

Interesting Case Series

Zone VII Extensor Tendon Injuries of the Hand

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DESCRIPTION

A 21-year-old man had a circular saw injury to dorsum of his left hand. He had complete laceration of extensor digitorum communis and was unable to extend the wrist. He retained full range of motion of thumb at metacarpophalangeal (MCP) and interphalangeal (IP) joints, and vascular and sensory function of digits grossly intact.

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QUESTIONS

- 1. Which tendons comprise each of the 6 extensor compartments? What are the 8 extensor zones of injury?**
- 2. What is the treatment of zone VII injuries?**
- 3. What are the special considerations and basic principles of extensor tendon repair? What are some potential complications of repair?**

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DISCUSSION

The radial nerve innervates the extensor muscles of the wrist, thumb, and digits, with direct branches innervating the carpi radialis brevis, and posterior interosseus nerve innervating other extensor muscles. The extensor retinaculum, a synovial lined sheath at the wrist composed of vertical and horizontal fibers, separates the extensor tendons into 6 compartments by vertical septa which originate from the supratendinous layer of the retinaculum. As illustrated in Figure 1, from radial to ulnar, the compartments are as follows:

1. abductor pollicis longus, extensor pollicis brevis
2. extensor carpi radialis longus, extensor carpi radialis brevis
3. extensor pollicis longus
4. extensor digitorum communis, extensor indicis
5. extensor digiti minimi
6. extensor carpi ulnaris

Figure 2 illustrates the extensor zones of injury of the hand:

1. DIP joint
2. middle phalanx
3. PIP joint
4. proximal phalanges
5. metacarpophalangeal joint
6. metacarpals
7. carpals
8. proximal wrist

Zone VII involves the wrist and extensor retinaculum. Multiple tendons are generally involved with injuries at this site, and a significant problem is tenodesis of tendons at the wrist. Treatment of injuries includes repairing tendons and often releasing the retinaculum overlying the repair to prevent adhesions, but part of the proximal or distal retinaculum must be maintained to prevent bowstringing. Postoperative care necessitates splinting with the wrist in 30° to 45° extension, the metacarpals in 30° of flexion, and the interphalangeal joints in full extension. Recent literature supports early motion protocols to facilitate tendon gliding, prevent deformity and extensor lag, and decrease adhesions. An important consideration for repair is maintaining a balance between intrinsic and extrinsic tendons and ligaments, and strength of repair is dependent on the number and size of sutures across the site. Complications of repair include adhesions leading to loss of extension and flexion, extensor tendon shortening, tendon tightness, infection, extensor quadriga effect, and specific zonal deformities such as mallet, swan-neck, and boutonniere.

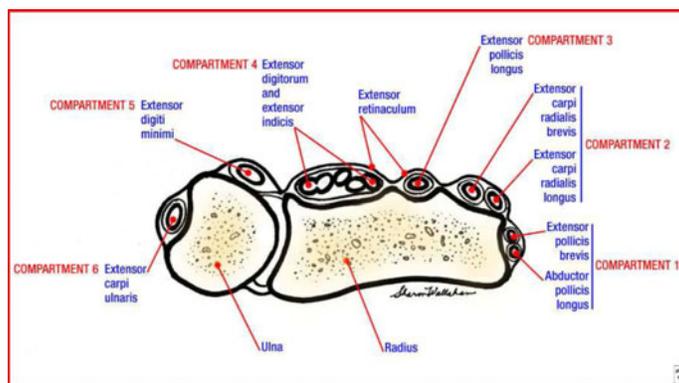


Figure 1. Extensor Compartments of the wrist
eMedicine – “Hand Injury, Soft Tissue”

<http://emedicine.medscape.com/article/826498-media> (accessed 12/1/09)

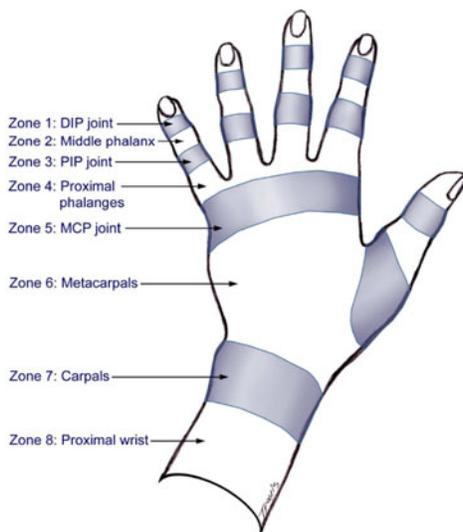


Figure 2. Extensor Zones of Injury of the hand
eMedicine – “Extensor Tendon Repair”

<http://emedicine.medscape.com/article/109111-media> (accessed 12/1/09)

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