Avascular Necrosis

Work related arm pain

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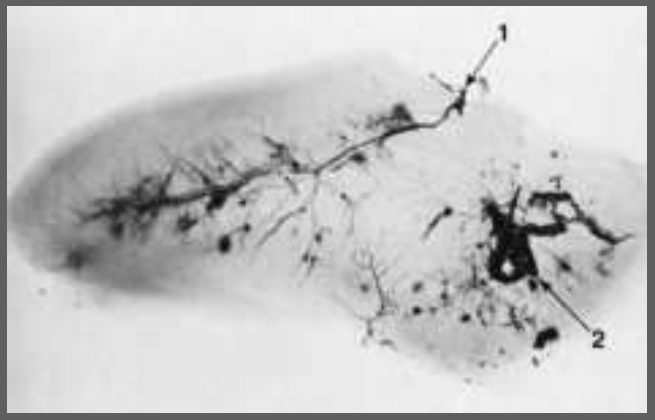
3/6/2013

www.gnulc.com

Scaphoid

- AVN?

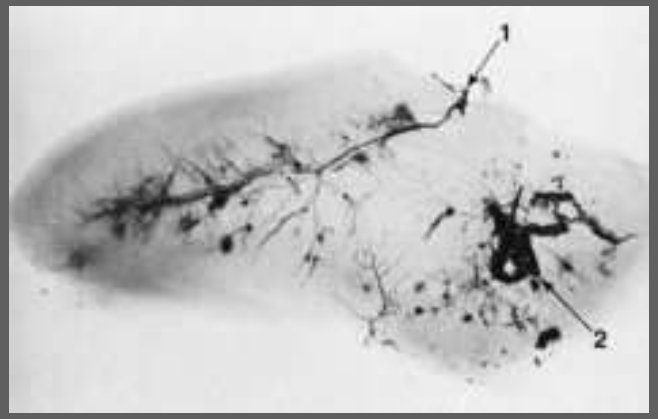


Scaphoid

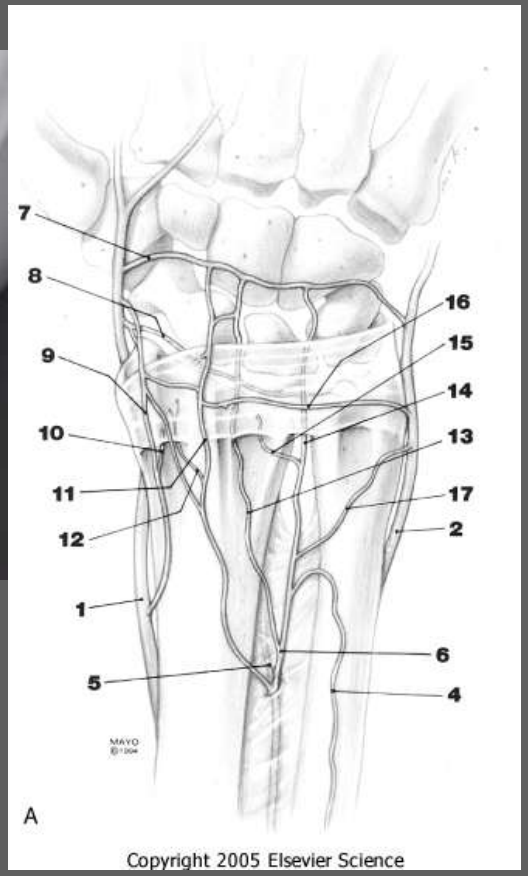
- Preiser’s

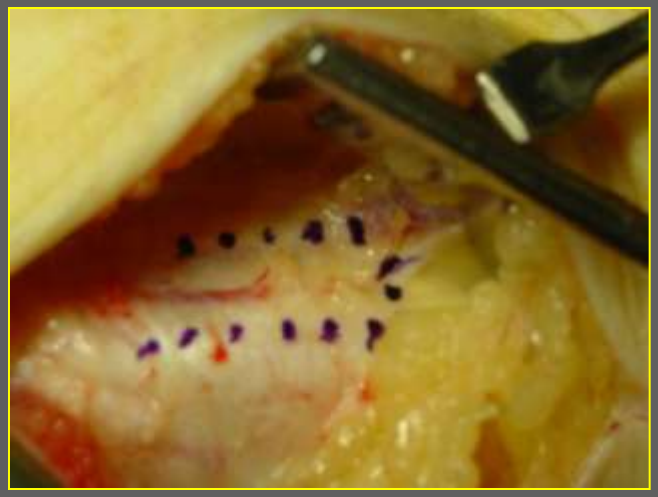
Scaphoid

- Proximal pole non-union



Vascularised bone graft





Kienbock's disease - 1910

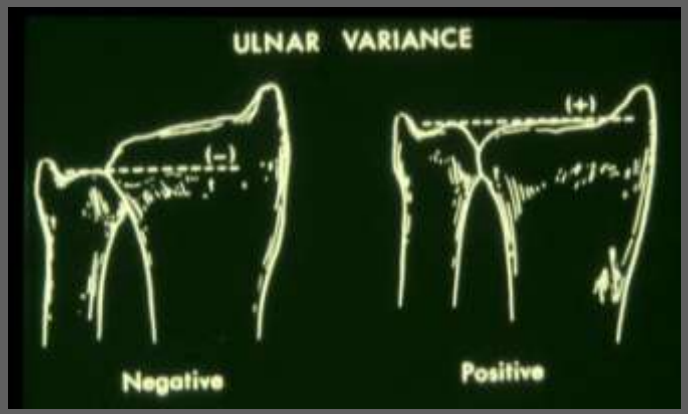
Repeated minor trauma to blood supply of lunate causing avascular necrosis

- Mechanical / anatomical factors

- 'susceptible' lunate

Ulnar Minus Variance

- Hulten (1920's)
  - 78% Kienbock's Disease
  - 33% General population



- Minus variance leads to increased shear stress across lunate

Vascular factors?

- Most normal lunates have a volar and dorsal arterial vessels (esp. volar as lunate dislocation rarely leads to avascular change)
- Vessels - branching configurations (I, X, Y)
- Systemic factors: hypercoagulability, corticosteroids, sickle cell, CP, septic emboli

Radiographic Stages - Lichtman

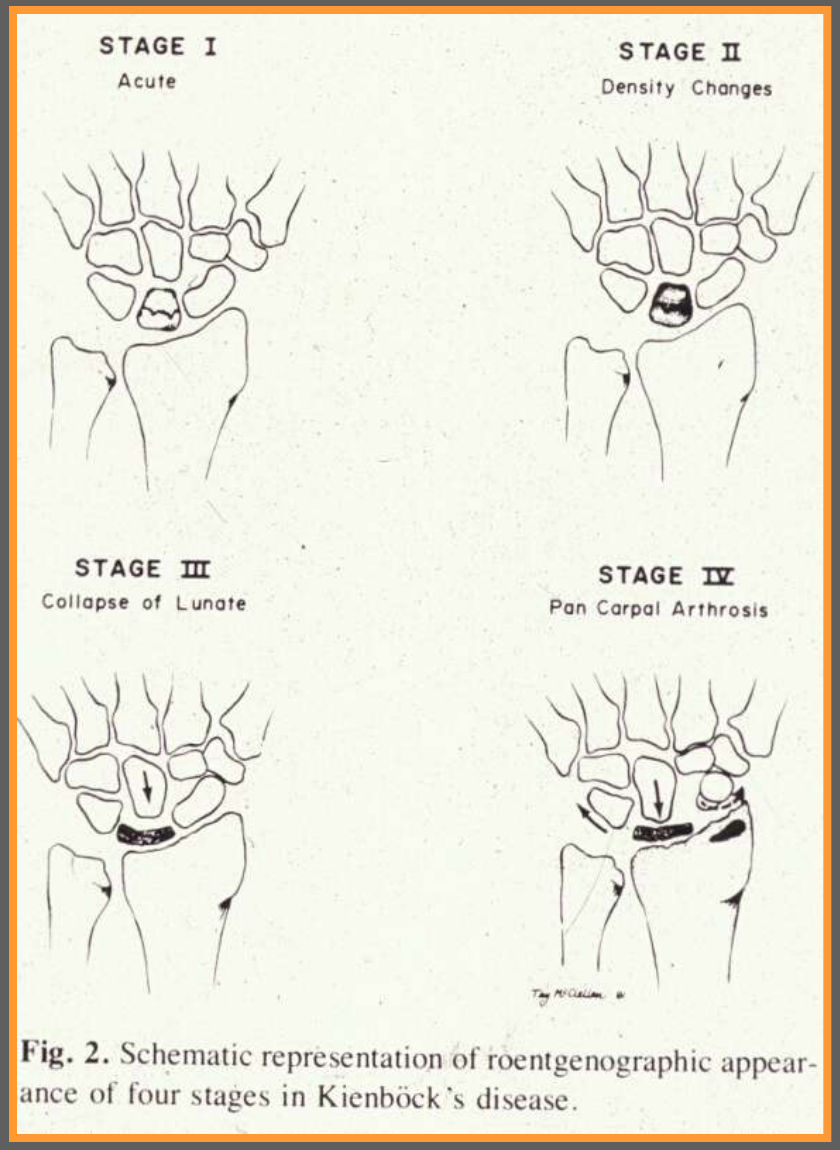


Fig. 2. Schematic representation of roentgenographic appearance of four stages in Kienböck's disease.

Stage I

Radiographic:

- Radiograph – normal
- MRI - Diagnostic (almost)

Clinical:

- Similar to wrist sprain

Stage II

Radiographic

- Relative density of lunate increased
- Normal wrist architecture

Clinical

- Painful synovitis

Stage III

Radiographic

- Lunate collapse
- Proximal capitate migration
- Decreased carpal height ratio

Clinical

- Pain, synovitis, stiffness

III-A

III-B

*Radiolunate angle over 60 degrees

Stage IV

Radiographic:

- Pan-carpal arthrosis

Clinical:

- Permanent decrease ROM
- Flare-ups of pain

Treatment

- Radiographic features do not always correlate with clinical findings
- Wide variation rate of progression
- Treat according to symptomology and deficit
- Always consider non operative first
- Surgery for those who fail conservative management and remain symptomatic
- Successful treatment – symptomatic improvement vs ??radiographic deterioration

Treatment: Stage I

Immobilization – how long?

5 months wrist pain

T-1 weighted MRI

T-2 weighted MRI

Treatment Stage I/II/IIIA if ulnar minus

= Radial Shortening

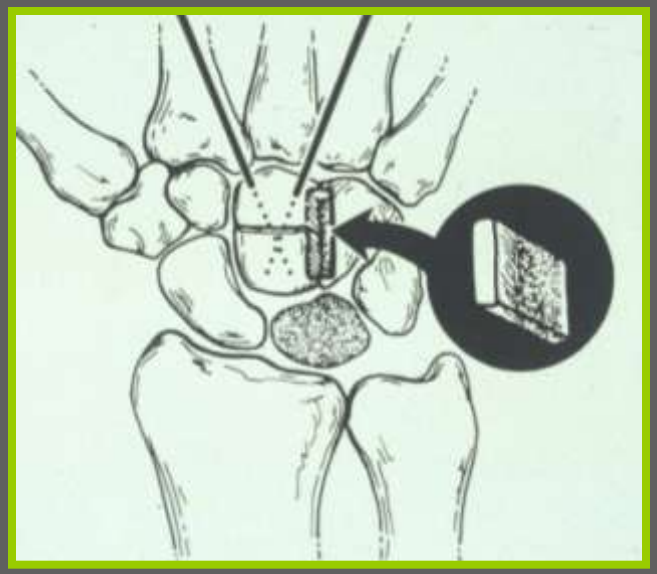
II/IIIA - if ulnar plus?

If ulnar plus?

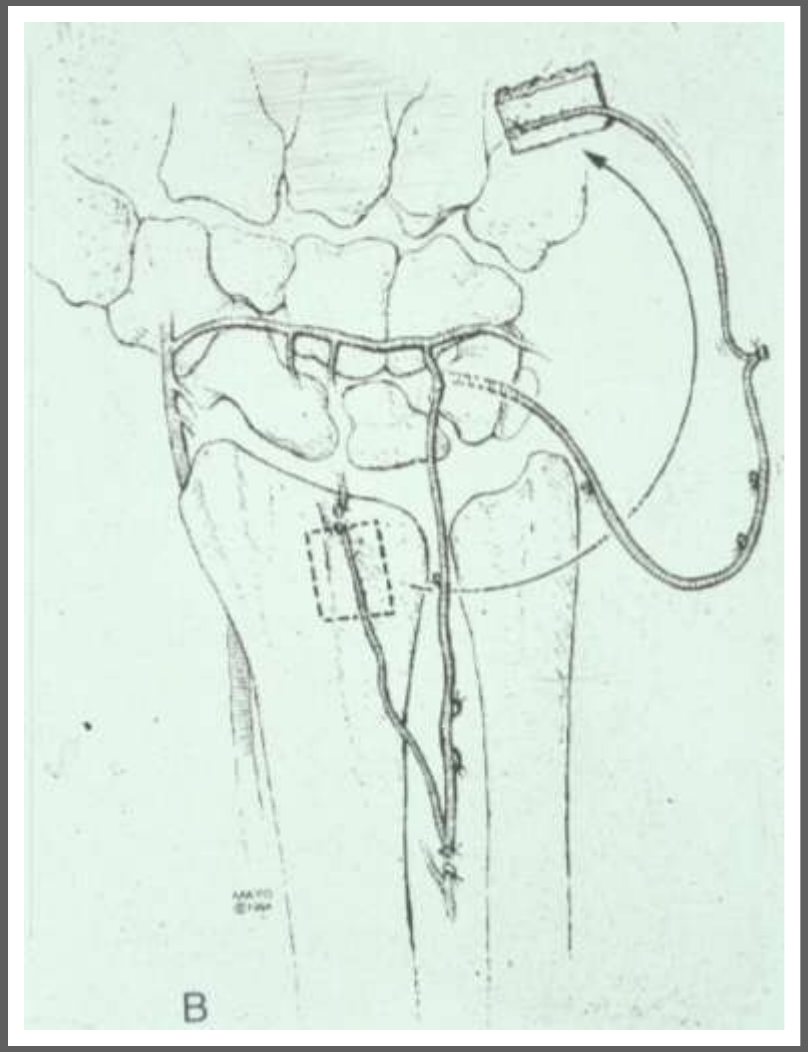
- Neurectomy
- Capitate shortening
- Direct revascularization
- Core decompression
- Wedge osteotomy
- Proximal row carpectomy

Capitate Shortening (Almquist)

Decreases radiolunate load by 66%
but
Increase radioscaphoid load by 150%



Dorsal Vascularized Pedicle



Treatment Stage IIIB (+/-)

- Radial shortening
- or
- Stabilize carpus:

  -STT fusion, or…

  -SC fusion

- Salvage procedure:

  - PRC

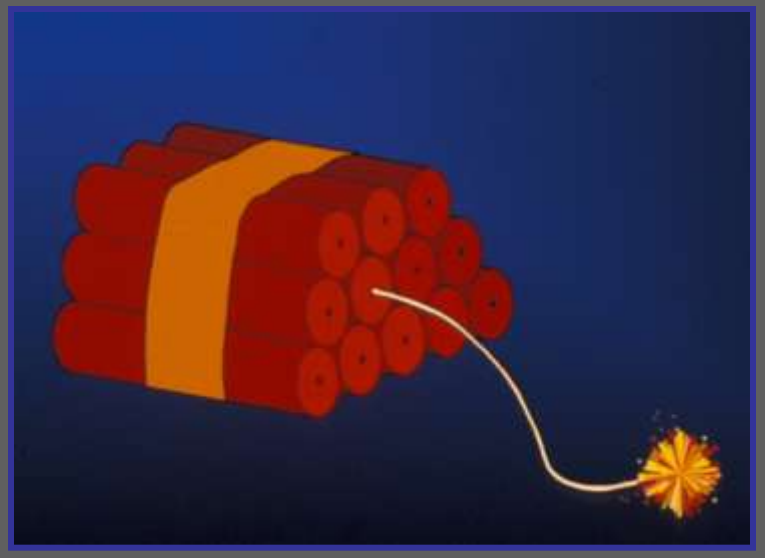
  - Wrist Arthrodesis

STT Fusion

Treatment Stage IV

Salvage Procedure

- PRC
- Wrist arthrodesis



Surgical Outcome of Radial Osteotomy for Kienböck's Disease—Minimum 10 Years of Follow-Up

Shukuki Koh, MD, Ryogo Nakamura, MD, Emiko Horii, MD, Etsuhiro Nakao, MD, Hironobu Inagaki, MD, Hiroki Yajima, MD,
Nagoya, Japan

The Journal of Hand Surgery / Vol. 28A No. 6 November 2003

- 62 cases radial shortening for stages 1 to 3B
- 25 followed up over 10 years
- Pain, grip strength and ROM improved
- Lichtman stages unchanged in 11, worse in 9, improved in 2 (?xrays in the other 3)
- 24 patients reported excellent results at at 5 yrs
- Results better in younger patients (<30yrs)

Work related arm pain

- ‘My pain came on at work, so...’
- More often subclinical problem aggravated / accelerated by work
- Causation
- Not found in medical textbooks

Diagnosis

- History!
- Epicondylitis, tenosynovitis, RSI
- Arm pain unknown origin
- factitious

Incidence pain

- Neck - 20% per week
- Shoulder – 17% consult GP/annum
- Arm – 13%

Industrial Injuries Advisory Council 2006 - prescribed diseases

- Tenosynovitis
  - Inflammation tendon sheath
- De Quervain's
  - ?due repetitive / unaccustomed activity

CTS

- Incidence <1%
- 90% unknown aetiology
- Risk factors - #, OA, diabetes, thyroxine, obesity

- ??repetitve wrist flexion / extension cause tenosynovitis and 2º CTS

IIAC

- >20 hours per week flexion / extension for 12mths of preceding 24mths and onset within 6months of leaving

Hand-arm vibration syndrome

- Symptom diagnosis
- Neurological – permenant
- Skin blanching – Stockholm classification

- CTS - ?vibration cause or aggravate

Epicondylitis

- Degenerative conditions
- No proven acute inflammatory phase

- Risk factors – age, smoking
- 14.5% incidence in manual workers

- Not related to work