II MIĘDZYNARODOWE SYMPOZJUM TRAUMATOLOGICZNE

Urazy kończyny górnej - od A do Z

THE 2nd INTERNATIONAL TRAUMA SYMPOSIUM

Injuries of the Upper Extremity - from top to bottom

PROXIMAL HUMERAL FRACTURES OSTEOSYNTHESIS OR ENDOPROSTHESIS

ZŁAMANIA BLIŻSZEGO KOŃCA KOŚCI RAMIENNEJ OSTEOSYNTEZA CZY ENDOPROTEZA ?

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Katedra i Klinika Ortopedii i Traumatologii Narządu Ruchu
Śląskiego Uniwersytetu Medycznego w Katowicach
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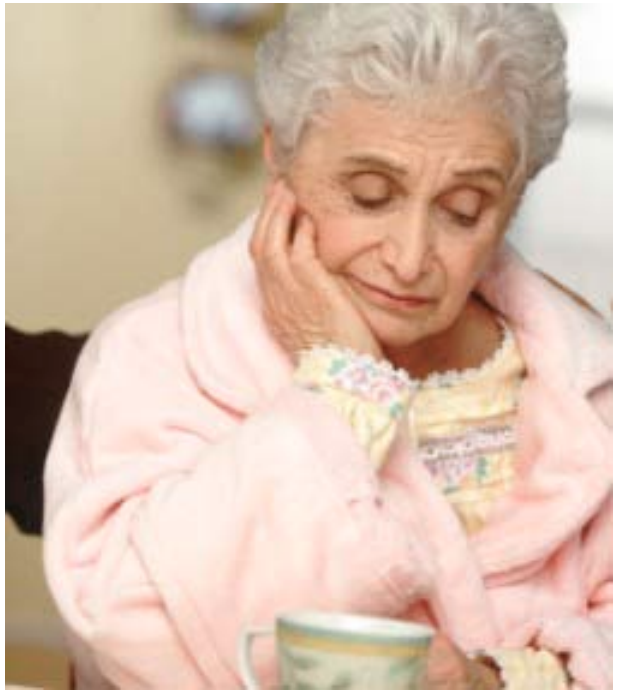
Proximal humeral fractures

Epidemiology

Incidence



- 5% of all fractures (the third most common)

- over 85% patients have poor bone quality

- 80% of cases affects women

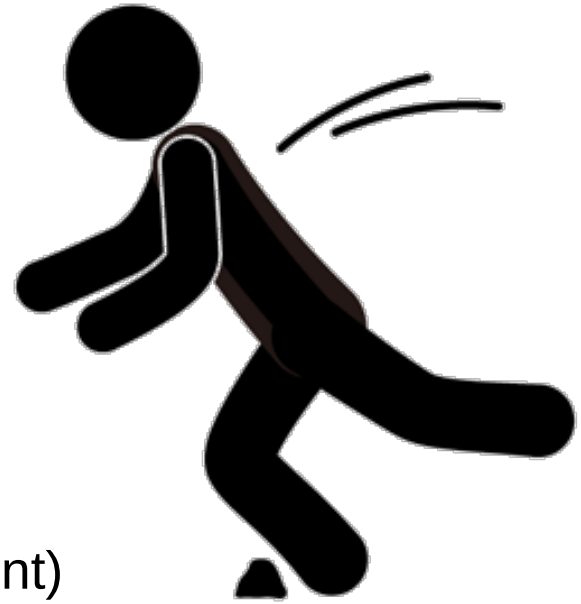
- increases with age

- 8% lifetime risk of fractures for women > 60yrs

Proximal humeral fractures

Etiology

More frequently:
- low energy injury
(fall from a standing height, on the outstretched hand)
- elderly patients
- usually females > 60 yrs



Less frequently:
- high energy trauma (sports injury / car accident)
    - younger patients, complex fracture patterns

Proximal humeral fractures

Common fracture patterns

minimal displacement

greater tuberosity GT

surgical neck SN

lesser tuberosity LT

2-part

anatomical neck AN

3-part

SN + GT

AN + GT

SN + AN

SN + LT

AN + LT

4-part

SN+GT+AN

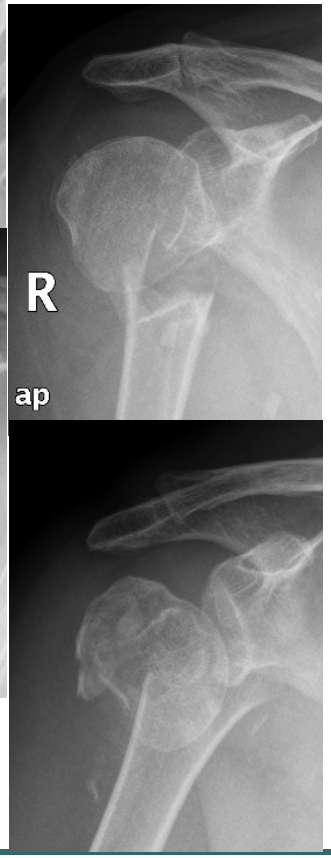
SN+GT+LT

LT+GT+AN

SN/AN + dislocation

SN/AN + head fragmentation

Anatomy



Risk of mal-union

Proximal humeral fractures

Classification: Neer with modifications

- number of fracture parts: head / greater tuberosity / lesser tuberosity / shaft
- displacement = more than 10mm (GT >5mm) or 45° angulation, fracture-dislocation

1-part fracture=nondisplaced 70-80%

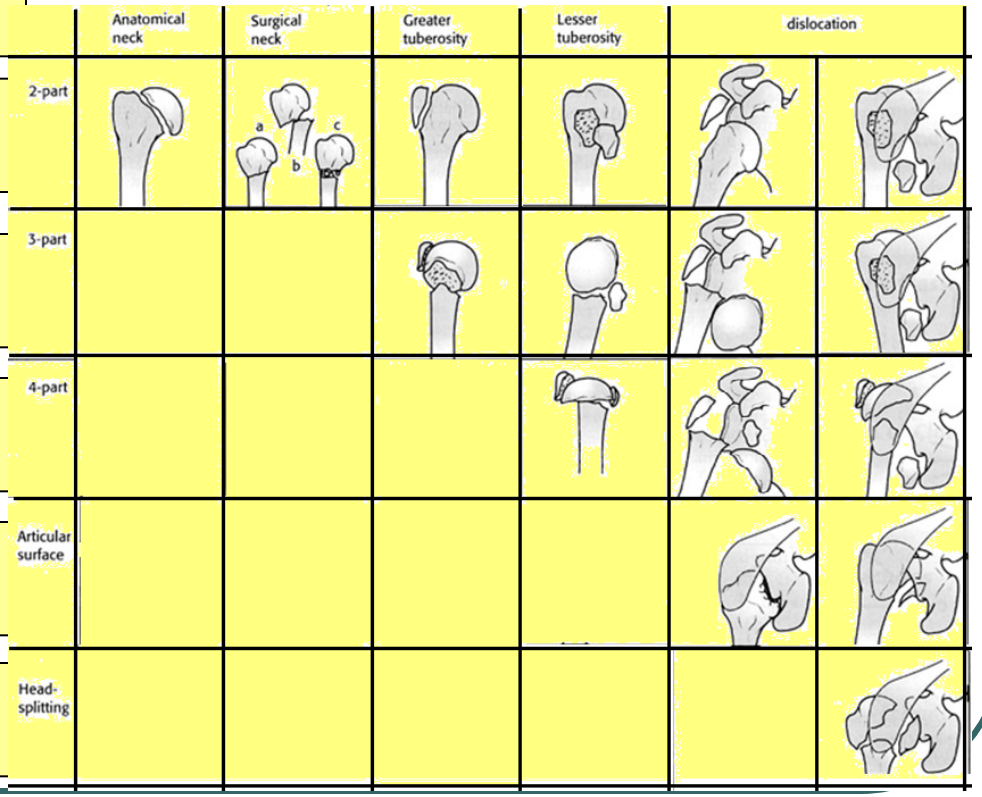
2 -part fracture ~20%

3 -part fracture ~5%

4 -part fracture <5%

Articular surface

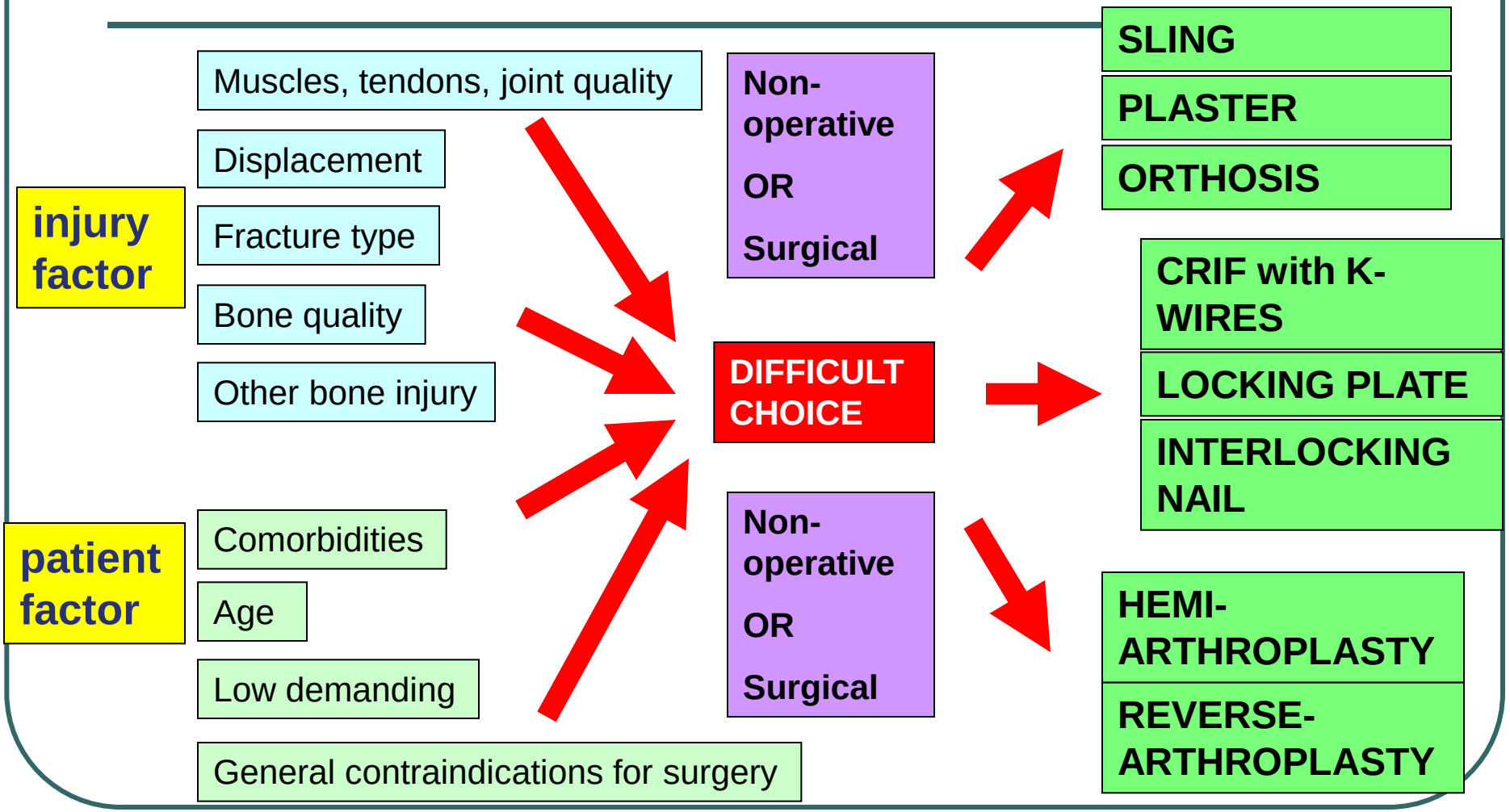
Head spliting



Neer CS II: Displaced proximal humeral fractures: I. Classification and evaluation. J Bone Joint Surg Am 1970:52[6]:1079.)

Proximal humeral - Treatment

Treatment



Khmelnitskaya et al. Evaluation and Management of Proximal Humerus Fractures. Advances in Orthopedics 2012:861598

Proximal humeral - Treatment

Proximal humeral fractures - Non-operative

- 70-80% fractures are MINIMALLY DISPLACED and treated non-operatively with success

- SEVERE CARIOVASCULAR OR RESPIRATORY DISEASES

- GENERAL CONTRAINDICATION FOR ANESTASIA

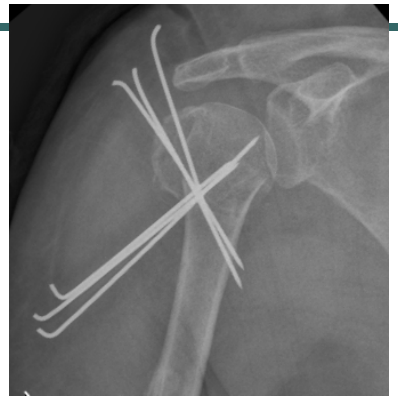
- LOW DEMANDING OR NON-COMPLIANT PATIENT

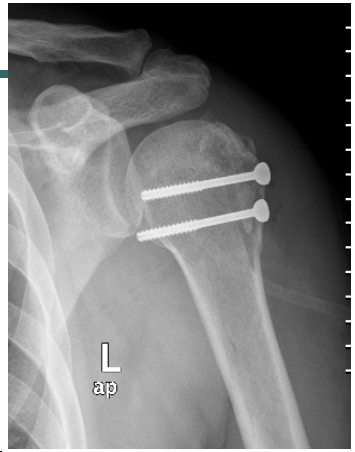
15-20% are comminuted or displaced - require surgical intervention

Proximal humeral - Treatment

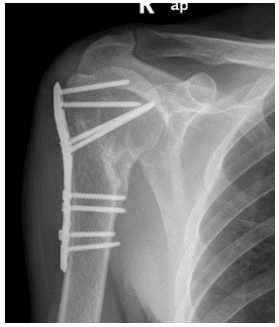
Proximal humeral fractures – operative

Closed reduction and percutaneus wires / screws

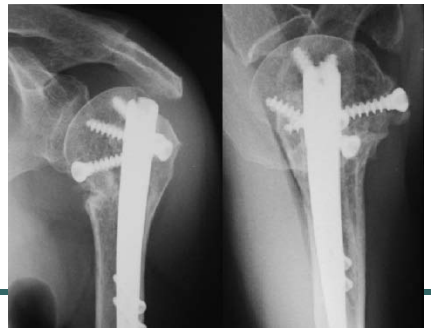




Open reduction and interlocking plates



Proximal interlocking humeral nail

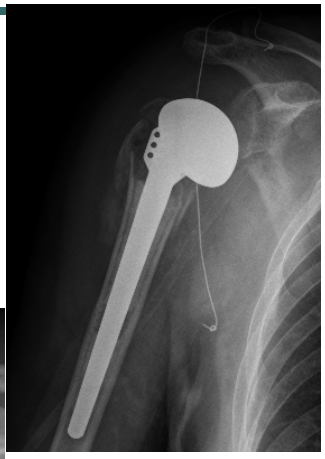


Proximal humeral - Treatment

Shoulder arthroplasty

40% of operated fractures

4 or 3 part frx with poor bone or risk of AVN, head split, destruction of articular surface, failed previous surgery

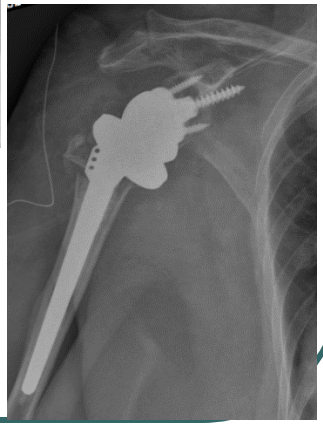


Hemi-arthroplasty

– better than fixation in >70 y.o.
– better than reverse arthroplasty in young

Reverse-arthroplasty

- glenoid arthrosis or damage
- rotator cuff tear or deficiency
- better than reverse arthroplasty in elderly



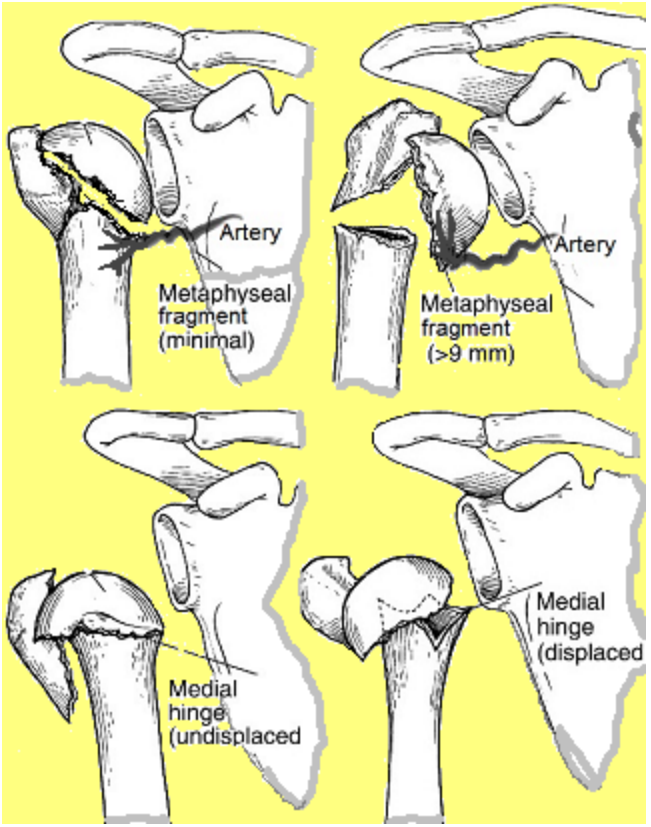
FIXATION OR ENDOPROSTHESIS ?

Classification: Hertel

Predictors of humeral head ischemia

1. length of dorsomedial metaphyseal fragment attached to the head segment

2. disruption of medial hinge



Factors related to humeral head ischemia
+ fracture with dislocation
+ head-split components
= all - 97 % predictive for head ischemia

R. Hertel, A. Hempfing, M. Stiehler, M. Leunig. JSES, Volume 13, 2004, Pages 427-433

R. Hertel, A. Hempfing, M. Stiehler, M. Leunig. JSES, Volume 13, 2004, Pages 427-433

Case

Decision- immobilisation

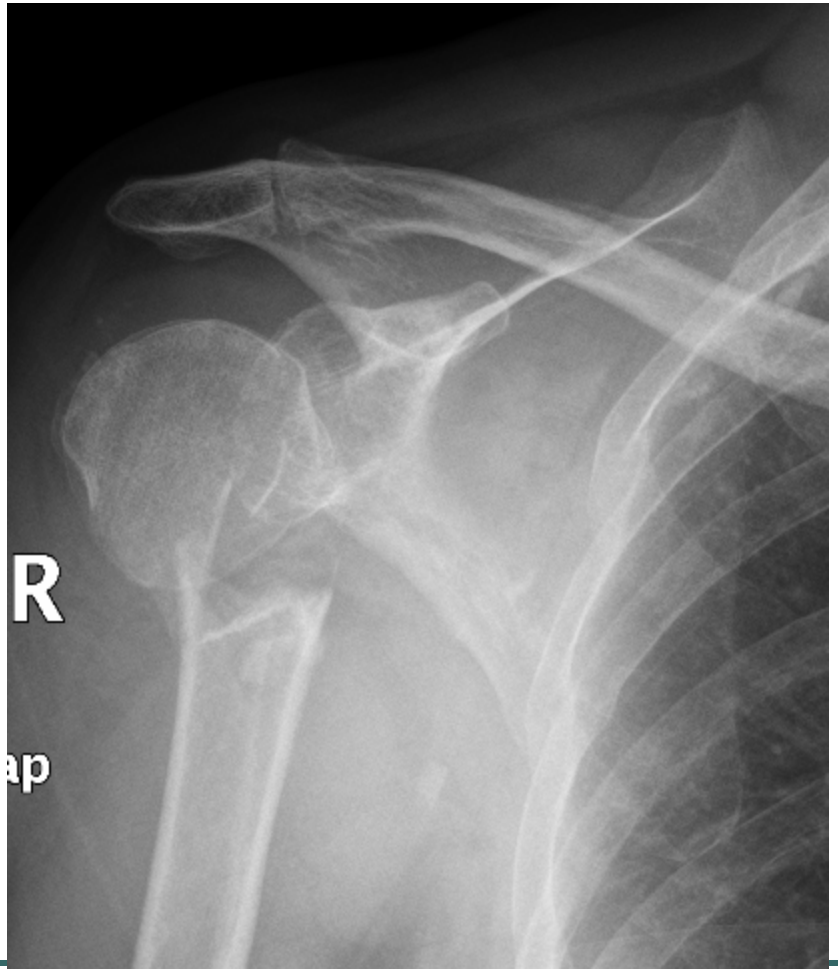
case #1
L.A. female 62
non-displaced

Case

Decision- immobilisation

case #2
P.T. female 72

severe coronary insufficiency



Case

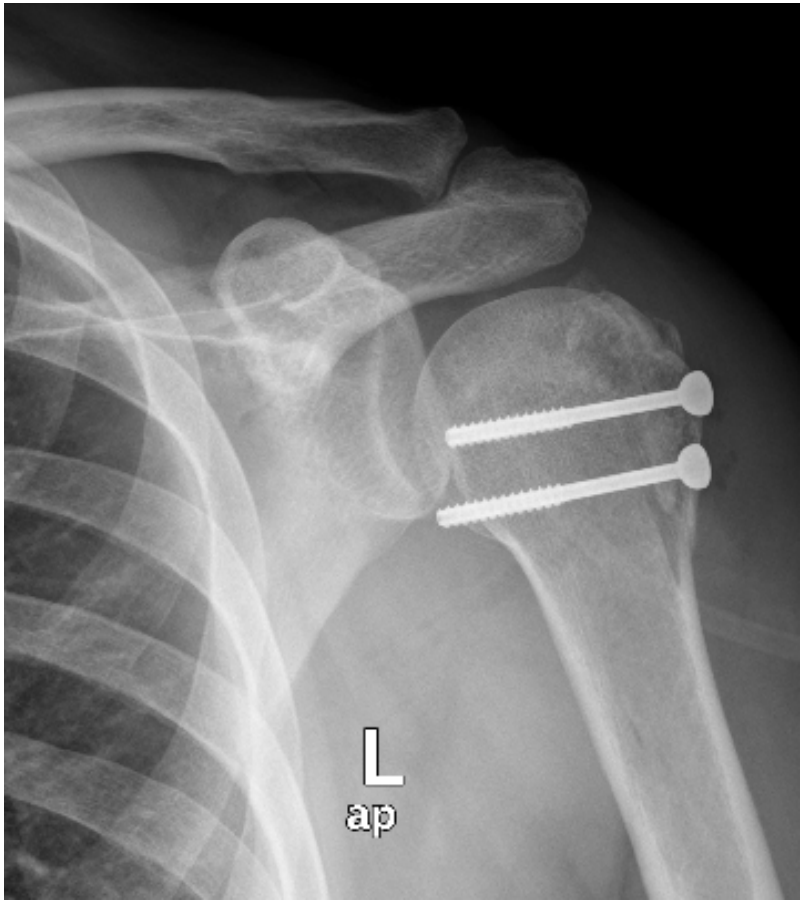
Decision- immobilisation

case #3
L.H. female 81
serious general contraindications for surgery

Case

Decision- fixation

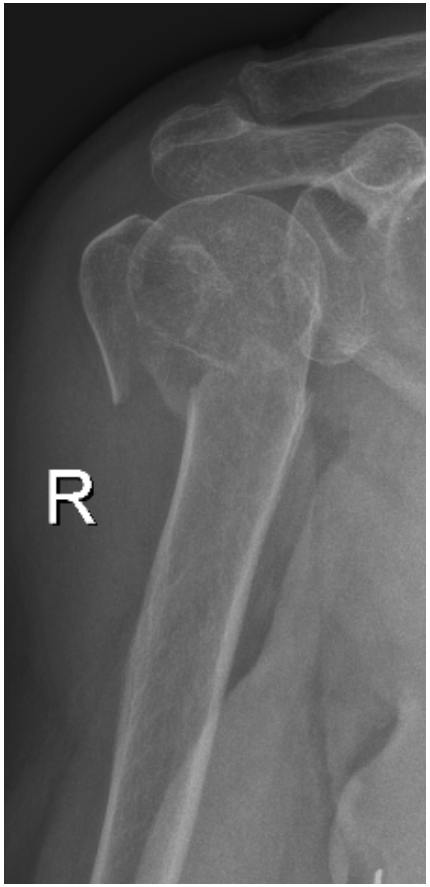
case #1
H.W. male 54
2part



Case

Decision- fixation

case #2
D.M. female 53
3part

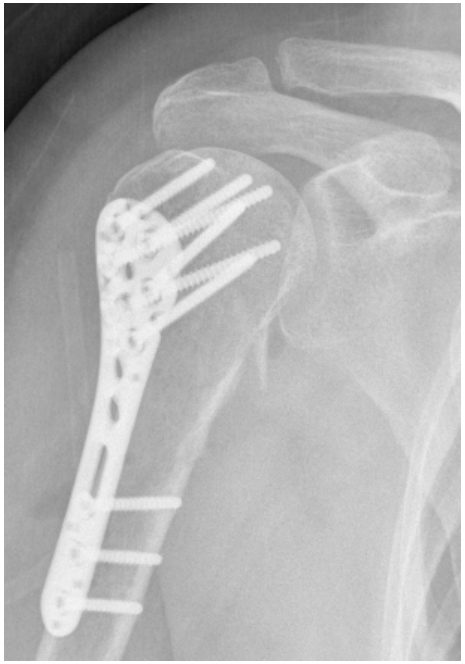


Case

Decision- fixation

case #3
K.W. male 61
3part






Case

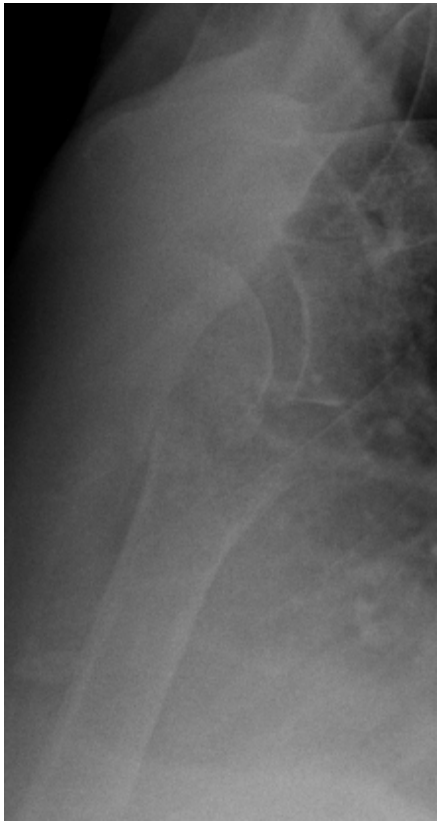
Decision- fixation

case #4
L.A. female 48
2part

Case

Decision- fixation

case #5
S.E. male 54
4part



Treatment complication

Treatment

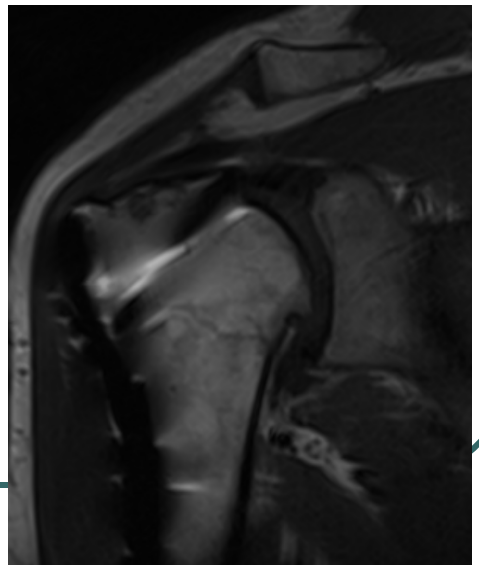
Closed reduction and percutaneus fixation

Open reduction and locking plates

Proximal humeral nailing

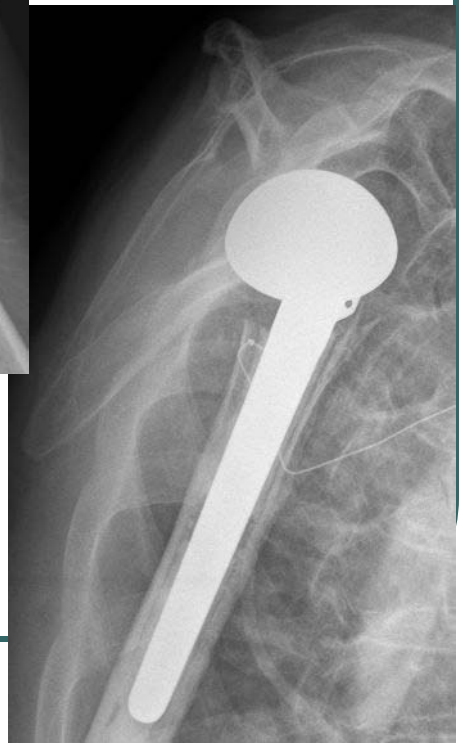
Complications

- **nonunion**
- **displacement**
- **osteonecrosis (20-50%)**
- **screw cut-out**



Case

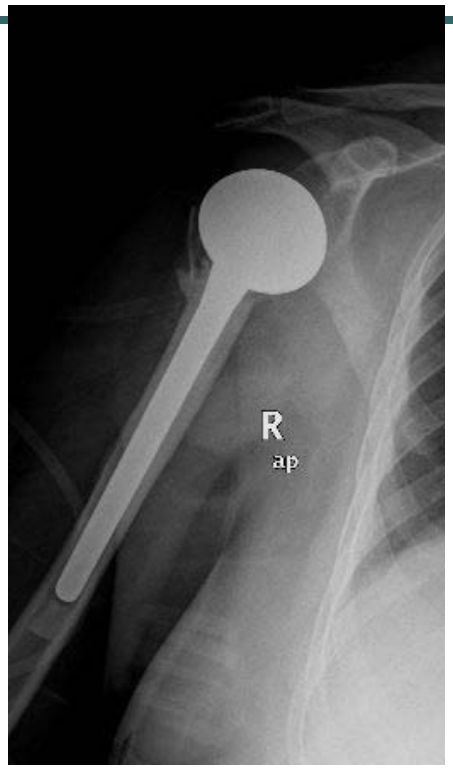
Decision- hemiarthroplasty



case #1
S.F. female 62
head split/disl.

Case

Decision- hemiarthroplasty



case #2
K.I. female 64
4part/med. hinge

Hemiarthroplasty

Decision- hemiarthroplasty

case #3
J.K. female 68
4part

Hemiarthroplasty – Complications

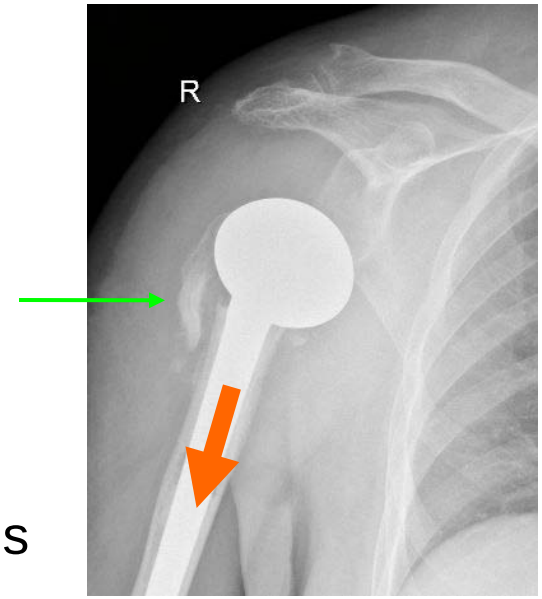
Hemiarthroplasty complications

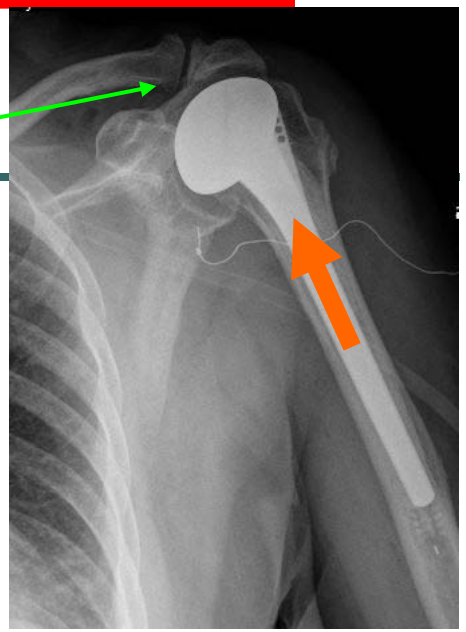
-superior migration / cuff dysfunction

-tuberosities nonunion,

-glenoid arthrosis,

-stem loosening / infections



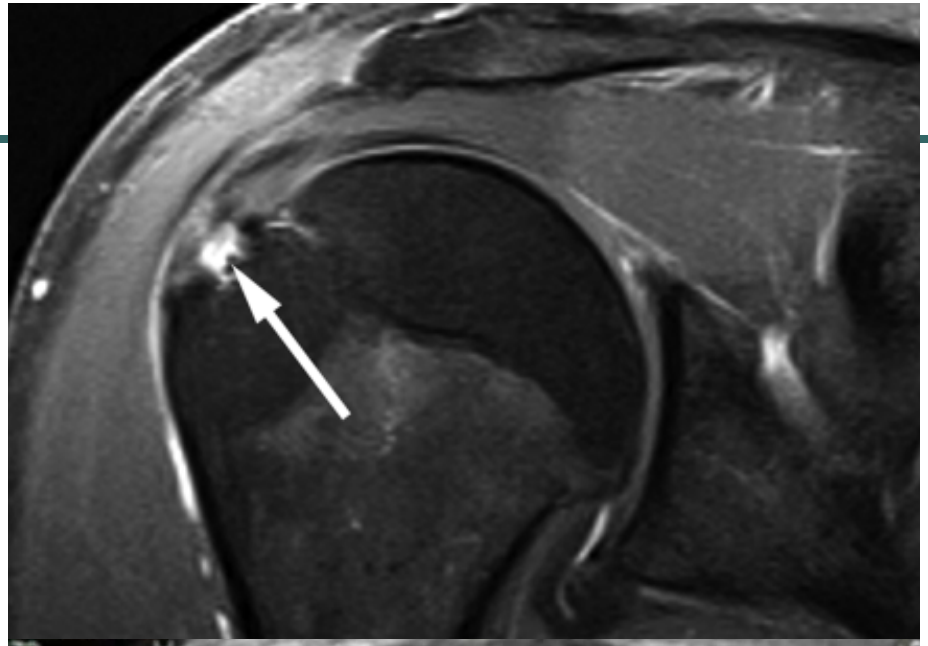


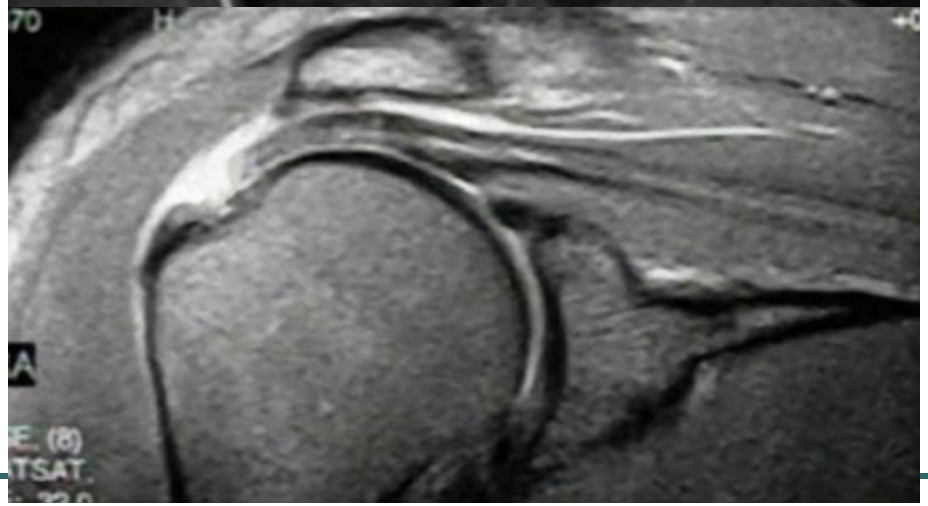
Soft tissue injury

MRI scans

-rotator cuff tear

-glenoid arthrosis,

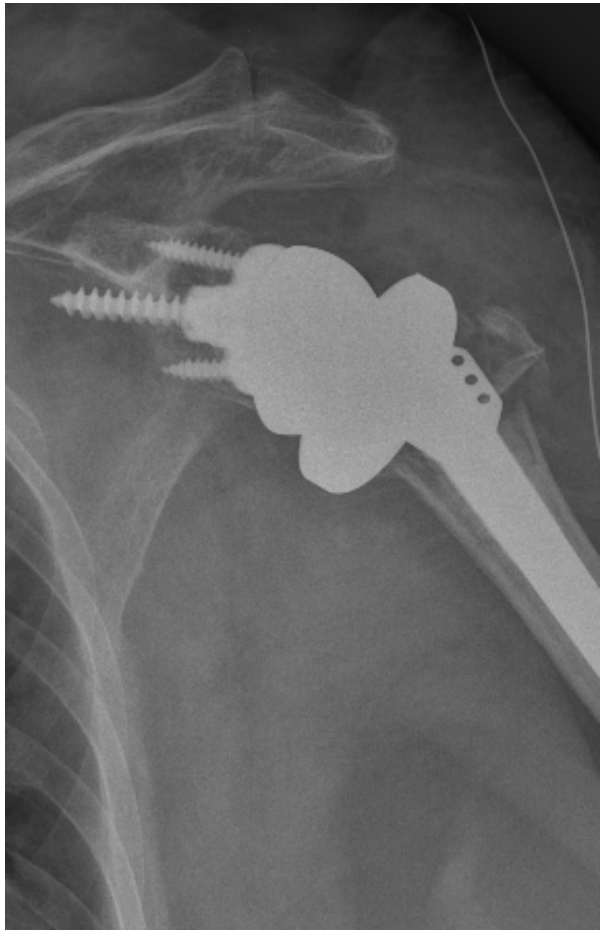




Case

Decision- reverse arthroplasty

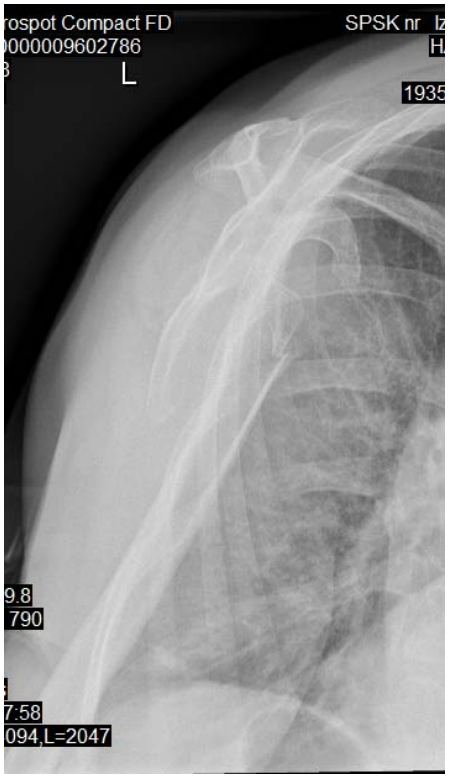
case #1
C.K. male 78
4part



Case

Decision- reverse arthroplasty

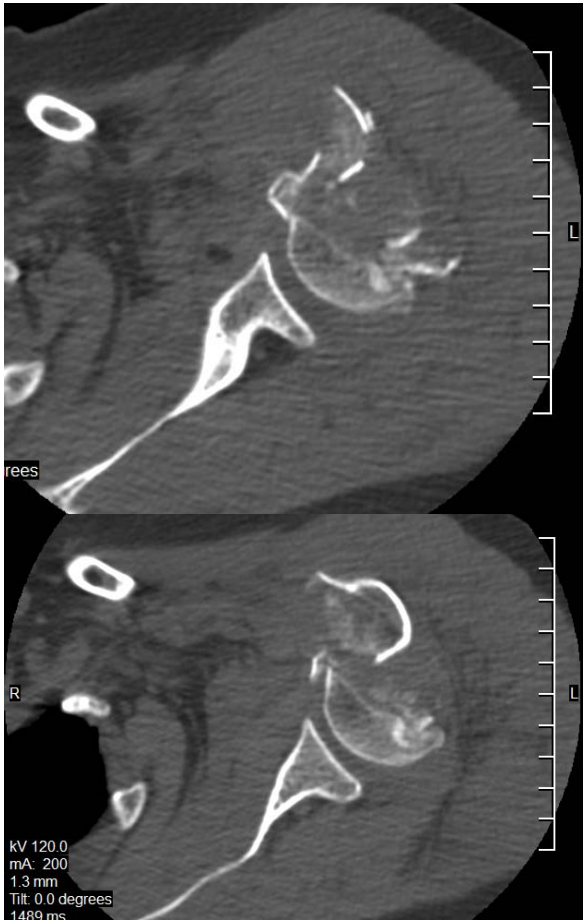
case #2
H.I. female 77
3part



Case

Decision- reverse arthroplasty

case #3
S.T. female 82
3part / dislocation



Outcomes

Succes

- case selection (fracture, age, time from injury)

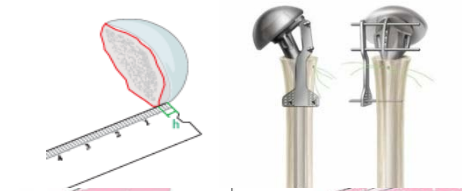
-choosing an operative treatment or immobilization

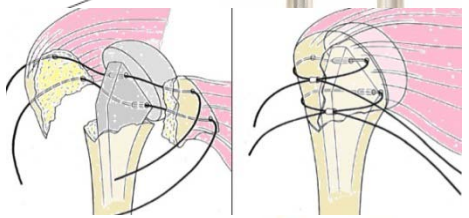
-risk assessment of healing problem

-choosing the type of fixation or the prosthesis

-perfect implant placement

-appropriate rehabilitation protocol





Rehabilitation

Regardless of the treatment method, one of the most important factors is proper rehabilitation and return to full efficiency and function.

Proximal humeral fractures

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Injuries of the Upper Extremity - from top to bottom

Thank You for Your Attention

ORGANIZATOR MERYTORYCZNY:
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