

INTRODUCTION

Fibroma of tendon sheath (FTS) is a benign soft tissue tumor that originates from the tendon or tendon sheath affecting most of the extremities [1]. It was originally described by Geschickter and Copeland in 1936 [1]. FTS is composed of dense spindle cell and collagen fibers and shares pathologic similarities with other soft tissue tumors such as giant cell tumor of tendon sheath [2]. It is commonly well circumscribed and attached to the tendon or subcutaneous tissues. FTS can present as painless or tender soft tissue mass. As the tumor becomes painful or increases in size, surgical excision is employed for both initial treatment and recurrence [3,4,5]. In this case report, we present the surgical management for a painful fibroma of tendon sheath of the extensor hallucis longus (EHL) tendon in a 14 year old female patient.



Fig 1A and B, respectively. Excised fibroma measures approximately 2.5cm x 1.5cm.

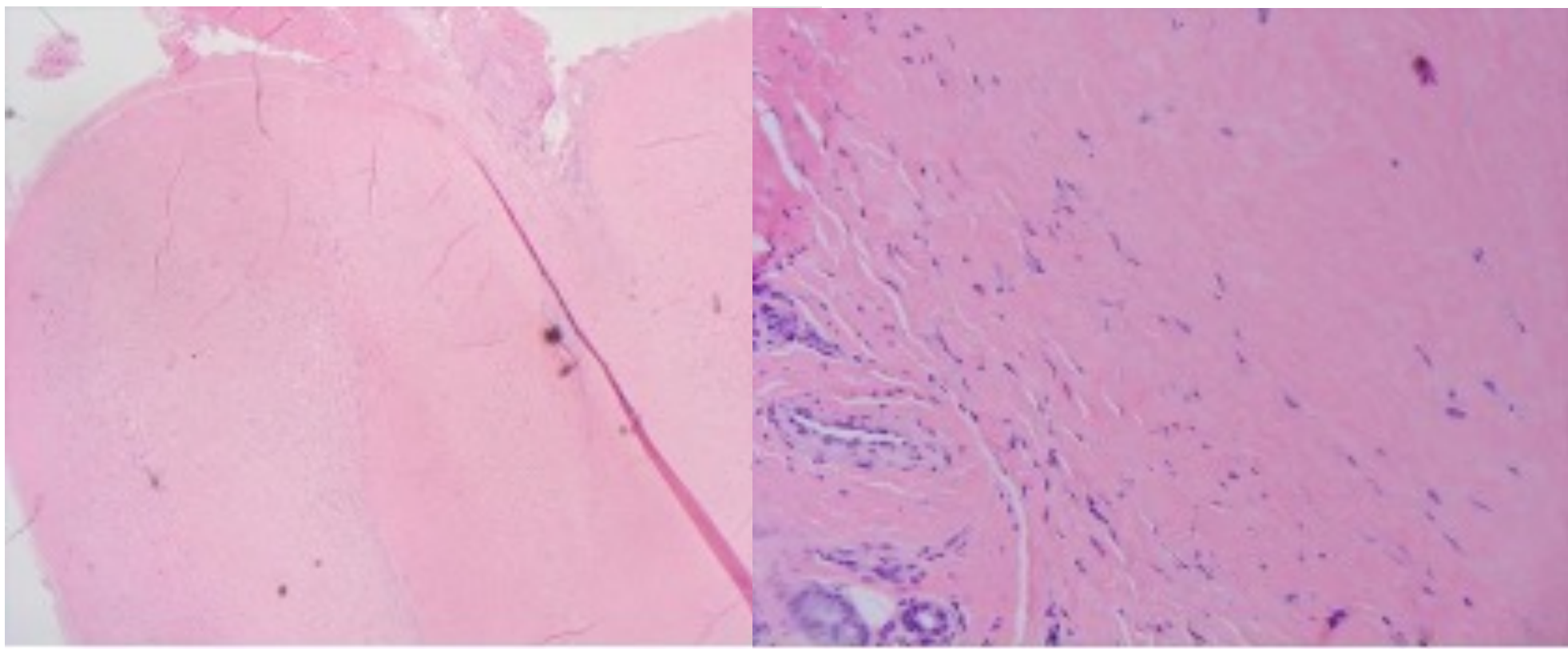


Fig 2A and 2B- Courtesy of Bako Diagnostic, Histological Imaging

Histological findings:

Paucicellular proliferation of spindled cells within dense collagen. There is clefting within the collagen, sometimes along the margins of endothelium-lined vascular spaces. Mitotic figures are not seen. S100, SMA, and CD34 staining is negative in the lesional cells. Images provided by Bako Diagnostics.

Diagnosis:

- Features most suggestive of fibroma of tendon sheath (tenosynovial fibroma).
- There is no histopathologic evidence of malignancy.

CASE REPORT

14 year old female presented to our clinic for initial consultation stating one year prior during physical education, a classmate stepped on her toes. Initially the pain was manageable, and as such the patient did not seek medical attention, however, over the course of a year a mass formed and continued to grow, which initiated the patient to seek medical attention. Patient was able to manage the pain with ibuprofen as needed. Based on the initial assessment, a ganglion cyst was in the differential and a procedure to attempt to drain the mass along the left great toe was carried out, although it was unsuccessful. Afterwards, an MRI was ordered to determine the soft tissue mass/lesion, along with supportive shoes with a wider toe box and orthotics that would not constrict the mass in the shoe. The main complaint of the patient was difficulty ambulating in shoes due to the mass pushing on the top of the shoe.

MRI results showed: Soft tissue mass intimately associated with the extensor hallucis longus tendon with anatomic location and signal characteristics most consistent with a giant cell tumor of the tendon sheath. After reviewing the MRI with the patient and family, they elected to proceed with surgical intervention to remove the soft tissue mass.

Surgical technique(s):

1. Patient underwent the first procedure on 3/2/2023 with the plan to remove the soft tissue mass. However, the soft tissue mass was so intimately related and integrated within the extensor hallucis longus tendon at its insertion point that there was no discerning between the tendon and the tumor at the level just proximal to the interphalangeal joint to its insertion point. As such the tendon was cut just proximal to the area where normal/healthy tendon was appreciated and the EHL stump was tacked into the periosteum of the proximal phalanx of the great toe with 4-0 fiber-wire. Subsequently a 0.062 K wire was drilled through the great toe to hold positioning in preparation for a future procedure to recreate the extensor hallucis longus tendon.
2. Patient underwent the second procedure on 3/21/2023 with the plan to isolate the plantaris tendon to use as an autograft for the loss of EHL length as described in the prior procedure. Unfortunately, the patient did not have a plantaris as confirmed by ultrasound imaging and as such, a portion of the peroneal longus tendon was split and resected to be used as an autograft to re-create the EHL tendon distally to allow for anatomic pull of said tendon. This was carried out using an appropriately measured length (4cm) to reach the distal phalanx, where the EHL and now autograft for EHL were secured with a modified kessel-bonney stitch and subsequently anchored into the distal phalanx of the left great toe using two (2) bone anchors.

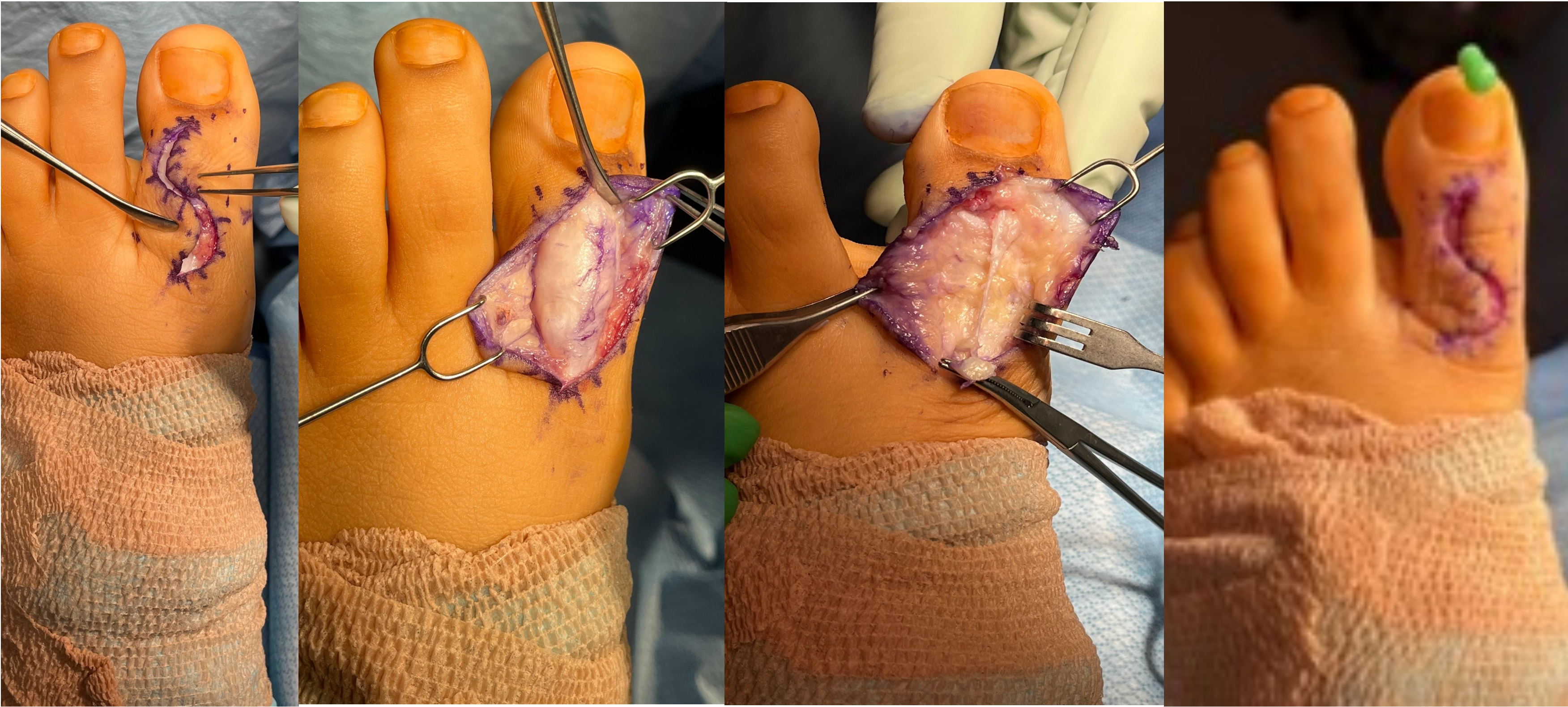


Fig 3. Lazy S incision at the dorsal aspect of the hallux (A). Identifying the fibroma intimately attached to EHL tendon (B) & S/p removal of mass (C) and s/p 0.62 K-wire placement (D)- All first procedure 3/2/23

DISCUSSION

Fibroma of tendon sheath is a benign fibroblastic nodular neoplasm that arises from the synovium of a tendon sheath. On histological examination, the tendon sheath typically demonstrates layers that are continuous with the outer fibrous tendon sheath and the inner synovial sheath layer with vessels. Although they are benign, they may recur in up to 40% of cases. The lesions nearly always arise in the distal portions of the extremities. Clinically, fibroma of the tendon sheath behave like giant cell tumors of the tendon sheath in that they are firm masses with an intimate relationship to the tendon sheath. Fibroma of the tendon sheath is typically differentiated from other soft tissue masses by its histological features, which include fibroblast-like spindle cells with elongated, basophilic nuclei located within a dense collagenous matrix. On MRI, fibroma of the tendon sheath usually show low signal intensity in both T1 and T2 weighted MRI images when in contact with the tendon sheath. If there is a presence of nerve or vascular compromise, patients should be counseled on the potential for further clinical worsening if the tumor is not removed expeditiously. The present case is a rare pathology that was very intimately related with the extensor hallucis longus tendon and ultimately required surgical resection and reconstruction of the EHL tendon. To our knowledge and through our review of the literature only 3 such cases have been reported in the foot and ankle.

CONCLUSION

This case demonstrates a rare lesion only seen published in the literature three (3) times with respect to the foot and ankle. The initial findings were concerning for a malignant tumor due to the characteristics of a growing mass and its aggressive nature invading and overtaking the long extensor tendon. The authors of this research did not feel it would be wise to apply any ortho-biologics during the procedure with concern for recurrence or seeding a new tumor and as such an autograft was utilized. This case turned out to benign in nature but serves as a reminder to err on the side of caution.

Post-op recovery:

After the first procedure the patient was initially non-weightbearing in a posterior splint and transitioned to partial weightbearing through use of a TALL CAM boot and crutches leading up to the second procedure. After the second procedure, the patient was once again initially non-weightbearing in a posterior splint and transitioned to partial weightbearing through use of a TALL CAM boot. Tissues were well coapted with no complications. Patient started physical therapy at 4 weeks post op and was transitioned out of her TALL CAM boot into a supportive running shoe for PT 6 weeks after the second procedure. Patient healed uneventfully and was discharged from our care.

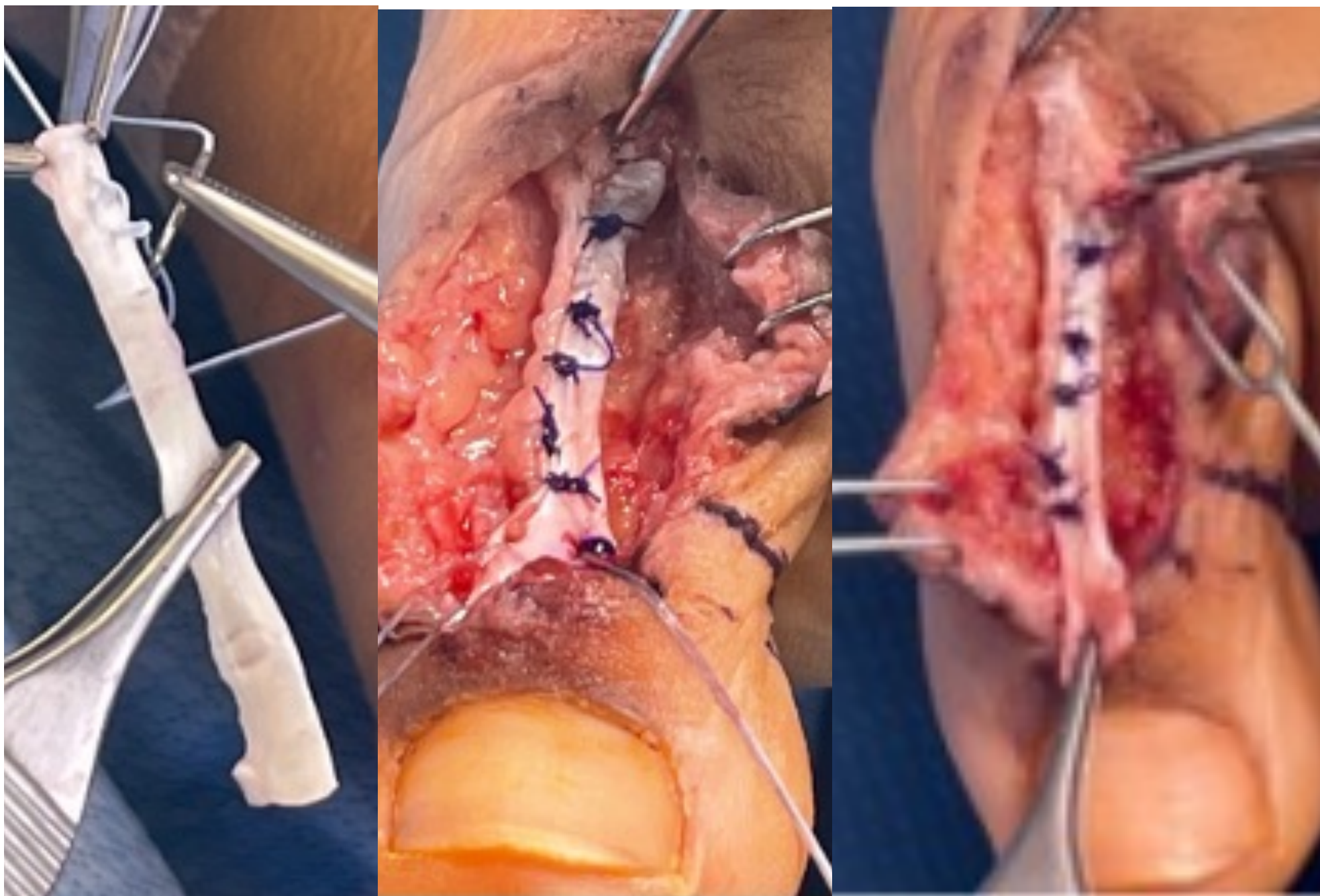


Fig 4 A, B & C respectively - Peroneal Tendon Autograft before and after transfer into the remaining EHL Stump.

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