Pediatric Flexor Tendon Injuries

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Outline

• Background and anatomy
• Differences between children and adults
• Repair techniques
• Postoperative rehabilitation protocols
• Outcomes related to pediatric tendon repairs

Background

• Less information about pediatric flexor tendon injuries
• Less frequent than adults
• Challenges exist because of smaller structures and anatomy
• Variations in age and maturity require variations in postoperative protocols

Anatomy and Physical Examination

• Location of laceration and mechanism of injury
• Observe resting cascade of the fingers and thumb
• Tenodesis
• Dryness in skin in zone of digital nerve
• Explore of glass or knife in area of underlying tendon or nerve

Background

• Most commonly caused by glass followed by knife
• Most commonly injured digits: index and small fingers
• Average age: 8 years
• Males > females
• Zone III most common location, followed by zone II
Verdan’s Zones

Differences Between Children and Adults
• Size of the injured tendon
• Compliance with postoperative protocols
• Maybe tendency toward quicker healing and less adhesion formation
• Difficulties in examination may lead to delayed presentation more commonly in children

Repair Techniques
• Core suture
  • Number of strands – 2, 4, 6+
  • Suture caliber – 3-0, 4-0, 5-0
  • Suture material – nylon, prolene, braided polyethylene
  • Placement pattern – multiple
• Epitendinous suture
  • Placement pattern
  • Placement depth

Modified Kessler

Modified Cruciate
Outcomes in pediatric tendon repairs
- Splint vs cast vs early active protocol
- Immobilization longer than 4 weeks associated with worse outcomes
- Worse outcomes with associated digital nerve injury, both tendons injured
- Worse outcomes in short arm cast versus long arm cast
- Age younger than 5 years
- Maybe worse outcomes in zone II injuries
- Despite prolonged immobilization, outcomes are better than in adults

Case
- 12 yo RHD female fell down some stairs on the day prior to presentation
- Presented to ED with complaints of swelling and pain in right small finger
Delayed Presentation/Rupture after primary repair

- Not infrequent in children
- Single stage vs 2 stage reconstruction
- Single stage can work well in children
- Single stage probably has better outcomes than 2 stage in children

Take Home Points

- 4-0 suture caliber sufficient
- 2 strand modified Kessler, +/- epitendinous
- If unable to comply with early ROM protocol, then immobilize
  - Long arm immobilization preferred in this group
  - Cast vs splint immobilization similar
  - Immobilize for 4 weeks
References

- Al-Qattan M. Zone I flexor profundus tendon repair in children 5-10 years of age using 3 "figure of eight sutures" Ann Plast Surg 2012.