MedStar Union Memorial Hospital
The Curtis National Hand Center

Effect of Extended FCR Approach on Contact Pressures between FPL and Volar Locking Plate

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Introduction

- Fixed-angle volar plating is an effective technique for distal radius fixation. Volar approach is less disruptive to tendons than dorsal exposure
- Studies have demonstrated plates placed distal to volar watershed line can place flexor tendons at risk.
- Little evidence exists to suggest an alternative approach. Extended FCR (EFCR) approach has been described.

Materials and Methods

- Biomechanical study using 10 matched fresh cadaveric pairs with standard FCR approach performed in one arm and extended FCR approach performed in contralateral side.
- Distal radius volar locking plate (VLP) was applied. Flexor/extensor tendons sutured separately in their respective anatomic position and tunneled through proximal forearm.
- Techscan™ pressure sensors were sutured in position between VLP and tendons
- Incisions closed in standard fashion and the wrist pinned at 20° of wrist extension.
- Cyclically loaded through digital flexion-extension to 4000 cycles to evaluate and quantify pressure between VLP and tendons.

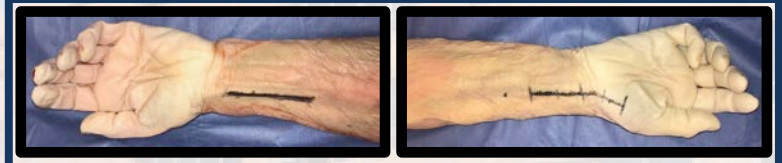

Figure 1 – Comparison of incisions

Figure 2 – Tekscan Sensors Position

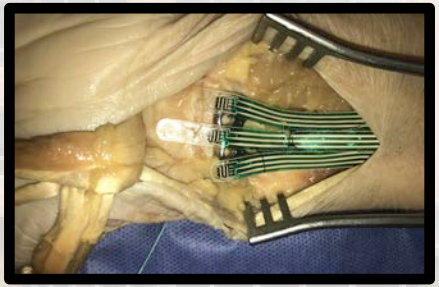

Figure 3 - Testing Apperatus

Results

- Ulnar sensor demonstrated higher pressures in EFCR at low cycles ; At 1000 cycles pressures lower in EFCR which continues through 4000 cycles
- Radial Sensor showed at approximately 2000 cycles pressure in EFCR specimen noted to be lower than standard approach.
- Both ulnar and radial pressure sensors had more than 20% reduction in mean contact pressure Gross tendon appearance unchanged compared to pre-loading
- No difference in gross findings between the 2 groups

Conclusion

- Overall, no statistically significant difference between two approaches.
- Data suggests at higher cycles (1000-4000) contact pressures are lower in the EFCR.
- FPL ruptures when reported tend to occur after fracture healing, therefore, EFCR could be beneficial.