

Reconstruction of a functional gliding surface with extensor retinaculum in extensor tendon reconstruction in the digits

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Background:

Tendon gliding is key to optimal recovery of hand function following complex tendon injuries. Gliding is facilitated by a low-friction gliding surface that is normally provided by the periosteum of the underlying bone. However, significant injuries may damage the periosteum, which must be reconstructed to allow uninterrupted tendon excursion. The absence of the periosteum may compromise a tendon's ability to glide freely, thereby limiting the range of motion.



Results:

All the six digits in the four patients had complete return to function. Additionally, all patients had near normal strength in the repaired hand along with excellent tendon excursion in both flexion and extension.

Patient	Months Follow-Up	PROM	AROM	Grip Strength	3-Point Pinch
1	24	0°-90°	5°-80°	80 lbs	15 lbs
2	8	0°-45°	5°-40°	70 lbs	12 lbs
3	6	0°-75°	5°-45°	60 lbs	13 lbs
4	18	0°-60°	0°-50°	75 lbs	14 lbs

Materials and Methods:

Six digits in four patients with complex, composite soft tissue defects involving tendon, periosteum and skin of the hand underwent surgical repair. Each digit had disruption of the bony cortex underlying the tendon injury including periosteal loss. Through an incision on the dorsum of the ipsilateral wrist, an extensor retinaculum graft corresponding to the size of the periosteal defect was harvested. It was then turned "upside down" and sutured into place over the bare cortex to replace the lost periosteum. This maneuver places the edge of the extensor retinaculum that is normally in contact with tendon surfaces in contact with the tendon graft.



Conclusions:

Extensor retinaculum grafting to replace lost periosteum is a technique that is easily employed, utilizes locally available autogenous tissues and produces excellent tendon function. Additionally, the histologic similarities between extensor retinaculum and periosteum add scientific merit to this novel approach^{1,2}. Based on our experience, we recommend the use of extensor retinaculum for periosteal reconstruction to provide an adequate gliding surface for a reconstructed tendon.

References:

- Allen, M.R., Hock, J.M. & Burr, D.B. Periosteum: biology, regulation, and response to osteoporosis therapies. *Bone* 35, 1003-1012 (2004).
- Klein, D.M., Katzman, B.M., Mesa, J.A., Lipton, J.F. & Caligiuri, D.A. Histology of the extensor retinaculum of the wrist and the ankle. *J Hand Surg Am* 24, 799-802 (1999).

Patient	Age	Gender	Digit Involved	Tendon Defect	Periosteal Defect	Zonet(s) of Injury
1	21	M	Index/Middle	6cm/2cm	1.5cm X 2.0cm	4
2	46	M	Middle	2cm	1.0cm X 1.5cm	1 & 2
3	27	M	Ring	3cm	1.0cm X 1.0cm	3
4	53	M	Index/Middle	2cm/2cm	1.0cm X 1.5cm	2 & 3

