

CALCIFICATION OF THE TENDO ACHILLIS: Dissection and Repair

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INTRODUCTION

Calcification of the tendo Achillis is a common painful condition of the heel. Differentiation from Haglund's prominence of the posterior-superior and posterior-lateral borders of the calcaneus is critical. Haglund's deformity is primarily a shoe irritation problem found in younger patients and its resection requires minimal compromise to the heel cord. Resection of calcifications of the tendo Achillis may require significant compromise to the heel cord and usually presents as an arthritic condition seen in older patients, however, younger individuals can be affected as well.

This discussion will primarily center on two areas of concern in surgical considerations of calcifications of the tendo Achillis. First is the anatomic dissection involved in posterior heel surgery. The second is a review of reattachment techniques, past and present, to aid in securing the heel cord to the calcaneus following the operative resection.

Many reviews have been presented on the types of calcification that can occur in the tendo Achillis, as well as their etiology. The efficacy and indications of the procedure in terms of prognosis and recovery have also been presented in multiple papers. The reader is referred to the bibliography for a list of reviews of these particular topics.

ANATOMIC DISSECTION

Anatomic dissection of the posterior calcaneus area is critical not only for preservation of soft tissue, but also for prevention of postoperative complications from shoe irritation. Meticulous hemostasis is critical to prevent wound dehiscence and hematoma formation. Minimal soft tissue mobility in this region may jeopardize wound coverage if compromise to the wound occurs. Mobility of the skin over underlying deep structures is critical to prevent irritation from shoes following the surgical resection. Strict compliance with the principles of anatomic dissection and layered wound closure is necessary in order to prevent these postoperative complications. (Figures 1-5H)

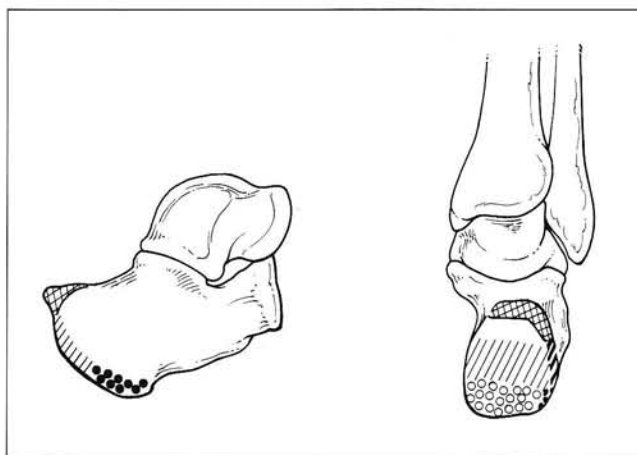


Figure 1A. Extent of osseous involvement in the Haglund's deformity. Note the minimal compromise of the insertion of the tendo Achillis.

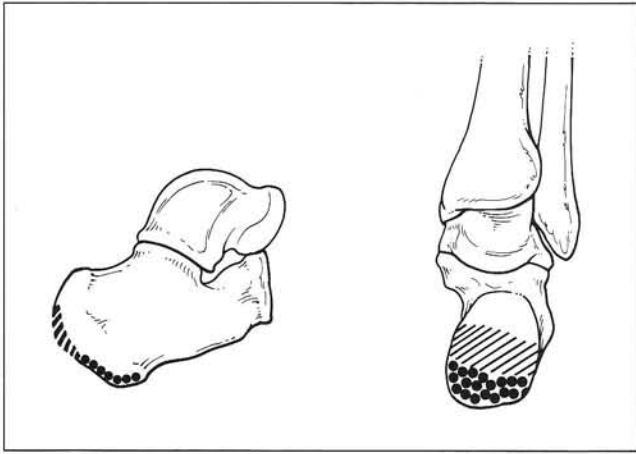


Figure 1B. Extent of the area for surgical resection of calcification of the tendo Achillis. Note how the insertion of the tendo Achillis can be significantly compromised with resection in this area (as compared to the Haglund's prominence).



Figure 2B. X-ray of calcification of the insertion of the tendo Achillis.

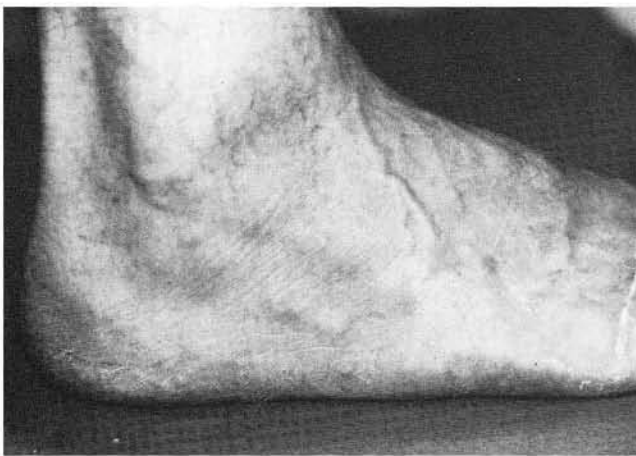


Figure 3B. Clinical presentation of calcification of the tendo Achillis.



Figure 2A. X-ray of Haglund's deformity. Bony prominence of posterior-superior and posterior-lateral borders of the calcaneus is shown.

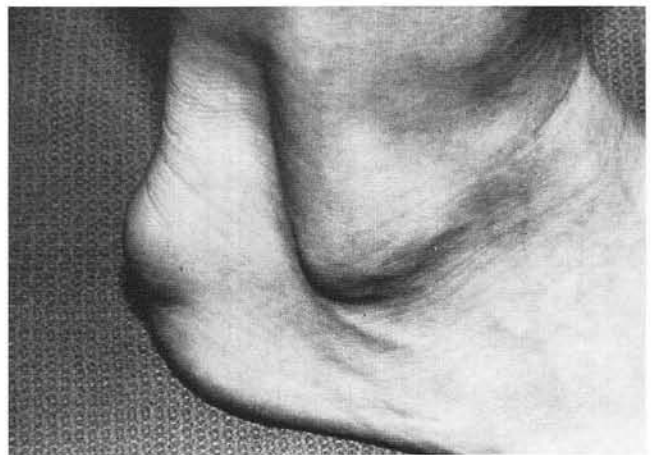


Figure 3A. Clinical presentation of Haglund's deformity. A bony lump of the posterior and lateral borders of the calcaneus is shown.

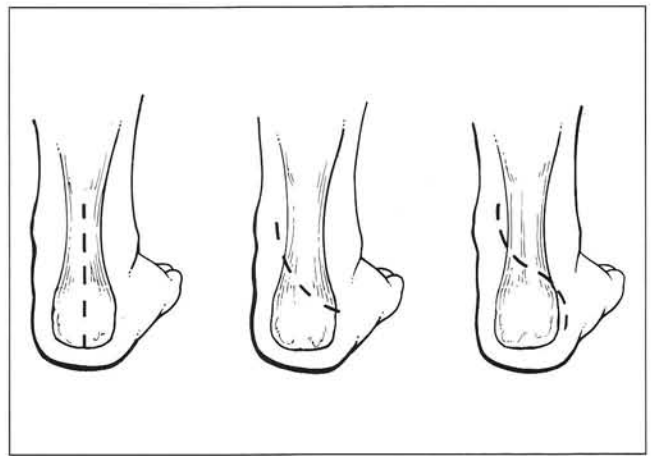


Figure 4. Surgical approach options for calcifications of the tendo Achillis. The author's preferred method is a straight line tendon-splitting approach (left). The simple curved incision (center) provides inadequate exposure to the area in terms of resection as well as for repair of any compromise to the heel cord insertion. The S-shaped incision (right) is useful for broad posterior calcaneal regions with extensive exostosis formation.



Figure 5A. Linear skin incision on the posterior central aspect of the calcaneus and tendo Achillis.

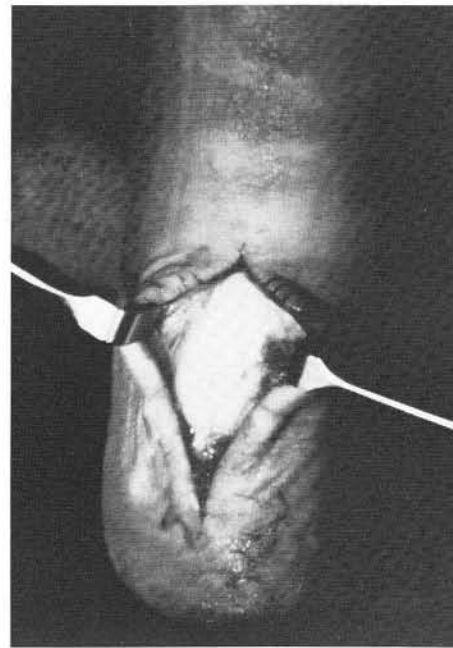


Figure 5B. Exposure of deep fascia and peritenon overlying the posterior aspect of the tendo Achillis as it inserts into the calcaneus.

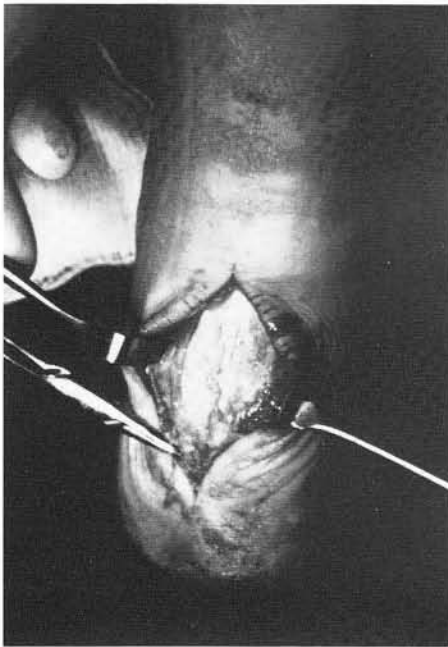


Figure 5C. Deep fascia and peritenon have been reflected exposing the underlying tendo Achillis. Preservation of this layer for closure, to maintain mobility of the skin over the deeper structures is critical to the repair. A linear incision has been made in the mid substance of the tendo Achillis at this point.

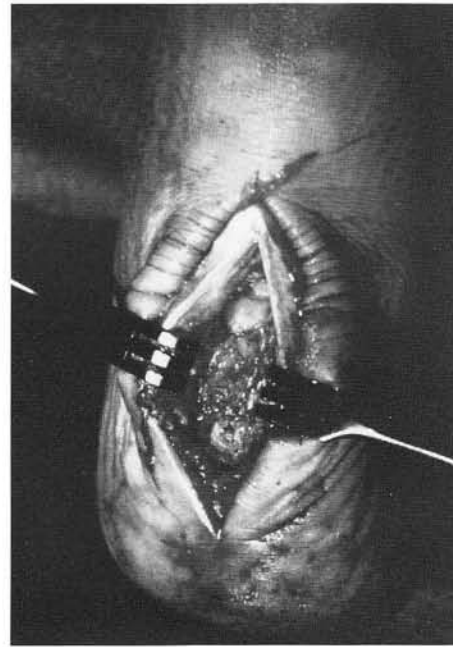


Figure 5D. Reflection of the tendo Achillis to expose the posterior aspect of the calcaneus. Note preservation of insertion into the inferior aspect of the calcaneus. A continuum of tissue is maintained, if possible, about the medial and lateral aspect of the calcaneus posteriorly. The tendo Achillis can be maintained as a continuum of tissue about the posterior aspect of the calcaneus and to the plantar fascia inferiorly. Depending on the degree of arthritic involvement, the tendo Achillis may become a rather thin and compromised layer on either its medial or lateral aspects. Either the medial or lateral fibers can usually be maintained to some degree.

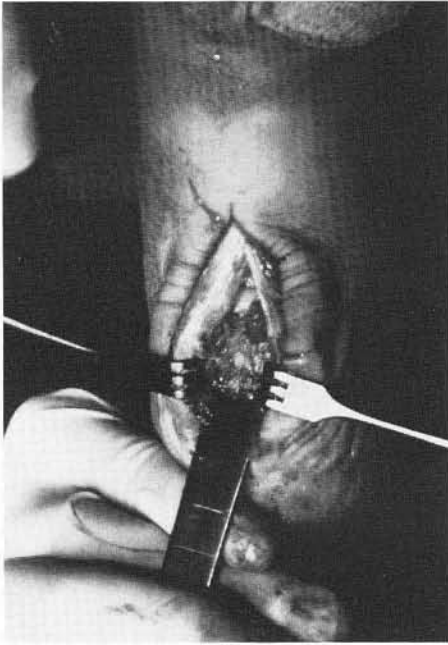


Figure 5E. Resection of the calcification of the posterior aspect of the calcaneus.



Figure 5F. Adequate integrity of the Achilles insertion was maintained in this particular case. Anchoring of the tendo Achillis into the calcaneus was not felt to be necessary. If significant insertional integrity can be maintained, simple medial to lateral repair of the heel cord is adequate.



Figure 5G. Final closure of incision with buried subcuticular suture.



Figure 5H. Postoperative midline incisional approach scar eight months following resection of calcification of the tendo Achillis.

REATTACHMENT OF THE HEEL CORD



Figure 6A. Dehiscence and loss of soft tissue over a prominent screw head on the posterior aspect of the calcaneus.

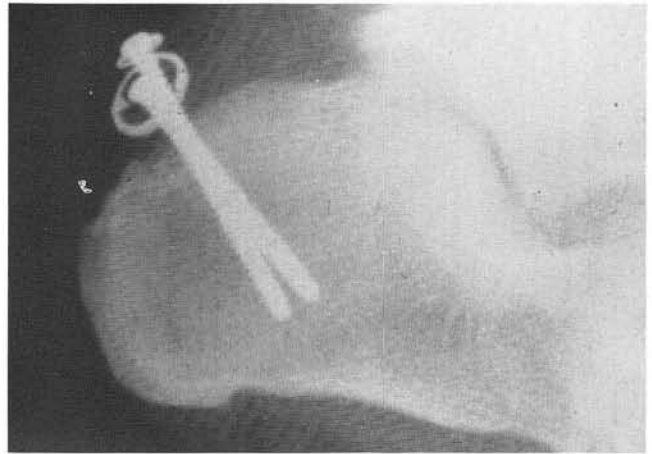


Figure 6B. Radiograph of an attempted reinsertion of the tendo Achillis with screw fixation. Care must be taken to monitor the prominence of the screw head and any washer system that may be used on the posterior aspect of the calcaneus to prevent shoe irritation and skin break-down. The size of the screw head and any washer system can be detrimental to the postoperative result.

Suture Technique

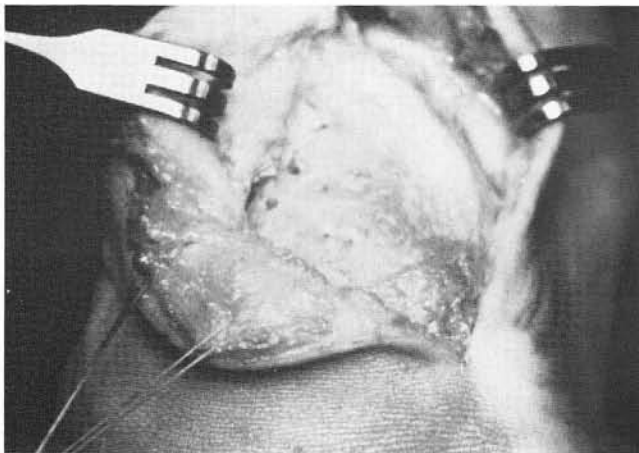


Figure 7A. Drill holes in place in the posterior aspect of the calcaneus with the tendo Achillis reflected medially for reattachment to the posterior calcaneus.

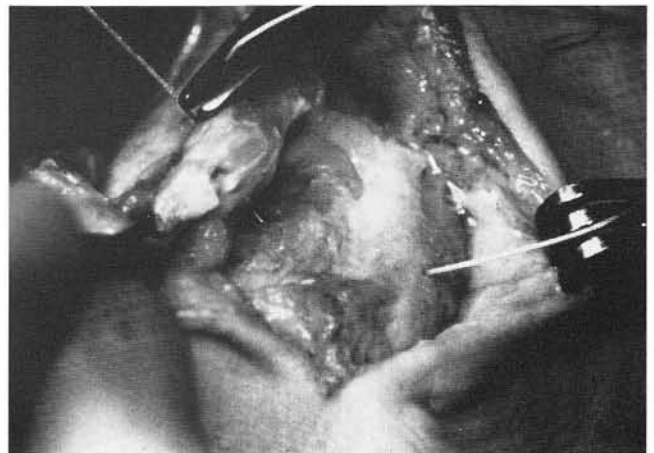


Figure 7B. Insertion of suture material through the tendo Achillis and into the posterior lateral corner of the cortical wall of the calcaneus.

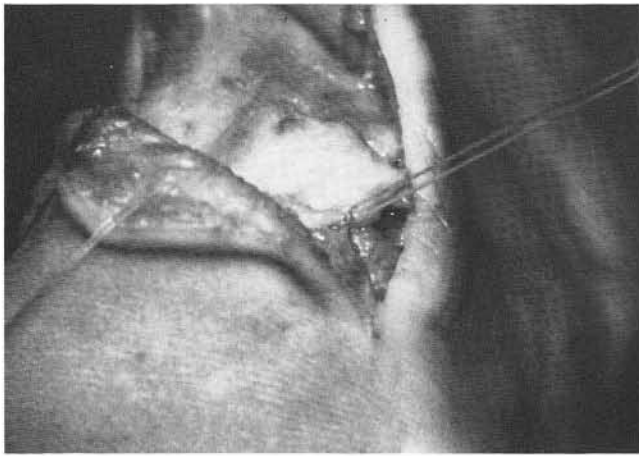


Figure 7C. Final securing of the tendo Achillis to the posterior calcaneus utilizing four individual non-absorbable sutures.

Zimmer-Statak Device

The Statak anchor system has the advantage of ease of insertion with a one-step drill and tapping system. The disadvantage of the system is the overall diameter size (3.82 mm). Due to the large diameter of the drill hole, the device has primarily rearfoot applications. It does provide a suitable anchoring system for reinsertion of the tendo Achillis. (Figures 8A-8F)

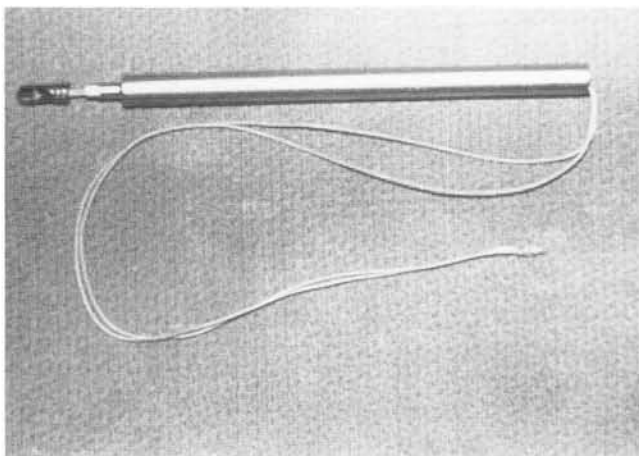


Figure 8A. Statak anchor system as provided by the manufacturer.

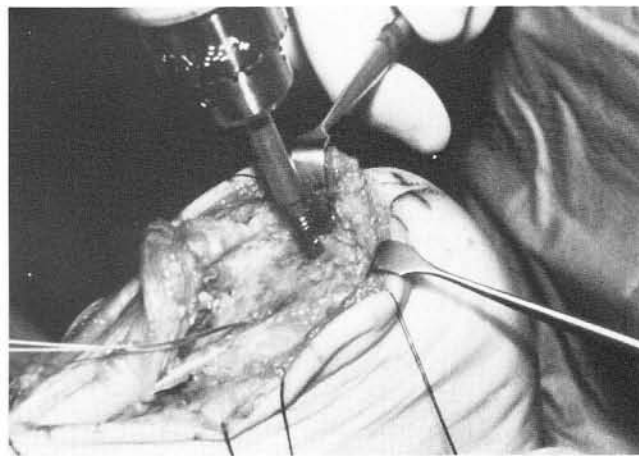


Figure 8B. The one-step counter sink, tap, and drill Statak anchor system is demonstrated in the posterior aspect of the calcaneus.

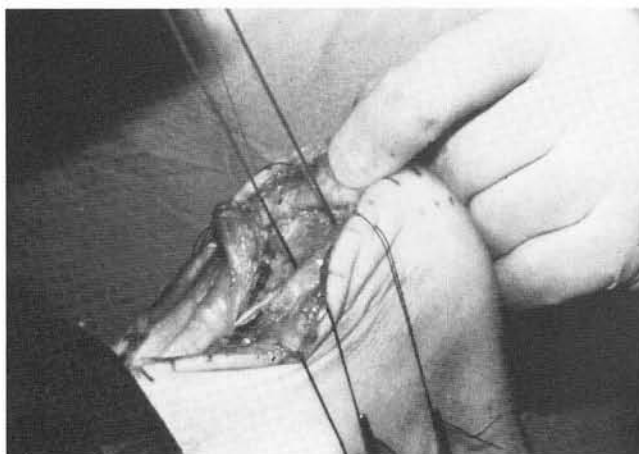


Figure 8C. Removal of drill tap device with suture material and anchor imbedded into the posterior calcaneus.

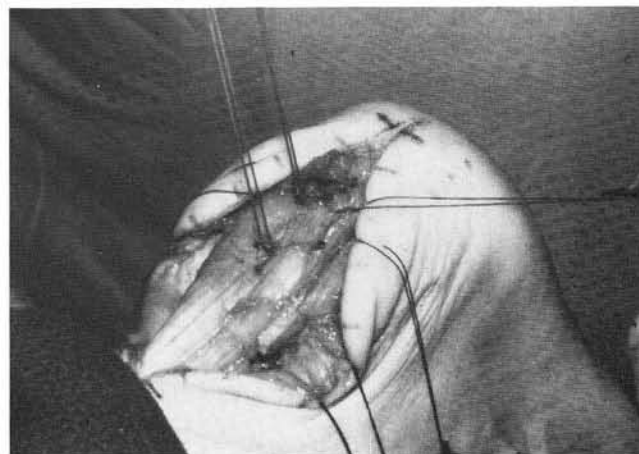


Figure 8D. Suture material has been routed through the tendo Achillis and is prepared for tying.

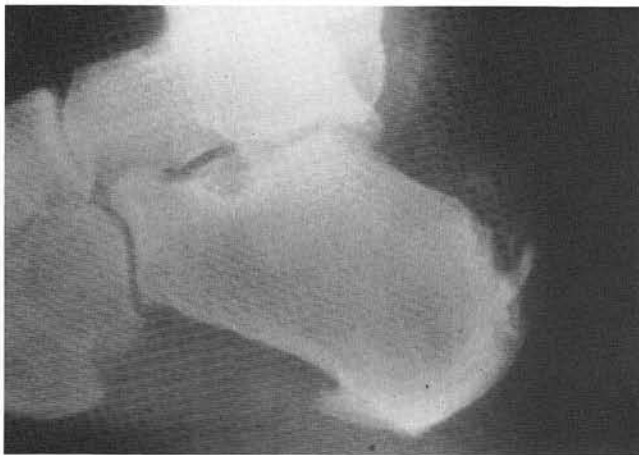


Figure 8E. Preoperative presentation of calcification of the tendo Achillis.



Figure 8F. Postoperative resection of calcification with utilization of the Statak anchor system.

Mitek System

The Mitek anchor system is designed to lock within the subcortical cancellus bone much as a molly-bolt inserts into a wall. A predrilled hole is used, and the system is inserted with an applicator. The advantage to the system is the small drill diameter size, measuring 2.7 mm for the G1 and G2 systems. Many different suture materials can be used with this system. A disadvantage to the system is its relatively small size when used in areas of osteoporotic bone. (Figures 9A-9G)



Figure 9A. Mitek anchor system as provided by the manufacturer.



Figure 9B. Calcification of the tendo Achillis has been resected and initial drill hole for the Mitek system has been created.

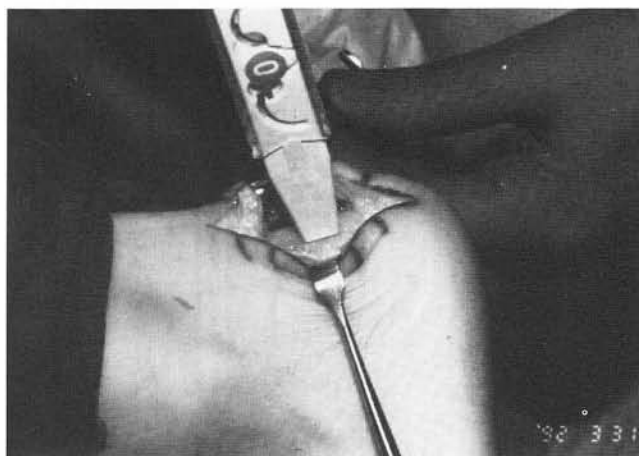


Figure 9C. Insertion device for the Mitek anchor system.

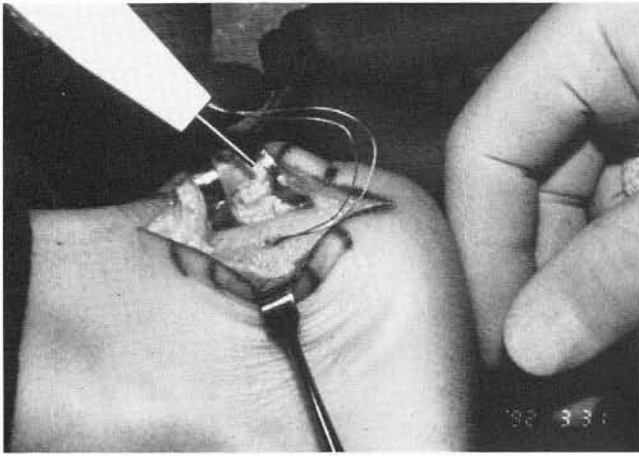


Figure 9D. Removal of the insertion device with suture secured within the posterior calcaneus.

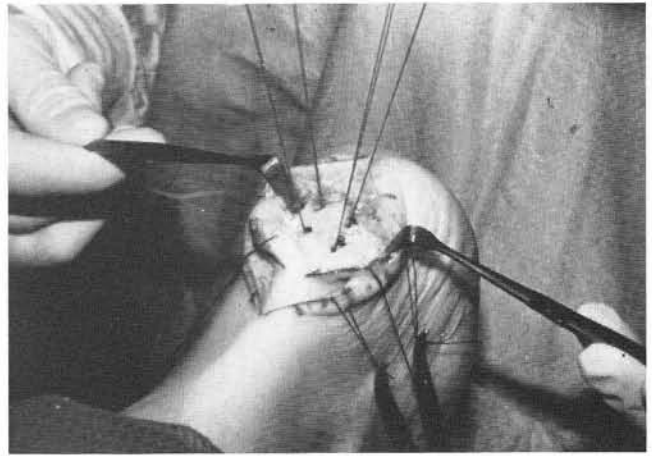


Figure 9E. Suture material into the posterior calcaneus ready for reattachment of the tendo Achillis.

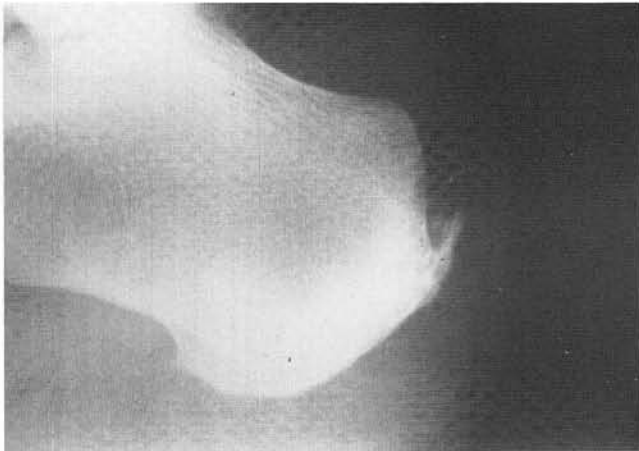


Figure 9F. Preoperative X-ray of a posterior spur of the calcaneus.

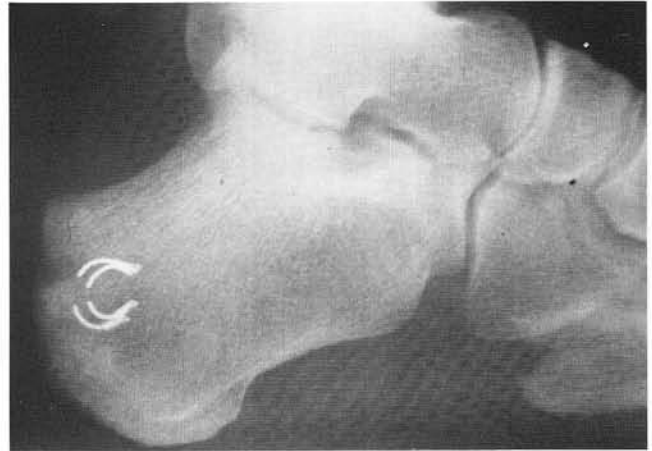


Figure 9G. Postoperative presentation of Mitek GI system in the posterior calcaneus.

CONCLUSIONS

The decision to perform resection of calcifications at the insertion of the tendo Achillis should not be taken lightly. A rather significant operative procedure with prolonged postoperative convalescence may be anticipated. Results of this procedure as noted by the author and in the literature are guarded. Some degree of comfort can be expected, however, a complete resolution of preoperative complaints rarely occurs. If the option for surgical resection is to be considered, meticulous accurate attention to anatomic dissection is critical in order to maintain soft tissue integrity. Many systems are available to assist in reattachment of the tendo Achillis. Depending on the degree of tendo Achillis compromise, surgical dissection may result in maintenance of significant insertional fibers so that no anchor system is necessary.

With the advent of the new anchoring systems, ease of reattachment of the tendo Achillis to this area is presently available.

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