Scaphoid fractures in adults

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(with the help of Timothy Herbert)

The presentation can be downloaded in a.pdf format at www.homepage.mac.com/dumontierchristian

Scaphoid fracture

- Incidence, epidemiology ?
- Diagnostic ?
  - Clinical
  - Imaging techniques

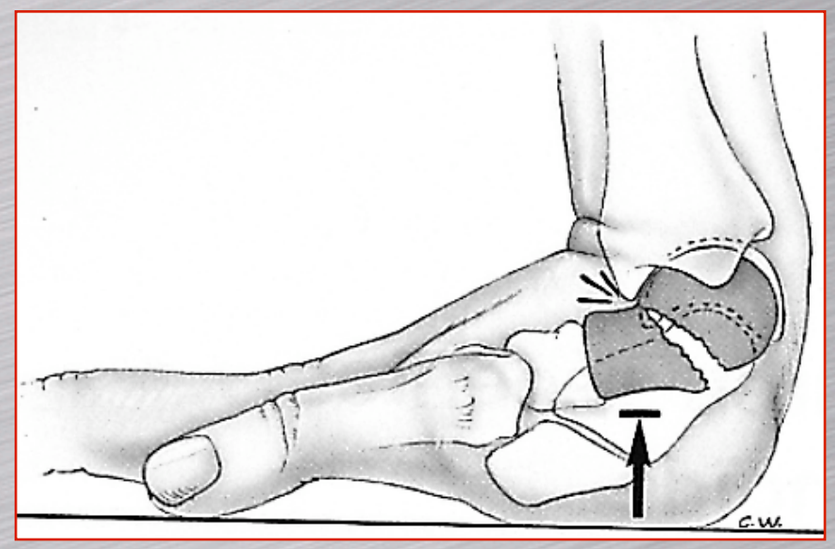
- Which orthopaedic treatment ?
- When to operate and how ?

Incidence

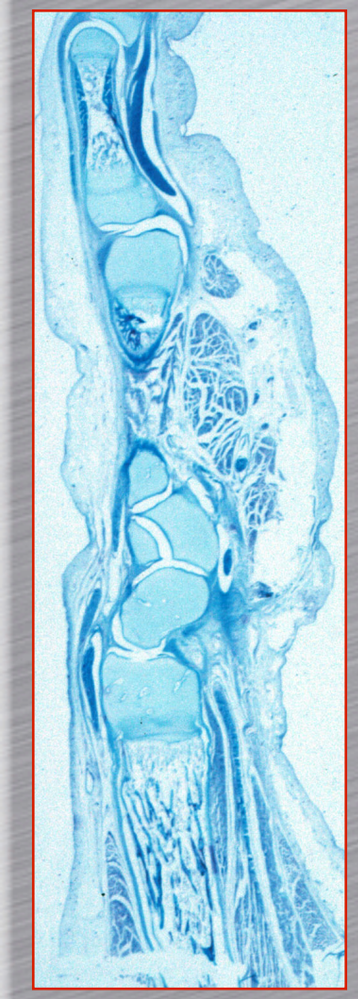
- Between 8 and 40 cases / 100,000 inhabitants
- 80% are males
- mean age was 25 years old
- 2% of all fractures, 11% of hand fractures and 60% of all carpal fractures

Clinical diagnosis

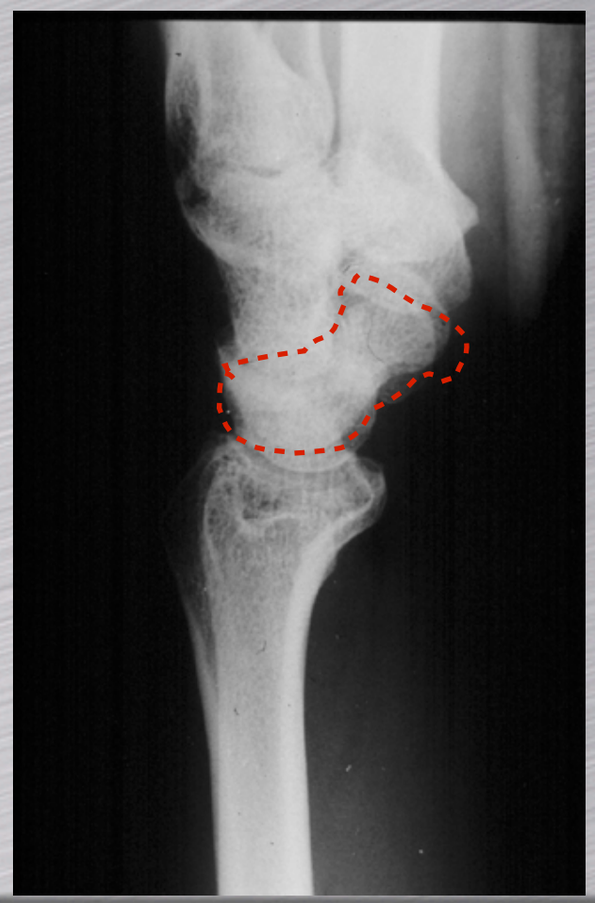
- Clinical signs are not specific, and even not sensible !
- It does not mean that wrist trauma patient should not be examined !
- We are looking for clinical signs of fracture
  - Pain during fracture mobilization
  - Haemarthrosis
  - A history of wrist trauma +++



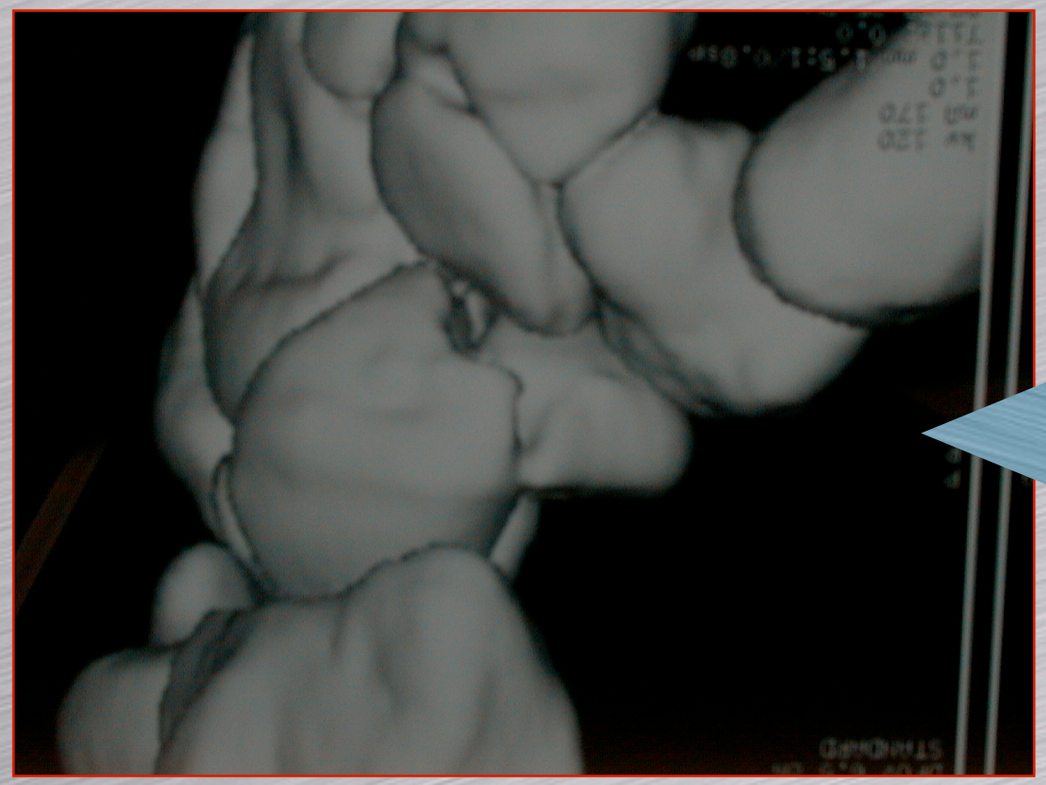
Radiographs



- AP and lateral views are necessary but not sufficient enough for diagnosis
  - Due to the spatial conformity of the scaphoid



Radiographs



- Most fractures are not displaced
- The beam is not parallel to the fracture line

- To enhance sensibility
  - Orientate the beam perpendicular to the long axis of the scaphoid (Schnek 1 & 2)

Radiographs

- To enhance sensibility
  - Pull on the thumb in ulnar inclination to open the fracture line (stress radiographs)

Radiographs

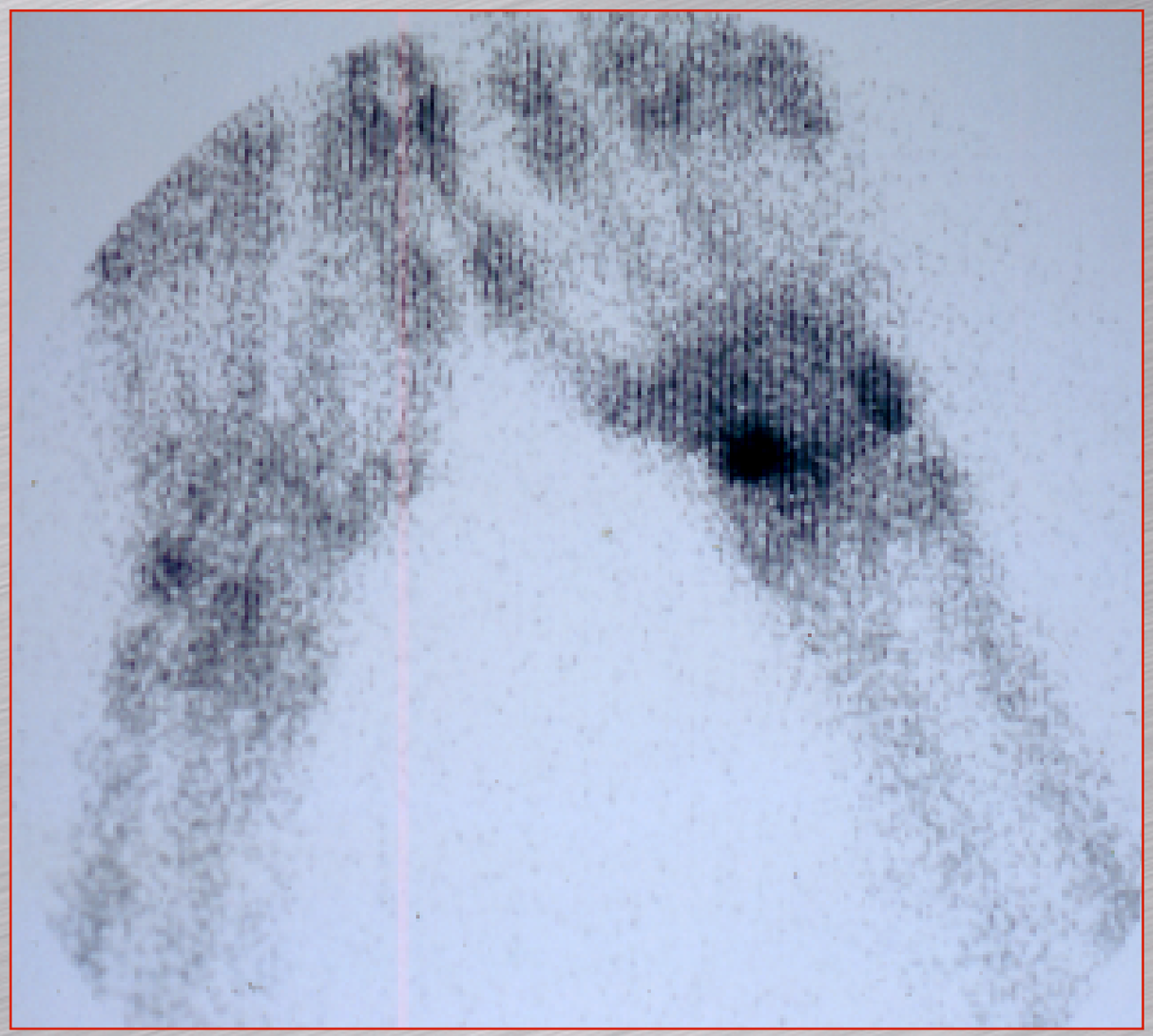
- To enhance sensibility
  - Orientate the beam perpendicular to the long axis of the scaphoid (Schneck 1 & 2)
  - Pull on the thumb in ulnar inclination to open the fracture line (stress radiographs)
  - Put the patient in plaster (not splint) and make new X-rays (out of cast) 2 weeks later

Are radiographs enough ?

- It is said that even with these techniques, 2 to 5% are still not diagnosed
- When to use sophisticated imaging techniques ?

Other imaging techniques

- Bone scan
- Sonography
- CT-scan
- MRI



Other imaging techniques

- Bone scan
- Sonography
- CT-scan
- MRI


LightSpeed Plus SYS#CT01_0C0 R 57 Institut de radio.
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KN S16.05
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DFOV 9.6cm
BONE
P
1
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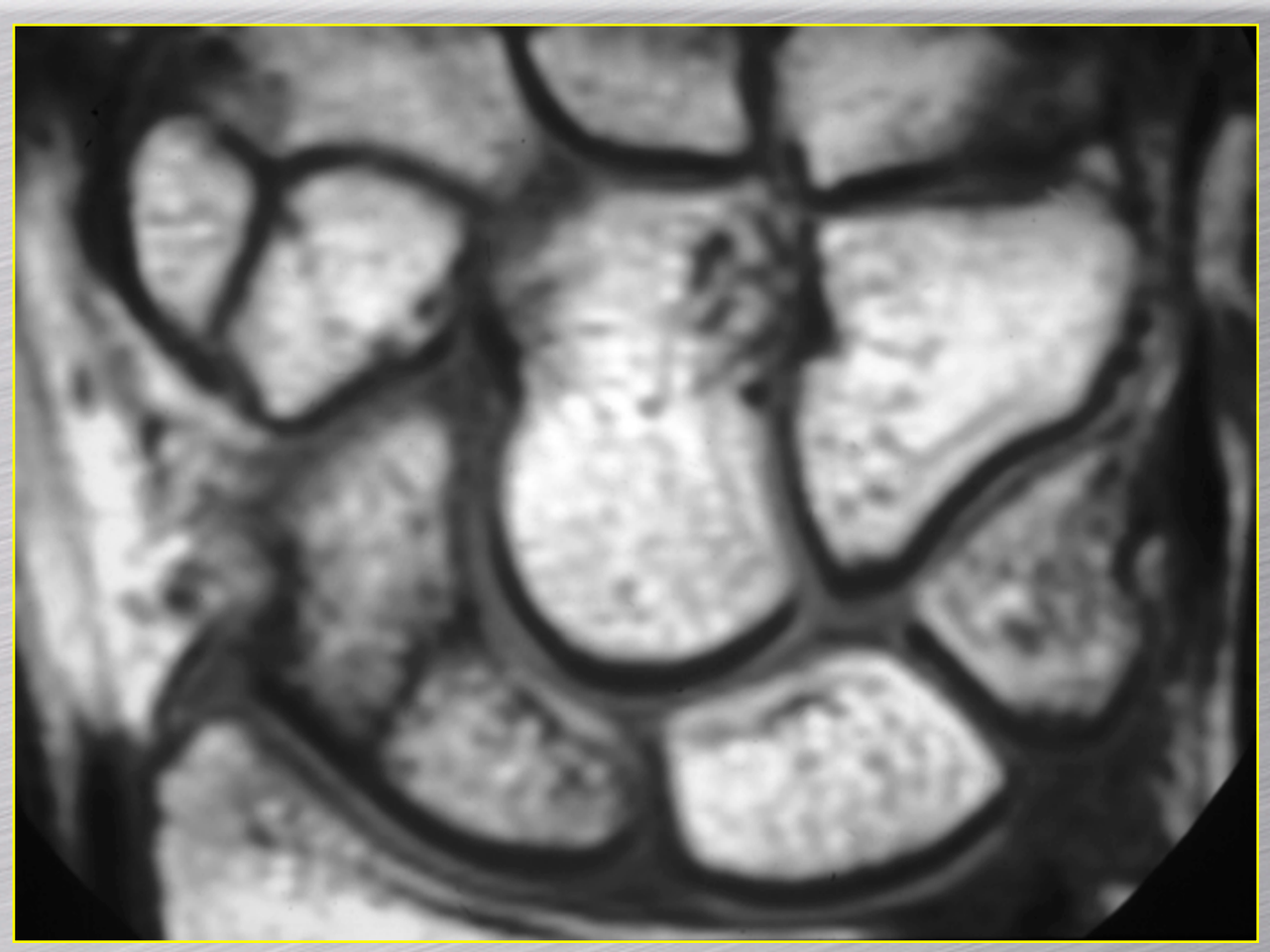
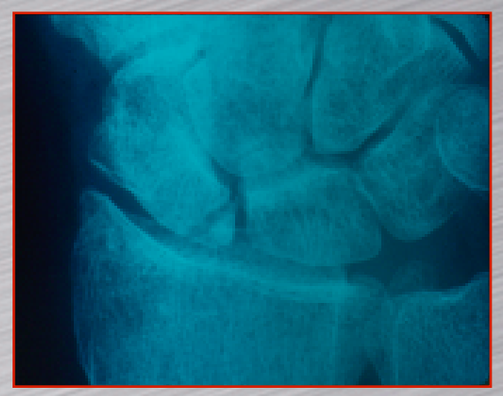


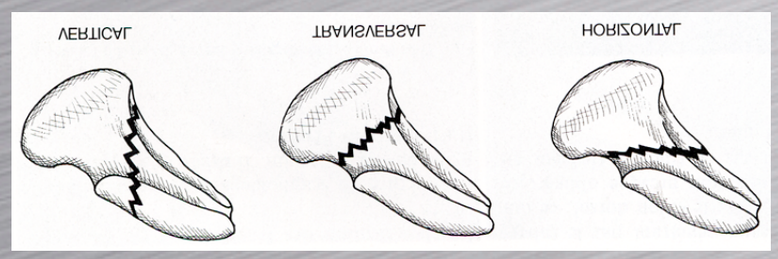
Classification(s)

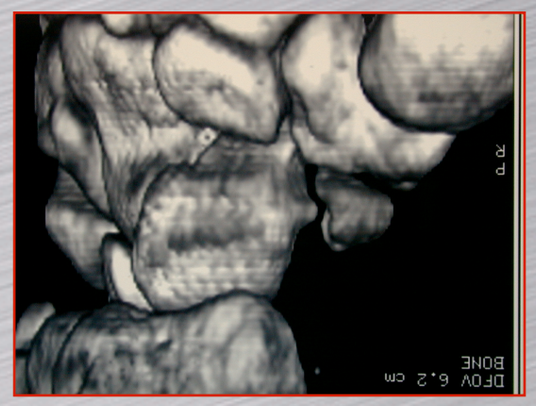
- A good classification should allow:
  - To choose the best treatment for that type of fracture
  - To give the patient a prognosis in term of healing and functional results

Classifications

- <u>Descriptive</u>
  - Displaced vs Un-displaced
  - Localisation (proximal Vs distal)
- <u>Functional</u>
  - Stable vs Unstable fractures

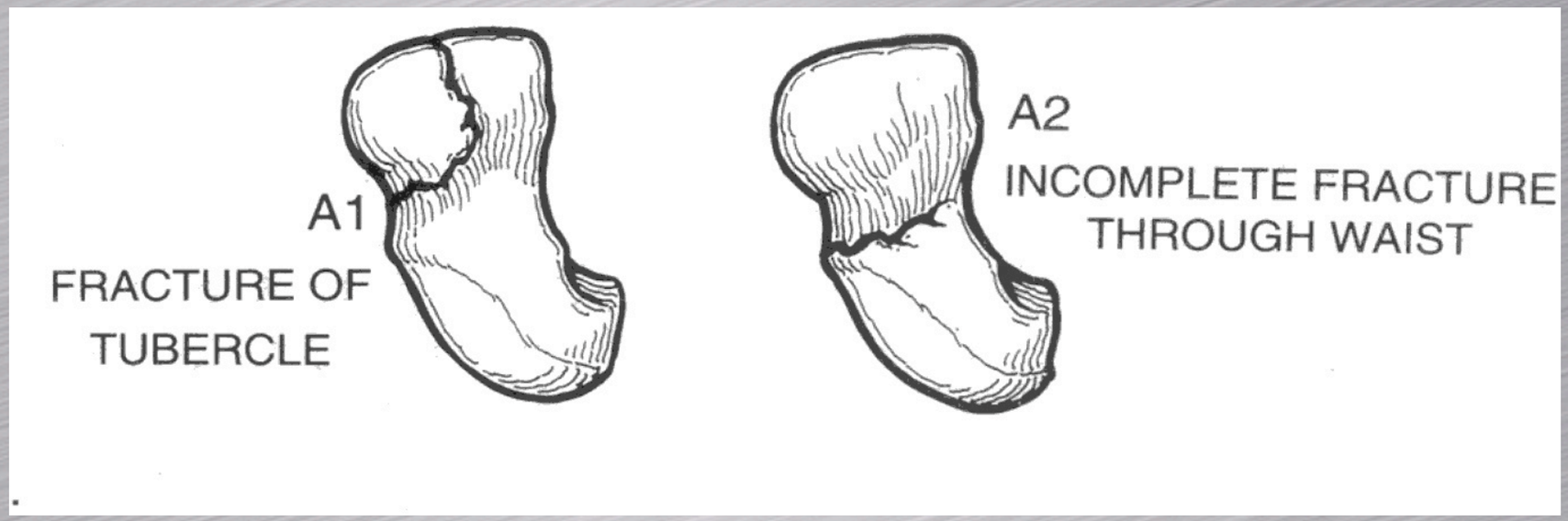




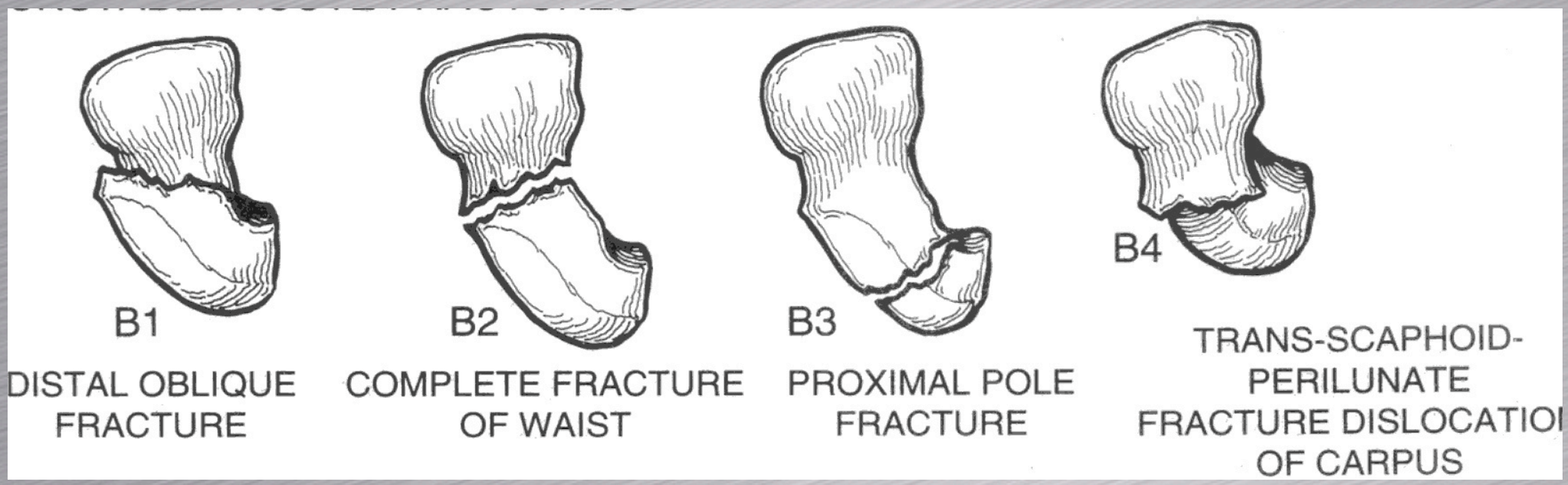


Herbert's classification

Type A: stable, orthopaedic TTT



Type B: unstable, surgical TTT

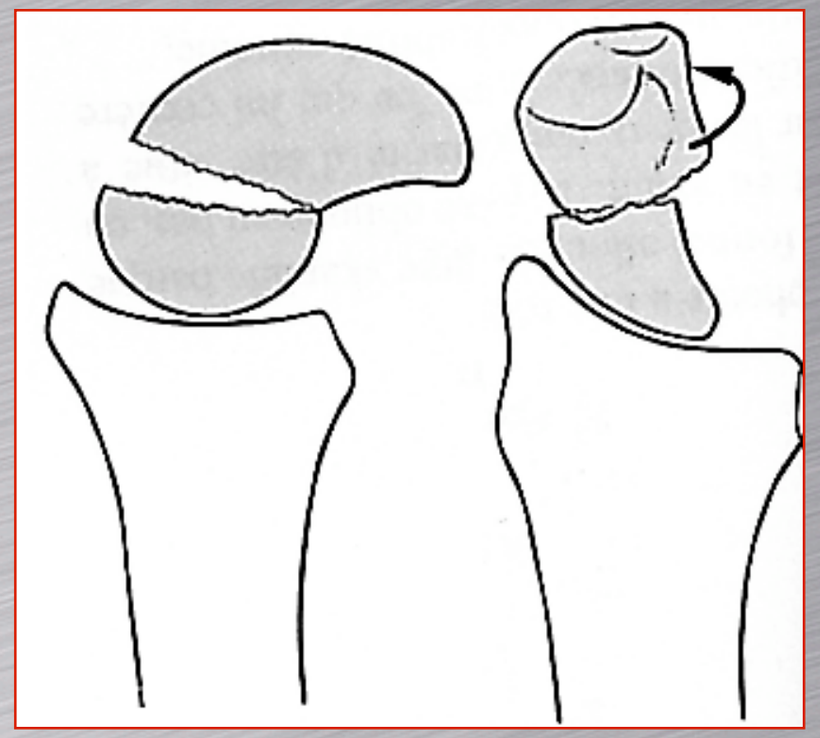


Treatment(s)

- Only Conservative
- Only Surgical
- Either conservative or surgical

Treatment must be surgical

- In all displaced fractures !
- Displacement consists of pronation and flexion of the distal part
- Displacement = associated (ligamentous) lesions

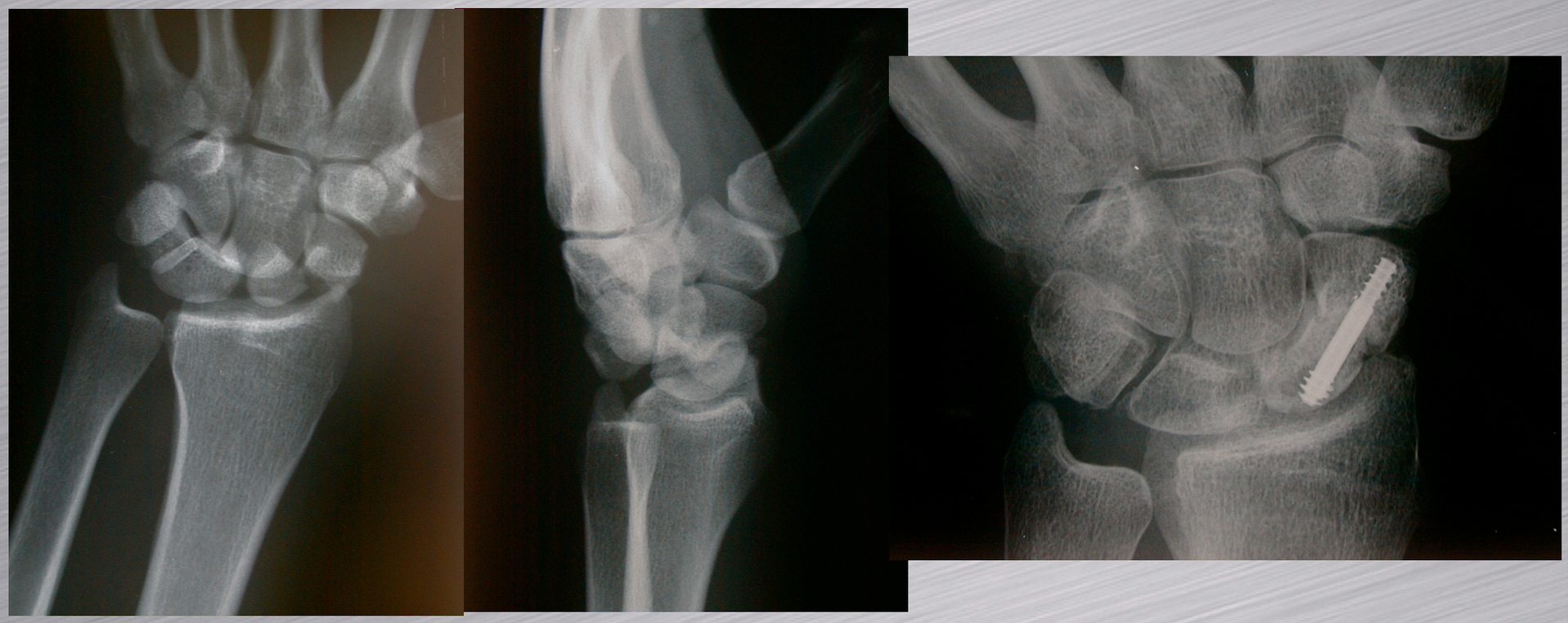


Treatment must be surgical

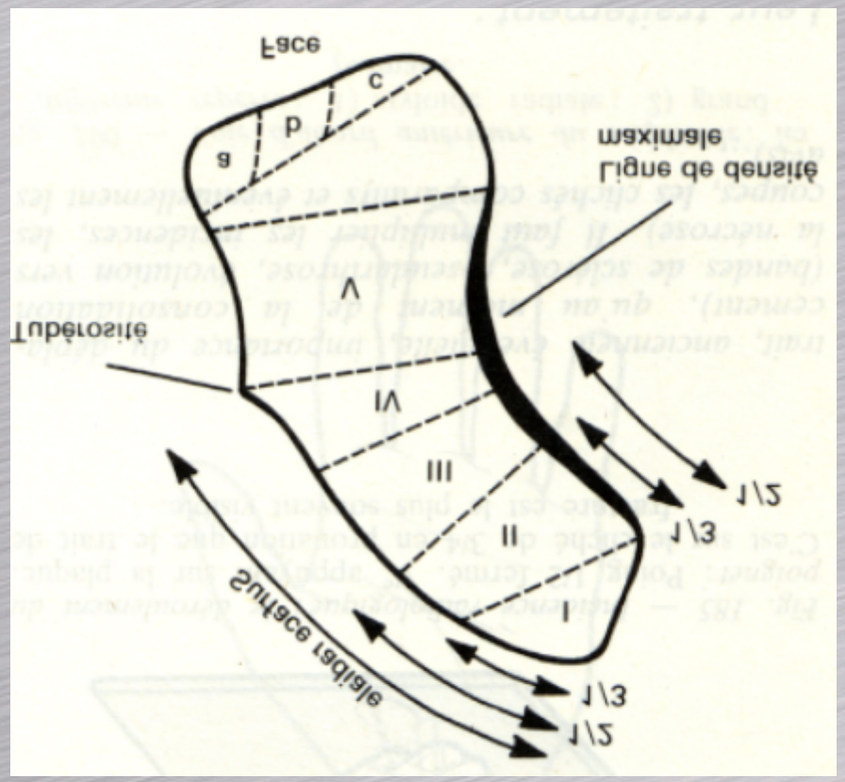
- In proximal pole fracture
  - Limited possibility of fixation in plaster
- High rate on non-union

Treatment must be surgical

- In associated lesions
  - Peri-lunate dislocation
  - Radius + scaphoid fracture
  - ...



Treatment must be conservative

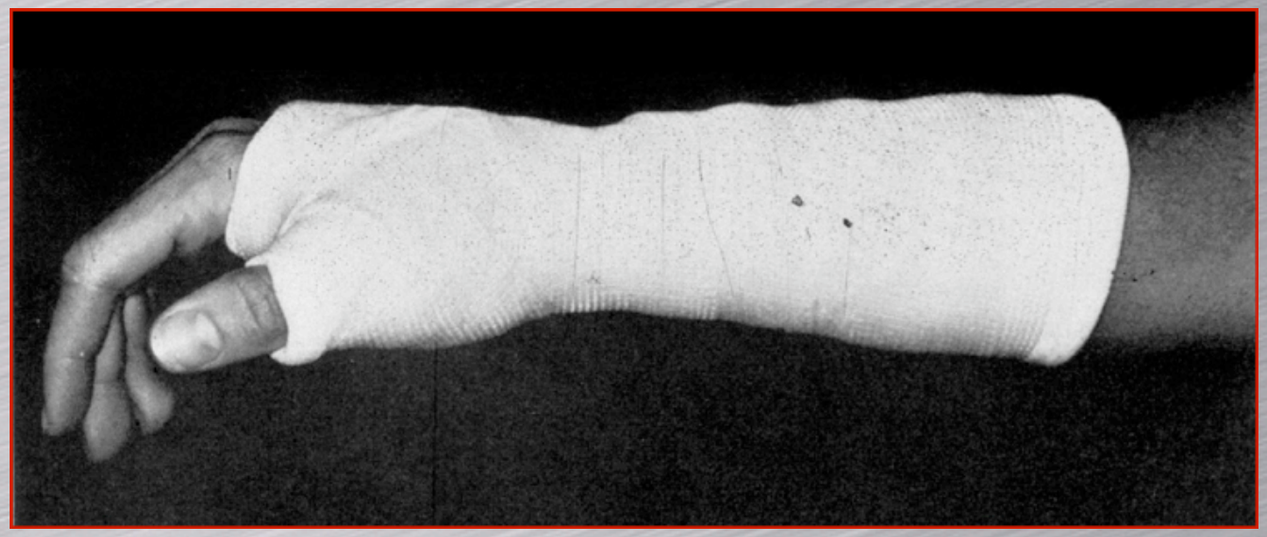


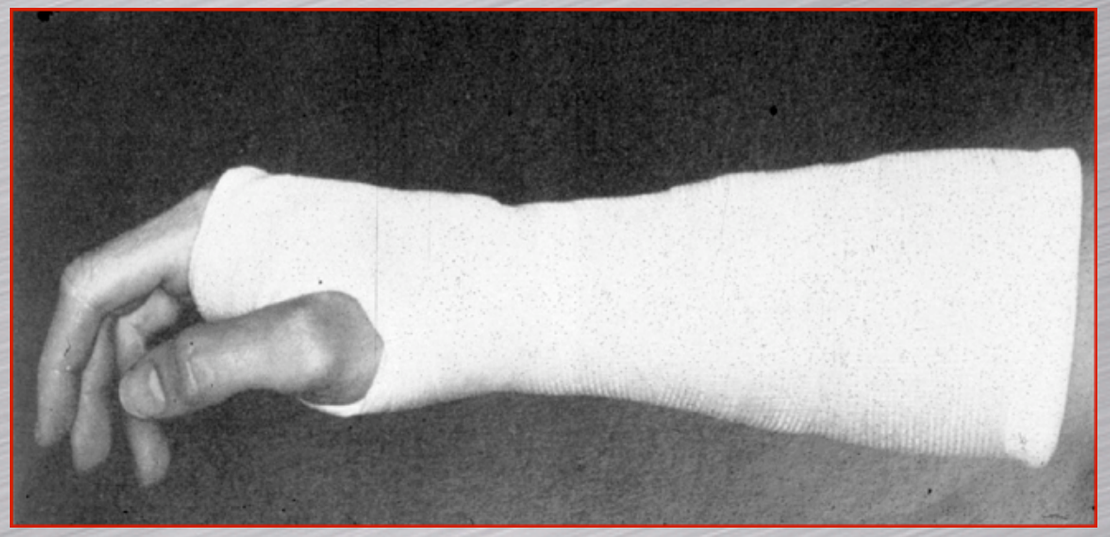
- In distal partial fracture (type VI a, b and c In Schernberg's classification)
- In incomplete fracture

Treatment can be conservative or surgical

- In non-displaced fracture
- In patients who do not accept a plaster
  - Blue-collar, sportsmen, You or I...

What is conservative treatment ?





Conservative treatment

- Immobilizing the wrist in neutral position
  - Below-elbow
  - Not including thumb

Conservative treatment

- A plaster or synthetic cast
- Changed every month with X-rays control

How long ?

- Quite empirical
- Waist fracture are immobilized 3 months (in France), 2 months (in the English world)

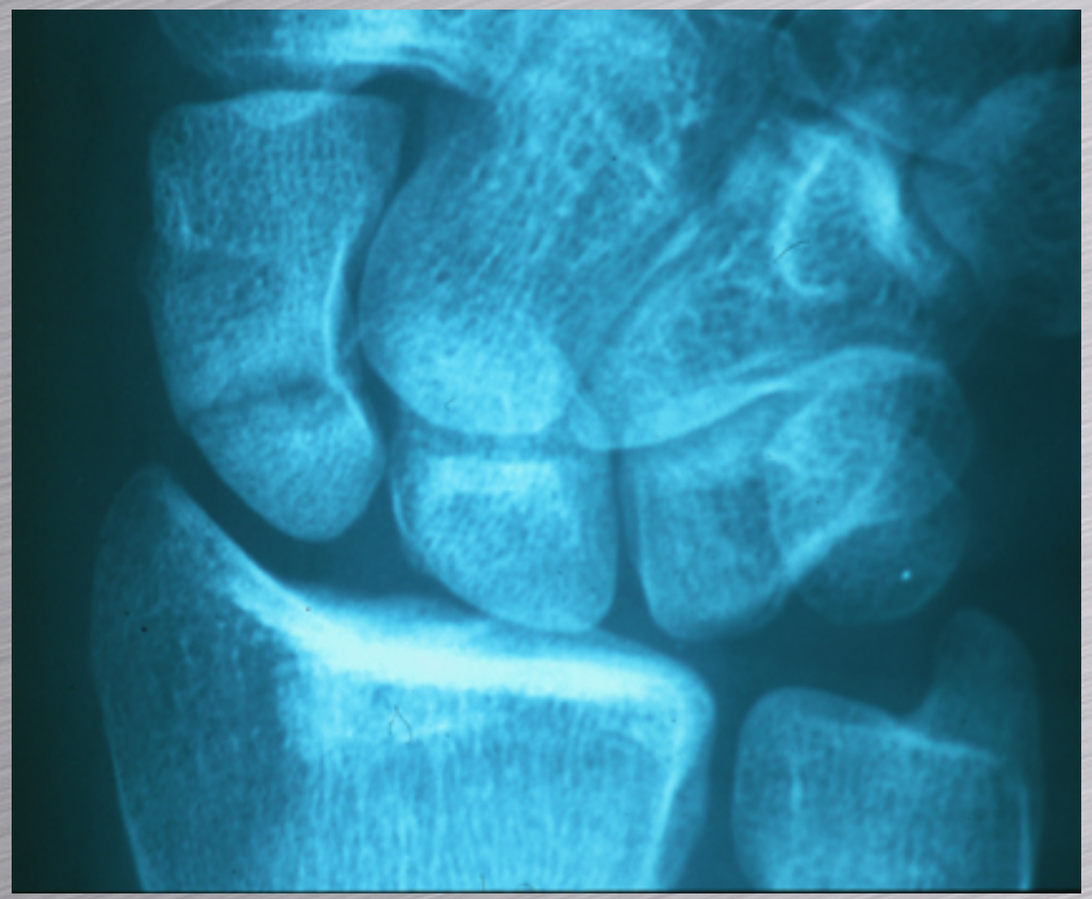
- It is impossible to appreciate healing on plain X-rays
  - Either you rely on successive X-rays at 6 and 12 months to appreciate healing
  - Either a CT or MRI may be used

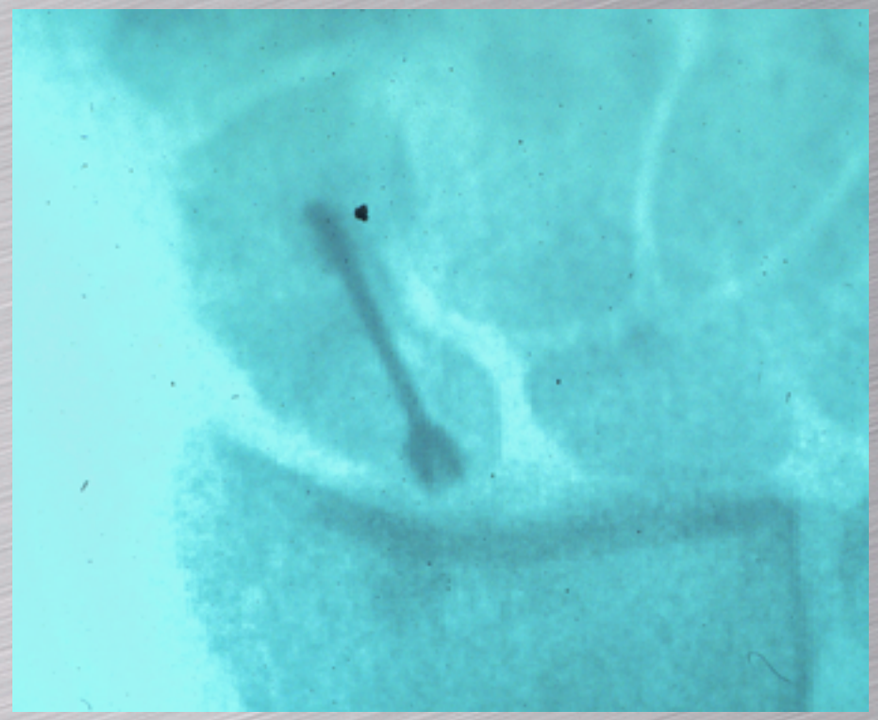
Rate of success ?

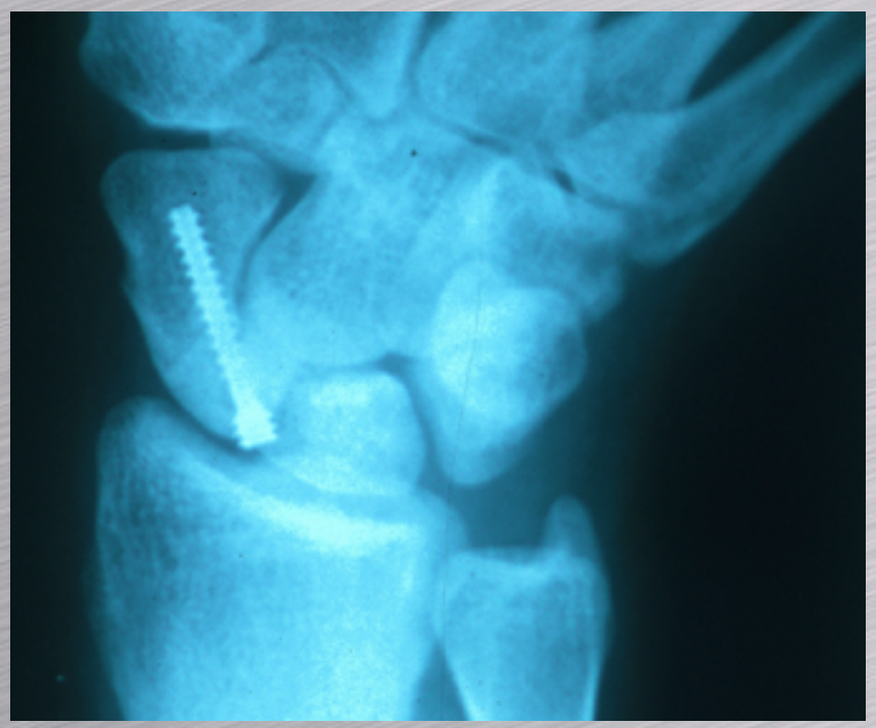
- Highly variable in the literature
- Rate of success diminishes while follow-up increases
- Estimated to be around 10%

Which surgical treatment ?

- Screws >> K-wires
- Cannulated screws > non-cannulated
- Per-cutaneous > open surgery
- Complementary immobilization is optional







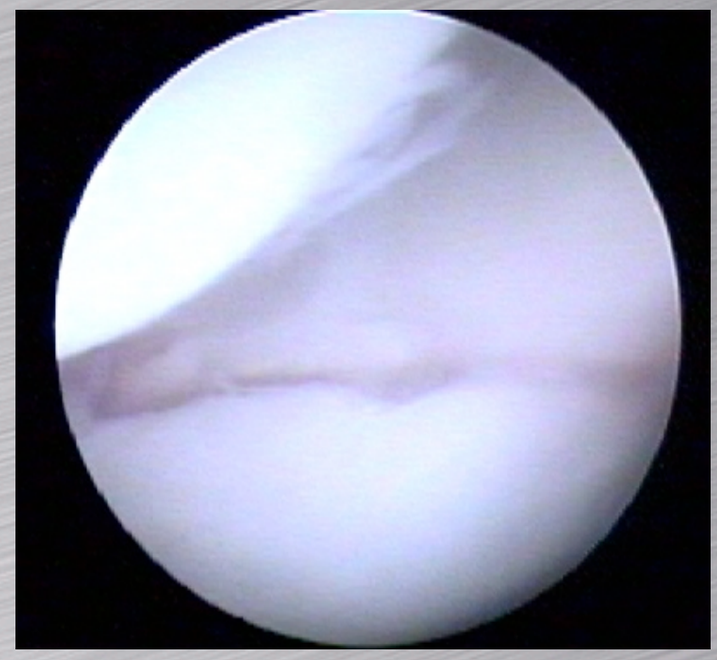
Dorsal approach

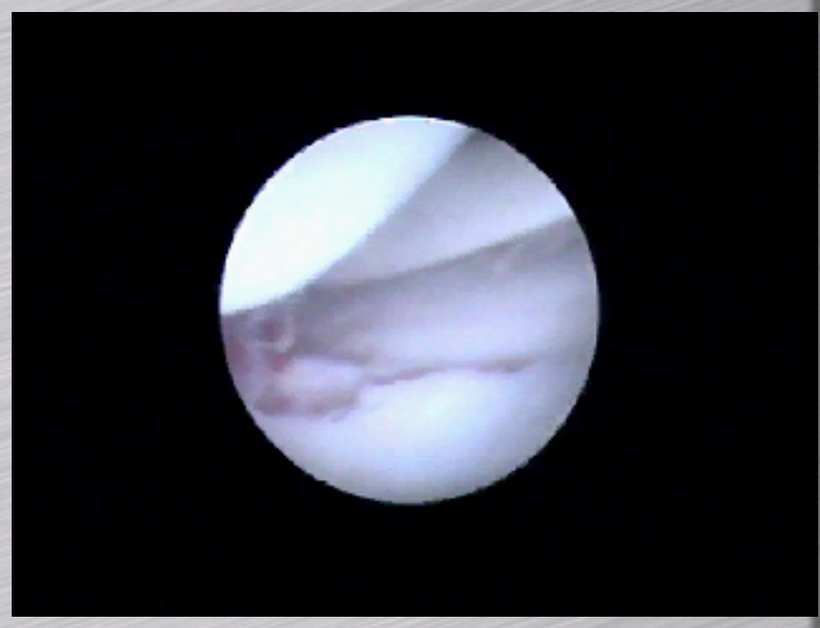
Palmar approach

Fluoroscopic control will help to choose the adequate screw

Arthroscopically assisted screw fixation ?

- Costly and time-consuming
- May help to perfectly reduced slightly displaced fracture
- May help to diagnose (and treat) associated ligamentous injuries





That's all folks

- In case of complications, you should see my colleague, Dr Kozin, next door