

Use of a palmaris longus graft for the treatment of a chronic rupture of the extensor hallucis longus

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Abstract

Injuries of the extensor hallucis longus (EHL) tendon is relatively rare, but surgical repair is necessary to avoid deformity and gait disorders.

Primary suturing is always the best option when possible; in the case of chronic lesions, retraction makes this solution impossible, necessitating tendon transfer or grafting. We report here the case of a patient with a lacerated suture after primary repair following early mobilization. The patient complained of gait disturbance in the meantime, which led to consultation.

After resumption of the old approach and debridement, a 2cm gap persisted between the two tendon ends. a graft was harvested from the palmaris longus. This time, immobilization was performed using an arthrodesis pin. after removal of the pin and rehabilitation, there was a clear improvement.

The use of the palmaris longus brings the advantage of an adapted diameter which minimizes the phenomena of snagging due to fibrotic projections, and unlike other grafts, avoids affecting another healthy joint.

Keywords: Extensor Hallucis Longus; Primary Repair; Secondary Repair; Tendon Graft

1. Introduction

Injuries to the extensor hallucis longus tendon commonly occur as a result of a wound or laceration on the dorsal aspect of the foot or ankle [1].

The repair of extensor tendons can be done using a multitude of complex surgical techniques, preferably including primitive suture, in the face of loss of function of a tendon and when primitive repair is not possibly caused by a loss of substance, alternatives exist, such as lengthening, transfer or tendon graft [2].

We report the observation of a patient with a hallux drop following failure of a primary suture of the tendon who benefited from a secondary repair by a tendon graft.

Aim

Describe the various methods of treating old ruptures of the extensor hallucis longus tendon and provide the reference, describe our case and compare its results with the literature while supporting the choice of technique used.

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2. Observation

Mr. A.L., 39 years old, suffered an open trauma of the dorsal aspect of the left foot during a work accident one year earlier and was operated on urgently with surgical repair of a section of the extensor hallucis longus. A secondary rupture occurred due to the release of the suture, probably due to early weight-bearing and removal of the protective splint.

The patient presented to the clinic complaining of a drooping hallux that occasionally interfered with stair climbing.

2.1. Surgical technique

Patient under regional anesthesia, placed in supine position on the operating table, A thigh tourniquet is used direct longitudinal dorsal approach along the axis of the first metatarsal is made, centered over the site of rupture, The scar tissue and fibrotic adhesions of both proximal and distal stumps of the EHL are excised in order to mobilize the tendon and both ends are regularized. Once the tendon edges are debrided, a hypodermic needle is placed into the tendon edges to prevent retraction. Exploration revealed a rupture at zone 4 [3], with a 2-cm gap between the two ends of the extensor tendon (Fig. 1 A). under local anesthesia the palmaris longus was taken and using the modified Kessler technique the graft was sutured to the tendon stumps, the ankle joint was in the neutral position and the MP joint in 5 ° of extension during suturing, the tightness of the sutures was tested by applying tension to the tendon and then the suture was protected by a metatarsophalangeal arthrodesis with a 20/10th pin (Fig.2).

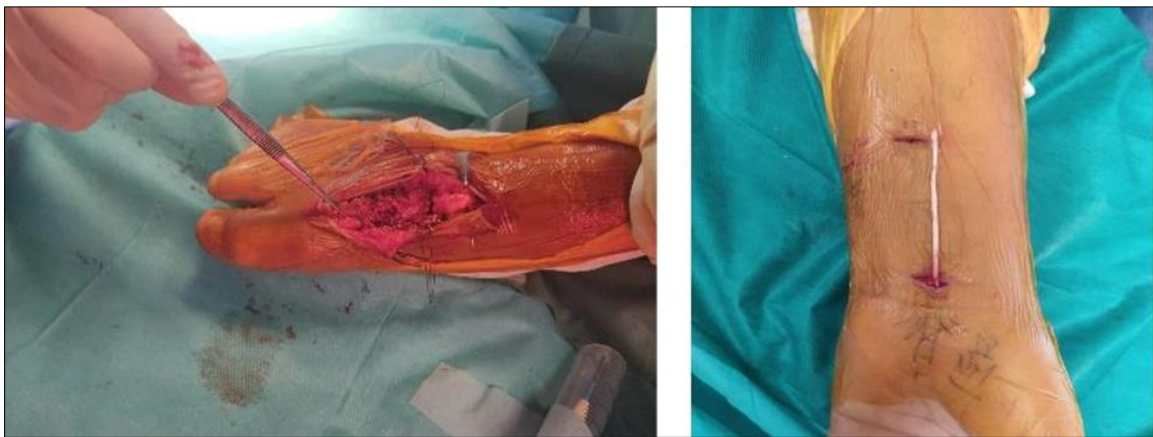


Figure 1 A Using the old approach with enlargement after debridement a defect measured at 2 cm B. a free graft is collected at the depend of the palmaris longus



Figure 2 Implantation of the tendon graft and recovery of the physiological tenodesis of the hallux

Regular monitoring did not reveal any infectious or local complications. The pin was removed at 6 weeks and rehabilitation began. At the 12th week, muscle strength was regained and the patient was able to stand on the tips of his toes, although there was still a decrease in the range of motion of the metatarsophalangeal joints due to the immobilization. (Fig.3)



Figure 3 10-week check. Positive active extension with persistent stiffness

3. Discussion

The largest series on tendon injuries (1014 tendon ruptures) reports a prevalence of 11% of extensor tendon injuries [3], with a paucity of publications on the management of these injuries [1].

The repair of skin and tendon losses in the foot is a serious therapeutic challenge, because of the limited laxity of the skin [4].

The extensor hallucis longus, whose contraction leads to a dorsal extension of the ankle and inversion of the foot [5], contributes 15% of the ankle's dorsiflexion force. The deficit therefore leads to gait disturbance [6] and dysfunction with deformity of the interphalangeal joint of the hallux [7].

in patients with chronic injuries, the tendon contracture exceeds the maximal excursion, tension-free opposition of the ruptured ends is impossible, and secondary reconstructions, such as tendon transfer, autografting or allografting are required [7], the therapeutic possibilities may be a tendon transfer using the tendon of the 2nd toe or the use of a graft from the fascia-lata or semitendinosus tendon, for small defects the palmaris longus can also be used or the 3rd peroneal [8].

the palmaris longus and plantaris tendons remain the prime choice for tendon grafts, with the palmaris being preferred if a strong tendon is required, whereas the plantaris represents the best option when more length is required [9].

An important consideration; the diameter of the graft tendon should be similar to the injured tendon in order to prevent adhesions due to fibrotic projections that would develop at both ends of the tendon due to unequal anastomosis [9]. Many of these grafts, particularly plantaris and peroneus tertius present a smaller diameter. In order to avoid this complication, other authors suggest using semitendinosus tendon autograft, due its similar width with EHL, with the disadvantage of theoretically jeopardizing an otherwise healthy joint to reconstruct the defect [9].

Postoperative management includes immobilization with a hallux splint in extension with off-loading for 3 weeks, a cam walker boot is used for another 3 weeks, allowing partial weight bearing as tolerated. At 6 weeks, physical therapy is initiated including progressive passive and active range of motion of the hallux. Return to sport activities usually begins progressively at 3 months. [8].

4. Conclusion

Injuries to the extensor hallucis longus tendon are frequent and can lead to deformities of the metacarpophalangeal joint of the hallux and even to walking disorders. There are many surgical options, the choice will take into consideration the site of the injury and the diameter, rehabilitation should not be early at the risk of leading to a re-rupture.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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