Scaphoid Waist Fractures
– Dorsal Approach

Brandon E. Earp, M.D.
Chief, Orthopaedic Surgery
Brigham and Women’s Faulkner Hospital
Vice-Chair, Orthopaedics
Brigham and Women’s Hospital
Frontiers in Upper Extremity Surgery
Tampa, Florida
November 4, 2017

• Heard all about the volar approach
• Pro’s / Con’s of Dorsal Approach
• When to consider this approach

Where is the fracture?
Where is the fracture?

But...when it is a waist fracture – how do you choose?
But...when it is a waist fracture – how do you choose?

Indications for Surgery
- Displaced/angulated fractures
  * denotes major stripping of blood supply
- Proximal pole fractures
  * high risk of nonunion by casting
- Evidence of slow healing in cast
- Cast poses major imposition
- Concomitant distal radius fracture

What about the stable nondisplaced ones?
- Can be treated with casting
  (often 12 wks or more)
What about the stable nondisplaced ones?

• Can be treated with casting

• However...

• Patients with surgically treated fractures:
  • Heal faster
  • Have earlier return to work/function
  • Have improved time to union (fewer delayed unions)

In Common:
• Headless
• Cannulated
• Differential pitch of screw threads

• Compression is best when screw is as transverse as possible to the fracture plane
• Minimizes the shear or translation forces at the fracture site
Herbert and Fisher’s Classification

CT computer model of cadavers

Soubeyrand et al. JHS 2009
• B2 fractures (transverse), virtual screw placement perpendicular to the fracture was achieved equally well with the 2 approaches.
• B1 fractures (oblique), the virtual screw could not be placed perpendicular to the fracture with either approach, but the dorsal approach with maximal wrist flexion allowed the best screw placement.
Scaphoid Waist Fractures – Dorsal Approach

Dorsal approach – how do we do it?
• Open, mini-open, percutaneous

• Measure screw length (make sure you are down on the scaphoid) – this is where a mini-open may help you!
• Subtract 4mm
• An anti-rotation wire may help with stability as screw is inserted
• Make sure to bury the screw proximally
• Don’t breach the scapho-capitate joint
• Make sure the screw doesn’t penetrate the ST joint

• 41 patients treated with volarly or dorsally
• Computerized analysis of screw-fracture angle on multiple views
• No difference in placement on PA and lateral views
• Dorsal approach allows better central screw placement along the scaphoid axis as noted on semipronated oblique view
• Dorsal approach screws were more perpendicular to the fracture planes on all views
• No difference in fracture healing, Mayo wrist scores.

Jeon et al. JHS 2009

• Meta-analysis of 7 studies
• Dorsal approach allows better central screw placement along the long axis of the scaphoid
• Nonunion : no significant difference
• Overall functional outcome : no significant difference
• Postoperative pain : no significant difference
• Grip strength : no significant difference
• Wrist flexion and extension and radial deviation : no significant difference
• Ulnar deviation was significantly greater with the volar approach

Kang et al. PLOS one 2016
Scaphoid Waist Fractures – Dorsal Approach

- Differences:
  - Entry point on scaphoid
    - Much easier for dorsal approach but does require maximal wrist flexion which makes imaging more challenging
  - Orientation of the screw
    - Easier from the dorsal approach for many fractures to ensure the screw is down longitudinal axis and perpendicular to the fracture
  - If vascularized graft is needed, dorsal approach allows excellent access to vascularized distal radius graft options

- Rehab
  - For me is the same regardless of approach
  - If excellent compression at fracture, splint until first postop, then removable splint and start moving
  - If concern about the fracture or the patient’s level of compliance, sometimes will cast until 6 wks

Dorsal Risks:
- Tendon injury
  - With percutaneous approach
  - Especially EIP and EDC index
- Prominent proximal screw head can cause radiocarpal arthritis
  - More commonly unrecognized with percutaneous approach
- Blood supply to scaphoid?
  - Take care to preserve dorsal ridge blood supply
• So whether you are going to do this:

[Image of a medical scan]

• So whether you are going to do this or that:

[Image of a medical scan]

• Know how to do both well so that you get excellent outcomes every time!
Scaphoid Waist Fractures – Dorsal Approach

Thank you!