Flexor Tendon Repairs
2016 UPDATE
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Disclosures
ENDO PHARMACEUTICALS SCIENTIFIC ADVISORY BOARD

Slowly Evolving field; still looking for the Holy Grail

• Basic Science
• Tendon repair
• Tenolysis
Basic Science of Flexor Tendons

• Type I collagen but type III in first 2-3 weeks
• Manske JOR 1986: Tendons can intrinsically heal
• Tenocytes: modified fibroblast
• Most healing is from epitenon tenocytes
• Current research into ways to enhance intrinsic healing

Basic Science of Repair

• Strength Repair: # of core sutures
• 3 weeks to return to strength at time of repair
• Adhesion formation-TGF B

Basic Science of Repair: Adhesions

• Studies looking at reducing adhesion formation
• Antibodies to TGF-B
• TGF-B Polypeptide active in many areas of cell growth (Immune system, MS, Cardiac etc.)
• Blocking TGF-B decreased adhesions but may also slow healing
• (Lubricin and 5 FU)
Biomechanics Flexor Tendon Repair
Resistance to Gap formation

- Locked suture repairs: superior gap formation
  - Modified Tang: Locked, Loop

- Pretensioning
  - Vanhees JHS 2013

Clinical Flexor Tendon Repair
Clinical Flexor Tendon Repair

- Most common Strickland/Indiana
- 4 strand repair
- Epitendon running suture

Outcomes Flexor Tendon Repair

- Outcomes of mechanism of injury
- Trumble: Level 1 study comparing Place and Hold to Durant protocol
- Includes complicated splint
- 25 degrees difference between active and passive rehab protocols
- Frucht JHS 2014: similar difference at 4 wks but less at 3 months

Clinical Flexor Tendon Repair

- Role of epitendinous suture challenged by Yaseen JHS 2015
- Gliding was adversely affected by epitendon sutures
- Some authors suggest a few peripheral sutures rather than circumferential

http://www.bonetalks.com/flexorlac/
What am I doing while waiting

- Mechanism and Zone and particularly what part of Zone 2

- Mechanism and where (2A, 2B, 2C, 2D)
- 6 strand modified locked Tang
- Loop suture 3.0 Supramid
- One knot inside tenorrhaphy
- Repair both tendons but in Zone 2B and C only one slip of FDS
- Epitendon sutures but not circumferential, look like it will glide better
- Lalonde: repair has to glide under pulley

What am I doing while waiting

- Hand therapy 3-5 days
- Place and Hold first week
- Active Flexion at 3.5
- DC Splint at 5.5 weeks

Hand therapy 3-5 days
- Place and Hold first week
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Secondary

- Tenolysis
  - Full passive motion
  - Risk of tendon rupture
  - Results proportional to Boyes grade
  - Eggli Ann Plast Surg 2005
  - 88% improved ROM (50 degree) but 16% rupture rate if tenolysis in palm and digit.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Minimal Scarring</td>
</tr>
<tr>
<td>2</td>
<td>Deep Scar: prior infection, surgery</td>
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<tr>
<td>3</td>
<td>Combined injury to Joint</td>
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<tr>
<td>4</td>
<td>Combined injury to Nerves</td>
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<tr>
<td>5</td>
<td>Multiple combined digit injuries</td>
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Tenolysis

- Tenolysis
  - Suture tenolysis
  - Bain Tech Hand Surg 2003
Reconstruction/Secondary

• Reconstruction
  • FPL s/p VLP
  • Acutely: intercalary graft
  • Late: Graft to P2.

Thank You
Reconstruction/Secondary

- Reconstruction
  - Pulley reconstruction
  - A2 only

- 2 stage reconstruction
  - Modified Paneva – Holovich
  - First stage is PIP annular plate