INDICATIONS AND CONTRAINDICATIONS FOR SHOULDER ARTHROPLASTY IN PROXIMAL HUMERAL FRACTURES

Sławomir Dudko, Damian Kusz, Łukasz Cieliński

Katedra i Klinika Ortopedii i Traumatologii Narządu Ruchu
Wydziału Lekarskiego w Katowicach Śląskiego Uniwersytetu Medycznego
Kierownik: prof. dr hab. med. Damian Kusz

PROXIMAL HUMERAL FRACTURES

Proximal humeral fracture (PHFrx) is the 3rd most common fracture in the elderly population.

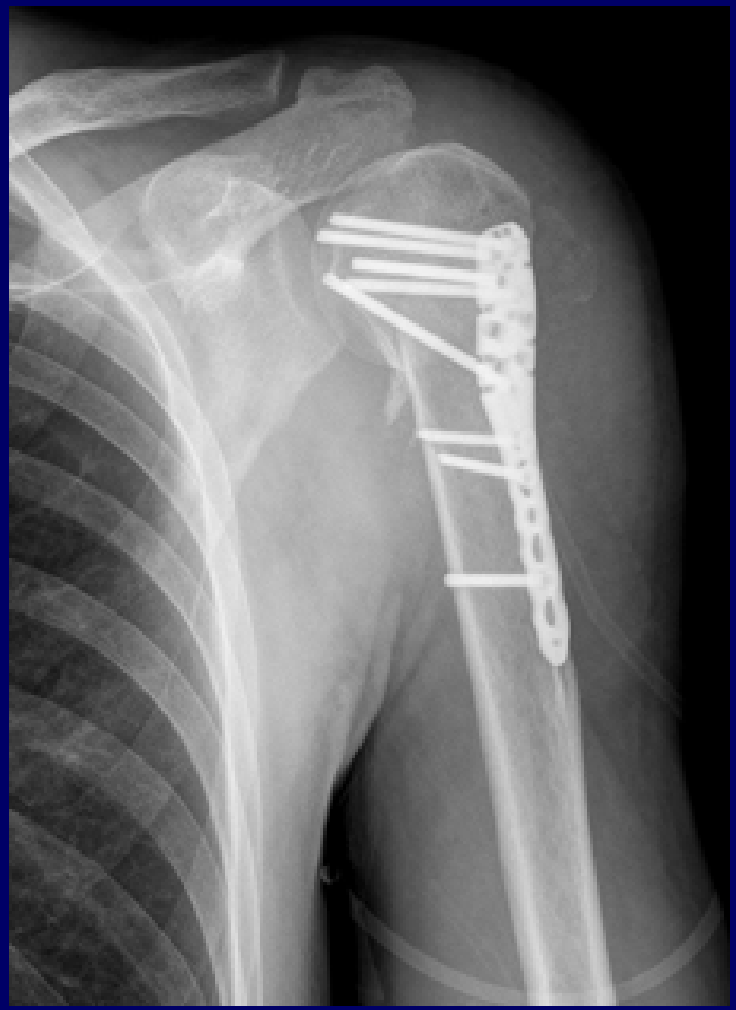
The AO classification of PHFrx is based on blood supply to the articular fragments and divides PHFrx into 3 groups: A, B and C.

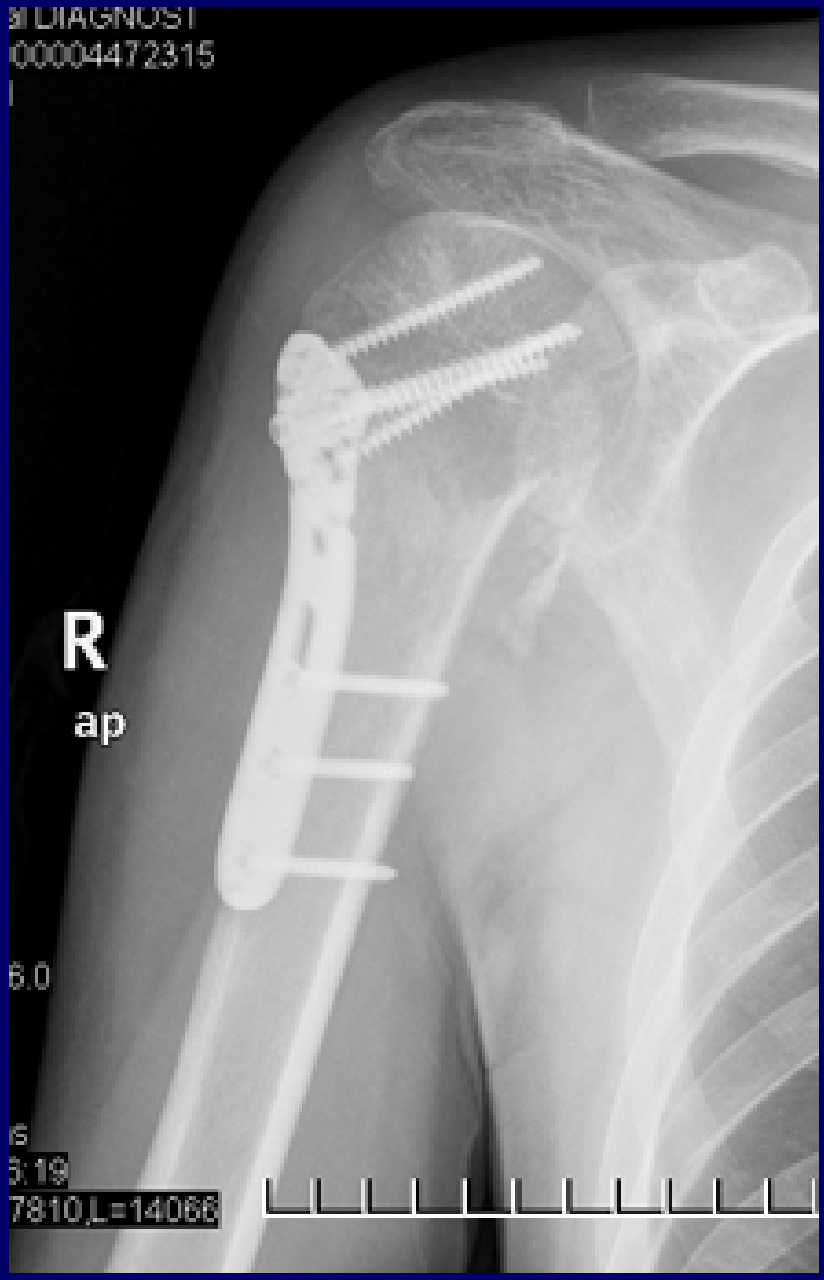
KLASYFIKACJA AO

type A: extra-articular unifocal (either tuberosity +/- SNOH)
A1: extra-articular unifocal fracture
A2: extra-articular unifocal fracture with impacted meaphyseal fracture
A3: extra-articular unifocal fracture with non-impacted meaphyseal fracture
type B: extra-articular bifocal (both tuberosities +/- SNOH or glenohumeral dislocation)
B1: extra-articular bifocal fractures with impacted meaphyseal fracture
B2: extra-articular bifocal fractures with non-impacted meaphyseal fracture
B3: extra-articular bifocal fractures with glenohumeral joint dislocation
type C: extra-articular (anatomical neck) but compromise the vascular supply of the articular segment
C1: anatomical neck fracture, minimally displaced
C2: anatomical neck fracture, displaced and impacted
C3: anatomical neck fracture with glenohumeral joint dislocation

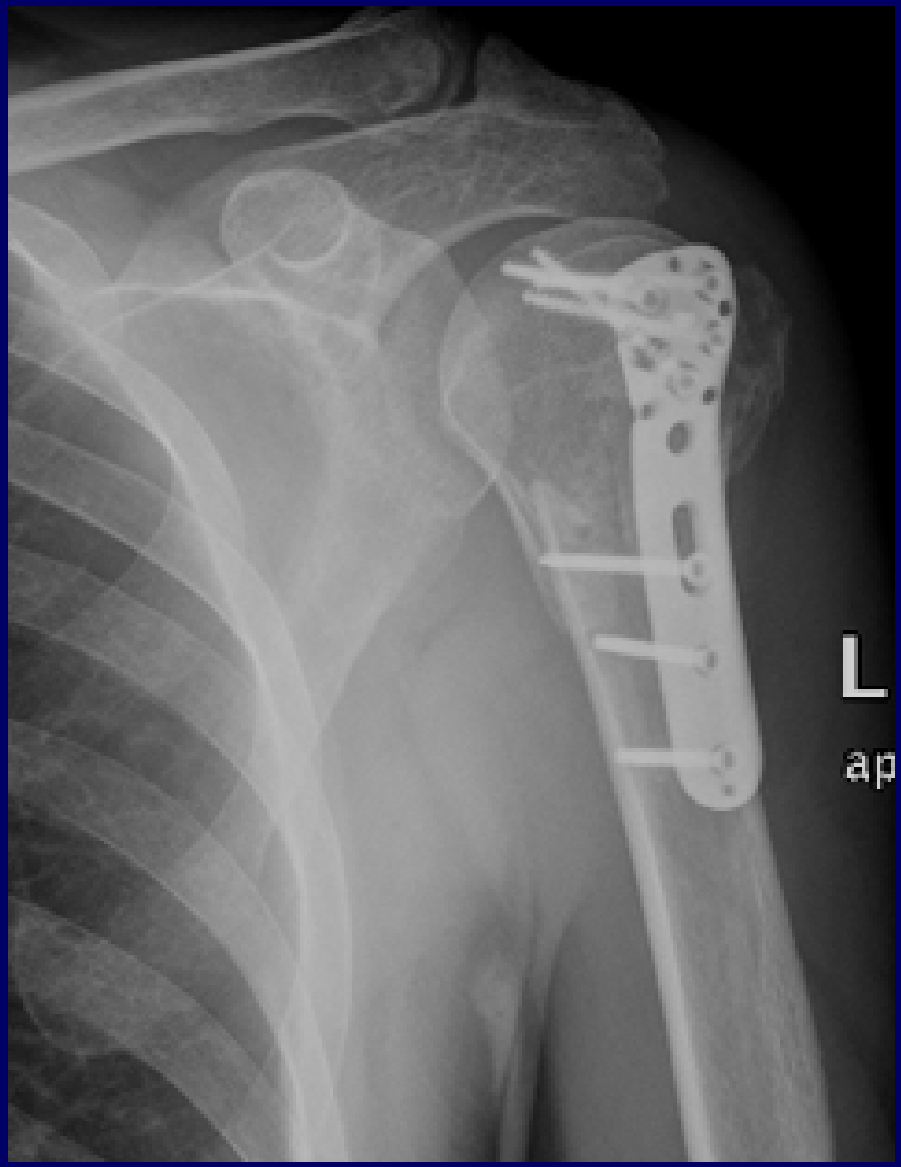
OSTEOSYNTHESIS

The current treatment options include locking plates and intramedullary nailing

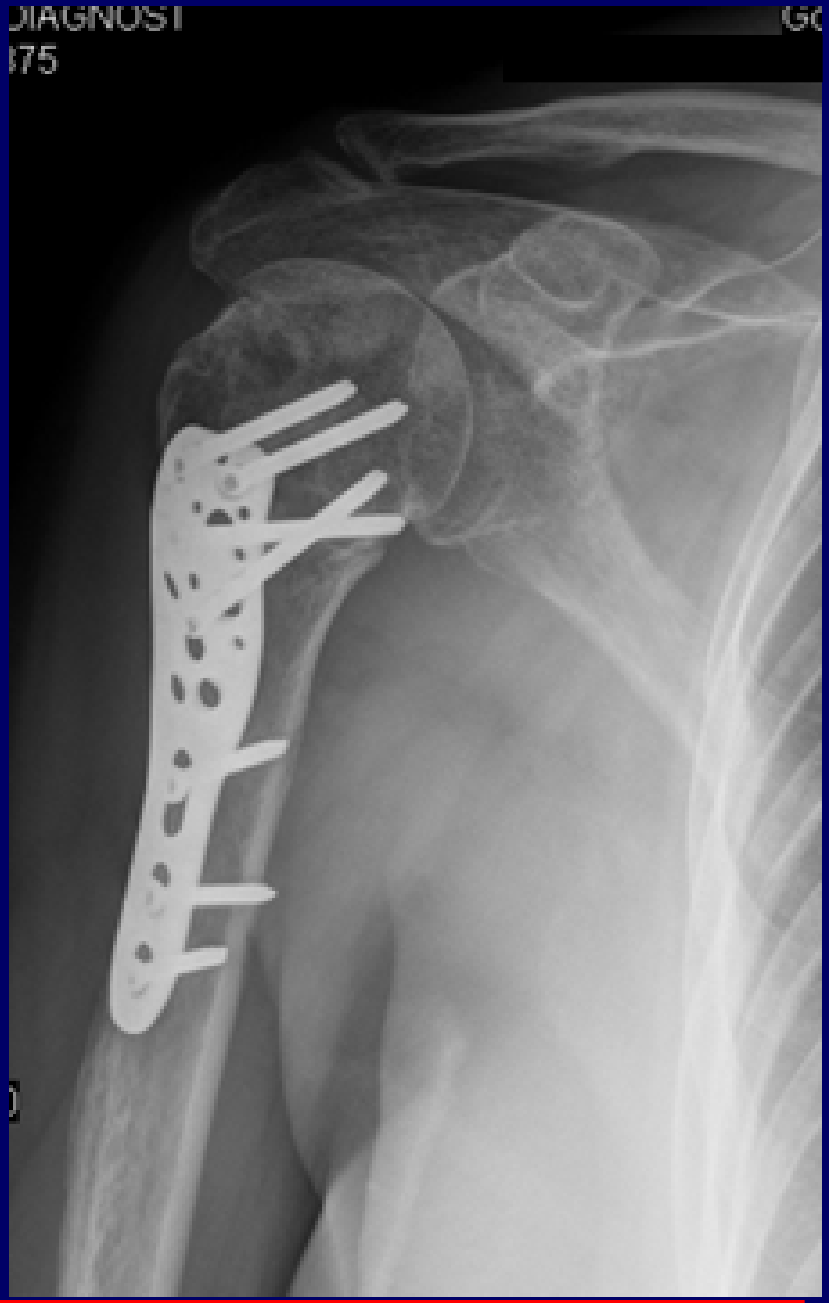


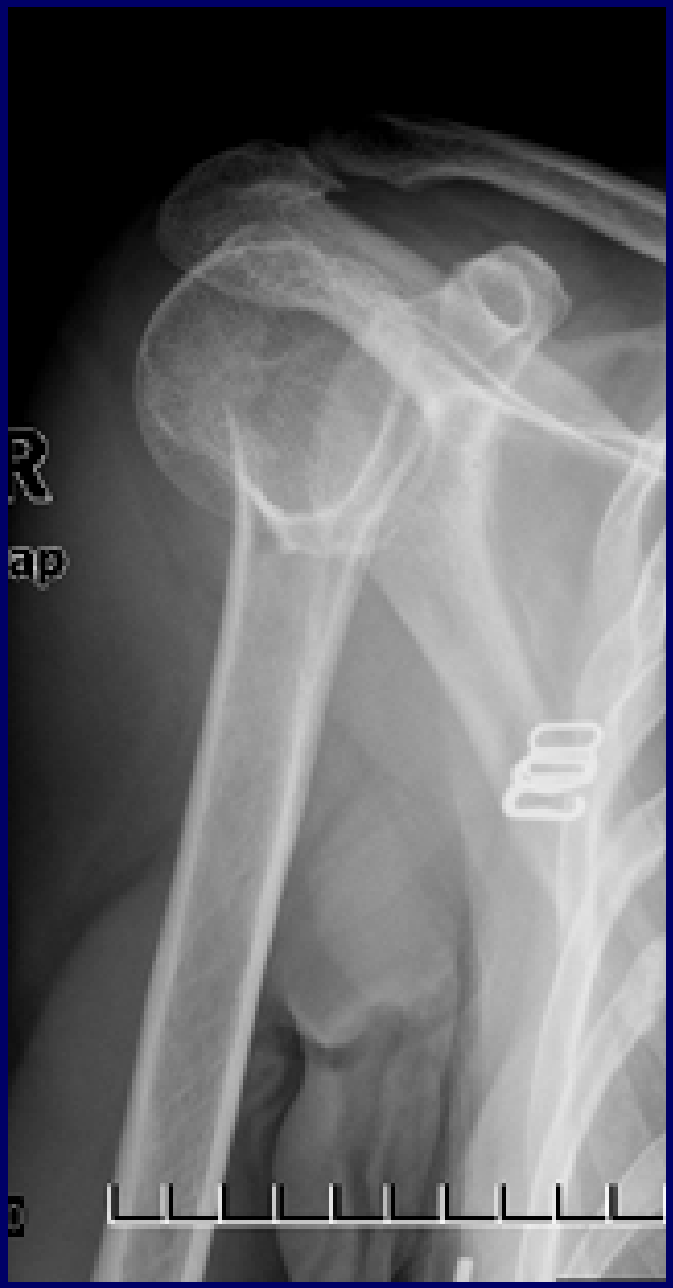

00004472315
R
ap
6.0
7810,L=14066


L
ap


L
ap

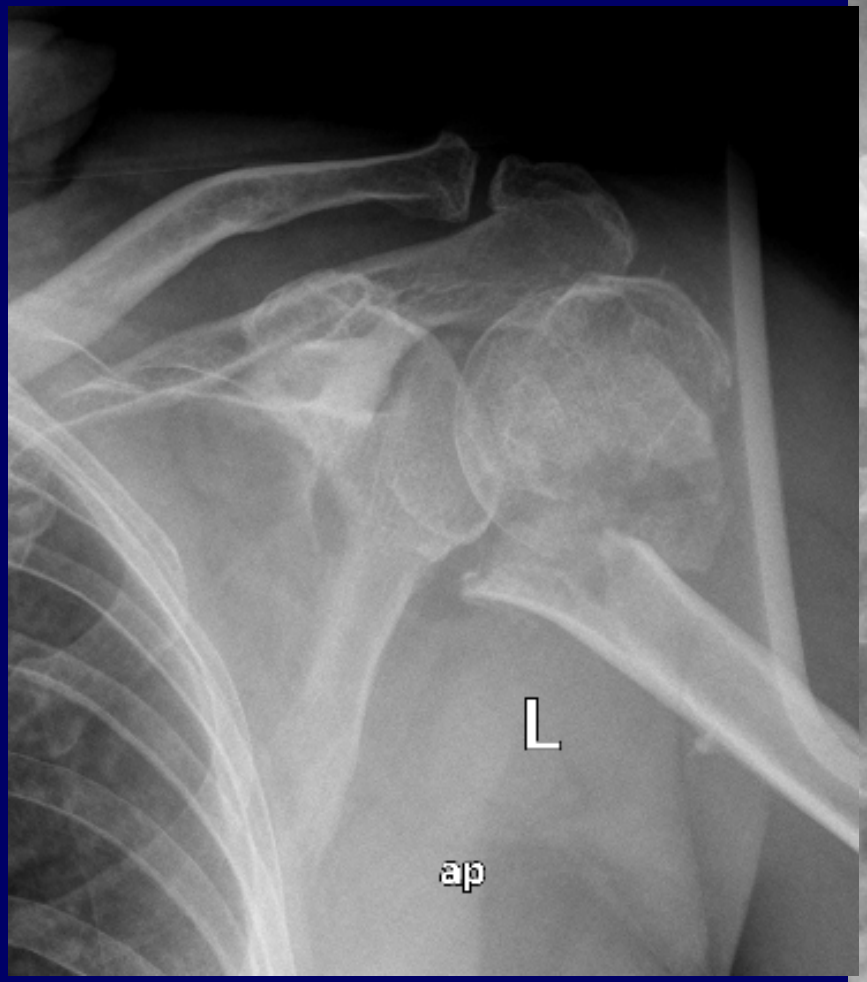

DIAGNOST
622

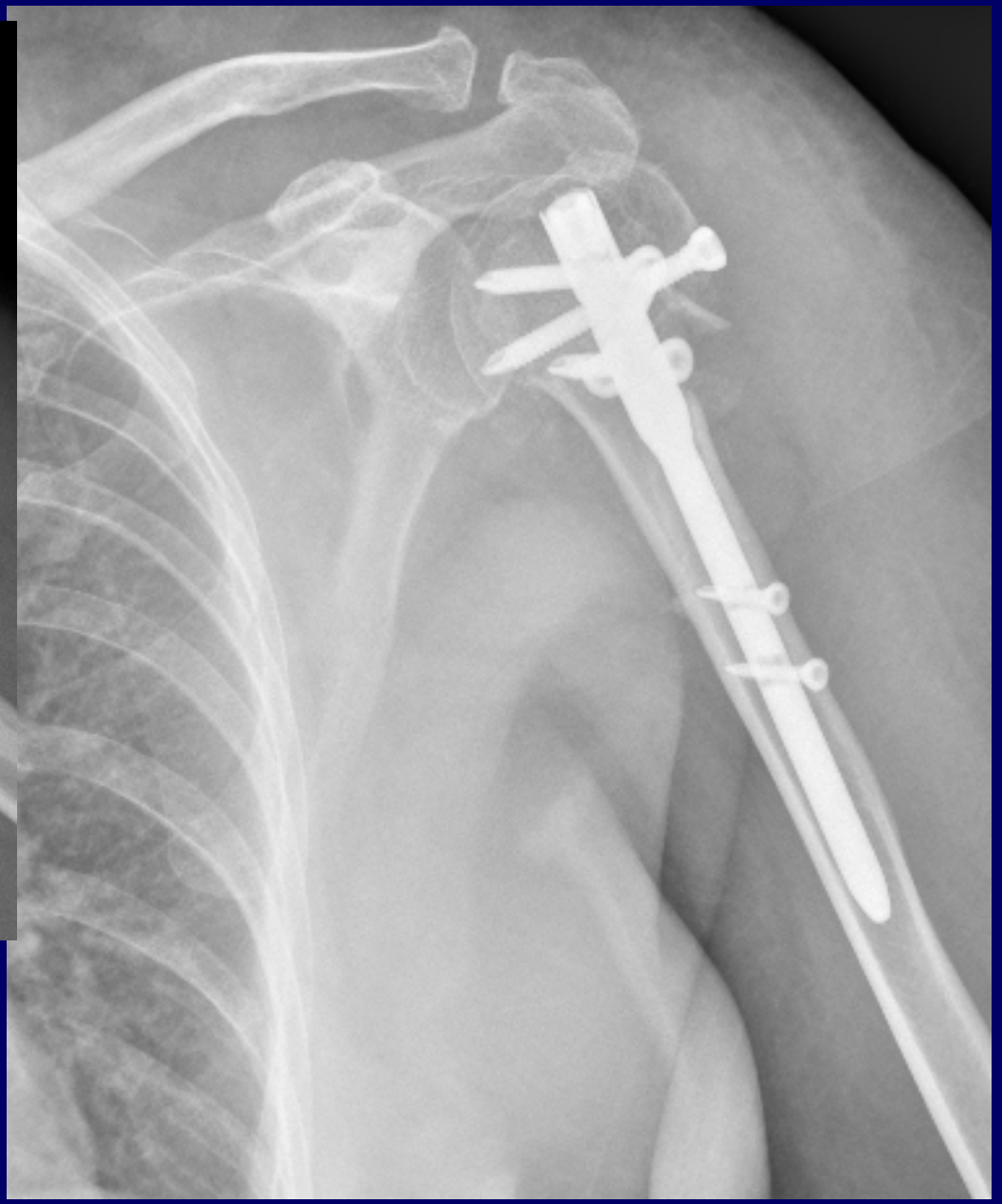

DIAGNOST
375


R
ap

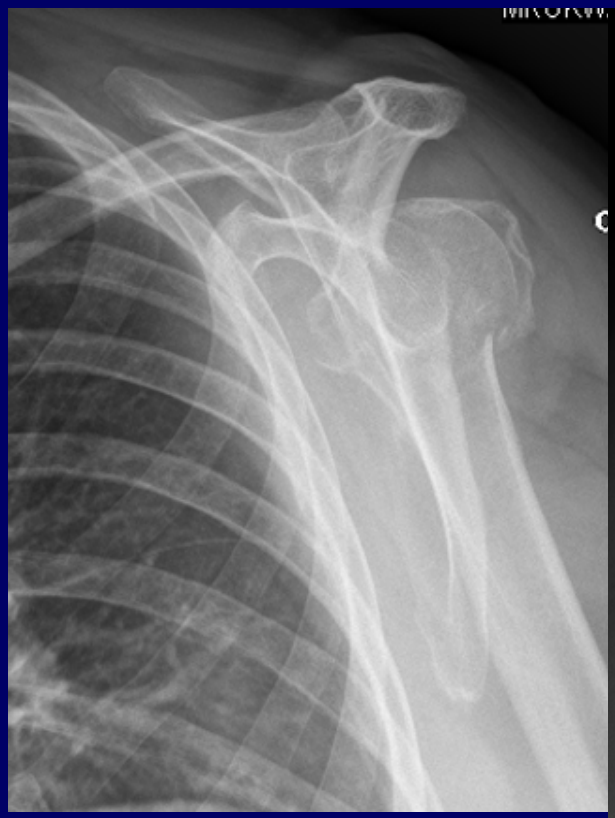

ap R

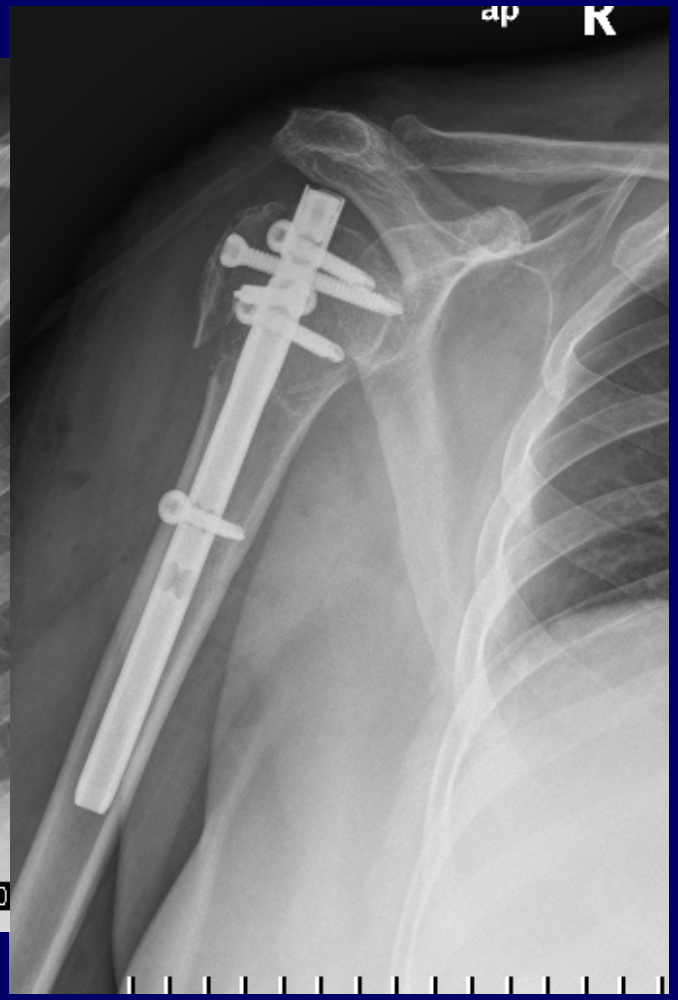
INDICATIONS AND CONTRAINDICATIONS FOR SHOULDER ARTHROPLASTY IN PROXIMAL HUMERAL FRACTURES



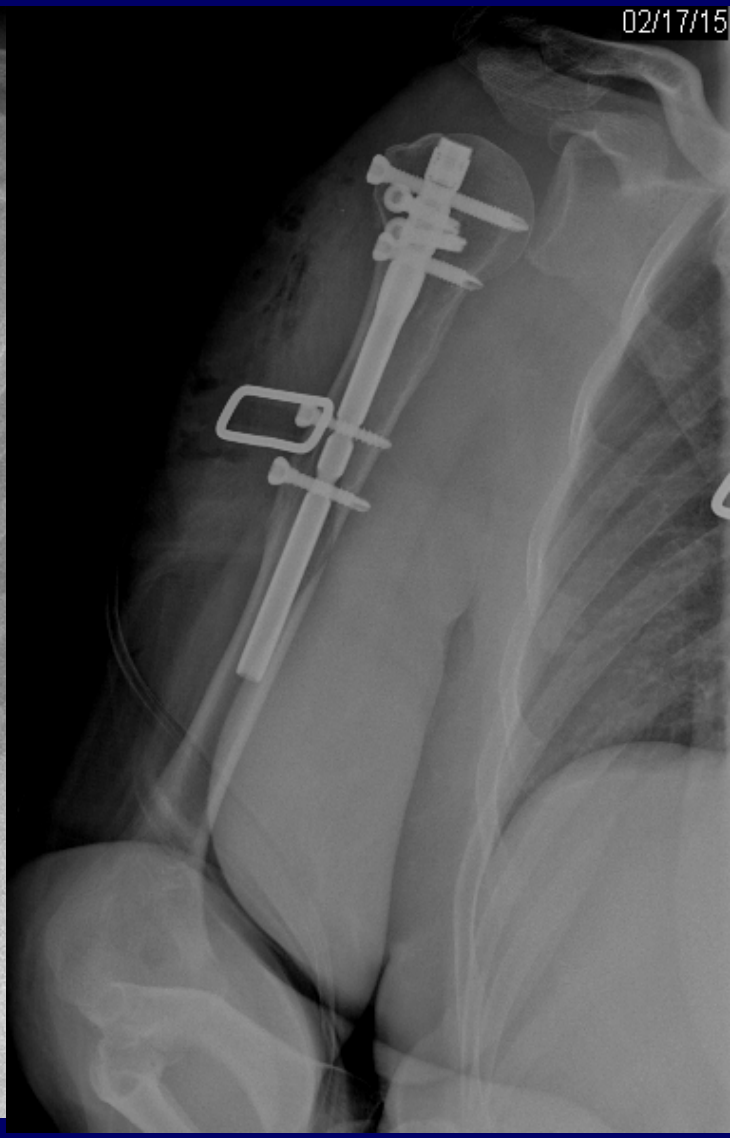


Mrukwa




ap
R

INDICATIONS AND CONTRAINDICATIONS FOR SHOULDER ARTHROPLASTY IN PROXIMAL HUMERAL FRACTURES



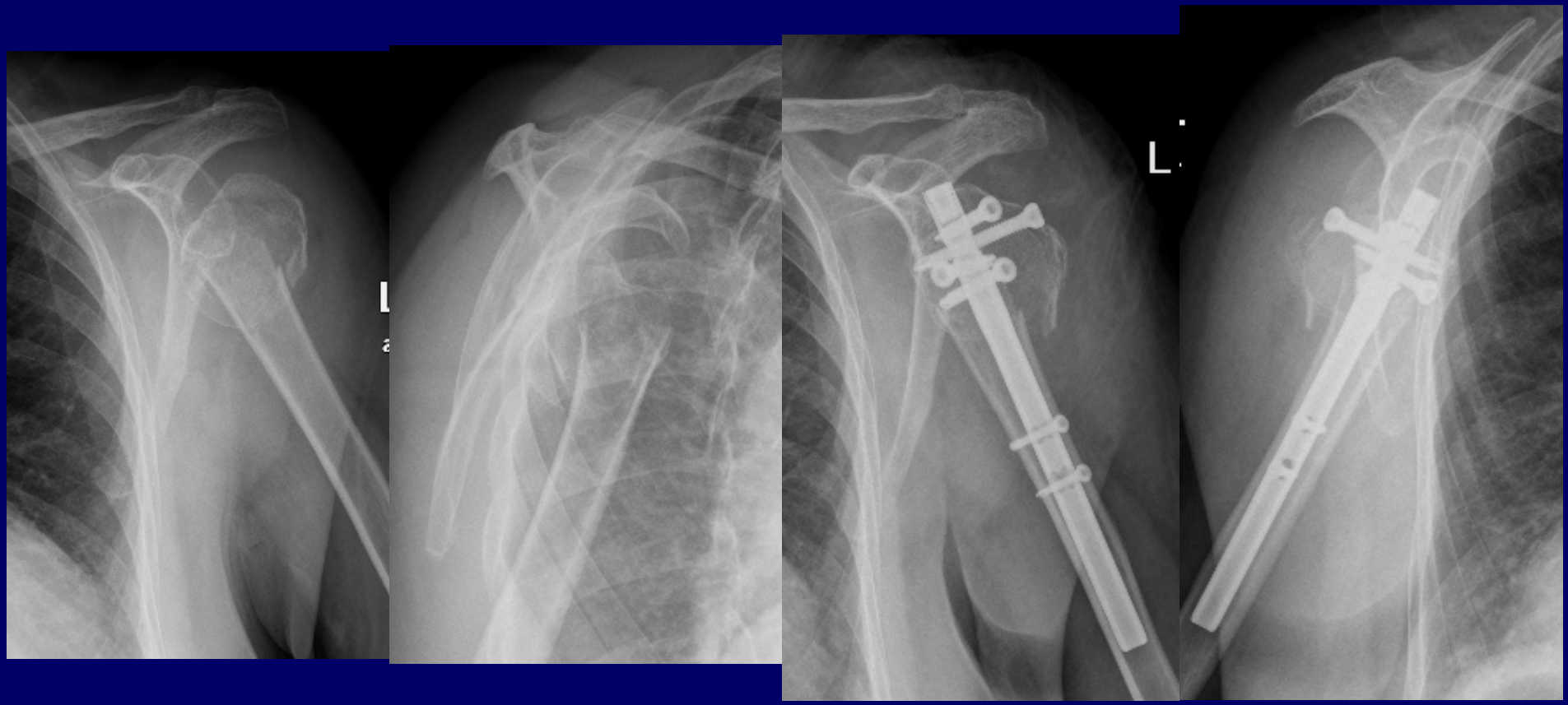
Sidelko kasperska

COMPLICATIONS

The current treatment, with locking plates and nailing, do not provide protection against complications, such as:

- avascular necrosis of the humeral head
- nonunion
- secondary displacement of fracture fragments
- failure of fixation
- cut-out / hardware penetration into the joint
- loss of rotator cuff function

INDICATIONS AND CONTRAINDICATIONS FOR SHOULDER ARTHROPLASTY IN PROXIMAL HUMERAL FRACTURES



Freihoefer

Avascular Necrosis of the humeral head is the most common cause of poor treatment outcomes in 4-part fractures.

The fracture fragments are displaced by muscle pull:

- humeral shaft pulled medially by *m.pectoralis major, and latissimus dorsi,*
- lesser tuberosity pulled antero-medially by *m.subscapularis*,
- greater tuberosity pulled medially, posteriorly and cranially by *m.supra-spinatus, infraspinatus,* and *teres.minor.*

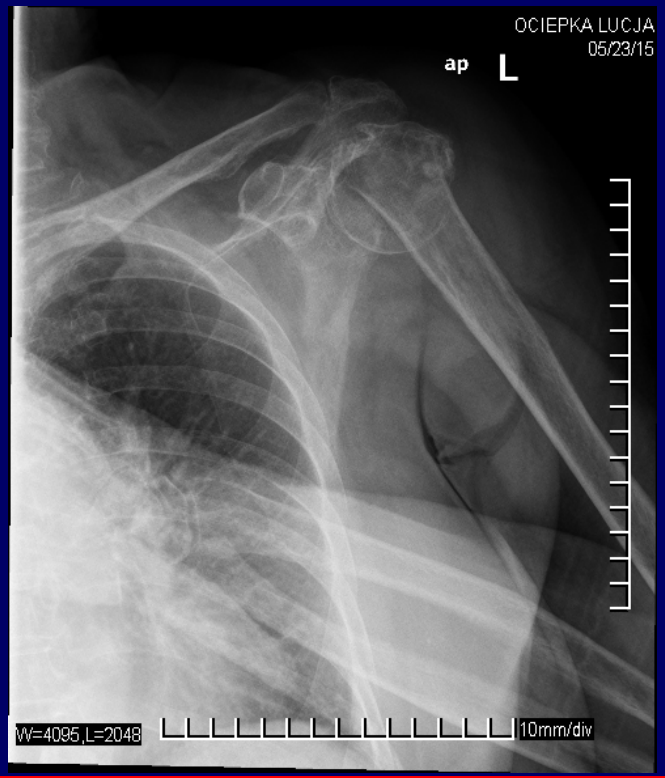
The humeral head looses contact with the glenoid and may displace anteriorly, posteriorly, laterally or inferiorly.

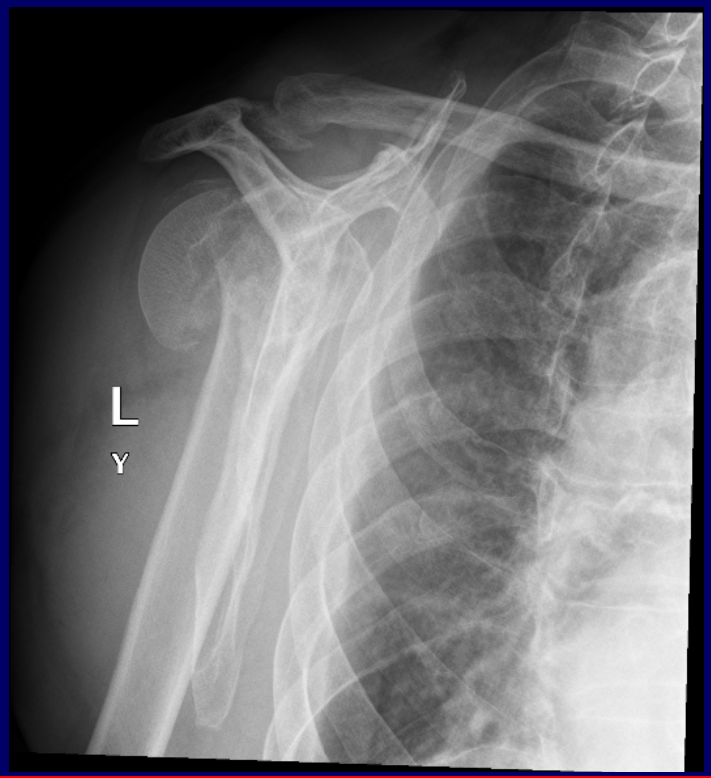
It may also angulate into varus or valgus.

The displacement and angulation results in bone necrosis and non-union.

The risk of necrosis of the proximal fragment increases from very low in type A to very high in type C, which dictates management.

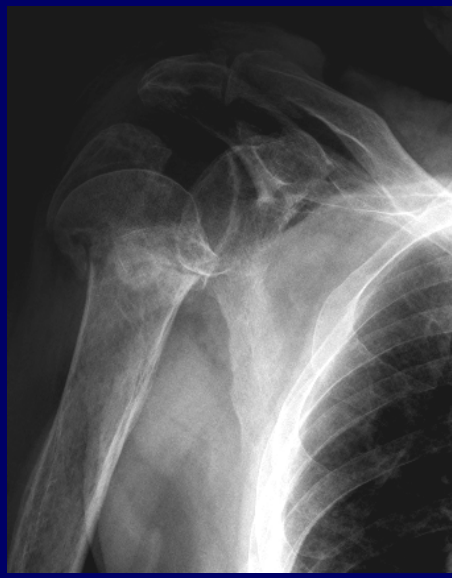
The risk of necrosis is much lower when the lesser or the greater tuberosities remain attached to the intraarticular fragment.





Problems with stable fixation and poor outcomes are also present in the 3-part fractures with comminution of the greater tuberosity and fractures involving articular surface of the humeral head.

The risk of complications is greater in elderly patients and patients with advanced osteoporosis.



Fractures of the proximal humerus are the second most common indication for shoulder arthroplasty (after osteoarthritis).

A PHFrx was the indication for the first shoulder arthroplasty, performed in 1950.

Currently, for the treatment of the PHFrx, we can use hemiarthroplasty or reversed total shoulder arthroplasty. The proper choice of implant helps to reduce the risk of complications.

The main problems of hemiarthroplasty include: osteolysis of the tuberosities, inappropriate tuberosity fixation, or nonunion, leading to rotator cuff dysfunction and poor outcomes.

INDICATIONS

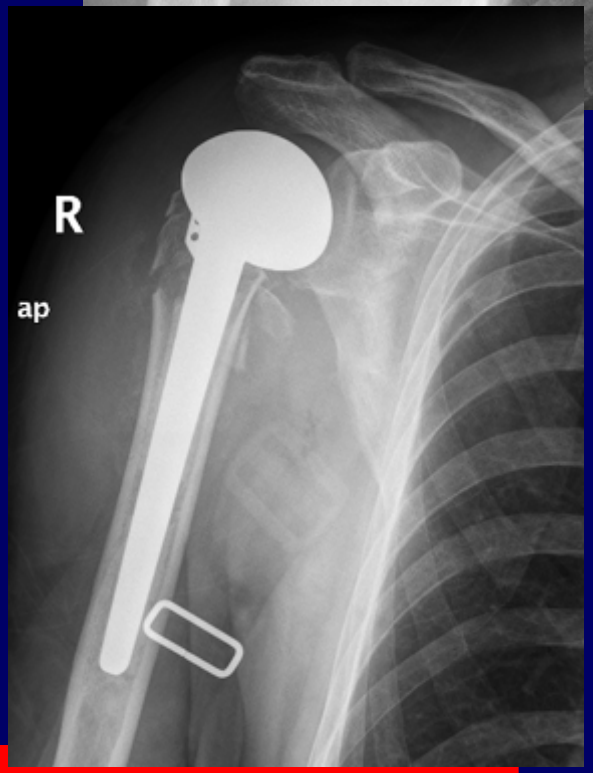
for shoulder arthroplasty in humeral fractures:

- 3-part / 4-part fractures, esp. AO group „C”,
- avascular necrosis of the humeral head,
- non-union,
- secondary displacement or implant failure,
- screw penetration into the joint,
- irreparable rotator cuff tear,
- age,
- osteoporosis,
- posttraumatic athritis with marked deformity.

INDICATIONS

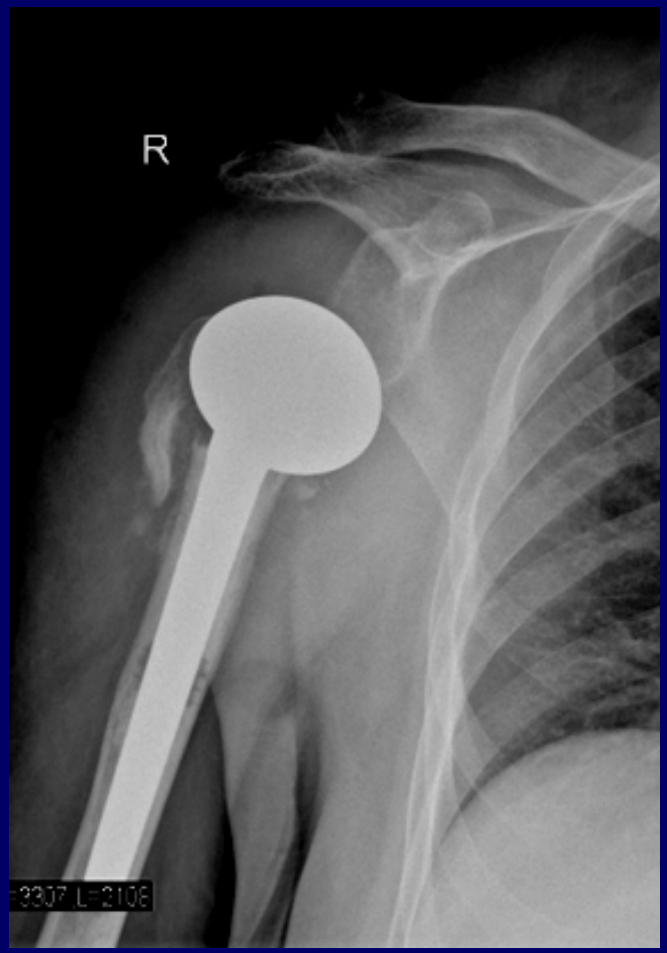
for shoulder hemiarthroplasty in humeral fractures:

- multifragmentary fractures with intact glenoid,
- non-union,
- younger patients
- rotator cuff intact or amenable to repair,
- marked destruction of the glenoid (prevents stable fixation of glenoid component)



PROS: lower cost, easier and faster procedure.

CONS: less optimal results.



INDICATIONS

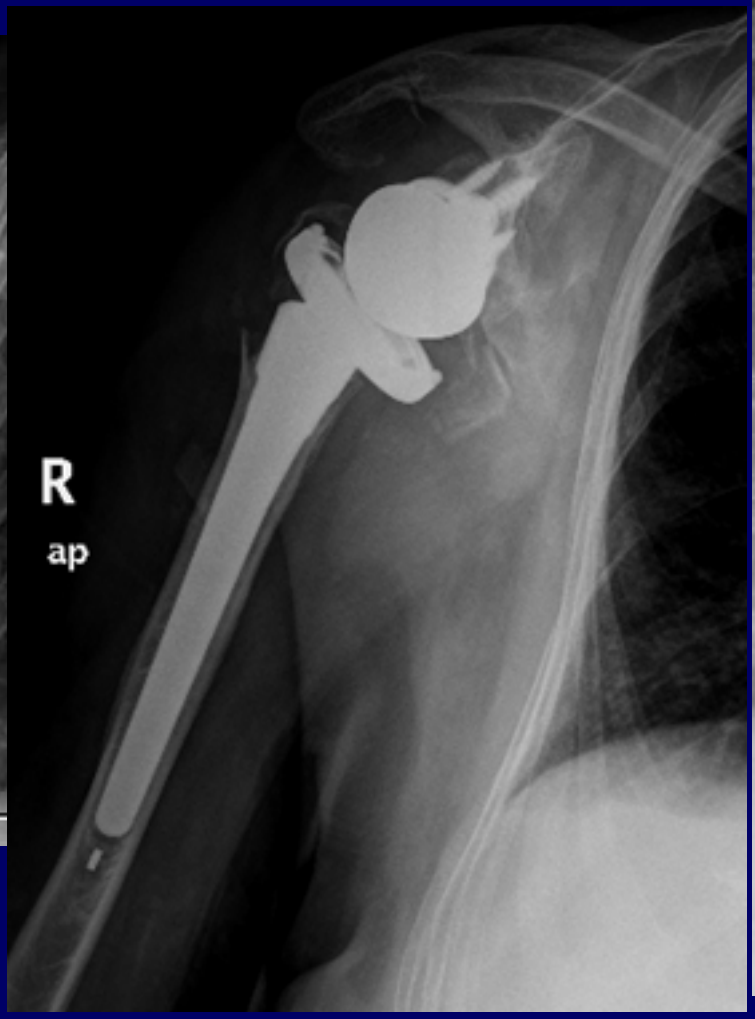
for reversed total shoulder hemiarthroplasty:

- older patients,
- irreparable rotator cuff dysfunction / tear,
- superficial erosion of the glenoid with good bone quality allowing for stable fixation of implants

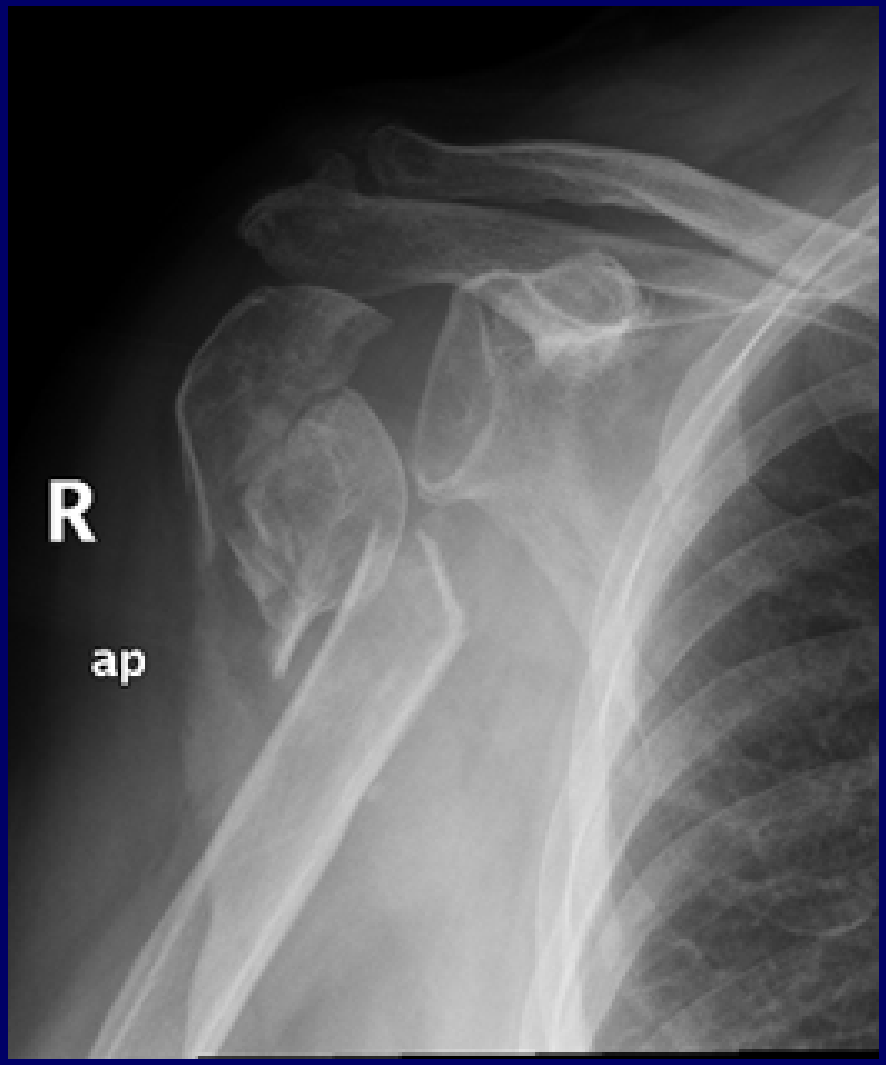
PROS: better results (esp. late), faster return to good range of motion.

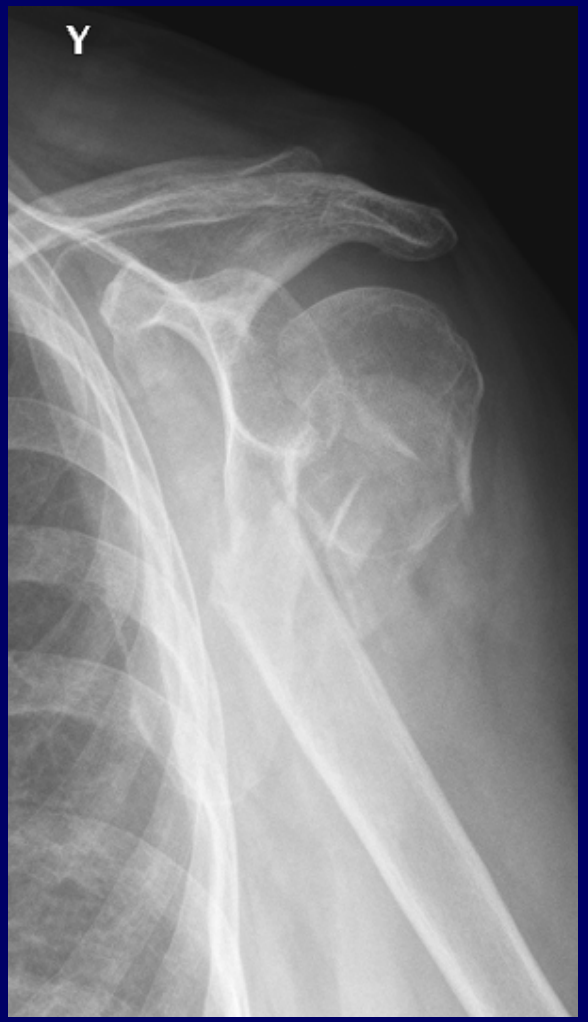
CONS: higher cost, with shorter life expectancy.

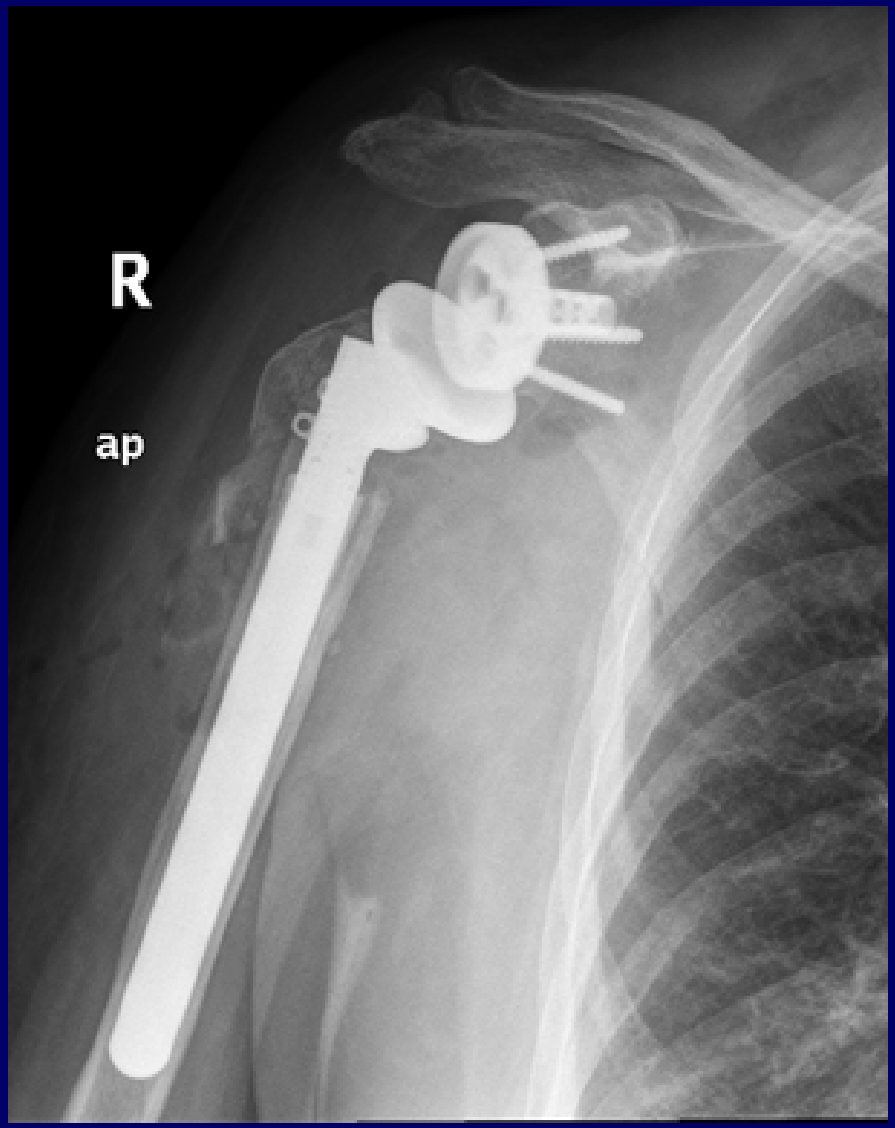
INDICATIONS AND CONTRAINDICATIONS FOR SHOULDER ARTHROPLASTY IN PROXIMAL HUMERAL FRACTURES

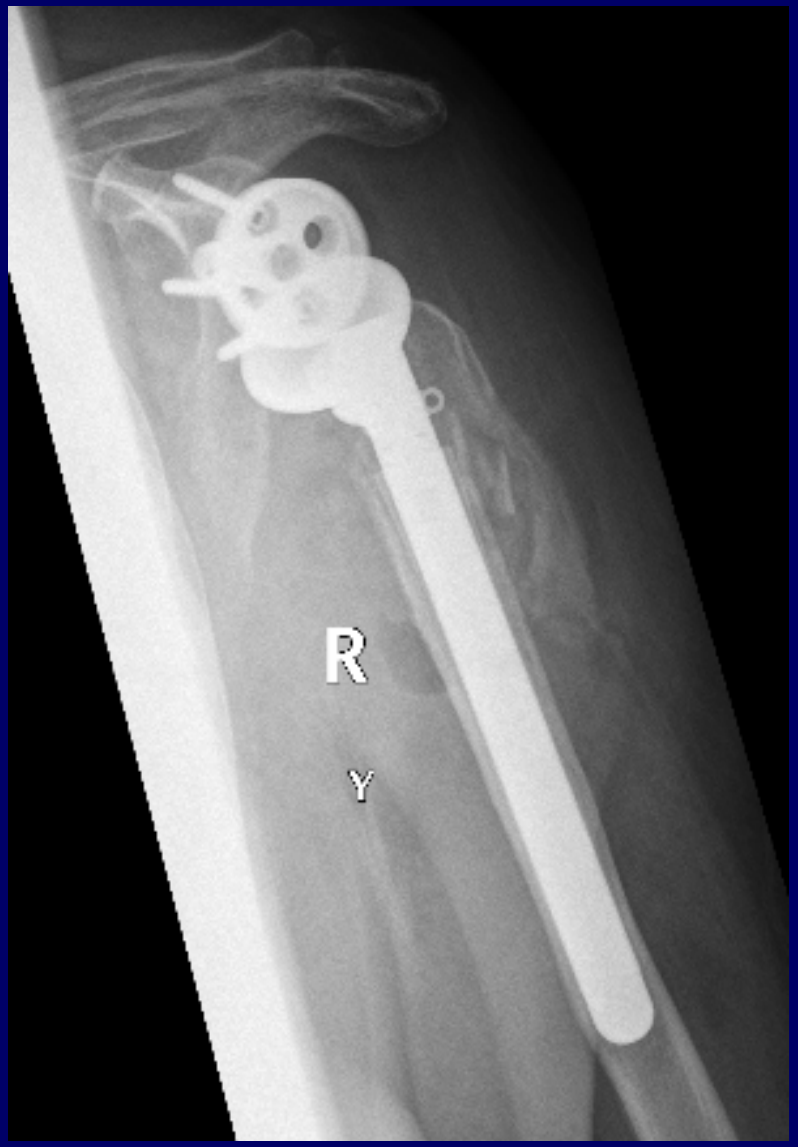


Miskiewicz


R
ap


Y


R
ap


R
Y

CONTRAINDICATIONS

For shoulder arthroplasty in humeral fractures:

1. Fractures amenable to osteosynthesis.
2. Concomitant dysfunction of rotator cuff and the deltoid.
3. Risk of loosening and instability: progressive neurologic disorder affecting joint function (Charcot joint) or sensory function (syringomyelia).
4. Active infection.
5. Poor patient compliance – lack of cooperation in the post-op period and physical therapy).

CONCLUSIONS

1. Indications for shoulder arthroplasty in comminuted fractures, which are at risk of avascular necrosis, are extending.
2. Shoulder arthroplasty is widely accepted by patients.
3. Indications for reverse shoulder arthroplasty are extending and include irreparable cuff dysfunction.
4. Good treatment outcomes are result of good patient selection, appropriate surgical technique and post-operative physical therapy.


DZIĘKUJĘ ZA UWAGĘ