Z Lengthening of Achilles Tendon through Three Longitudinal Mini Incisions

Mohamed Mokhtar Abd-Ella, MD

Category: Ankle

Keywords: Achilles lengthening, equinus deformity, Z lengthening of Achilles tendon

Introduction/Purpose: Achilles tendon lengthening is considered an integral step in management of major foot and ankle deformities. Many procedures were described. Selective gastrocnemius recession is sometimes useful but is insufficient in severe equinus deformities in which the Achilles tendon itself needs to be lengthened. Z lengthening is sufficient to correct severe equinus deformities but is associated with marked scarring and tension on the wound after correction of the deformity. Percutaneous triple hemisection is an alternative but has the disadvantages of uncontrolled lengthening and risk of rupture in correcting severe deformities.

In this study, a new technique of Z lengthening through three small longitudinal incisions to avoid the disadvantages of open Z lengthening and percutaneous triple hemisection was evaluated.

Methods: Three longitudinal incisions of 1 to 1.5 cm were done, one over the most distal portion of the Achilles tendon and the second and third incisions over the midportion and the upper end of the tendon. Through the distal incision, the distal part of the tendon was split into two equal halves and the medial half was detached from the calcaneus and sutured. The suture was then passed using an artery forceps to the middle and then the superior incision with gentle pulling to complete the splitting of the two halves. Then, the lateral half was detached from the tendon proximally. Then, the equinus was corrected and the two halves were sutured together through the middle incision with removal of excess tendon. Longitudinal incisions were preferred to avoid fish mouth opening with deformity correction and to leave a chance to convert to open lengthening should posterior capsular release found necessary.

Results: Ten patients with severe fixed equinus deformity alone or as an element of more complex foot deformities with clinically and radiologically reasonable ankle joints that can be preserved were included in the study. Three patients had poliomyelitis, two had Charcot-Marie Tooth syndrome, two had cerebral palsy, two had idiopathic equinocavus deformity and one had posttraumatic deformity. The average age was 24 years (range: 14-36). The follow up was at least six months. Equinus deformity was successfully corrected in all patients and the Achilles lengthening procedure was successful in all cases without need to convert to the classic open technique. No wound healing problems were encountered and the extensive scarring associated with open Z lengthening of the Achilles tendon was not encountered.

Conclusion: Z lengthening of the Achilles tendon using three mini incisions can be a good option to treat severe equinus deformities with avoiding the complications of open Z lengthening and the percutaneous triple hemisection. It has however a limitation when posterior ankle capsular release is needed, but in such cases, the incisions can be connected converting the procedure to an open Z lengthening. Further studies are needed with larger number of cases and with comparison to other methods of Achilles lengthening.