

Kienböck Disease (Lunatomalacia)

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Kienböck Disease

- ▶ Avascular necrosis of lunate
- ▶ Unknown cause
 - Men; age 20-40
 - Dominant hand
 - Unilateral
 - Manual labor
 - 75% preceded by trauma



Etiology

- ▶ Microfractures → vascular compromise
- ▶ Repetitive compressive loading
- ▶ Compression of lunate
 - Between capitate and distal radius



Risk Factors

- ▶ Negative ulnar variance



Clinical Manifestations

- ▶ Wrist pain → forearm
- ▶ Stiffness, tenderness, swelling over lunate
- ▶ Pain with passive dorsiflexion of middle finger

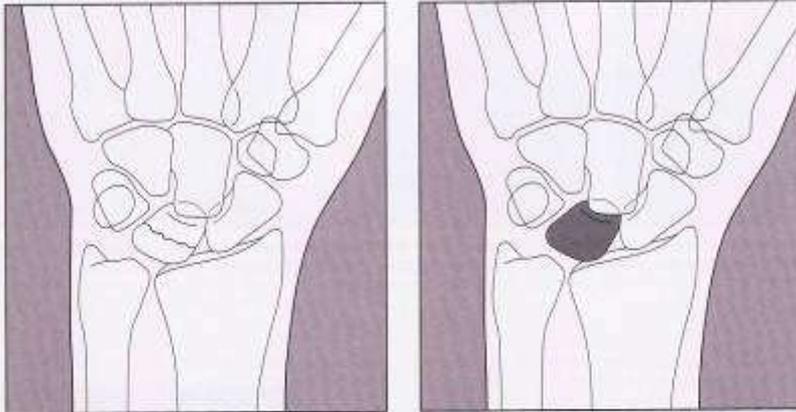


Radiographic Findings

- ▶ Sclerosis of lunate
 - May include negative ulnar variance
- ▶ Loss of height → fragmentation
- ▶ Further collapse → carpal instability
 - Degenerative joint changes, lunate cysts
- ▶ Involvement of entire wrist

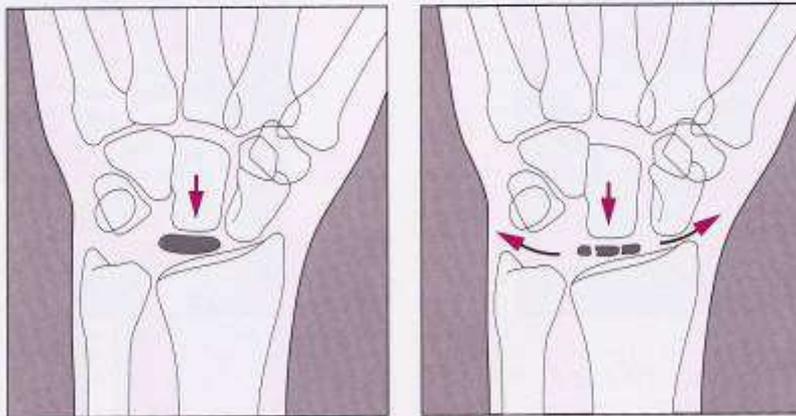
Classification

CLASSIFICATION OF KIENBÖCK DISEASE



Stage I

Stage II



Stage III

Stage IV

- ▶ Lichtman's Radiographic Classification
 - Stage 1: Normal architecture, evidence of linear or compression fracture
 - Stage 2: Definite density changes in lunate
 - Stage 3: Collapse of lunate
 - ▶ 3A: Without fixed scaphoid rotation
 - ▶ 3B: With fixed scaphoid rotation
 - Stage 4: Generalized degenerative changes in carpus

Stage 1



Stage 2



Stage 3



Stage 4

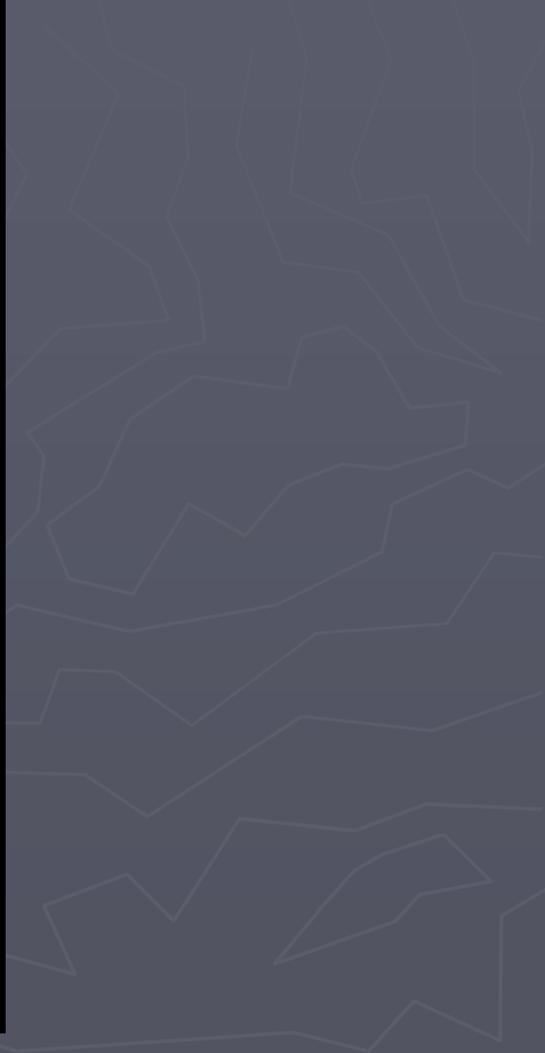


“Broken Canoe” Sign



3







Radiographic Diagnosis

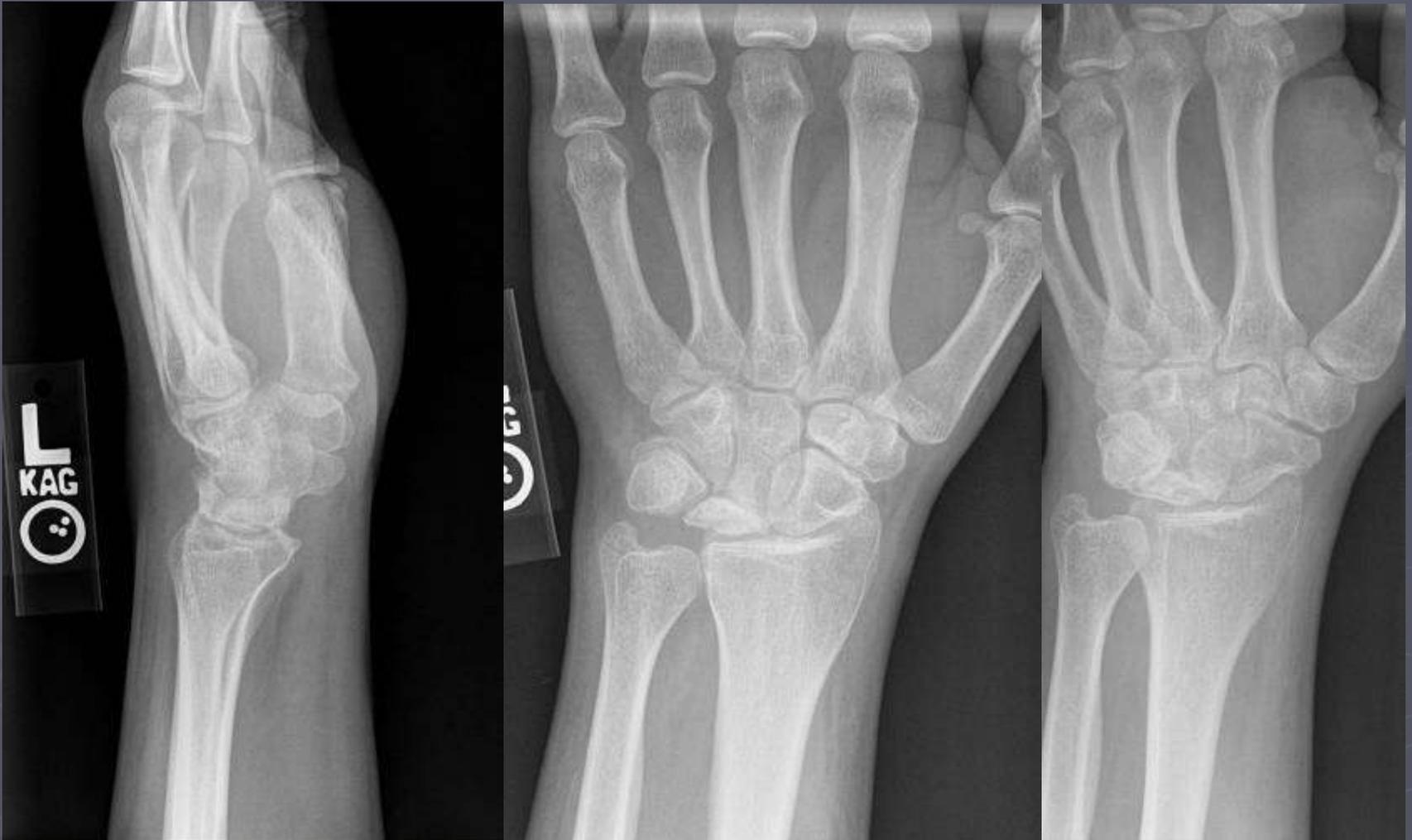
- ▶ Primary: plain film
- ▶ MR yet undefined role
 - Well-established for osteonecrosis
 - Coronal slices
 - Classify pattern and extent of damage
 - T1 spin echo
 - ▶ Focal loss of signal involving radial half of lunate
 - ▶ Diffuse loss of signal over entire lunate
 - T2 spin echo
 - ▶ Variable

Unknown Age/Sex





21 yo M



46 yo F









Operative Treatment

- ▶ Ulnar lengthening / radial shortening
- ▶ Proximal row carpectomy
- ▶ Lunate replacement
- ▶ Lunate revascularization
- ▶ Arthrodesis

Acknowledgements

► Dr. Tudor Hughes

