

Anterior Curvilinear Incisions: Preserving a Pedicle Flap to prevent



Tension and Soft Tissue Complications



A. Paul Savelloni, DPM¹; D. Scot Malay, DPM, MSCE, FACFAS²; Andrew B. Peacock, DPM, AACFAS³

¹Academic Chief Resident, Penn Presbyterian Medical Center, Philadelphia, PA

²Attending Surgeon, Director of Podiatric Research, Penn Presbyterian Medical Center, Philadelphia, PA

³Fellow, Pennsylvania Intensive Lower Extremity Fellowship, and Staff Surgeon, Penn Presbyterian Medical Center, Philadelphia, PA

Purpose and Literature Review

Wound healing complications following total ankle arthroplasty (TAA) performed with use of the standard anterior longitudinal approach are commonplace. Glazebrook et al published a systematic review of 2386 TAA and reported that wound complications were the 4th highest complication of TAA with an occurrence of 8.1% (1). Factors associated with a statistically significant increase in overall wound complications after TAA include a history of diabetes mellitus and smoking, whereas factors associated with a trend toward complications include female sex, corticosteroid use, and underlying inflammatory arthritis (2). Although anterior wound dehiscence can be minor, it has the potential to result in deep infection and the need to explant the prosthesis or amputate the extremity. Postoperative infection has been described as the most prevalent cause of implant failure (1). The purpose of this case study is to show that use of a curvilinear anterior incisional approach to TAA provides adequate exposure and heals without dehiscence.

Case Study

An 80-year-old diabetic female presented with pain due to primary osteoarthritis localized to her right ankle. Examination showed that she also had gastrosoleus equinus that limited right ankle dorsiflexion, with a hypertrophic anterolateral scar from previous surgery in the distant past. After failing conservative treatments, including a custom ankle brace, TAA and Hoke tendoAchillis lengthening were undertaken in November, 2016. To minimize risk of dehiscence, an anterior curvilinear incision was used to create fasciocutaneous flaps with a central near-transverse segment at the joint line. Deep dissection proceeded in the standard longitudinal fashion parallel to the extensor tendons. After closure (Figs. 1-3), an incisional wound vacuum dressing, and Jones compression splint, were used for the first 5 postoperative days. At 6 days postoperative, the vacuum dressing was discontinued and non-adherent dressings and a posterior splint were employed, and the patient remained non-weight bearing until 3 weeks postoperative when the skin sutures were removed and use of a fixed, below-the-knee immobilizing splint and weight bearing to tolerance were initiated. At this time, moreover, physical therapy for passive and active and motion, strengthening, and proprioception was undertaken. She progressed well through the postoperative phase (Figs. 4-6) and used a lace-up ankle brace beginning at 6 weeks postoperative. At her 1-year follow up visit in November, 2017, she was pain free and ambulating without difficulty in a regular shoe without bracing. The anterior curvilinear incision had allowed exposure for TAA, and healed without dehiscence, hypertrophy, or contracture.

Case study



Analysis and Discussion

To our knowledge, a curvilinear anterior ankle incision for TAA is not routinely used. The traditional longitudinal, linear anterior ankle incision, in our opinion, can be unforgiving, as it has limited subcutaneous dermal support, and it is without substantial vascularity from muscle perforators. For this reason, Bibbo recommended a modified anterior approach that spared perforator zones in the anterior soft tissues (3). Interestingly, we modified Bibbo's perforator-sparing incision to accommodate our patient's existing scar from her previous surgery. We further exaggerated the transverse component of the incision so it would lie parallel to relaxed skin tension at the planned joint line, to diminish the tendency to gap and dehiscence. We also think that postoperative control of edema is important, since it can lead to dehiscence and exposure of underlying tendons and neurovascular structures, which can, in turn, lead to deep infection and implant failure. Matsumoto et al (4) described a cohort of TAA patients that used vacuum dressing on closed anterior ankle incisions, and noted that use of the vacuum significantly reduced healing complications (OR 0.1) when compared to conventional, non-adherent dressings. Schipper and colleagues (5) observed fewer post-TAA wound complications when a compression wrap was used instead of a cast. We employed a closed incision vacuum dressing and a compression splint in the patient described in this report. The curvilinear incision used in the case described in this report provided adequate exposure for TAA, along with robust coverage of anterior tendons, without compromising flap vascularity. Moreover, the oblique orientation relative to relaxed skin tension countered scar hypertrophy and contracture, even in a patient with a prior anterolateral wound scar. Further research is needed to compare the curvilinear incision to the standard anterior linear incision, as well as other approaches (trans-fibular, posterior), in order to determine if it is associated with a lower incidence of dehiscence and infection after TAA.

References

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