

# *The arthritic wrist* **Tricks and pitfalls**

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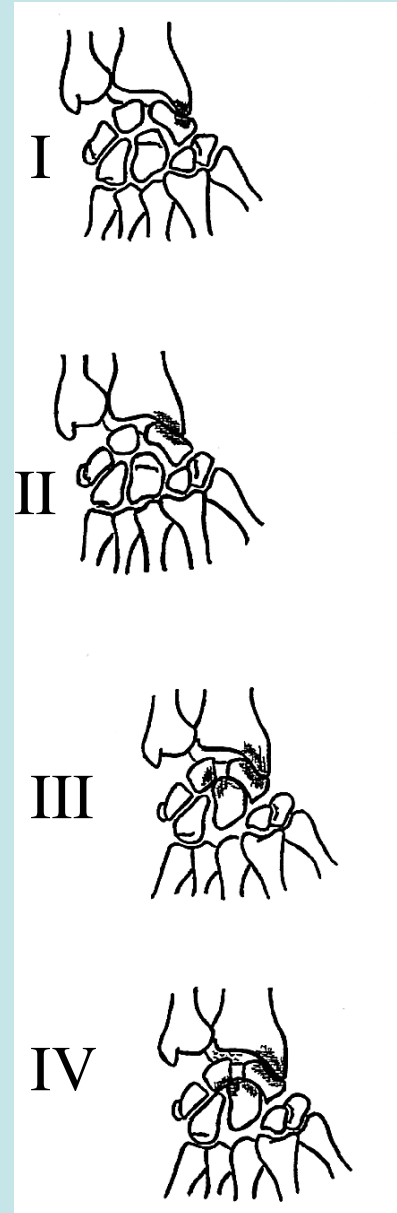


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# Criteria

- Patient
  - Pain, strength, mobility
  - Functional demand
  - Results of medical treatment
- Watson grade
  - SLAC, SNAC, or SCAC wrist
- Surgeon experience



*Arthritic wrist*

## Surgical procedures

- Styloidectomy and other ectomy
- Partial implant of scaphoid
- Distal scaphoid resection
- Proximal row carpectomy
- Partial wrist fusions
- Total wrist fusion
- Denervation
- Wrist arthroplasty

# Styloidectomy

- Remove the impingement and synovitis
- Grade I +/- II
- Not efficient in SLAC
- Better in
  - very old SNAC I or II
  - Scaphoid malunion
- Arthroscopic procedure
- No literature



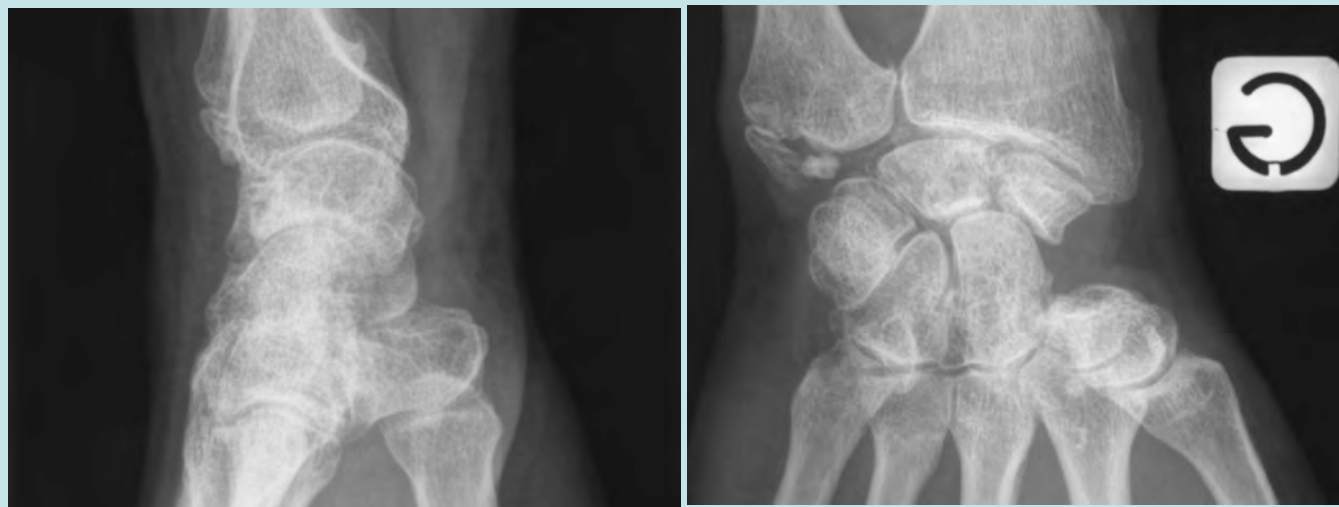
# Partial implant of scaphoid

- Pyrocarbon (*APSI Bioprofile*)
- Péquignot JP *Chir Main* 2000 276-85
- SNAC II
- Styloidectomy associated



# Distal scaphoid resection

- Malerich *J Hand Surg Am* 1999 1196-1205
- SNAC II
- Better on stiff wrist
- Palmar approach



4 yrs

# Proximal row carpectomy

- SLAC - SNAC II
- Postop. posture splints
- Long time of strength collapse
- Radiocapitate change at long term



10 yrs

# Partial arthrodesis: indications

- SNAC - SLAC III +++



- SNAC - SLAC II

Alternative option with

- PRC

- Distal scaphoid resection

- Malerich 1999

- Pyrocarbone implant

- Péquignot 2000



# Options for partial wrist fusion

+ scaphoidectomy

SNAC, SLAC III

- 4 bones fusion (LCTH)
- 3 bones fusion (LCH)
- 2 bones fusion (LC)

Scaphoid conservation

SLAC I

- Scaphocapitate
- Scapholunocapitate
- Scapholunate
- STT

RSL joint destruction

- radioscapholunate

# Partial arthrodesis with scaphoid excision: rationale

- To remove the radioscapoid impingement
- To stabilize the midcarpal joint
  - with possible correction of
    - DISI deformation
    - ulnar translation
- To preserve
  - carpal height
  - the safe radiolunate joint



# Partial arthrodesis

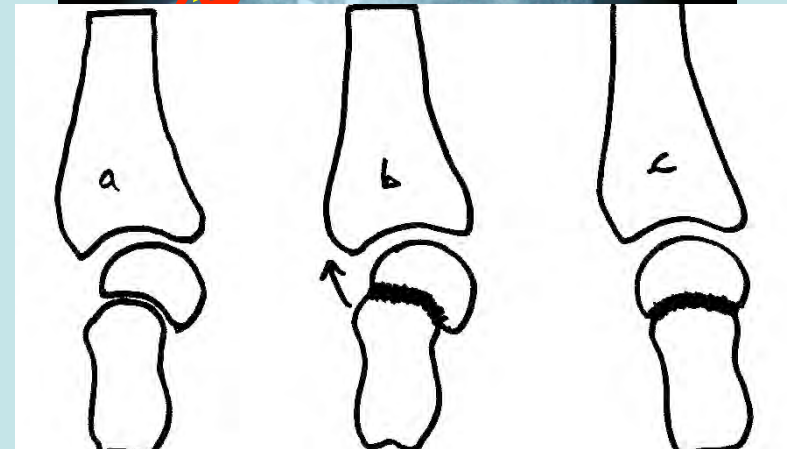
- Common points
  - Scaphoidectomy
  - Central column arthrodesis
- Different procedures
  - Capitulum fusion
  - 4 bones fusion
  - Capitulum fusion with triquetrum resection



# Capitolunate fusion Watson (early 80')

## Technique

- Dorsal or lateral (Kadji) approach
- Carpal realignment
- Preservation of the carpal height
- Fixation: wires, screws, plate, staples



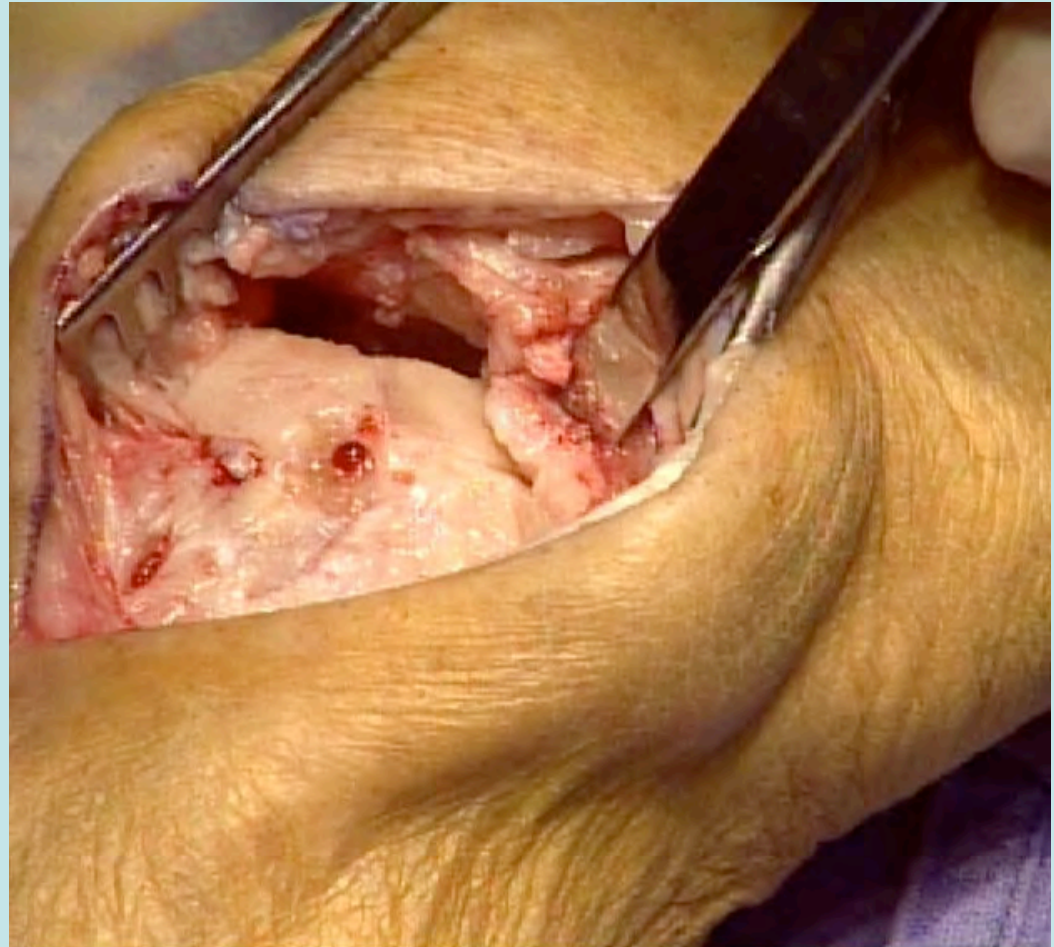
# Capitolunate fusion: results



	F/E range of motion	Strength % of controlateral	Nonunion
Krakauer 1994	50°	80%	50%
Kirschenbaum 1993	60°	(25 kg)	30%
Ashmead 1994	72°	80%	30%
Chaise 1996	59°	65%	0%
Kadji 2002	60°	80%	18%
Kitzinger 2003	62°	80%	30%

# 4 bone fusion (Watson 1984)

- technique
  - Dorsal approach
  - PIN denervation
  - Scaphoid removing
  - Dorsal osteophytis removing
    - Radius, lunate, capitate, triquetrum



# 4 bone fusion: carpal realignment



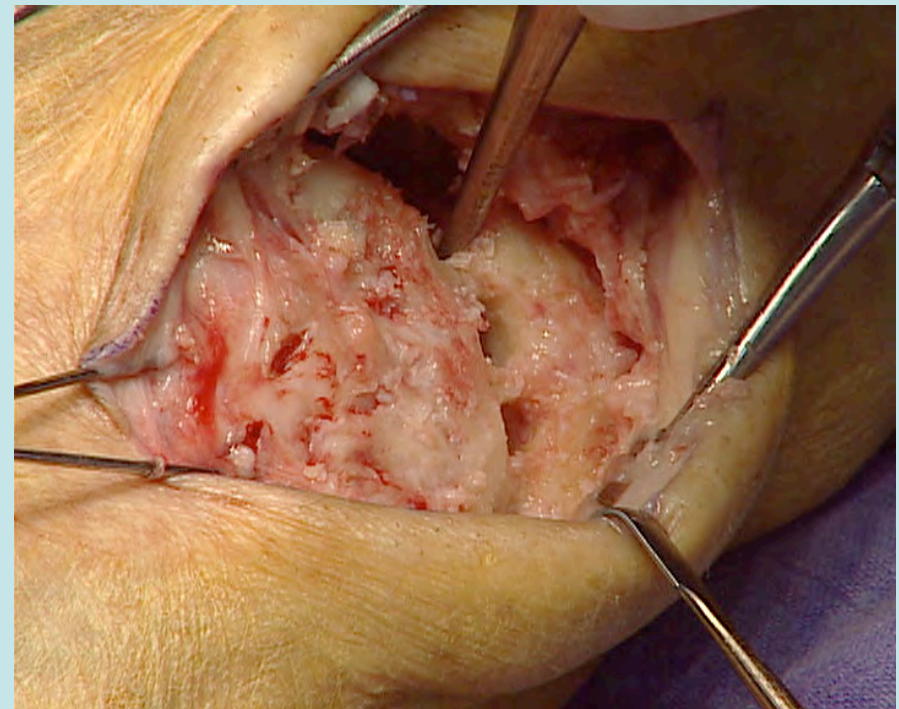
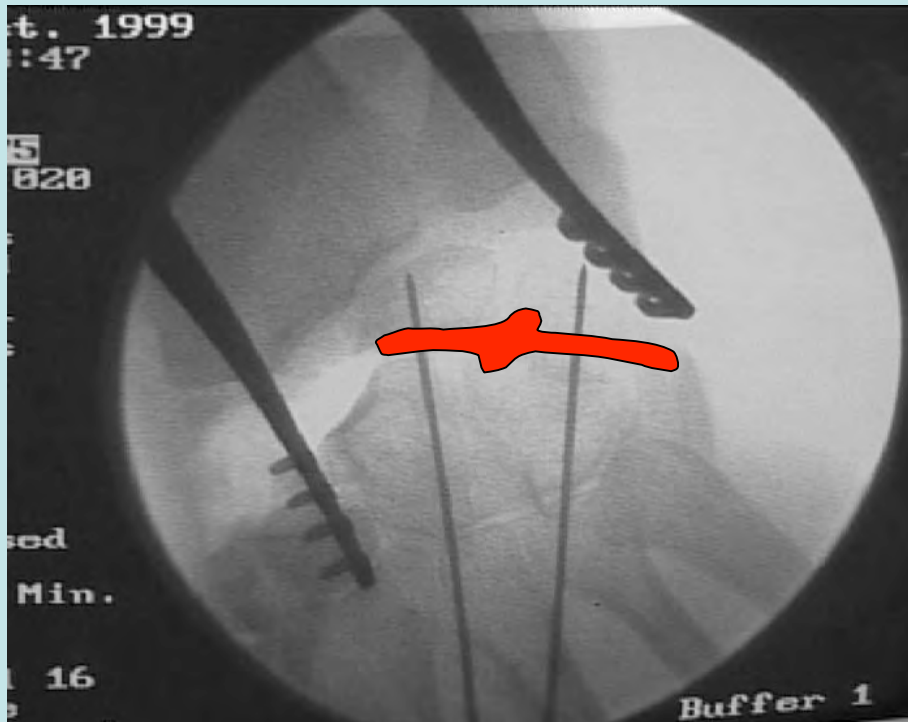
# 4 bone fusion: carpal realignment

- Antero-posterior tilt
- Extension
- Axial compression
- Lateral translation
  
- Transcient K-wires fixation
- Fluoroscopy checking





# 4 bone fusion: midcarpal joint decortication



# 4 bone fusion: midcarpal joint grafting

## Cancellous bone

- Scaphoid
- Distal radius
- Olecranon
- Iliac crest
- allograft + bone substitute  
(Tomaino 2001)

## Packed grafting

## Manual axial compression

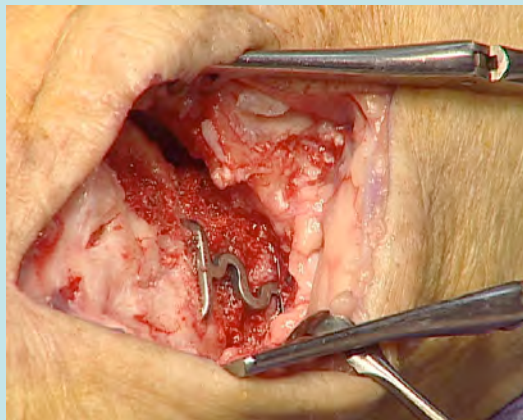


# 4 bone fusion: fixation

- K-wires
- Cortical graft (Garcia-Lopez 2001)
- Screws
- Plates
- Shape memory staples



# 4 bone fusion: quadripodal staple fixation (*QUA Memometal*)



# 4 bone fusion: post-operative care

- Anterior splint 4 wks
- Early mobilisation before 3 wks post op?



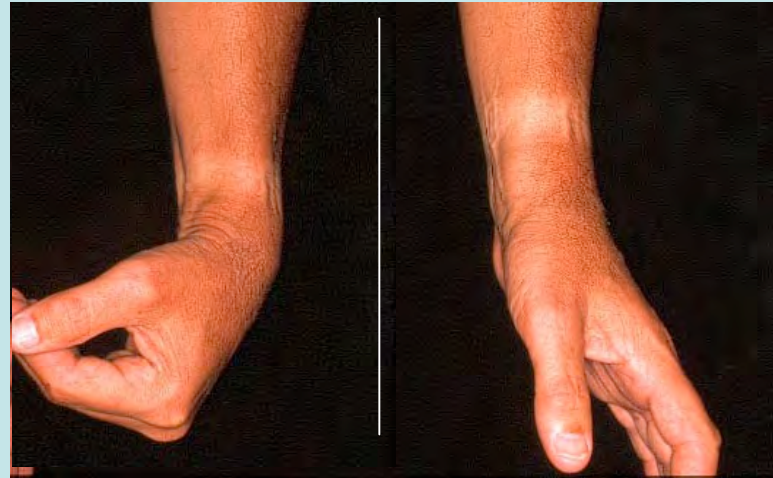
# 4 bone fusion: results

SLAC & SNAC	Range of motion flex-ext	Strength % of controlateral	Nonunion
Watson 1984	108°	82%	5 %
Voche 1993	44,5°		0 %
Tomaino 2001	72°	58%	0 %
Krakauer 1994	54°	80%	9 %
Wyrick 1995	67°	74%	17 %
Dagrégorio 1998	54°	79%	0 %
Sauerbier 2000	54°	65%	2,9 %
Bertrand 2002	70°	59%	5,8 %

Our series 60 cases > 1yr	52° (- 30°)	69% (+13%)	0%
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# 4 bone fusion: prognostic factors

- Delay
- SLAC
- Luxation
- Carpal realignment
  - Dagrégorio 1998
  - Bertrand 2002



# Capitolunate fusion with resection of the triquetrum

- Delattre 1997
  - Shortening fusion
  - 3 bones fusion



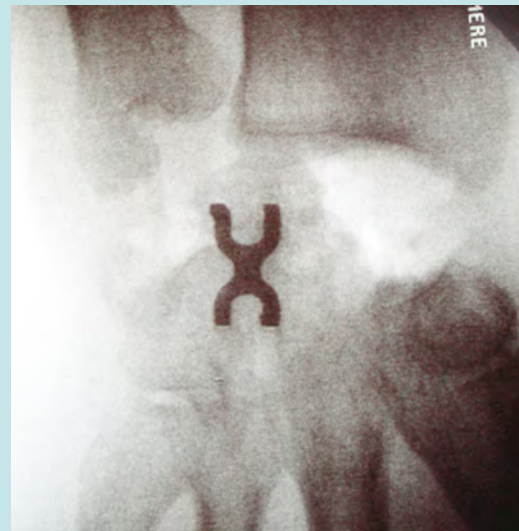
Calandruccio

Alnot

Delattre

- Calandruccio 2000
  - = 4 BF

- Alnot 2002
  - Shortening fusion
  - > 4 BF
  - = PRC





# Partial arthodesis

With conservation of scaphoid (SLAC wrist)

- Radio scapholunate fusion
- Scapho-capitate fusion
- STT fusion
- Scapho-lunate fusion

# Radio-scapho-lunate fusion

- Remove the distal scaphoid
- Usefull range of motion



# Scapho-capitate fusion

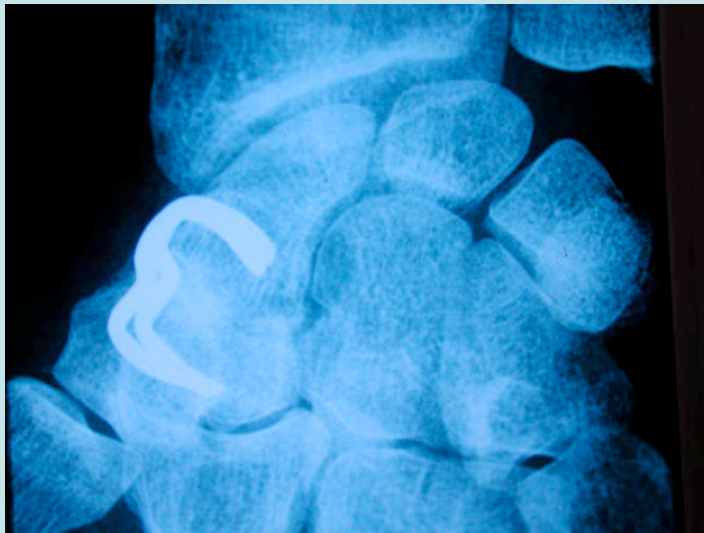
- Avoid radio-scaphoid impingement



7 yrs

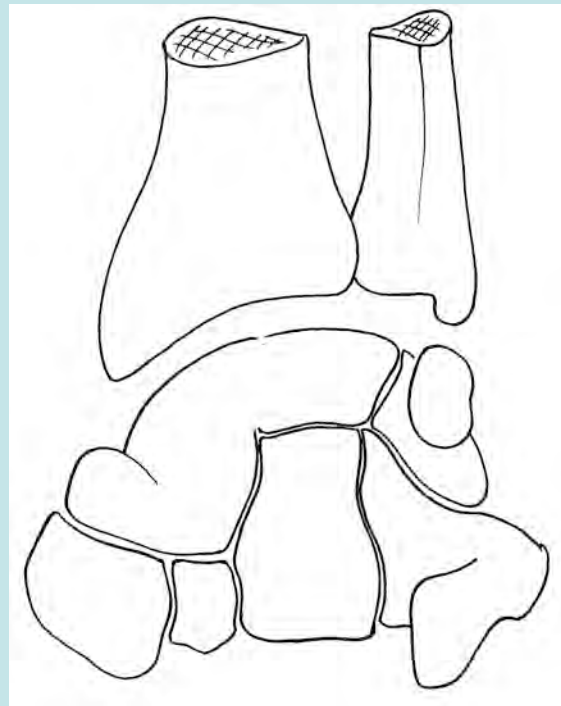
# STT fusion

- Avoid radio-scaphoid impingement
- Semi-flexion position of scaphoid



# Scapho-lunate fusion

- Try to fusion it
- Avoid radio-scaphoid impingement



# Partial arthrodesis: conclusion

- All procedures are
  - Salvage procedure
  - Very efficient on pain
  - Preserve some motion
  - Preserve some strength



# Partial arthrodesis: What procedure ?

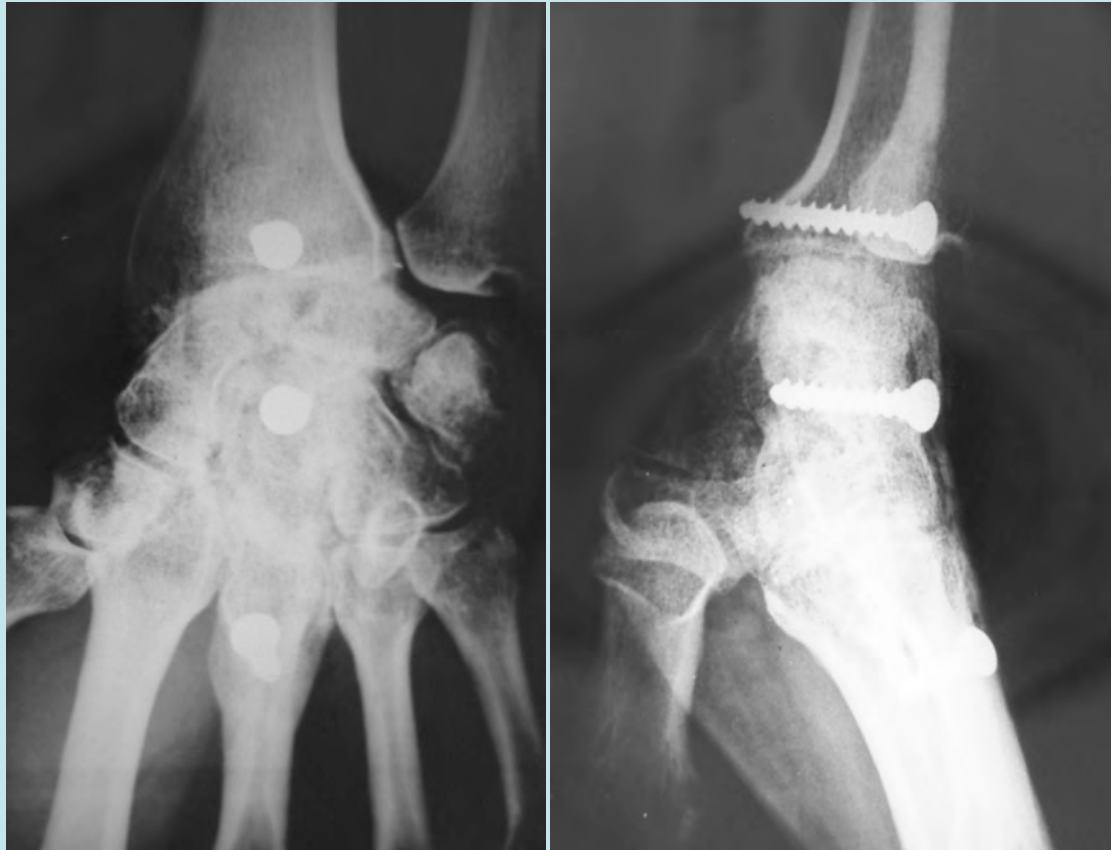
- Depends on
  - Stiffness
  - Duration of the SNAC or SLAC
  - Ulnar translation
  - DISI deformation
  - Shape of the lunate
  - Patient demand and age



4 bone fusion has a great value

# Total wrist fusion

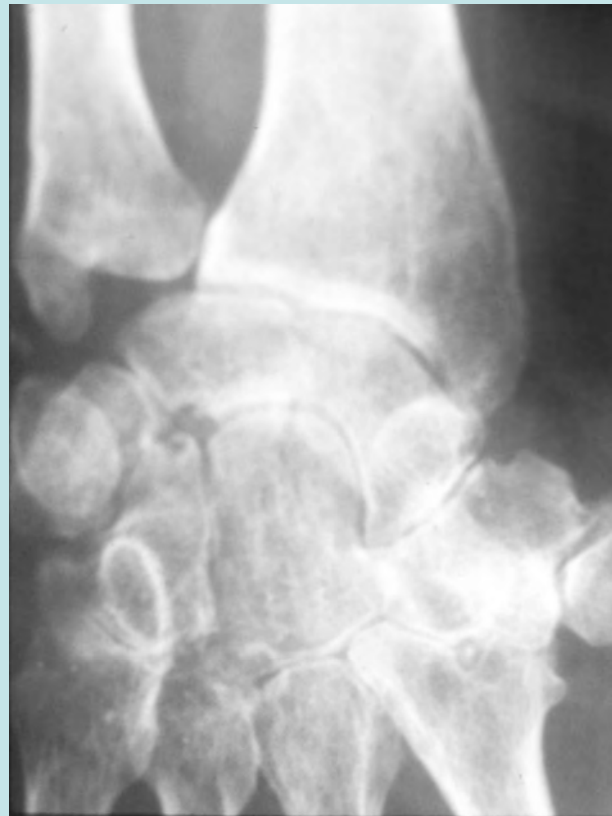
- Try an other procedure if possible





# Wrist denervation

- A waiting procedure



# Wrist prosthesis

- FORGET IT !
- Or make sure you have a good insurance