the impaction and pressure which the Integra clamping system provides is not present.

We devised a system utilizing a straight osteotome which was placed parallel to the grooves on the inferior surface of the tibial component approximately 10mm from the inferior surface (to accommodate for the PE) (Fig 4a). By holding the osteotome parallel to the grooves we were able to partially slide the PE onto the tibial component. The talar trial impactor was then placed under the talar component. Utilizing a tamp and a mallet, the talar trial impactor was then malleted into the PE, successfully forcing the PE component posteriorly into the tibial component (Fig 4b). We then utilized the talar trial impactor, a tamp, and a mallet to forcefully snap the PE component into the tibia. Following this, the final talar component was applied without any complications. The patient's ankle was placed into full ROM under fluoroscopy and implants were fully aligned and functional.

Figures 3a, 3b

Figures 4a, 4b

Figure 4a

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Results / Discussion

Improved translation and alignment of talar component was noted immediately post operatively. Clinically, the patient had notably reduced pain and discomfort. She remained non-weight bearing for an extended period of two months until progression into a CAM walker and physical therapy. Current radiographs to this day still show a stable and functional talar component, and a fully functional TAR. Patient is able to weight bear and ambulate without issue.

This case study details revisional TAR for talar anterior translation replacing the talar component and PE component while leaving the tibial component in tact. Our surgical techniques for this case are presented, including a novel method for replacing the polyethelene component without removing the tibial component in Salto Talaris TAR. We hope that this case study adds to the sparse literature available on revisional TAR and will benefit those facing the challenging prospect of treating anterior talar translation.

References

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