Biomechanical Properties of Volar Hybrid and Locked Plate Fixation in Distal Radius Fractures

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Disclosure

All Materials Provided by: Medartis (Basel, Switzerland)
Distal Radius Volar Locking Plates

- Diverse Designs
- Superior Stiffness
- Improved Fixation in Comminuted & Osteoporotic Bone
- Can be used with both Locking & Non-locking Screws
Hybrid Construct

- Non-locking screws
  - Stability from friction by plate-bone compression

- Locking screws
  - Fixed angle device using the screw-plate interface
Question

Is a hybrid plate construct stronger than a standard all-locking plate construct in the treatment of distal radius fractures?
Materials & Methods

- 3 Groups: Normal, Osteoporotic, Overdrilled
- Each Group Drilled and Plated with All-Locking (n=14) or Hybrid (n=14)
- 10 mm Dorsal Opening Wedge Centered 20 mm Proximal to Lunate Fossa
Materials & Methods

- Mounted into Instron, 6° of freedom
- 10 N preload
- 3 cycles from 20 N to 100N at 1 N/s
- Failure at 1 mm/min
Locking and Hybrid Distal Radius Constructs Have a Similar Stiffness
Locking and Hybrid Distal Radius Constructs Have a Similar Load at Failure

![Graph showing load at failure for normal, osteoporotic, and overdrilled conditions for hybrid and locking constructs.](image-url)
Conclusions

Good fixation of extra-articular distal radius fractures does **NOT** require all-locking screw fixation
Conclusions

Hybrid constructs provide similar stiffness and stability compared to all-locked constructs in the three different bone models tested.