

Reconstruction of Finger Flexor Tendon and Pulley Repair with Human Acellular Dermal Matrix (ADM)

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CASE STUDY

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Injury causing the rupture or laceration of the flexor tendons of the fingers often requires surgical intervention.^{1,2} This tendon and pulley system works in conjunction to maximize efficiency and to avoid a “bowstring” effect of the flexor tendons that can cause noticeable losses in finger strength, motion, and flexion.³ Consequently, the tendon-pulley system plays a vital role in normal hand function.⁴ Several different biomaterials exist, primarily autografts and allografts, that can act as substitutes or augments to the pulley system.⁴ However, autograft use comes with several disadvantages including second surgical site morbidity, increased patient pain and limited graft material.

An alternative treatment for injury of the finger flexor tendon is a matrix scaffold for new tissue generation, an acellular human dermal matrix (ADM) allograft as reviewed by Wainwright and Bury.⁵ Decellularized human skin has been used for a variety of medical procedures, primarily involving wound healing, soft tissue reconstruction and sports medicine applications.⁶⁻⁹

The following case presentation involves treatment of an injured finger flexor tendon with this Matracell-processed dermis.

Patient

- 16 year-old, Male

Diagnosis

- Injury to the flexor digitalis profundus (FDP) close to its distal insertion on the left hand (Fig. 1)
- The flexor digitalis superficialis was intact

Treatment

- A palmaris longus tendon graft was sutured with Prolene 4/0 (Ethicon, Somerville, NJ, USA) to the distal stump of the FDP and to the proximal end of a silicone rod to be passed through the digital canal (Fig. 2)
- However, due to the thinness and inconsistency of the graft, a strip of 4cm x 4cm non-meshed Matracell-processed dermis was used to augment the suture site (Fig. 3)

- After an initial unsuccessful repair attempt, the dermis was trimmed to the size of the A4 pulley and sutured with Prolene 4/0 stitches. (Fig. 4)
- Short arm splint was applied for four weeks with the wrist in 30° flexion and early protected active ROM was allowed
- Rehabilitation program continued four additional weeks

Outcome

- Postoperative course was uneventful: no swelling was observed
- By six months post-op, the patient regained active 10° to 60° ROM (Figs. 5,6,7)
- Excellent augmentation of the flexor tendon repair was achieved along with restoration of the pulley system using Matracell-processed dermis

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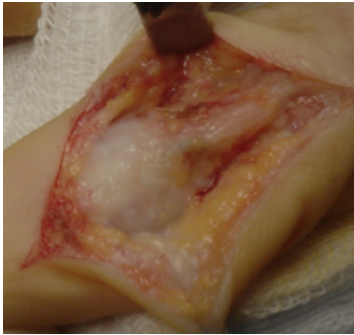


Figure 1. Injury to the flexor digitalis profundus

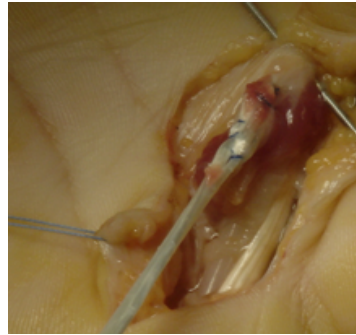


Figure 2. A palmaris longus tendon graft was sutured to the distal stump of the FDP



Figure 1. Dermacell was used to augment the suture site

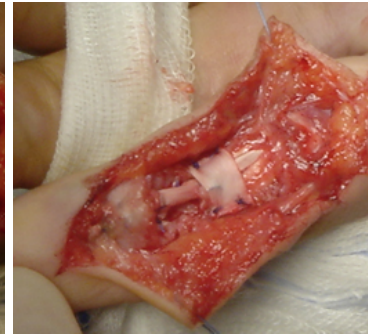


Figure 1. Dermacell was trimmed to the size of the A4 pulley and sutured



Figures 5,6,7. By 6 months post-op, the patient regained active 10° to 60° ROM

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