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Surgery technical

Retrieval of the retracted flexor tendons for long fingers: New tip

Récupération des tendons fléchisseurs rétractés des doigts longs : nouvelle astuce

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Abstract

Zone II flexor tendon injuries continue to be a challenge for hand surgeons. During the injury event, the tendon ends may retract towards the palm. Retrieval of these lacerated ends can be problematic because the tendon sheath is unstretchable. This demanding surgery requires a precise repair technique where the tendon stumps are handled in an atraumatic manner. Microtrauma to the tendon sheath must be avoided as this can induce adhesions and lead to poor functional outcomes. Several retrieval methods for retracted tendon ends have been described in published studies. In this technical note, we will describe a technical variation that streamlines the surgical procedure and uses commonly available materials. This simple trick makes the procedure easier and avoids having to suture the tendon to the tubing.

Keywords: Flexor tendon; Zone II injuries; Retracted flexor tendon; Tendon retrieval; Flexor tendon retrieval

Résumé

Les lésions des tendons fléchisseurs de la main, situées au niveau de la zone II, constituent un réel challenge pour les chirurgiens. Au cours de ces lésions, les extrémités tendineuses peuvent se rétracter vers la région palmaire, nécessitant leur récupération à travers un canal digital inextensible. Cette chirurgie difficile est exigeante et demande de la minutie de la part du chirurgien afin d'être le plus atraumatique possible et de respecter les extrémités tendineuses et le canal digital, évitant les microtraumatismes sources d'adhérences et donc de mauvais résultats fonctionnels. Plusieurs techniques de récupération de ces extrémités tendineuses rétractées ont été décrites dans la littérature. Nous décrivons ici une variante technique qui nous a facilité le geste chirurgical, utilisant un matériel rapidement disponible. Simple et facile à exécuter, elle apporte un artifice supplémentaire pouvant faciliter le déroulement de cette chirurgie en permettant d'éviter le recours à des sutures du tendon à la tubulure.

Mots clés : Tendon fléchisseur ; Lésions en zone II ; Rétraction tendon fléchisseur ; Récupération du tendon ; Récupérateur de tendon

1. Introduction

Zone II flexor tendon injuries continue to be a challenge for hand surgeons. During the injury event, the tendon ends may retract towards the palm. Retrieval of these lacerated ends can be problematic because the tendon sheath is unstretchable [1]. This demanding surgery requires a precise repair technique where the tendon stumps are handled in an atraumatic manner. Microtrauma to the tendon sheath must be avoided as this can induce adhesions and lead to poor functional outcomes [2–4]. Several retrieval methods for retracted tendon ends have been described in published studies [5–19].

This article describes a simple but reproducible alternative to the usual techniques. The inexpensive materials that are required are available in all operating rooms.

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2. Surgical technique

The proximal tendon ends are typically retrieved with small forceps inserted through an opening in the sheath, in combination with proximal to distal ''milking'' of the antebrachial anterior compartment or by applying the reversed Esmarch tourniquet technique [5].

The technique described here to retrieve tendon ends that are retracted into the palm is simple and does not require any specialized materials. It only requires a 15-cm long piece of tubing from an IV infusion set available in all operating rooms (Fig. 1) and 3-0 Prolene® type suture.

The sequence for this technique is described below.

The piece of tubing is inserted in a retrograde manner through the sheath laceration along the digital canal.

A counterincision is made at the distal palmar crease, in line with the injured finger. Once dissection is complete, the lacerated tendon ends can be exposed.

The proximal ends of the lacerated tendons and the tubing segment are externalized through this counterincision. These two elements must be retrieved proximal to the palmar aponeurosis pulley A0.

A shark's nose cut is made in the proximal end of the tubing, along with two lateral eyelets (Fig. 1).

After verifying the anatomical relationship of the tendons relative to each other (deep/superficial), a horizontal mattress suture is placed through the two tendon ends with 3-0 Prolene®; the needle is subsequently removed (Fig. 2).

The free suture ends are passed through the corresponding eyelet on each side of the tubing (Fig. 3A). By pulling on the suture, the tendon ends are seated into the two slits in the tubing.

While holding light but constant proximal traction on the suture (the suture will bend 180° at the eyelets) (red arrow on Fig. 3B), pull the tubing out by its distal end (green arrow on Fig. 3B). This will slide the tendon-tubing unit through the digital canal.

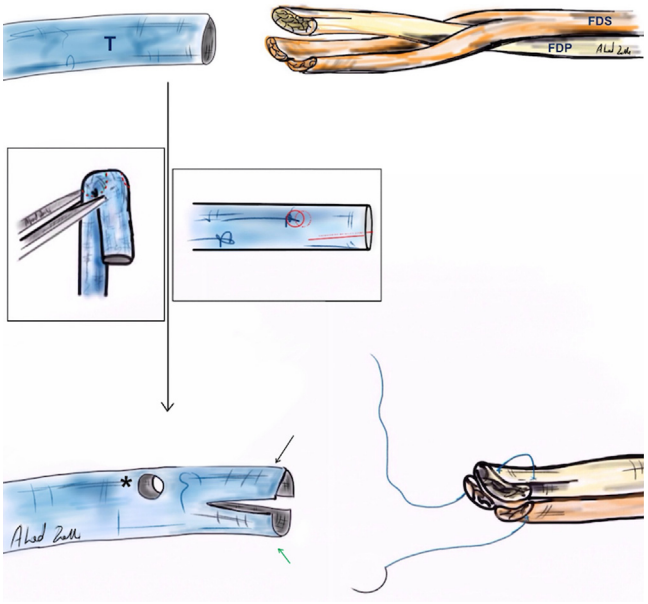

Fig. 2. Tendon ends (right side): horizontal mattress stitch placed through the tendon ends (FDS and FDP). Tubing (left side): scissors are used to cut two lateral eyelets (*) and two anterior (black arrow) and posterior (green arrow) slits in the shape of a shark's nose at the proximal end of the tubing. (T: tubing; FDS: flexor digitorum superficialis; FDP: flexor digitorum profundus).

With the proximal ends now externalized through the laceration opening, the surgery can continue as usual by suturing the corresponding tendon ends.

In some cases, only the flexor digitorum profundus (FDP) is retracted, while one or more of the flexor digitorum superficialis (FDS) slips remain intact. The goal here is not only to retrieve the FDP, but also to restore its normal anatomical relationships, especially with both the division of FDS and its chiasma tendinum (Camper's chiasma), and its spatial orientation. Our technique can also be used to achieve these objectives.

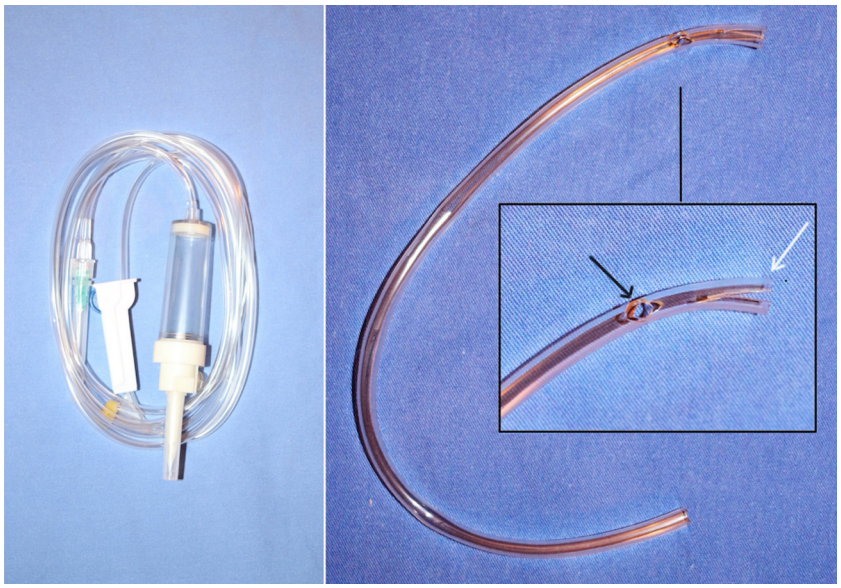

Fig. 1. Left photo: IV infusion set. Right photo: cuts in the tubing segment (white arrow: shark nose; black arrow: lateral eyelets).