RADIOLOGICAL EVALUATION OF ULNAR THUMB METACARPOPHALANGEAL LIGAMENTOPLASTY FOR RECONSTRUCTION OF THE ULNAR COLLATERAL LIGAMENT IN CADAVERS

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INTRODUCTION
INTRODUCTION

- Various ligamentoplasties of Ulnar collateral Ligament (UCL)

Reconstruction of the ulnar collateral ligament of the thumb metacarpophalangeal joint: a cadaver study.

Hogan CA¹, Roland RT, Levin LS.
INTRODUCTION

- Various ligamentoplasties of Ulnar collateral Ligament (UCL)
- Triangular configuration with the apex proximally
  - optimal for stabilizing the metacarpophalangeal (MCP) joint,
  - preserving range of motion
- Interference screw ≈ native ligament

Reconstruction of the ulnar collateral ligament of the thumb metacarpophalangeal joint: a cadaver study.

Hogan Cù, Roland RT, Levin LS.

Thumb metacarpophalangeal ulnar collateral ligament injuries: a biomechanical simulation study of four static reconstructions.

Lee SK1, Kubliak EN, Lawler E, Iesaka K, Liporace FA, Green SM.
LITTLE LIGAMENTOPLASTY

- 2 bicorticals tunnels
  - phalangeal PA
  - metacarpal transverse
- PL graft
- Triangular configuration with apex proximal
- Tensioned: Non absorbable suture or Metal clip over skin
LITTLE LIGAMENTOPLASTY

- 2 bicorticals tunnels
  - phalangeal PA
  - metacarpal transverse
- PL graft
- Triangular configuration with apex proximal
- Tensioned: Non absorbable suture or metal clip over skin
LITTNER LIGAMENTOPLASTY

- 2 bicorticals tunnels
  - phalangeal PA
  - metcarpal transverse
- PL graft
- Triangular configuration with apex proximal
- Tensioned: Non absorbable suture ou Metal clip over skin
  - Difficulty: tension
  - Complication: Skin necrosis
• PL free graft
- PL free graft
- Dorso-ulnar incision
- PL free graft
- Dorso-ulnar incision
- Phalangeal postero-anterior tunnel (3mm)
- Metacarpal blind tunnel (3 mm)
- PL free graft
- Dorso-ulnar incision
- Phalangeal postero-anterior tunnel (3mm)
- Metacarpal blind tunnel (3 mm)
- PL passed through phalangeal tunnel
  - QuickPass Tendon Shuttle™, Arthrex®
  - Ends sutured to each other (Fiberloop™, Arthrex®)
• PL free graft
• Dorso-ulnar incision
• Phalangeal postero-anterior tunnel (3mm)
  • Metacarpal blind tunnel (3 mm)
• PL passed through phalangeal tunnel
  • QuickPass Tendon Shuttle™, Arthrex®
  • Ends sutured to each other (Fiberloop™, Arthrex®)
• PL passed through the radial tunnel
  • SpeedWhip™ Arthrex®
• PL free graft
• Dorso-ulnar incision
• Phalangeal postero-anterior tunnel (3mm)
  • Metacarpal blind tunnel (3 mm)
• PL passed through phalangeal tunnel
  • QuickPass Tendon Shuttle™, Arthrex®
  • Ends sutured to each other (Fiberloop™, Arthrex®)
• PL passed through the radial tunnel
  • SpeedWhip™ Arthrex®
• Interference screw (Tenodesis Screw™ 3 mm resorbable Arthrex®)
  • 8 mm length
  • ulnar side of metacarpal tunnel
OBJECTIVE

- Describe « Ulnar Thumb Metacarpo Phalangeal Ligamentoplasty »
- Radiographic evaluation
- Scientist evaluation: Jimenez et al., 2017
- UTMP Ligamentoplasty vs Littler Ligamentoplasty

Single-Bundle vs Double-Bundle (Anatomical) Reconstruction of the Thumb Ulnar Collateral Ligament: Biomechanical Study

Megan L. Jimenez¹, Stephen D. Hioe², Amir R. Kachooei³, Jonathan W. Shearin⁴, Christopher M. Jones⁴, and Michael Rivlin⁴

Ligament replacement for chronic instability of the ulnar collateral ligament of the metacarpophalangeal joint of the thumb.

Glickel SZ¹, Malerich M, Pearce SM, Littler JW.
METHODS

• 10 fresh cadaver forearms
  • sectioning UCL

• Five thumbs UTMP / five Littler ligamentoplasty

• Radiographic evaluation: before/after UCL section and after ligamentoplasty
  • MCPA Front / Lateral with and without weight stress
RESULTS

- Before Sectioning  UCL : Articular Stability

<table>
<thead>
<tr>
<th>Angles</th>
<th>Averages</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCPFA with load</td>
<td>9° Littler</td>
</tr>
<tr>
<td></td>
<td>13° UTMP</td>
</tr>
<tr>
<td>MCPLA with load</td>
<td>40° Littler</td>
</tr>
<tr>
<td></td>
<td>52° UTMP</td>
</tr>
</tbody>
</table>

Mean PL length : 11.5 cm  
Metacarpal width : 14.9 mm
RESULTS

- After Sectioning UCL: NO stability

<table>
<thead>
<tr>
<th>Angles</th>
<th>After section</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCPFA with load</td>
<td>35° Littler</td>
<td>&lt;.05</td>
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<tr>
<td></td>
<td>41° UTMP</td>
<td></td>
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<tr>
<td>MCPLA with load</td>
<td>41° Littler</td>
<td>&gt; .05</td>
</tr>
<tr>
<td></td>
<td>53° UTMP</td>
<td></td>
</tr>
</tbody>
</table>
RESULTS

- After Ligamentoplasty: ARTICULAR STABILITY

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<tr>
<td>MCPFA with load</td>
<td>11° Littler 10° UTMP</td>
<td>&gt; .05</td>
</tr>
<tr>
<td>MCPLA with load</td>
<td>40° Littler 52° UTMP</td>
<td>&gt; .05</td>
</tr>
</tbody>
</table>
CASE 1

A

Front MCP angle 10°

0.4 mm

0.3 mm

Sesamoid Parallelism 0.3°

B

Frontal MCP angle 25°

0.7 mm

0.3 mm

Sesamoid parallelism 9°

Lateral MCP angle 48.9°

Lateral MCP Angle 55°
CASE 1

**A**
- Front MCP Angle 10°
- Lateral MCP Angle 48.9°
- Sesamoid Parallelism 0.3°

**B**
- Frontal MCP Angle 25°
- Lateral MCP Angle 55°
- Sesamoid Parallelism 9°

**C**
- Frontal MCP Angle 9°
- Lateral MCP Angle 51.5°
- Sesamoid Parallelism 0.6°
CONCLUSION

• Restore articular stability
• Maintain Range of Motion
• Good tension control during Bone fixation
• No skin necrosis

• Prospective clinical study +++

Radiological evaluation of ulnar thumb metacarpophalangeal ligament reconstruction for chronic thumb instability in cadavers
THANK YOU