



A Simple and Quick Tendon Transfer Technique to Restore Thumb Function

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Introduction

Extensor Pollicis Longus (EPL), the long extensor tendon for the thumb, is one of the commonest tendons to rupture and require treatment. If it is an acute traumatic rupture or sharp division, the tendon should be repaired using techniques similar to other divided tendons. However closed rupture, i.e. rupture without a skin wound, is relatively common with EPL. Most of these are attrition rupture, secondary to rheumatoid arthritis, wrist osteoarthritis, wrist or scaphoid fracture. The latter can lead to a rupture secondary to attrition against a malunited sharp bone surface or secondary to a vascular insult to the tendon. In this group of closed ruptures, direct repair is not possible in most, requiring tendon reconstruction to restore function. Extensor Indicis Proprius (EIP) tendon is commonly chosen for a number of advantages [1]: EIP can be harvested with minimal morbidity as index finger can function with just Extensor Digitorum Communis (EDC). EIP is also synergistic to EPL; therefore patients can recover thumb extension very quickly without need for much re-education or training. Traditionally, this tendon transfer is carried out under general or regional anesthesia through two (or more) incisions [2] one over the Metacarpophalangeal Joint (MCPJ) of the index finger to harvest the EIP and the second one over the thumb metacarpal to carry out the transfer (REF). (Figure 1: Red lines denote traditional incisions). We would like to propose that as the donor (EIP) and the recipient (EPL) tendons are close anatomically, it is possible to carry out the transfer through one short incision under local anesthesia with good outcome and minimal complications. A similar simple and effective tendon transfer technique (modified Camitz transfer in severe median nerve compression) done under local anesthesia has been published elsewhere [3].

Operative Technique

A patient is selected with 100% rupture of the EPL tendon with functional deficiency (Figure 2 and 3). The normal course of EPL and EIP are drawn with dotted lines after drawing the location of Lister's tubercle (which demarcates the point where EPL tendon turns towards the thumb at the wrist level). A 3 cm incision is planned halfway between these two lines (Figure 4). After infiltrating local anesthesia (a combination of 10 ml to 15 ml of 1% lignocaine with 1:80,000. Adrenaline and 1500 units of Hyaluronidase) is infiltrated to cover the area marked with dotted red line (Figure 5). Tourniquet is inflated only after complete anesthesia for the area is confirmed. After making the incision, the distal stump of EPL tendon is identified and its integrity checked (pulling at the distal tendon should extend the interphalangeal joint of the thumb adequately) (Figure 6). No attempt is made to explore the proximal EPL or to find the actual site of EPL rupture as that in this case will not alter the management. EIP tendon is identified ulnar to the EDC slip to the index finger

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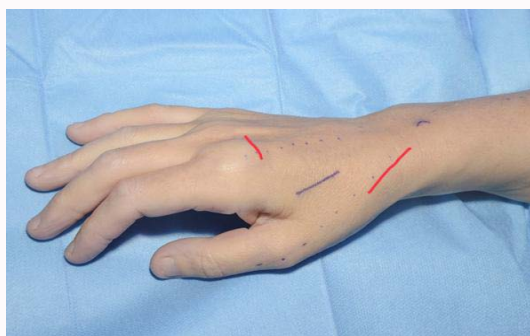


Figure 1: Red lines denote traditional incisions.



Figure 2: A patient is selected with 100% rupture of the EPL tendon with functional deficiency.



Figure 3: A 3 cm incision is planned halfway between these two lines.



Figure 4: After infiltrating local anesthesia is infiltrated to cover the area marked with dotted red line.



Figure 5: After making the incision, the distal stump of EPL tendon is identified and its integrity checked.



Figure 6: EIP tendon is identified ulnar to the EDC slip to the index finger.

(Figure 7). EIP is divided close to the junction with EDC near the metacarpophalangeal joint of index finger to gain adequate length for the transfer (Figure 8). EIP may need to be freed up proximally to make sure it can join EPL without any obstruction or restriction



Figure 7: EIP is divided close to the junction with EDC near the metacarpophalangeal joint of index finger to gain adequate length for the transfer.

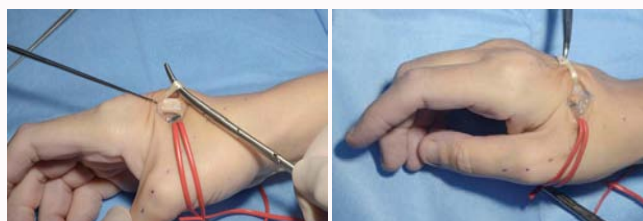


Figure 8: EIP may need to be freed up proximally to make sure it can join EPL without any obstruction or restriction.



Figure 9: In case of EIP to EPL transfer, some over correction is advised.

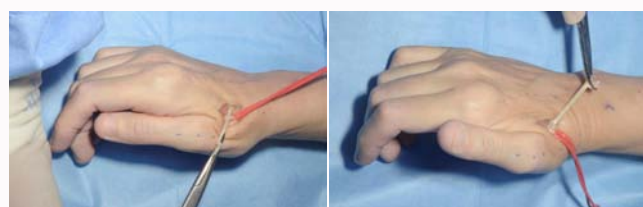


Figure 10: The weave is completed- at least four passes are recommended to allow a strong transfer and early mobilization.

(Figure 9). The EIP is then attached to the distal EPL with a Pulvertaft weave. As usual with all tendon transfer, the tensioning suture after the first pass determines the success of the transfer. In case of EIP to EPL transfer, some over correction is advised (Figure 10). The weave is completed at least four passes are recommended to allow a strong transfer and early mobilization (Figure 11).

The wound is closed in two layers with polyglactin 910 sutures for dermis and nylon sutures for skin (Figure 12).

A light bandage with a Plaster of Paris volar splint is applied, arm is elevated and tourniquet is released.

Discussion

EIP to EPL remain one of the most useful and most successful tendon transfers for the upper extremity. The author regularly carries out this procedure under local anesthesia through a single incision. As long as the tourniquet time is kept between 10 min to 15 min, in his



Figure 11: The wound is closed in two layers with polyglactin 910 sutures for dermis and nylon sutures for skin.



Figure 12: A light bandage with a Plaster of Paris volar splint is applied, arm is elevated and tourniquet is released.

experience, the patients tolerate the procedure well. Local anesthesia is not suitable when a prolonged tourniquet time is anticipated, e.g. multiple procedures, previous injuries, surgery or scarring to the area, patients with high body mass index or patients who request general anesthesia.

Disclaimer

The series of photographs shown in this article were taken in a patient under general anesthesia, as taking appropriate photographs while maintaining a sterile field takes longer than the duration a patient can comfortably withstand a tourniquet.

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