

## Letters to Editor

### Reconstruction of foot extensor tendons with gracilis tendon graft

Sir,

Crush injuries of foot with loss of extensor tendons and overlying soft tissue are challenging to reconstruct. Multiple methods of tendon reconstruction have been proposed in the past. The graft materials commonly used are free Palmaris longus, plantaris, extensor digitorum longus (EDL) from uninjured foot and fascia lata. In such injuries, soft tissue cover is also commonly required.<sup>[1,2]</sup> Need for foot tendon reconstruction is uncommon. Foot on the other hand has served as a source of both free and vascularised tendon grafts.<sup>[3]</sup>

In the lower extremity, Gracilis tendon is routinely used for ACL reconstruction because of its close proximity and robustness.<sup>[4]</sup> It also has been used for reconstruction of stronger tendons like quadriceps and tendoachilis.<sup>[5]</sup> One case of free gracilis tendon graft for EHL reconstruction has been reported.<sup>[6]</sup> According to the best of our knowledge, simultaneous use of gracilis tendon as a free graft and microvascular gracilis muscle transfer for soft tissue cover has not been reported previously in the literature. We recently managed a soft tissue defect over dorsum of foot with

loss of extensor tendons with gracilis muscle free flap for cover and tendon graft for foot extensor tendon reconstruction.

A 22-year-old male presented with crush injury of right foot with multiple metatarsal fractures and soft tissue defect over dorsum of foot with loss of extensor tendons to lateral four toes [Figure 1a]. Free gracilis muscle flap was planned for this patient. Intra-operatively it was decided to harvest the full length of gracilis tendon [Figure 1b] as a graft for reconstruction of extensor digitorum tendons [Figure 1c] of the foot. To increase the length of the graft, intramuscular dissection of the tendon was done. We could get 16 cm of the tendon graft that was 6.5 mm wide and 2.5 mm thick. We could perform group repair of EDL 1 and 2 (2<sup>nd</sup> and 3<sup>rd</sup> toes) and EDL 3 and 4 (4<sup>th</sup> and 5<sup>th</sup> toes) with the Pulvertuft weave technique [Figure 1c].

This technique in our opinion is simpler and more logical as violation of the other donor site for harvesting the tendon is avoided. Also, the quality and diameter of the tendon is very good. The same tendon could be easily split into two or more strands for simultaneous reconstruction of multiple tendon units and the main muscle unit is utilized for final soft tissue cover along with a split thickness graft. The graft and the flap settled well and the patient is ambulant. [Figure 1d-f] demonstrates the final result of this patient after 6 months. He has got



**Figure 1:** (a) Soft tissue defect over dorsum of right foot with loss of extensor tendons and overlying soft tissue. (b) Gracilis muscle being harvested with full length of its tendon for wound cover and tendon reconstruction respectively. (c) Tendon reconstruction with pulvertuft technique clubbing tendons of 2-3<sup>rd</sup> and 3-4<sup>th</sup> toes. (d) Well-settled flap and the graft from dorsal aspect. (e) Lateral view showing good contour and the toe flexion. (f) Photograph from the plantar aspect showing well-settled flap with good contour and extension of toes. There is no deformity of toes

10-15° of active movements of the toes. He doesn't have flexion contracture of toes, and toes are maintained in the neutral position. A composite injury to the underlying bones, non-vascularised grafts, and the soft tissue reconstruction may be partly responsible for this lack of active movements. But the reconstruction has splinted the toes in a functional position and the patient is able to perform all his routine activities. The authors would like to propose its use for similar situations, as this graft material is easily available and still not being commonly used by plastic surgeons.

**Rahul K. Patil, Kiran Jayaprasad,  
Saurabh Sharma, Mohit Sharma**

Department of Plastic and Reconstructive Surgery,  
Amrita Institute of Medical Sciences,  
Cochin, Kerala, India

**Address for correspondence:**

Dr. Rahul Patil, Department of Plastic and  
Reconstructive Surgery,  
Amrita Institute of Medical Sciences,  
Ponekkara, Cochin, Kerala, India.  
E-mail: doctrahul@yahoo.co.in

**REFERENCES**

1. Cautilli D, Schneider LH. Extensor tendon grafting on the dorsum of hand in massive tendon loss. *Hand Clin* 1995;11:423-9.
2. Adams BD. Staged extensor tendon reconstruction in fingers. *J Hand Surg* 1997;22:833-7.
3. Taylor GI, Townsend P. Composite free flap and tendon transfer, an anatomical study and a clinical technique. *Br J Plast Surg* 1979;32:170-83.
4. Williams GN, Snyder-Mackler L, Barrance PJ, Axe MJ, Buchanan TS. Muscle and tendon morphology after reconstruction of the anterior cruciate ligament with autologous semitendinosus-gracilis graft. *J Bone Joint Surg Am* 2004;86:1936-46.
5. Maffulli N, Leadbetter WB. Free gracilis tendon graft in neglected tears of the achilles tendon. *Clin J Sport Med* 2005;15:56-61.
6. Smith B, Coughlin M. Reconstruction of a chronic extensor hallucis longus tendon laceration with a gracilis tendon autograft. *Orthopedics* 2008;31:1047.

**Access this article online**

Quick Response Code:



Website:

[www.ijps.org](http://www.ijps.org)

DOI:

10.4103/0970-0358.105984