SCAPHOID FRACTURES: FIXATION TIMING AND TECHNIQUE

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Scaphoid: Awkward, but Important

- The scaphoid links the proximal and distal carpal rows
- Acts as a “tie-rod”
- Why is it an “awkward but important little bone”?
Scaphoid Fractures

- Most commonly fractured carpal bone
  - 1.47 fractures per 100,000 person-years
  - 2:1 Male : female ratio

- 11% of all fractures in the hand

- Mechanism usually fall on extended wrist

Van Tassel et. al. 2010, Wolf et. al. 2010
Scaphoid Fractures

Herbert

“Stable”

“A1

B1

B3

A2

B2

B4

“Unstable”
Scaphoid Fractures

- Untreated scaphoid fractures lead to nonunions
- Scaphoid Nonunions lead to degenerative changes in the wrist (SNAC)

Dr. Milan Stevanovic “big problem”
Treatment of Scaphoid Fractures: Timing

- Multiple retrospective studies of Scaphoid Nonunions
  - 31-53% of patients had a delay in treatment of 4+ weeks
- Denmark 1988: Delay of 4 weeks 45% chance of Nonunion

Treatment of Scaphoid Fractures: Timing

- SWIFFT Trial: multicenter, open label, randomized superiority trial
- 439 (408) patients with minimally displaced scaphoid waist fractures (2mm or less) randomized to “aggressive casting” or immediate Fixation, 1 year follow-up
- 1 Non-union in fixation group, 4 in casting group
- Need to fix 73 scaphoids to prevent 1 nonunion
- Casting 6-12 weeks prior to fixation does not significantly increase nonunion rate.

Dias et. Al. 2020
Diagnosis of Scaphoid Fractures: Timing

Xrays: 25% false negative rate for non-displaced scaphoid fracture
MRI: near 100% sens and specificity
CT Scan: 72% sens and 100% specificity

Waeckerle 1987, Patel et. Al. 2013, Mallee et. Al. 2015,
Scaphoid Fractures: Fixation

- Cannulated Headless compression screws
- Can be inserted Dorsal or Volar
- Percutaneous or open approach
- Conical design provides more compression as compared to shank design
Scaphoid Screw Fixation

Location, Location, Location

- Centrally placed screws have greater stiffness and load to failure
- Longer screws have less fracture fragment motion

Dodds et. Al. 2006, McCallister et. Al. 2003
Scaphoid Screw Fixation: Technique

- Easier to place screw in central axis from Dorsal approach as compared to Volar, no difference in vivo
- During percutaneous Volar insertion need to be trans-trapezial 20% of the time for central insertion

Dorsal Percutaneous Fixation
29 male RHD M Construction worker, fell playing soccer
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s/p ORIF within 1 week of injury
29 male RHD M Construction worker, fell playing soccer

s/p ORIF 3 months postop
55y/o RHD M s/p MVA 11/22

Xrays at the time of injury
55y/o RHD M s/p MVA 11/22

Xrays: 15 months after injury
References


