

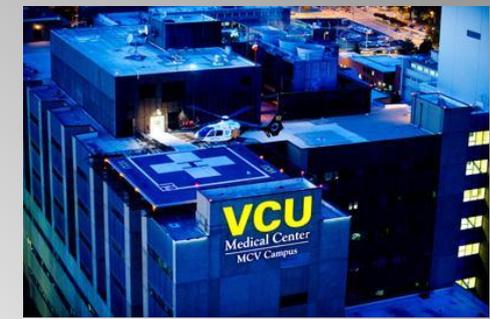
Flexor Digitorum Profundus (FDP) Avulsions:

A Cadaveric Comparison of Three Reconstructive Techniques

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Introduction

Zone 1 FDP Avulsions (“Jersey Finger”) require surgical re-approximation to the volar base of the distal phalanx typically utilizing:

1) pullout-wire (suture) +/-dorsal button

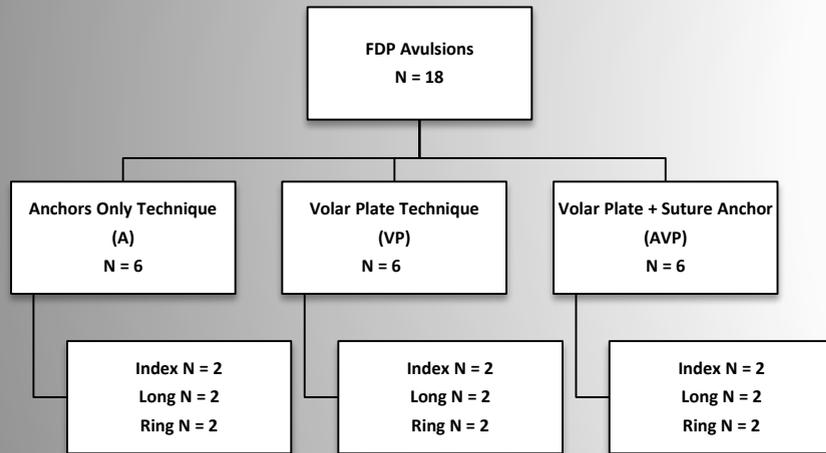
→risks: nail bed deformity/infection

2) suture anchor

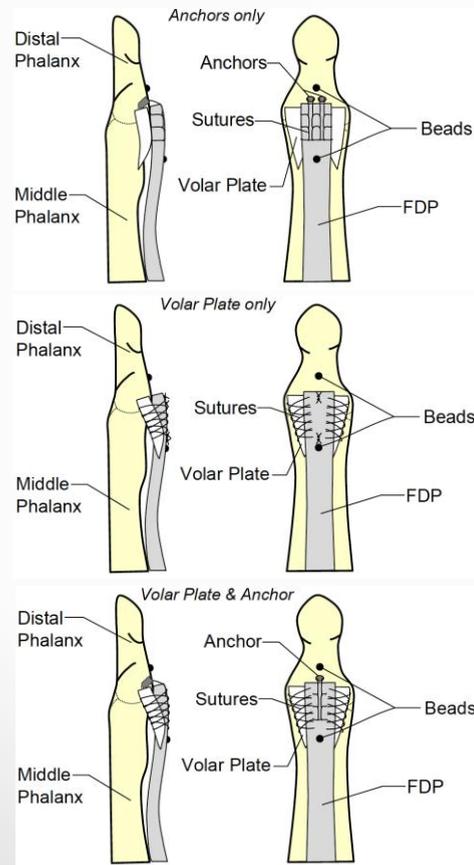
→risks: dorsal cortex/joint penetration, nail problems, pullout (osteoporotic bone)

-- The DIP volar plate may offer strong, local soft tissue to augment the repair and allow for early, active mobilization with minimal complications

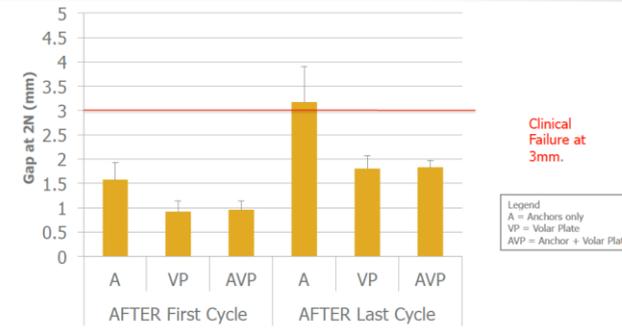
Materials/Methods



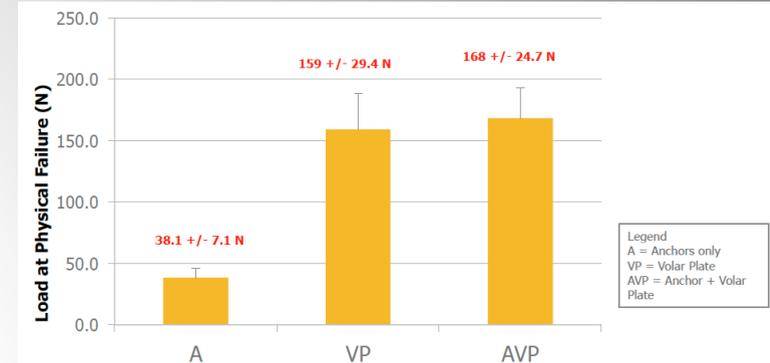
- Utilizing cadaveric specimens
- All soft tissue dissected including A5 pulley and FDS
- FDP released sharply from its insertion
- Repaired with anchor only (A),volar plate only (VP), or anchor and volar plate (AVP)
- Beads placed to help measure gaps
- 500 cycles between 2 – 15N
- Measured gap every 100 cycles
- One-time load to failure
- Physical failure = hardware failure/volar plate avulsion.
- Clinical failure = 3mm gap



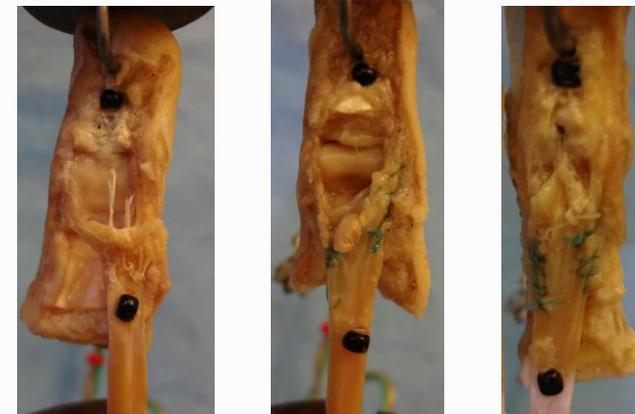
Results



- A had significantly more gapping after cycling than VP and AVP (p<0.0001).
- No difference in gapping between VP and AVP groups (p>0.91).
- The amount of gapping after cycling for all VP and AVP specimens was less than the clinical failure criteria of 3mm.



- A failed at a significantly lower load than VP and AVP (p<0.0001).
- No difference between VP and AVP (p<0.87).



(A) repairs:
Failed at anchor-suture interface

(VP) repairs:
Failed by volar plate avulsion

(AVP) repairs:
2 failed by k-wire Breakage (data excluded)
Remaining failed by suture rupture followed by plate avulsion

Discussion

- Volar plate is sturdy and easy to lift up
- Incorporation into repair significantly increased load to complete failure (and to clinical failure defined by gapping of 3mm)
- Several anchor only groups failed (clinically) during cycling
 - no anchors pulled out of bone
 - anchors tended to fail at suture/anchor interface
- Adding anchor to volar plate repair did not affect strength
- No DIP joints exhibited instability following volar plate manipulation
- Care must be taken to not release distal insertion of volar plate

Conclusion

Incorporating the volar plate significantly increases the strength of repair in FDP avulsion injuries

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