Traumatic Rupture of Achilles Tendon: Importance of the Sural Fasciocutaneous Flap

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Abstract

The rupture of the Achilles tendon represents 18 cases out of 100,000 in Europe and sports-related accidents constitute the main etiology. In sub-Saharan Africa, these lesions have been poorly described, and motorcycle accidents seem to be the first cause. Most often, these lesions are accompanied by a loss of skin tissue, thus, posing the problem of tendon recovery. We report here a case of Achilles tendon rupture with cutaneous loss in an 8-year-old child where a fascio-cutaneous sural flap allowed the coverage of the tendon with a satisfactory outcome.

Keywords: Traumatic rupture, Achilles tendon; Sural fasciocutaneous flap

Introduction

The Achilles tendon is the thickest and most resistant tendon in man; and it supports forces up to 6 times the weight of the body [1]. In Europe, Achilles tendon rupture occurs in 18 cases per 100,000 and usually occurs during abrupt deceleration during physical activity [1,2]. In sub-Saharan Africa, this incidence is poorly known and motorcycle accidents seem to be the main cause of acute rupture [3]. In the literature, many studies concern the surgical treatment of Achilles tendon ruptures [1,3-5], but few have been interested in the loss of the overlying skin substance. This case, therefore, seeks to present the use of the sural fascio-cutaneous flap in the reconstruction of skin loss associated with the rupture of the Achilles tendon.

Case Presentation

We report the case of an 8-year-old male who was admitted to the Yaoundé University Teaching Hospital (YUTH) following a left ankle injury associated with partial functional impotence of the ipsilateral lower limb. The mechanism of injury revealed that the child was a passenger in a moving motorcycle when his left foot got trapped in the spokes of the rear wheel. At the primary assessment he was quite alert with satisfactory hemodynamic parameters. The lesion report highlighted:

- A laceration with soft tissue loss of the posterior aspect of the left ankle of about 3 cm × 4 cm.
- Achilles tendon rupture 1 cm from its calcaneal insertion, (Figure 1).
- A positive Thompson’s sign.

Distal pulses were present, with preservation of the foot sensitivity. In addition, radiograph of
the ankle revealed no osseous lesions. Traumatic rupture of the left Achilles tendon with marked skin loss of 3 cm × 4 cm was retained as diagnosis.

**Treatment**

The management was operative. We preceded by initial debridement and general irrigation of the wound with normal saline. Then the repair of the tendon was done with Ethibond decimal 2 non-absorbable suture by trans-osseous stitches. The skin defect was then made up with a rotation sural fascio-cutaneous flap.

**Surgical Approach**

Positioning: Patient was placed in the prone position with a sand bag under the left ankle.

First step: Trimming and reinsertion of the tendon on its calcaneal insertion. Second act: Dissection of the sural flap; a 10 cm incision was made proximal to the point of the tendon exposure. This incision was extended then extended vertically down to the fascia of the triceps surae. A pedunculated fasciocutaneous flap 3 cm wide was mapped out and dissected by reserving a distal hinge about 2 cm from the exposure area. The flap was then rotated back onto the exposed tendon, and we sutured the flap to the skin with a few interrupted stitches with non-absorbable suture. The donor site was then filled with a full thickness skin graft harvested from the inguinal fold. The foot was at the end immobilised at 40 degrees equinus position with an anterior semi-circular plaster slab maintained for 21 days (Figure 2).

The evolution was marked by necrosis of the distal end of the flap, with the resulting skin defect later covered by split thickness skin grafting (Figure 3).

Functional rehabilitation was done from the 21st day and the evolution was favorable with good first intention healing and total functional recovery after 2 months (Figure 4).

**Discussion**

Traumatic fractures of the Achilles tendon are increasingly observed in sub-Saharan Africa. Their frequency seems to increase with the use of motorcycle taxis and the appearance of a singular clinical form associated with the loss of cutaneous substance opposite. The mechanism of the injury encountered in this scenario was the entrapment of the foot between the spokes of the wheel of a moving motorcycle. These lesions are most often accompanied by a loss of cutaneous substance more or less important compared to the tendon [3]. All this poses not only the problem of restitution of the tendon, but also that of the filling of the skin defect.

For suture of the Achilles tendon, we used the “classical” open surgical approach, considering the extent of skin lesions. However, new so-called mini-invasive techniques seem to be more advantageous in cases of closed rupture; this is seen in the Achillon instrumentation mini-invasive suture, which considerably reduces the risk of infection and allows an early functional rehabilitation [1-3,5].

He reconstruction of the Achilles tendon when there is a significant loss of skin substance is a real challenge, because it is necessary to cover the tendon to avoid necrosis [6,7]. The sural flap is an alternative to fill this loss of substance [7-9]. In our case, we used this flap with a distal pedicle with a satisfactory result despite a complementary skin graft that was used to make up for some secondary skin necrosis. This result reflects that obtained by Naser M et al., [7] in 2009 in Iran. However, some studies report necrosis rates ranging from 5% to 36% [10-15]. Other complications such as ischemia, congestion, flap dehiscence, and infection described by some authors [7,10] were not been experienced in this case; this could be explained by the relatively young age and absence of typical risk factors in our patient. A good evaluation of the risk factors for
these ischemic complications should be made before choosing this alternative (obesity, smoking, diabetes). As for the donor site, we did not note any morbidities. However, we noted hyperkeratosis at the level of the scar.

**Conclusion**

Achilles tendon ruptures associated with loss of skin substance are a major challenge for reconstructive surgery. The distal pedicle fascio fascial flap with distal pedicle is an alternative. Despite some complications that are sometimes observed, the result is generally satisfactory.

**References**

5. Achilles tendon rupture - Treatment.