

Beyond Conventional Donor Tendons: Flexor Tendon Reconstruction with Fascia Lata—A Narrative Review and Case Illustration

Carmine Scarlato, MD*

Rossella Pagliaro, OT†‡

Luigi Troisi, MD, PhD,

FEBOPRAS*†

Giorgio Eugenio Pajardi, MD*†

Macarena Vizcay, MD†

Background: Hand flexor tendon injuries can be treated with primary repair by direct tenorrhaphy or, when this option is not feasible, with secondary repair by reconstruction with tendon grafts. Commonly used autologous grafts include palmaris longus and plantaris; however, these may be congenitally absent or unavailable. Fascia lata (FL) is widely used for ligament and tendon reconstruction in other anatomical regions, but its use in hand surgery is rarely reported.

Methods: A narrative review of the literature was conducted using the PubMed and Scopus databases to identify clinical and experimental studies on the use of FL grafts in tendon reconstruction. Relevant case reports and series were analyzed to summarize indications, techniques, and outcomes. A representative clinical case is also presented to illustrate the use of FL in a 2-staged flexor tendon reconstruction.

Results: FL has demonstrated favorable biomechanical and histological properties across multiple sites including shoulder, knee, Achilles tendon, and upper limb, with satisfactory long-term outcomes. Only a few reports have described its use in hand flexor tendon reconstruction, generally noting good motion recovery and low donor-site morbidity. The reported case illustrates a successful 2-stage reconstruction of a flexor digitorum profundus tendon using a rolled FL graft in a 20-year-old patient.

Conclusions: FL represents a reliable and versatile autologous graft option when conventional donor tendons are unavailable. Further biomechanical and clinical research is needed to establish its long-term performance and optimal applications in hand surgery. (*Plast Reconstr Surg Glob Open* 2026;14:e7457; doi: 10.1097/GOX.0000000000007457; Published online 2 February 2026.)

INTRODUCTION

Reconstruction of flexor tendon injuries remains a major challenge in hand surgery. When primary repair of a tendon by direct tenorrhaphy is precluded—owing to delayed presentation, excessive gap between tendon stumps, or poor tissue quality—secondary repair with autologous tendon grafting or tendon transfer is required.

Common autografts include the palmaris longus (PL), plantaris, long extensor of the toes, and flexor digitorum superficialis (FDS). However, congenital absence, prior injury, or patient preference may preclude their use, necessitating alternative donor tissue.

Fascia lata (FL), harvested from the lateral thigh, is a well-established autologous material used for tendon and ligament reconstruction across various anatomical regions, including the shoulder, knee, and Achilles tendon. Its abundant availability, high tensile strength, biocompatibility, and tendency to remodel into tendon-like tissue make FL a plausible alternative donor site for tendon reconstruction. Despite its characteristics, the application of FL in hand flexor tendon reconstruction is seldom reported and remains nonstandardized.

From the *School of Specialization in Plastic, Reconstructive and Aesthetic Surgery, Università degli Studi di Milano, Italy; †University Department of Hand Surgery & Rehabilitation, San Giuseppe Hospital, IRCCS MultiMedica Group, Milan, Italy; and ‡School of Occupational Therapy, Milan University, Italy.

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This narrative review aimed to provide a comprehensive overview of the use of FL as a tendon graft, summarizing experimental and clinical evidence across different anatomical sites and emphasizing its potential role in the hand. A representative case, from our institution, of a 2-staged flexor digitorum profundus (FDP) tendon reconstruction using a rolled FL graft is presented to illustrate the surgical technique and clinical outcome.

MATERIALS AND METHODS

A narrative review of the literature was conducted using the PubMed and Scopus databases. Search terms included “fascia lata,” “tendon graft,” “reconstruction,” “hand,” and “autologous graft.” Clinical studies, case reports, case series, and experimental studies published in English were included. Reference lists of key publications were screened for additional sources. Extracted data included anatomical site, surgical technique, graft preparation, outcomes, and complications. Findings were synthesized thematically without quantitative meta-analysis.

LITERATURE REVIEW

Biomechanical and Histological Properties

Biomechanical and histological studies indicate that FL exhibits tensile strength and elasticity comparable to native tendon. An experimental study performed on rabbit models demonstrated progressive remodeling toward tendon-like tissue, with collagen fiber realignment and regeneration of a fibrocartilaginous enthesis.¹

A biomechanical study conducted on cadaveric specimens defined an optimal FL graft thickness of 8 mm and fixation at 15–45 degrees of shoulder abduction to restore proper stability during superior shoulder reconstruction.² These properties support the use of FL as a durable and biologically compatible graft material.

Applications in Major Tendons and Ligaments

FL grafts have been successfully applied to ligament and tendon reconstruction across several anatomical regions. In the shoulder, FL autografts used in superior capsular reconstruction have been associated with pain relief and stability restoration.³ Clinical studies, including a randomized trial,⁴ a multicenter analysis,⁵ and a systematic review,⁶ have confirmed superior outcomes, low re-tear rates, and durability for a 10-year period.^{7,8}

Beyond the shoulder, vascularized FL flaps have been used for Achilles tendon defects, providing reliable soft-tissue coverage and functional recovery.^{9–14}

In the knee, FL has been used for anterior cruciate ligament,¹⁵ patellar tendon,^{16,17} and quadriceps tendon¹⁸ reconstruction, including complex scenarios and pediatric patients.

Successful reconstructions have also been reported for triceps¹⁹ and proximal biceps,²⁰ collectively highlighting FL as a reliable and durable graft for tendon reconstruction across multiple anatomical sites.

Takeaways

Question: When conventional donor tendons (eg, palmaris longus, plantaris) are absent or unavailable, what alternative autologous graft can be used for flexor tendon reconstruction in the hand?

Findings: A narrative review and an illustrative case demonstrate that fascia lata possesses favorable biomechanical and biological properties, enabling effective use as a rolled graft for flexor tendon reconstruction. The reported patient achieved near-complete motion recovery and minimal donor-site morbidity.

Meaning: Fascia lata represents a reliable, versatile alternative for flexor tendon reconstruction when traditional donor tendons are unavailable.

Applications in Hand and Forearm Tendon Reconstruction

Evidence for the use of FL in hand and forearm tendon reconstruction remains limited but encouraging.

Talanker et al²¹ published a case series describing upper limb reconstruction in 2 patients who had sustained high-voltage electrocution injuries. Skin coverage was achieved with an ALT free flap, whereas the FDP tendons were reconstructed using FL grafts. Full-thickness FL grafts harvested from the ALT donor site were rolled into multiple tubular constructs to bridge the tendon defects. In both cases, the proximal FDP tendons were absent; therefore, available FDS tendon stumps at the muscle belly were transferred to the distal FDP tendon through the interposed FL grafts.²¹

Furthermore, Bhat et al²² reported the case of a young patient who developed rupture of the FDS tendon of the fourth finger and fibrosis of the remaining 3 FDS tendons. The FL graft was divided distally into 3 slips, enabling satisfactory restoration of interphalangeal and metacarpophalangeal joint movement.²²

Prasad et al²³ described a total flexor apparatus reconstruction of the fourth and fifth fingers—including FDP tendon, transverse carpal ligament, and A1 and A2 pulleys—in a 24-year-old man following excision of a giant-cell tumor of the tendon sheath. FL grafts were used to reconstruct both pulleys, the FDP tendon, and the carpal tunnel, taking advantage of the generous available graft size. Functional outcomes were reported as satisfactory.²³

Regarding extensor tendon reconstruction, Son et al²⁴ presented a 23-year-old patient with a complex cobra-induced thumb injury treated with a single-stage free composite ALT flap incorporating vascularized FL for simultaneous extensor tendon reconstruction and soft-tissue coverage. The procedure achieved satisfactory aesthetic and functional results, though flap thickness remained the main limitation.²⁴

In addition, several reports have described interposition of FL grafts between the biceps tendon and the finger flexor tendons to restore digital flexion. Goubier and Teboul²⁵ proposed a novel technique for total brachial plexus palsy in which the TFL tendon was sutured between the biceps and the FDP tendons; thus, elbow flexion induced by biceps contraction generated

simultaneous finger flexion, resulting in hand closure.²⁵ Meirizal et al²⁶ reported the case of a biceps-to-FDP and FPL transfer augmented with FL in a 14-year-old boy undergoing complex reconstruction after extensive infected-tissue debridement for a neglected forearm fracture.²⁶

Finally, Nazari et al²⁷ evaluated the outcomes of biceps-to-finger flexor transfer using interposed FL grafts in 15 patients with ischemic Volkmann contracture. Postoperative assessment demonstrated significant improvements in hand-grip strength, finger and wrist range of motion, hand dexterity, and performance of daily activities.²⁷

Advantages and Limitations

Advantages of FL include autologous availability, high tensile strength, favorable remodeling potential, and minimal donor-site morbidity; the sheet-like morphology permits tailoring into tubular or layered constructs.

Limitations include the need for an additional harvest site with potential scarring and lower intrinsic elasticity than native tendon. Importantly, evidence specific to small-caliber hand tendons remains limited, highlighting the need for further investigation.

Case Illustration

A 20-year-old left-handed male medical student, in treatment with mood-stabilizing medications, sustained a volar lacerated-contused wound at the base of the proximal phalanx of the small finger of his dominant hand following glass trauma in April 2023. Primary repair with FDP tenorrhaphy achieved a satisfactory outcome according to the Strickland Scoring System.

Approximately 5.5 months later, the patient developed a sudden loss of active flexion. The patient had been compliant with physiotherapy but tended to overexert during home exercises due to concerns about swelling of the proximal phalanx of the surgically treated finger. He also reported transient episodes of loss of consciousness related to mood-stabilizing medication, after one of which he noted impaired finger function.

A rupture of the FDP repair was diagnosed. An end-to-end repair was attempted under favorable intraoperative conditions; however, the patient presented with a re-rupture 5 days later. Therefore, a 2-staged tendon reconstruction was performed with placement of a silicon rod. During the procedure, samples of the tendon stump were sent for histological analysis, which yielded negative results for connective tissue pathology.

Possible reconstructive options using tendon grafts were discussed with the patient. However, he had congenital bilateral agenesis of the PL tendon and declined the use of the FDS tendon of the fourth finger. He also preferred not to use a plantaris tendon graft and refused the option of definitive arthrodesis because of his young age. An FL graft harvested from the thigh was therefore proposed, with a clear explanation that this technique had not previously been used for this specific tendon reconstruction. The patient understood the potential risks and benefits of the procedure and provided informed consent.

An incision was made along the middle third of the lateral aspect of the right thigh, and a 15×4 cm strip of FL was harvested to be used as a tendon graft to bridge the gap between the 2 FDP stumps—the proximal located in zone III and the distal in zone I (Fig. 1).

The FL strip was then rolled into a tubular shape to achieve geometric correspondence with the tendon stumps and to optimize the distribution of mechanical stress across both the graft and the suture lines. The rolled strip was secured with a continuous longitudinal 3-0 polypropylene (Prolene) suture.

The neotendon was subsequently sutured to the proximal and distal FDP stumps of the small finger using a 4-strand 3-0 Prolene core repair, reinforced with an epitendinous 5-0 Prolene suture (Fig. 2).

Postoperatively, physiotherapy was initiated on postoperative day 4 following the Manchester protocol, consisting of 2 sessions per week for the first 2 months and 1 session per week for the following 2 months, for a total of 24 sessions.

At the conclusion of the rehabilitation program, total active motion, grip strength measured with a Jamar dynamometer, pain intensity using the visual analog scale, and disability level using the Disability of the Arm, Shoulder and Hand (DASH) questionnaire were assessed.²⁸

At week 20, the patient demonstrated a total active motion of 178 degrees, grip strength of 29.6 kg in the surgically treated left hand (compared with 32 kg in the contralateral nondominant right hand), and a DASH score of 41 out of 150, showing the greatest limitation in power grips exceeding 5 kg. The patient reported no pain either at rest or under load, corresponding to a visual analog scale score of 0. (See Video [online], which displays active range of motion in flexion and extension.)

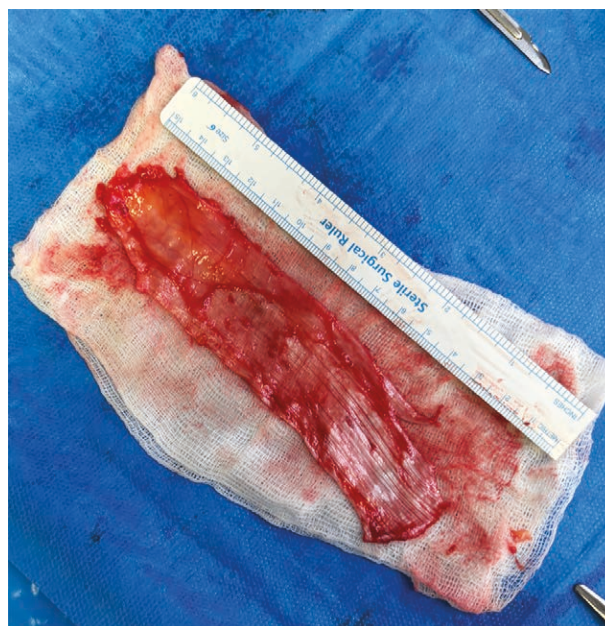


Fig. 1. FL graft before rolling and insertion.



Fig. 2. Neotendon made from an FL graft rolled before suturing.

DISCUSSION

The PL and plantaris tendons are widely used as autologous grafts for flexor tendon reconstruction because their harvest causes no functional loss or significant donor-site morbidity, as they are vestigial structures resulting from evolutionary regression. However, for this very reason, they may be congenitally absent in some patients.

The FL, owing to its versatility and biomechanical robustness, represents an appealing alternative for tendon reconstruction, particularly when standard donor tendons are unavailable. Compared with traditional grafts, such as PL or plantaris, FL provides a larger surface area and can be tailored to the desired shape and dimensions, allowing fabrication of tubular constructs suitable for flexor tendons reconstruction.

The existing literature supports the long-term durability and biological integration of FL grafts. In rotator cuff reconstruction, autologous FL has demonstrated stable outcomes beyond 10 years, with histological evidence of collagen maturation. These characteristics likely contributed to the favorable outcome in the presented case.

Nevertheless, the scarcity of reports on FL use for hand tendon reconstruction underscores the need for biomechanical testing and prospective clinical studies. Surgical techniques, optimal graft thickness, and fixation method must be standardized before broader clinical adoption.

The patient described in our case is distinctive in that, after multiple failed repair attempts, no suitable donor tendon was available—both for anatomical reasons and

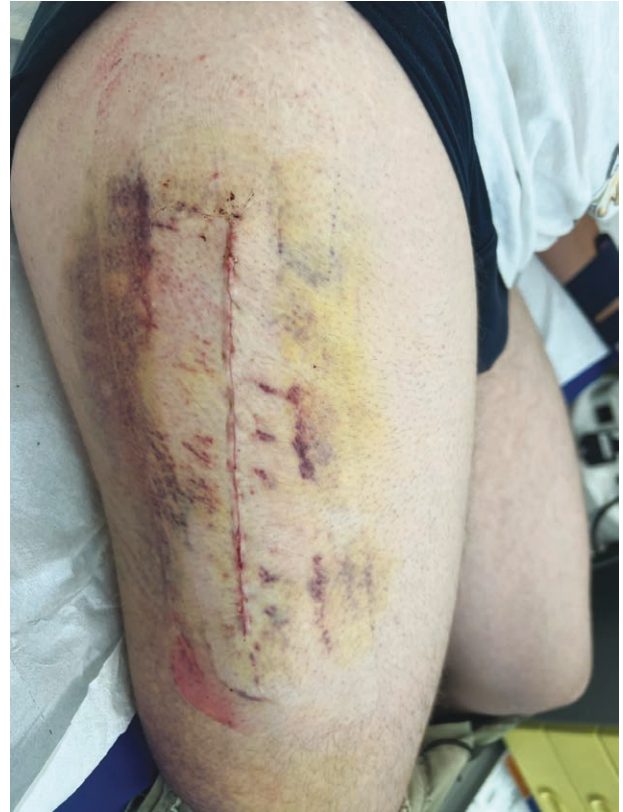


Fig. 3. Donor site in postoperative week 1.

personal choice. An alternative approach using an FL graft was therefore offered, representing a technique not typically considered a standard treatment for this type of injury.

At the completion of the 2-stage reconstruction and rehabilitation protocol, the outcome was highly encouraging. The patient achieved excellent active and passive flexion–extension range of motion, grip strength comparable to the contralateral healthy hand, absence of pain at rest and under load, and minimal disability in carrying out daily activities—particularly those requiring grip strength—while donor-site morbidity remained minimal (Fig. 3).

In situations where traditional donor tendons are unavailable, a rolled FL graft represents a viable and effective therapeutic option for flexor tendon reconstruction, offering a valuable alternative surgical technique for selected patients.

CONCLUSIONS

FL represents a promising autologous material for hand flexor tendon reconstruction when conventional donor sites are unavailable. The presented case and supporting literature review highlight its favorable biomechanical properties, biological integration, and satisfactory functional outcomes. Further clinical studies are required to validate long-term outcomes and refine surgical indications, graft preparation, and fixation technique for this emerging reconstructive option.

Carmine Scarlato, MD

School of Specialization in Plastic, Reconstructive and
Aesthetic Surgery
Università degli Studi di Milano
Via Festa del Perdono, 7
20122 Milano, Italy
E-mail: carmine.scarlato@unimi.it

DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

PATIENT CONSENT

All patients presented in the article provided consent for publication of the images. The privacy rights of all human subjects were observed.

ETHICAL APPROVAL

We ensure that this article reports procedures performed in compliance with relevant laws and institutional guidelines. According to institutional policy, approval from the institutional review board/ethics committee was not required.

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