

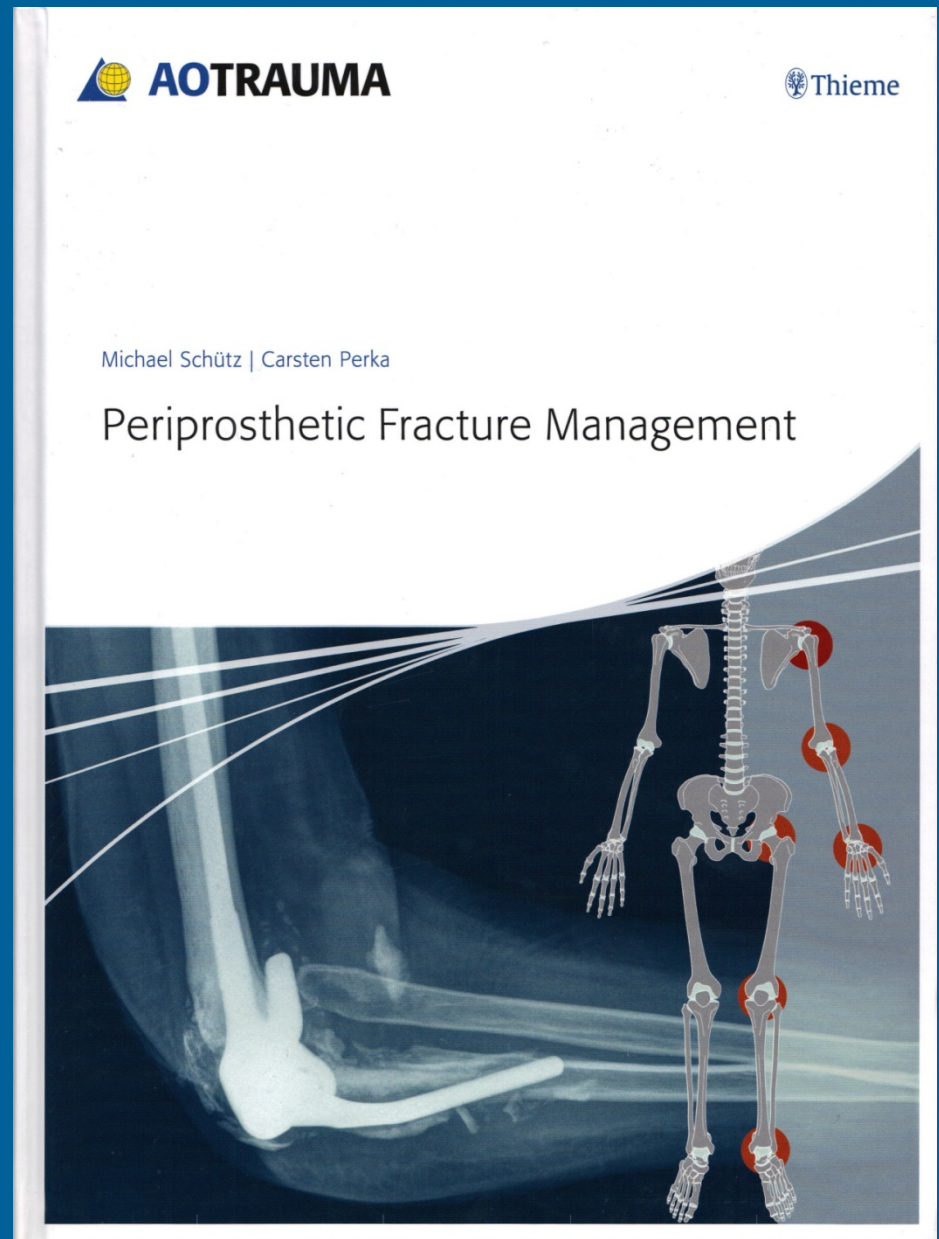
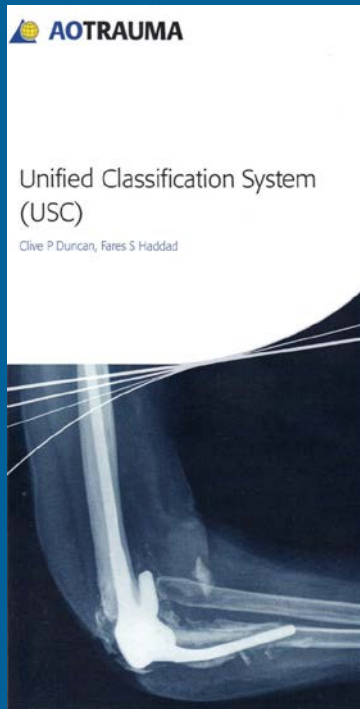
# Det nya klassifikationssystemet för protesnära frakturer

## Unified Classification System (UCS)

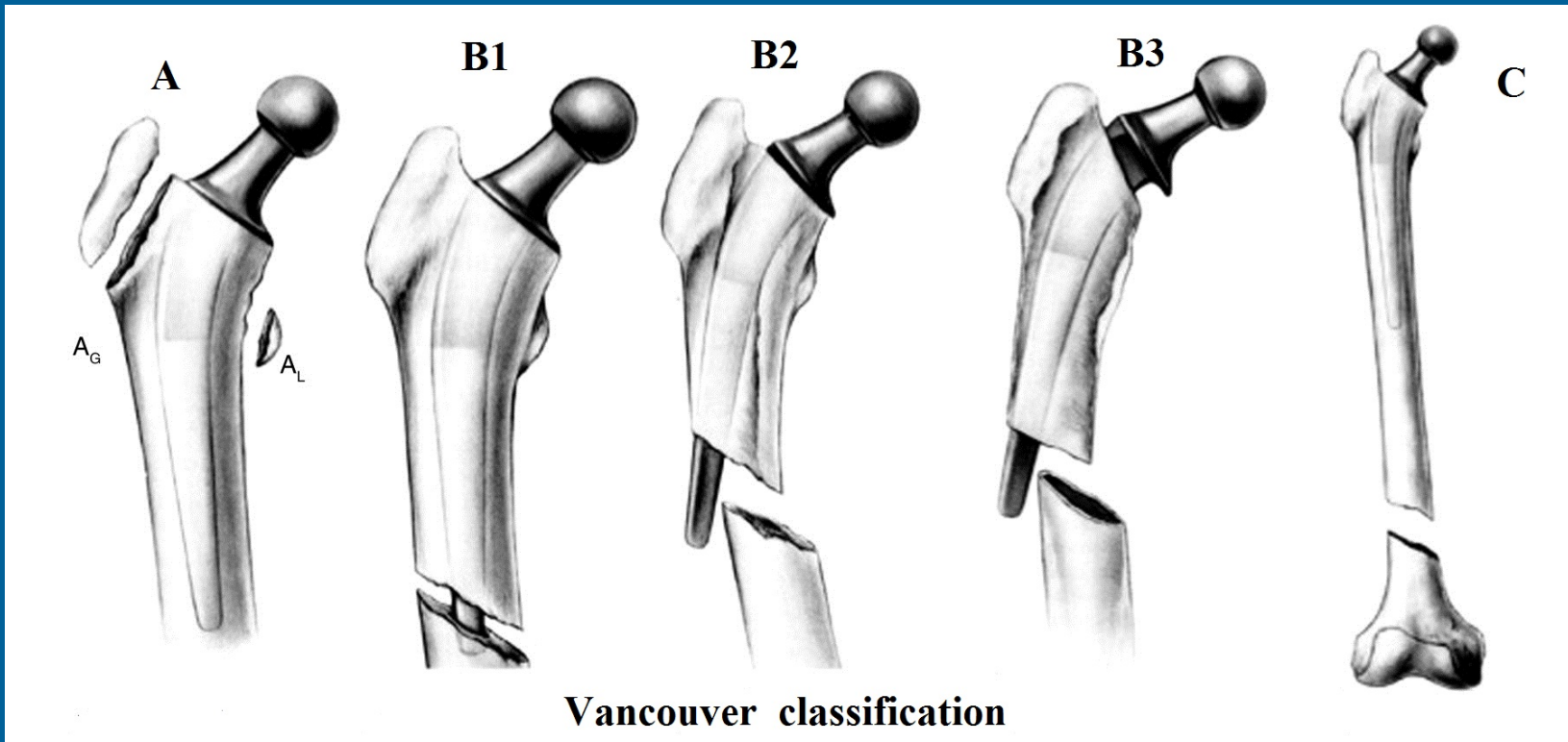
Georgios Chatziagorou  
Ortoped, SU/Mölndal

Rev. M Möller, SFR

# UCS beskrivs ingående i bok och pamflett



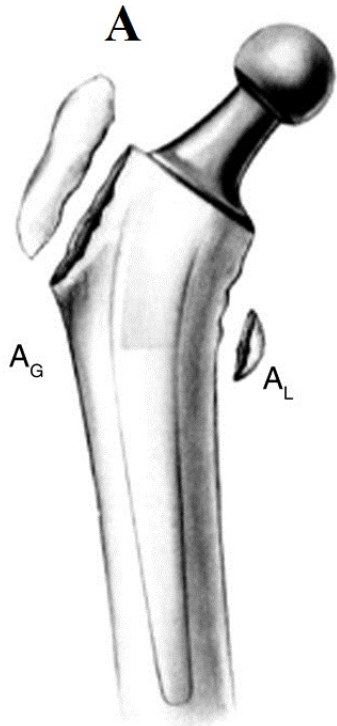
## Så började klassifikationer av dessa frakturer



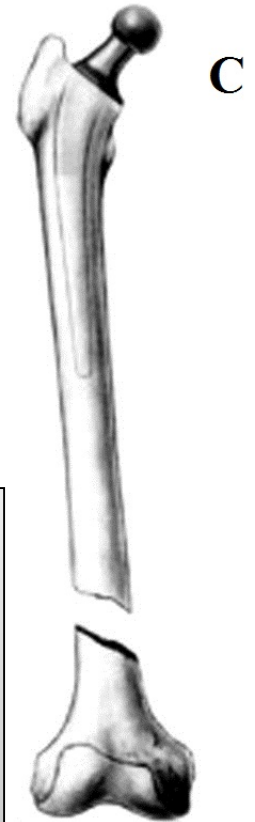
**Classification of the hip.**

*Orthop Clin North Am. 1999 Apr;30(2):215-220*

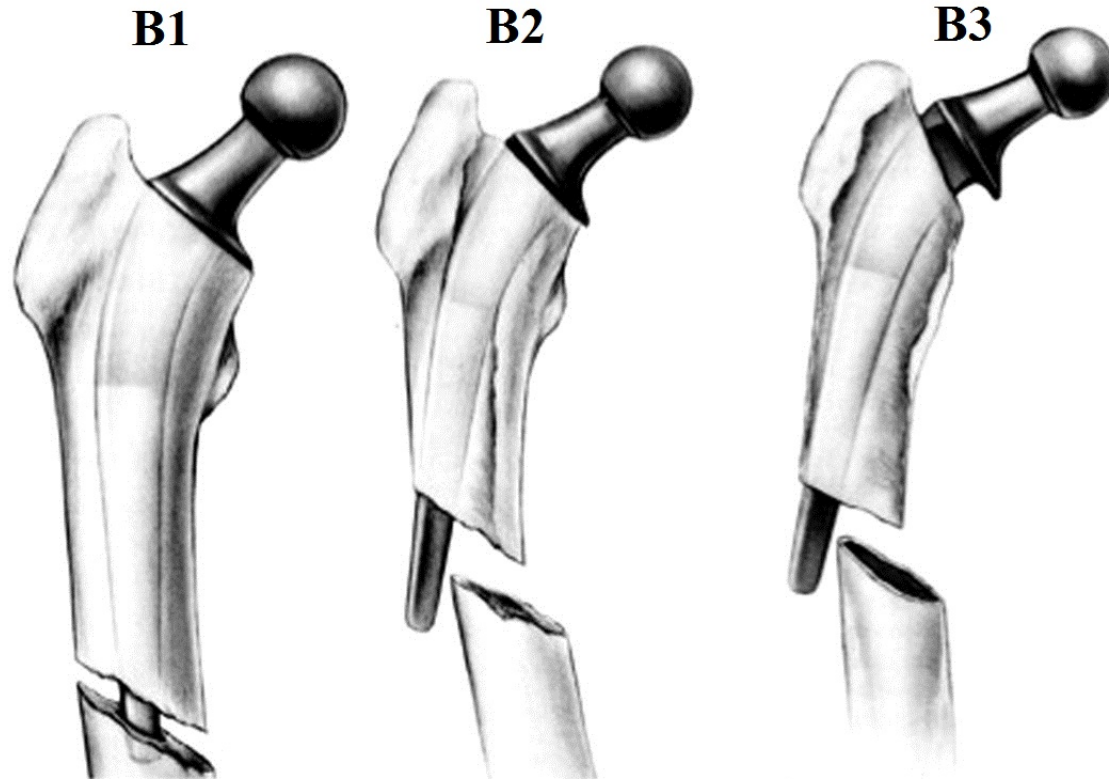
*"Type A fractures occur proximal to the prosthesis. They are trochanteric, either greater ( $A_G$ ), or lesser ( $A_L$ ).*



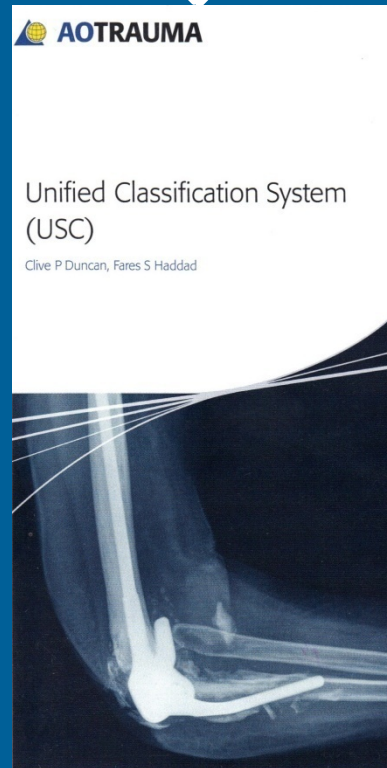
*"Type C fractures occur well below the stem tip, where the fracture can be treated in isolation to the prosthesis."*

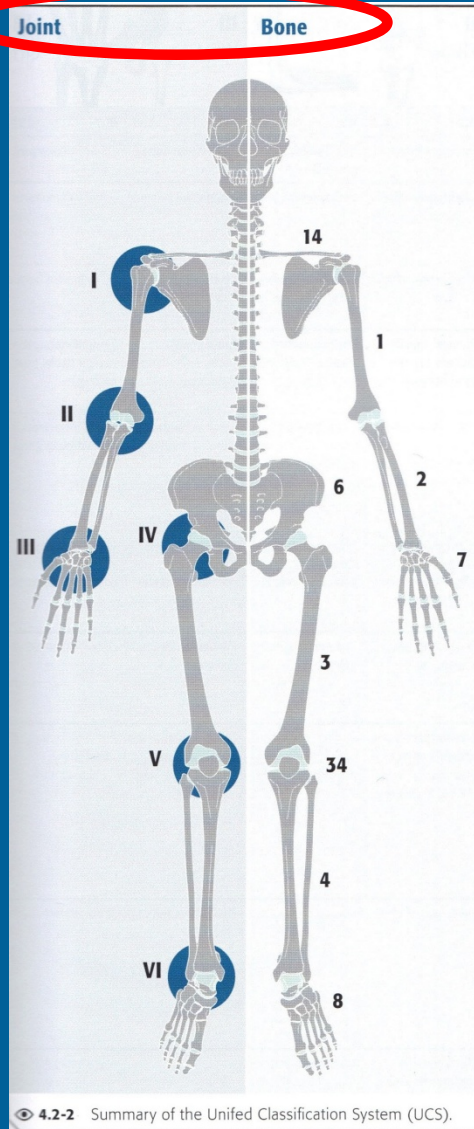


*Type B fractures occur around the stem or just below it.*

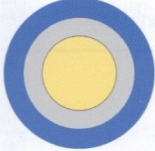




*"If the femoral component is loose and there is severe bone stock loss, whether caused by generalized osteopenia, osteolysis, or severe comminution, the fracture is classified as type B<sub>3</sub>."*



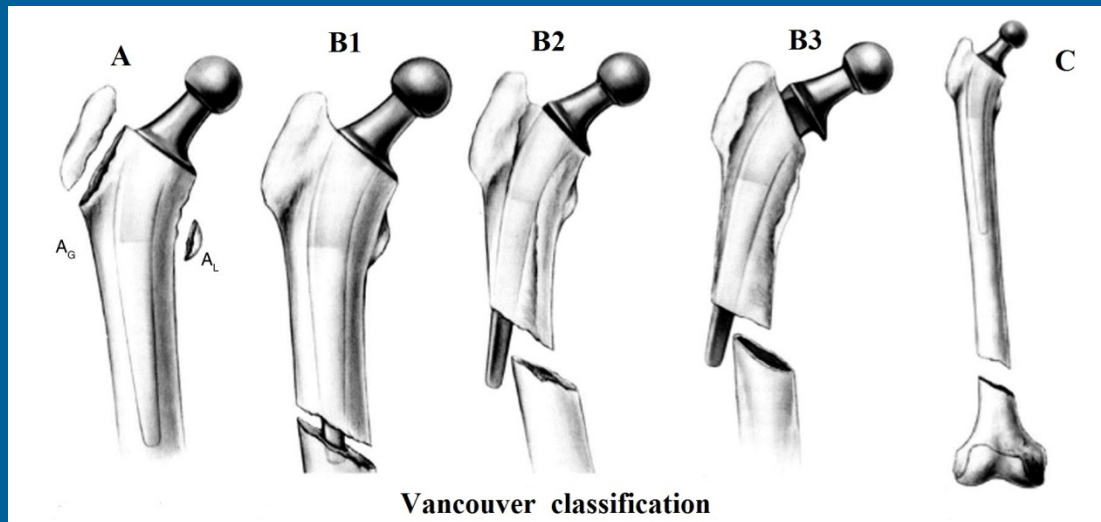
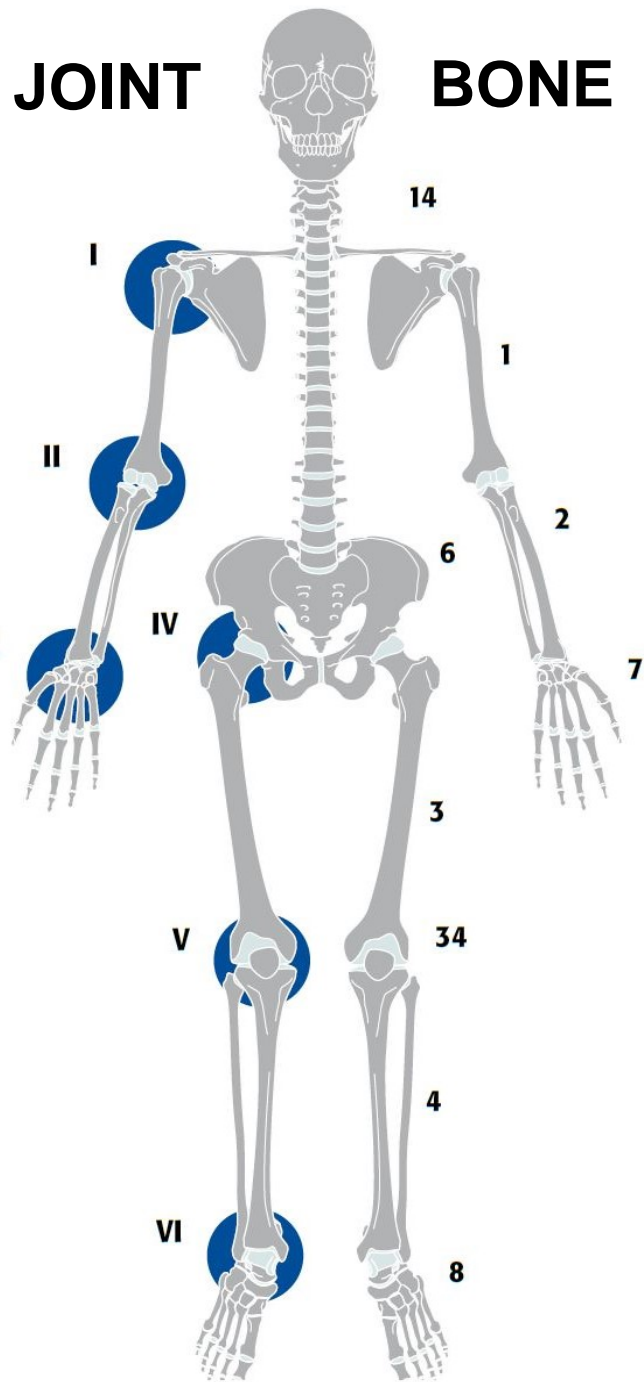


4.2-2 Summary of the Unified Classification System (UCS).

Type	Quality and Fixation
A <b>Apophyseal</b> or extraarticular/periarticular	
B <b>Bed</b> of the implant or around the implant	
C <b>Clear</b> of or distant to the implant	<b>B1</b> Good bone, no implant loosening
D <b>Dividing</b> the bone between two implants or interprosthetic or intercalary	
E <b>Each</b> of two bones supporting one arthroplasty or polyperiprosthetic	<b>B2</b> Good bone with implant loosening
F <b>Facing</b> and articulating with a hemiarthroplasty	
	<b>B3</b> Poor bone or bone defect, implant loosening



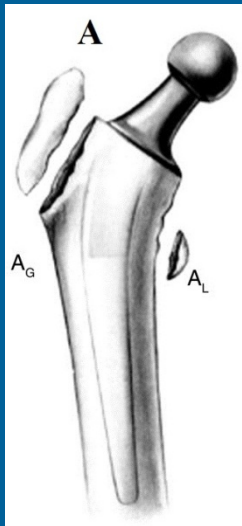
# JOINT BONE



Led (protes): höftled → IV  
 Ben (fraktur): lårben → 3

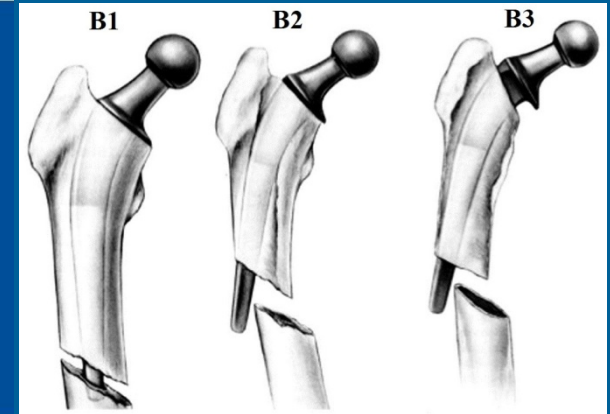
} IV.3 ...





**A**  
*Apophyseal or extraarticular/  
periarticular*

**B**  
*Bed of the implant or  
around the implant*



**TYP**  
*(frakturens lokalisation)*



**C**  
*Clear of or distant to the implant*

**D**  
*Dividing the bone between two im-  
plants or interprosthetic or intercalary*

**E**  
*Each of two bones supporting one  
arthroplasty or polyperiprosthetic*

**F**  
*Facing and articulating with a hemiar-  
throplasty*

*"requires subclassification"*

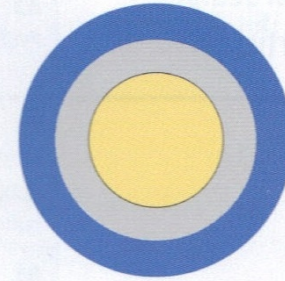
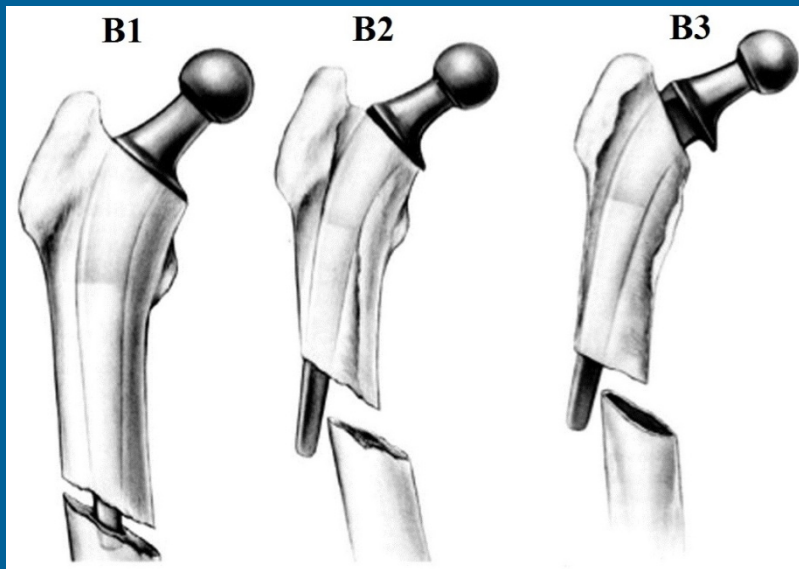
**fraktur mellan höftprotes  
och  
knäprotes**

**fraktur både i acetabulum  
och  
i femur**

**Acetabularfraktur vid en  
halvprotes**

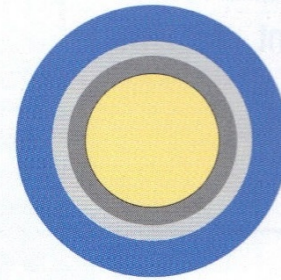
## QUALITY *(of the bone)*

## FIXATION *(of the implant)*



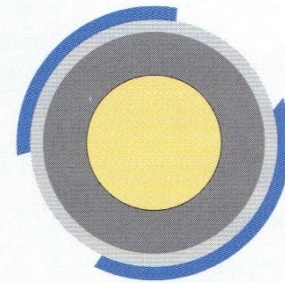
**B1**

Good bone, no implant loosening



**B2**

Good bone with implant loosening

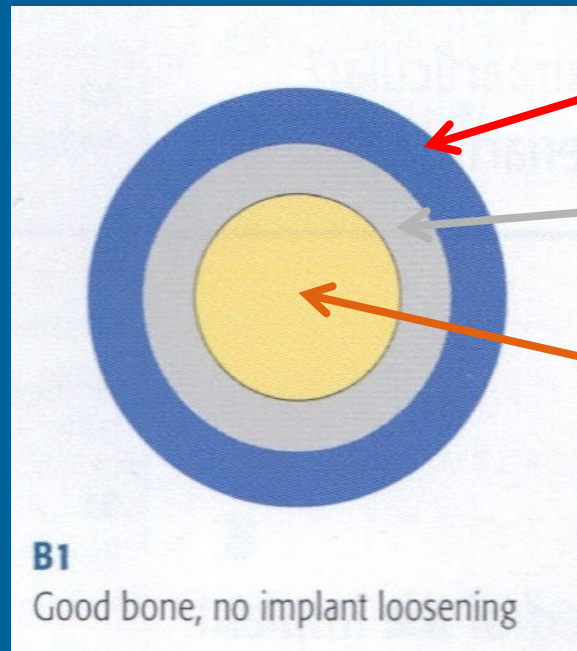
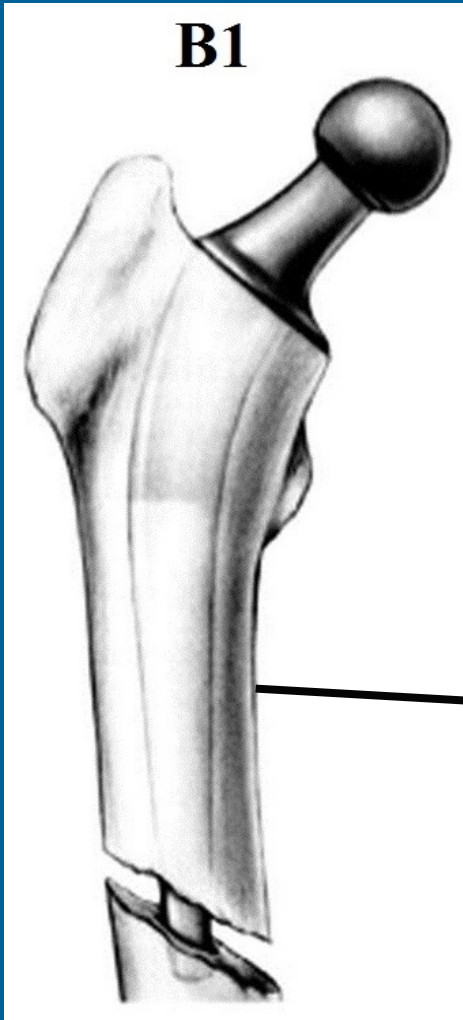


**B3**

Poor bone or bone defect, implant loosening

**QUALITY** (of the bone)

**FIXATION** (of the implant)



**skelett**

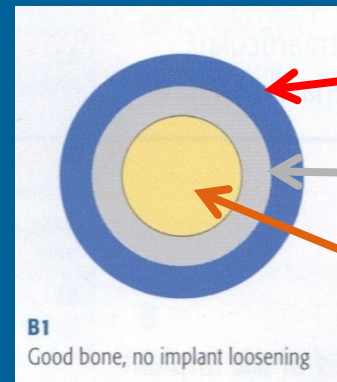
**cement**

**protes**

**IV.3-B1**

**QUALITY** (of the bone)

**FIXATION** (of the implant)

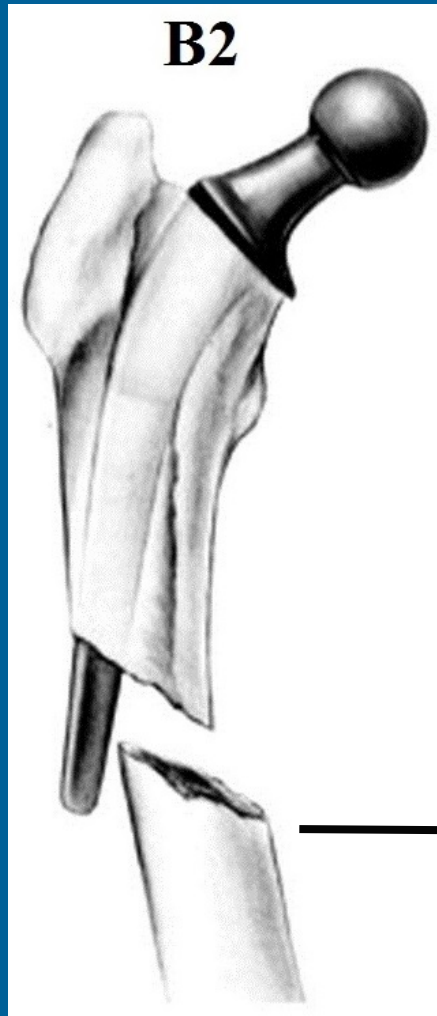


**skelett**

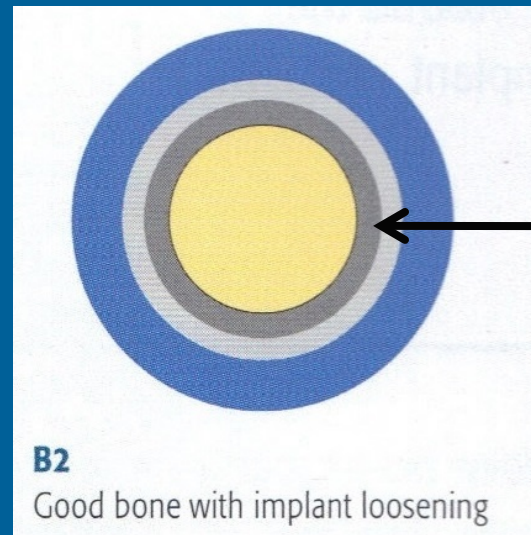
**cement**

**protes**

**B1**  
Good bone, no implant loosening



**B2**



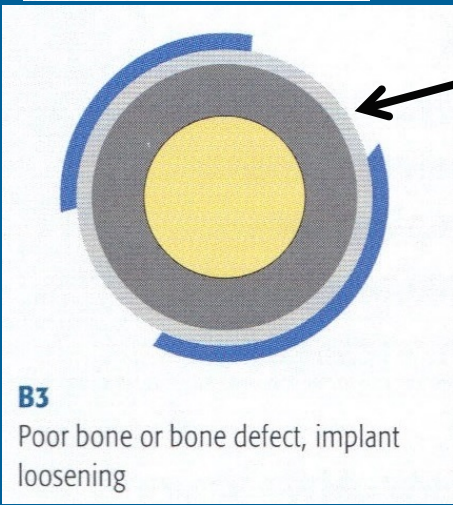
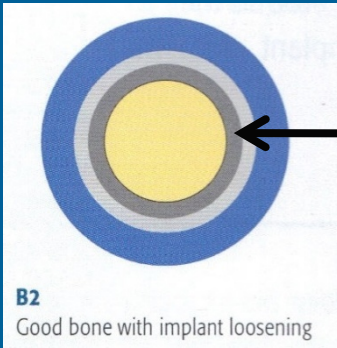
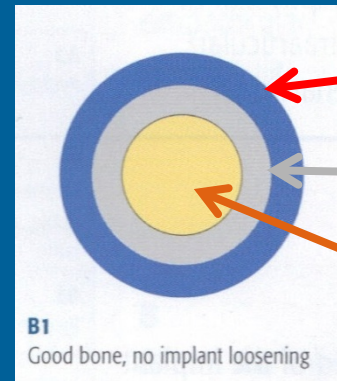
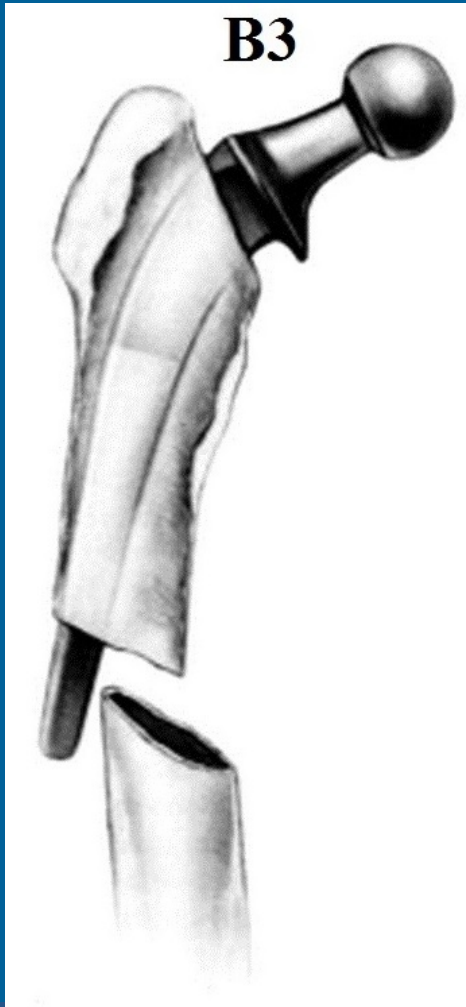
**lossning**

**B2**  
Good bone with implant loosening

**IV.3-B2**

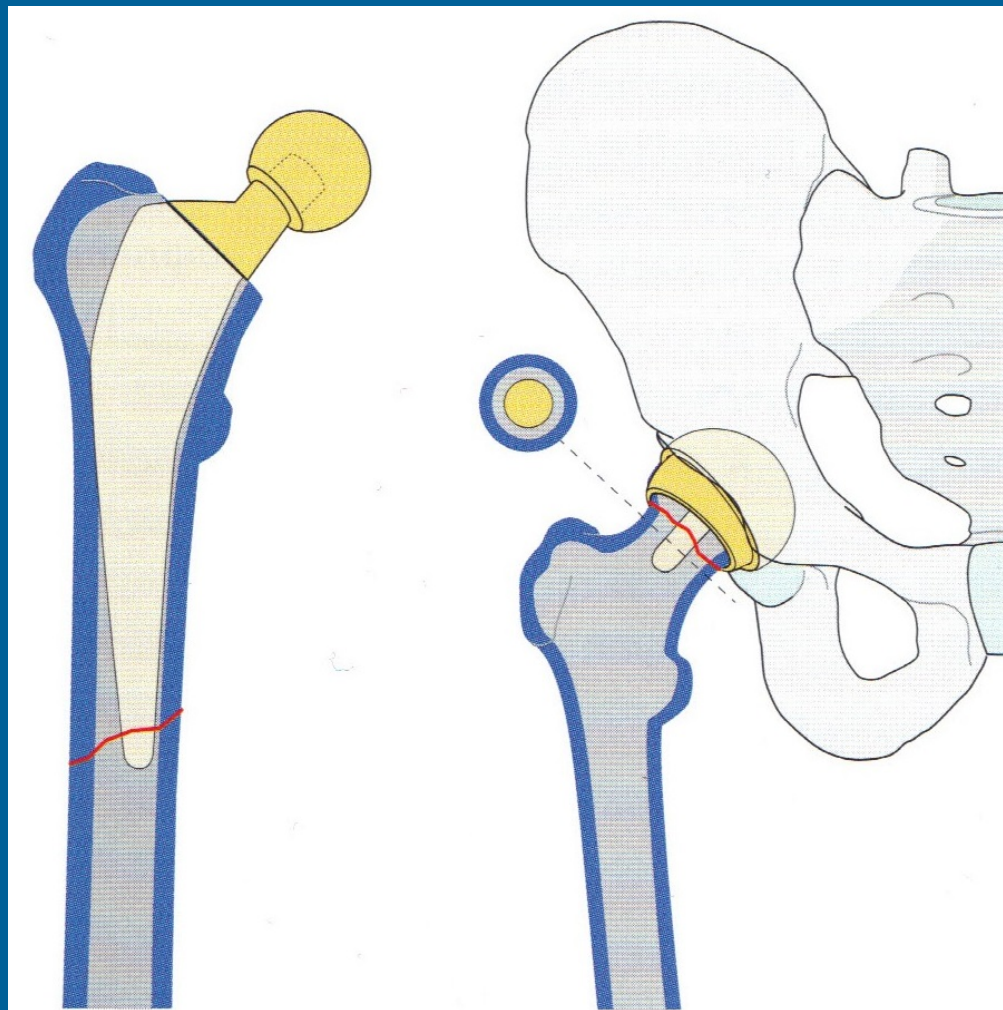
**QUALITY** (of the bone)

**FIXATION** (of the implant)

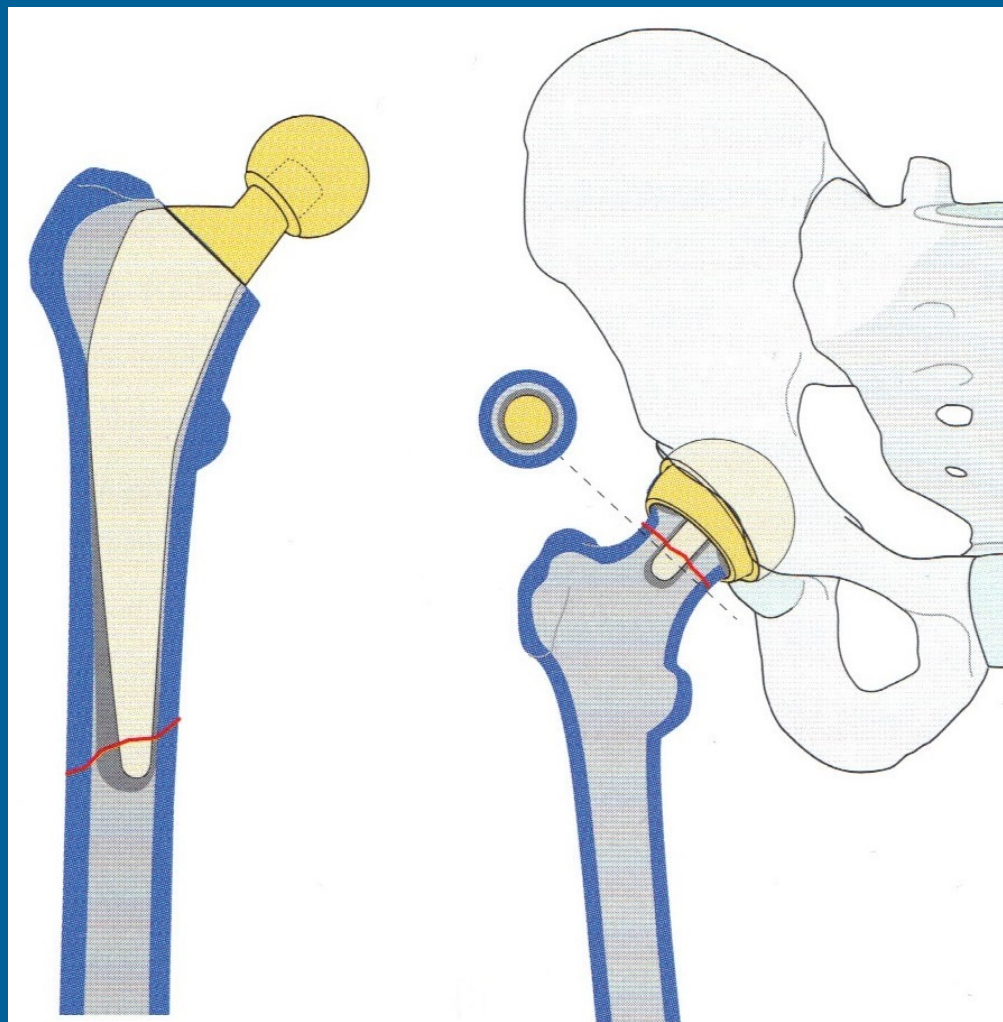


**IV.3-B3**

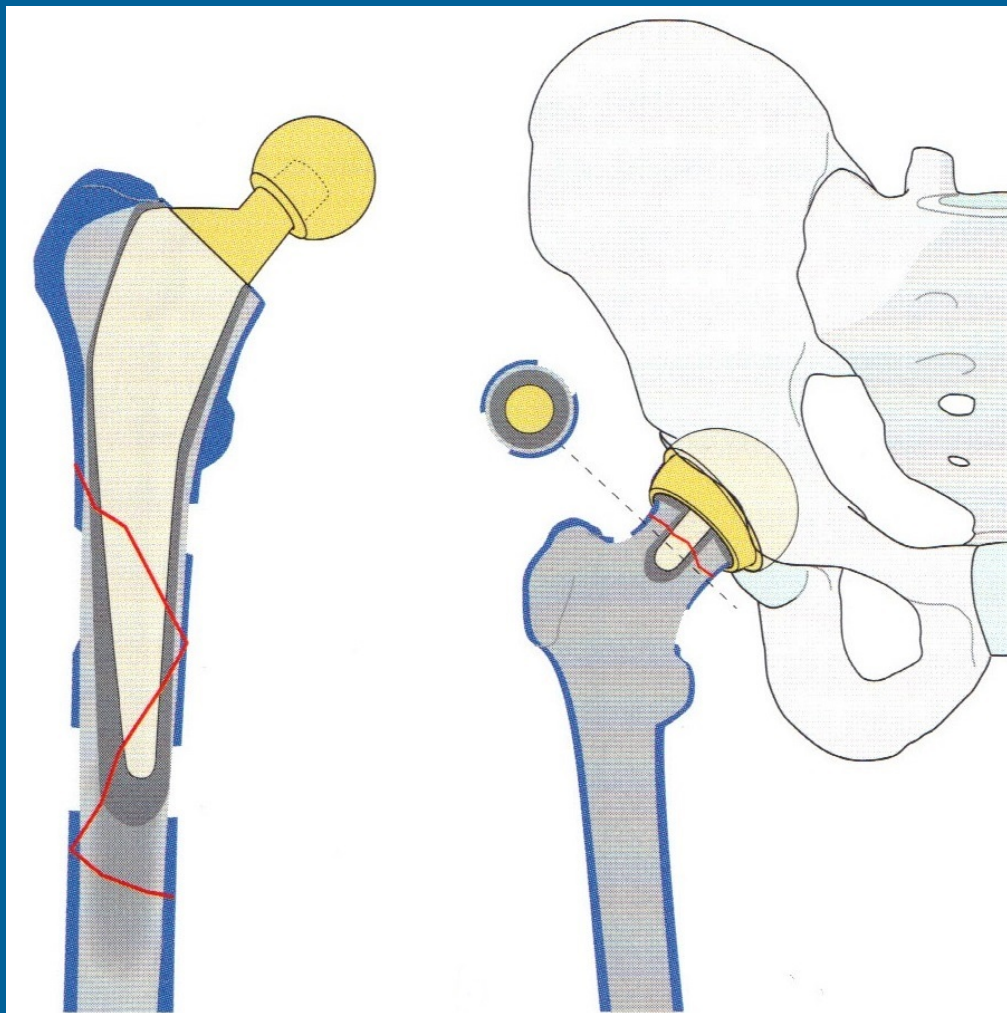
# IV.3-B1



## IV.3-B2



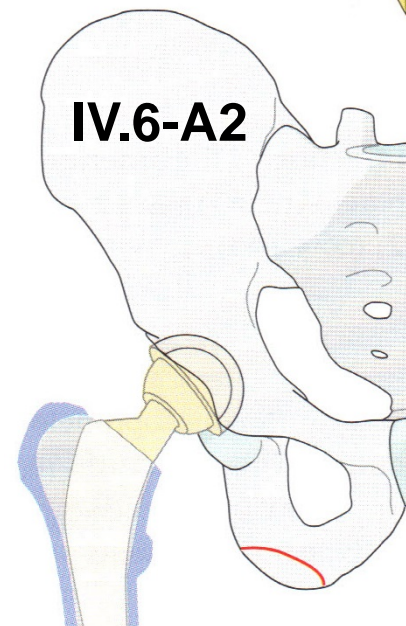
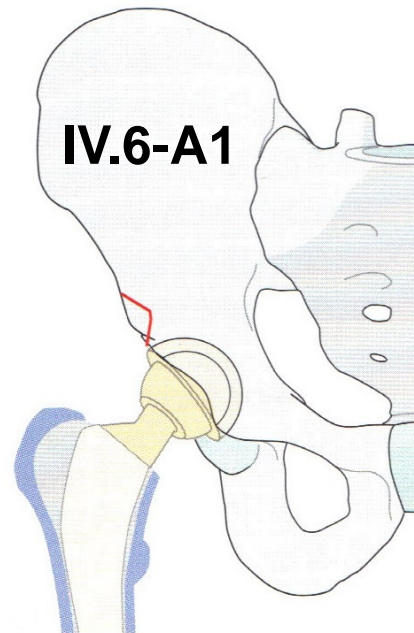
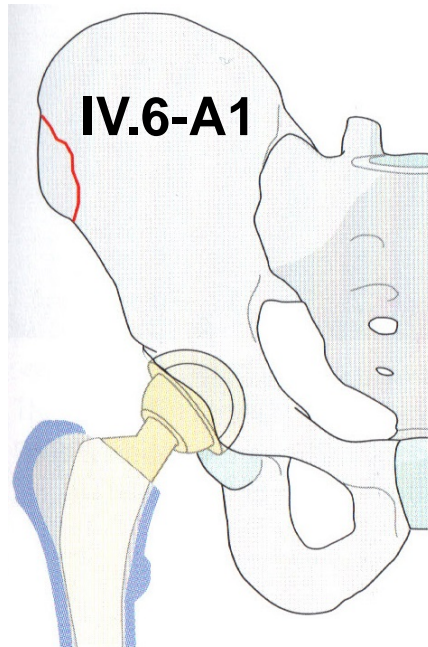
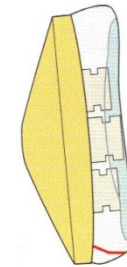
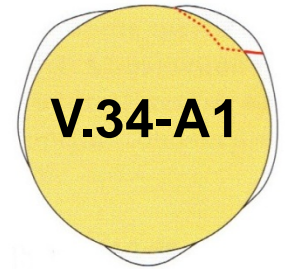
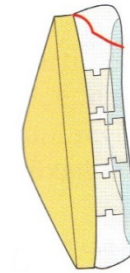
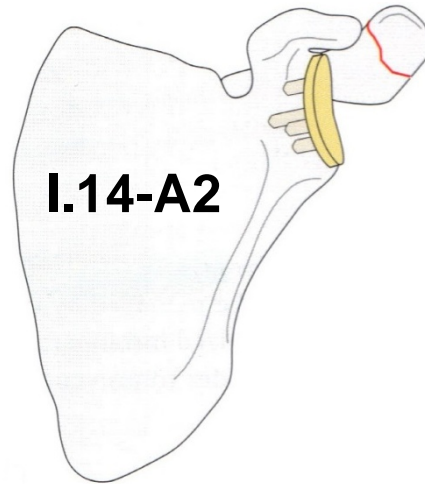
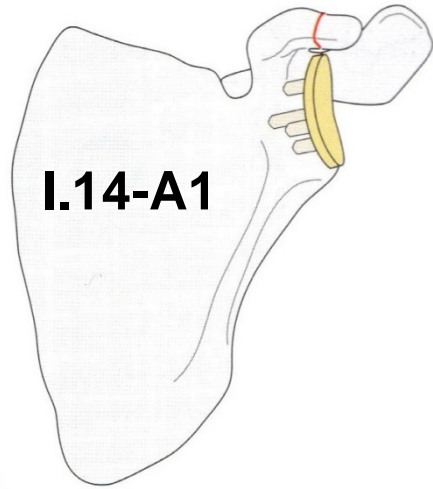
## IV.3-B3



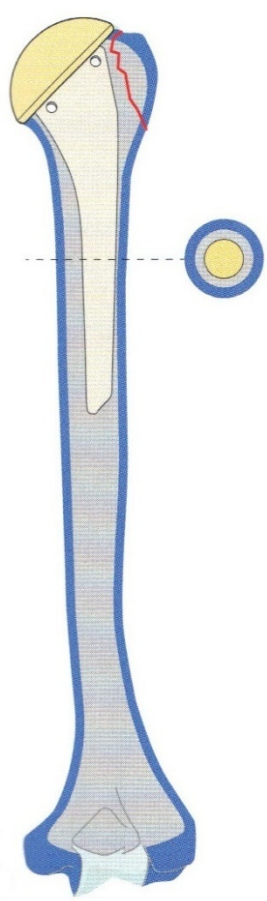


## Typ A. Axel & Höft

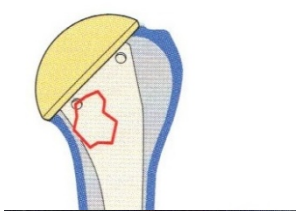
## Typ A. Patella



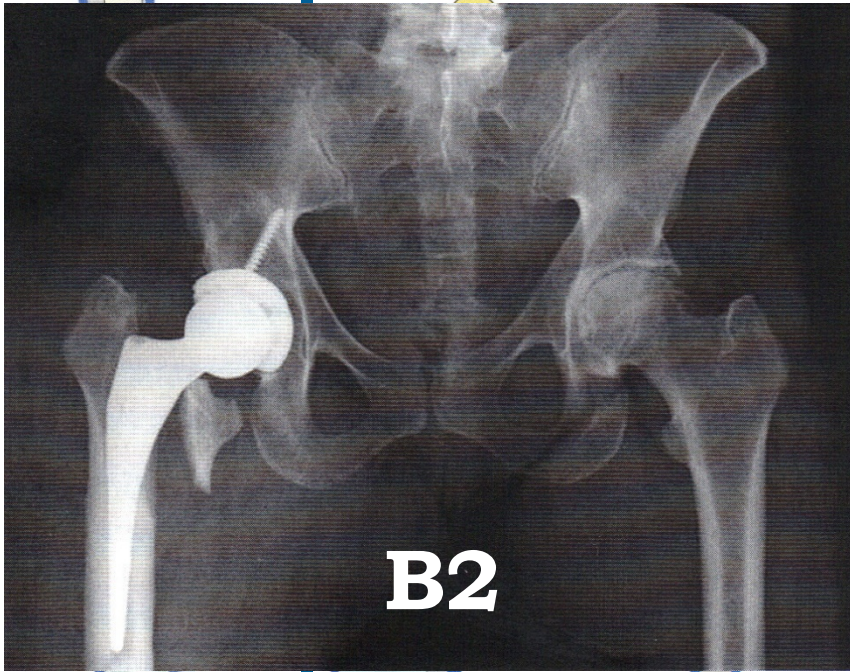
# Typ A. axel & höft



I.1-A1

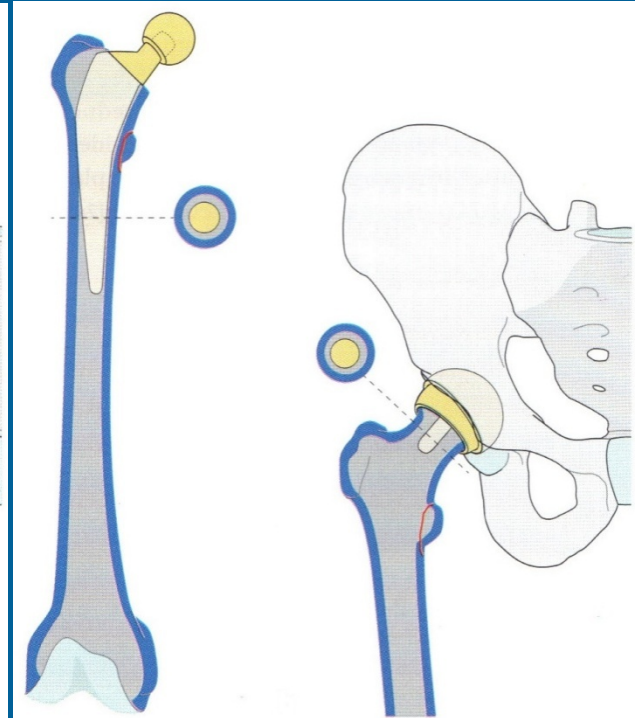


I.1-A2



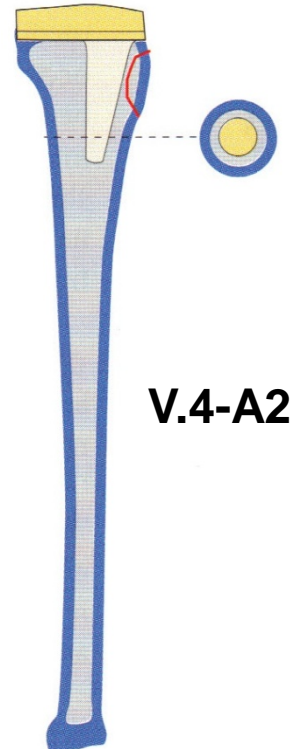
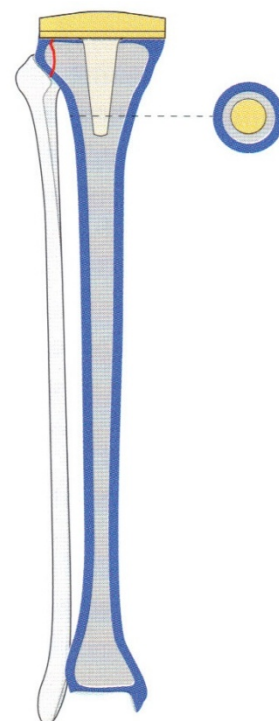
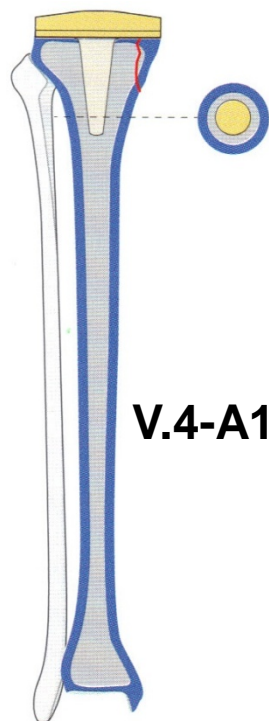
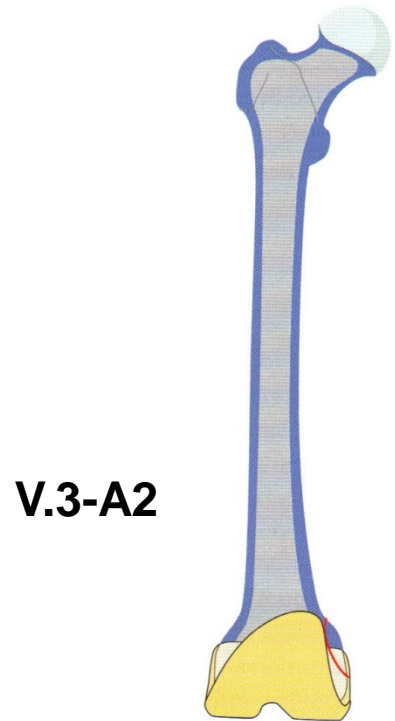
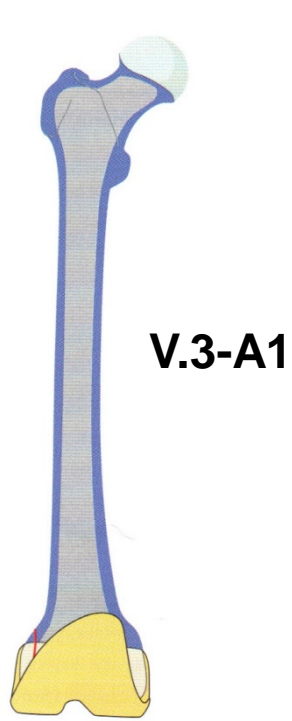
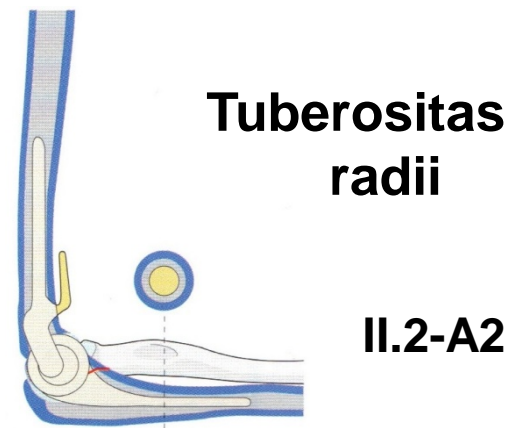
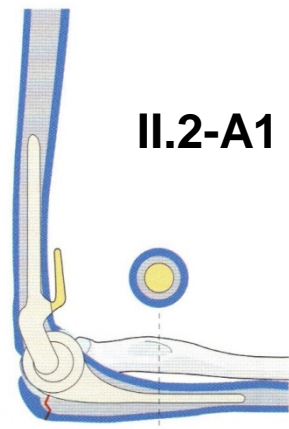
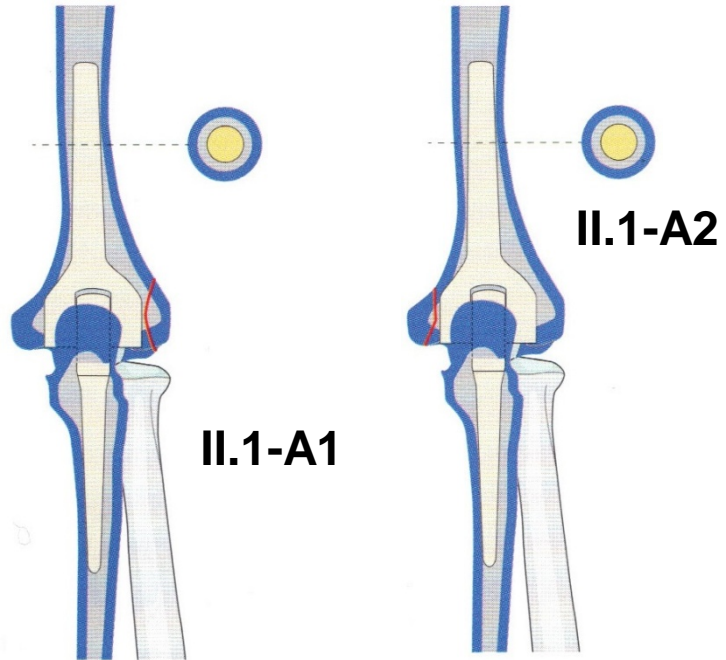
B2

IV.3-A1

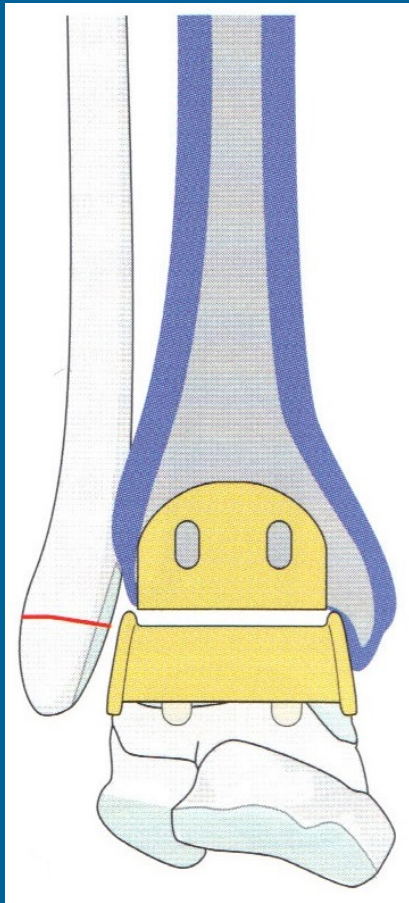


IV.3-A2

# Typ A. armbåge & knä



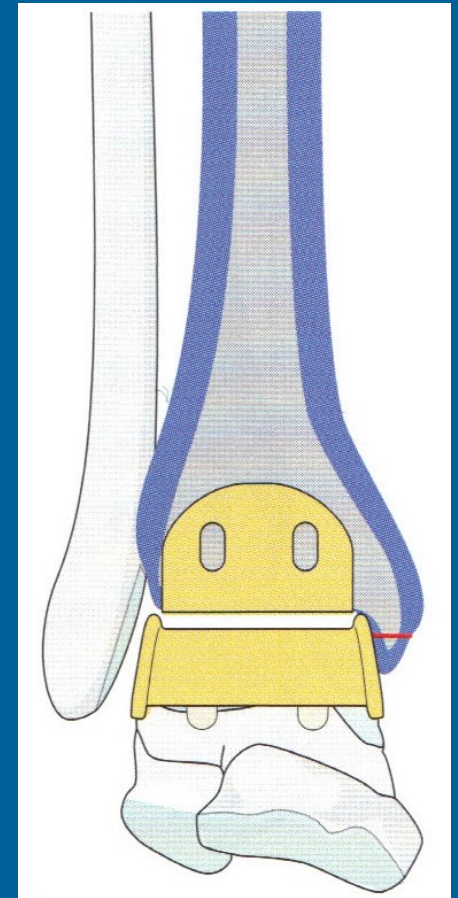
## Typ A. fotled



VI.4-A2



VI.4-B1



VI.4-A1

# B1 – B2 – B3

”If the fracture involves the bone-implant interface, which is responsible for the stability of fixation of the implant, this group will be categorized as type B.

”In some cases the distinction between type B1 and B2 will require further radiological investigation or examination of the bone-implant interface at the time of operation.”

”The distinction between type B2 and B3 is one of individual interpretation, without a clear-cut transition.”

”The fracture is categorized as type B2 if the loose implant can be revised with a fairly straightforward technique. If more specialized techniques or a salvage procedure are necessary, then it should be classified as type B3.

In the majority of cases, the type B fracture will either be type B2 or B3. Implant loosening was either present prior to fracture, or it will have occurred as a consequence of the injury.

In a minority of cases, after critical analysis, the fracture will prove to be a type B1.

## Typ C

”Type C involves a fracture which is in the bone containing the implant, but distant from the bed of the implant.”

”If the fracture is quite distant to the arthroplasty, to the extent that the implant can be ignored, it will be categorized as type C.”



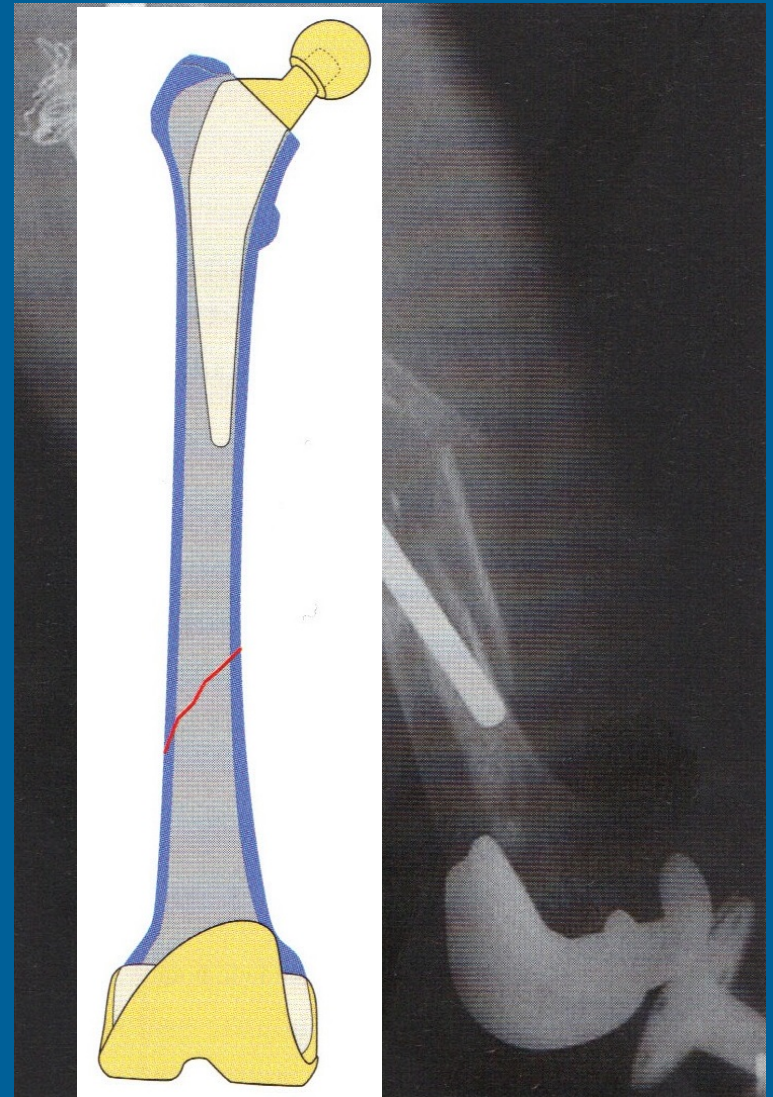
## Typ D / Interprosthetic / Intercalary

Intercalary (thefreedictionary):  
"inserted between other elements or parts"

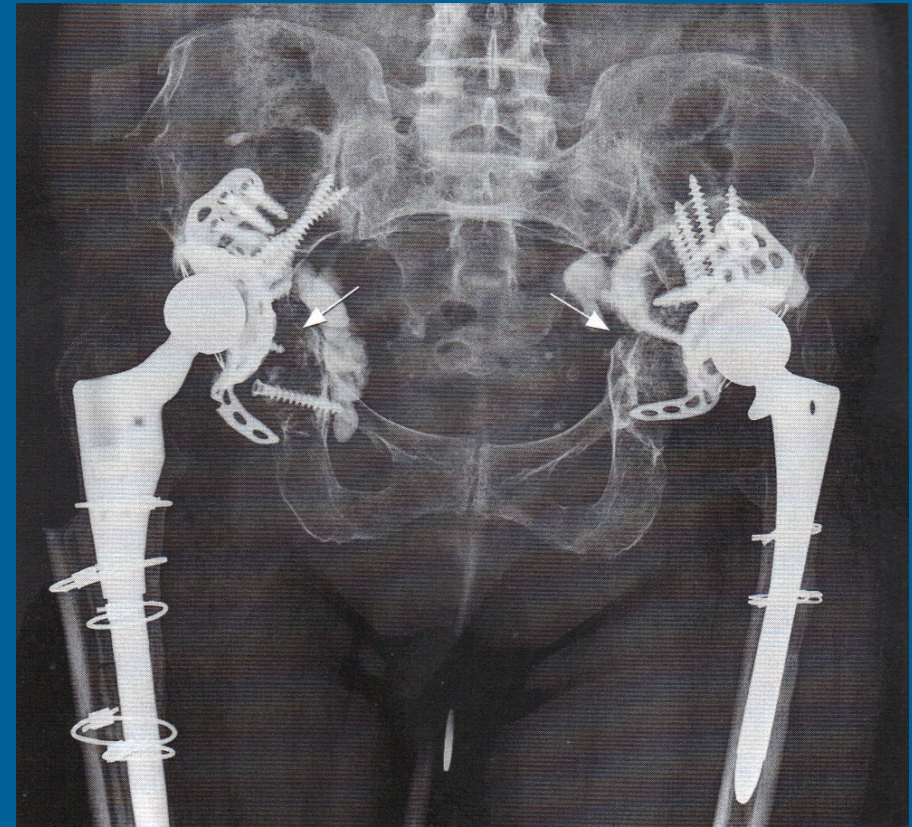
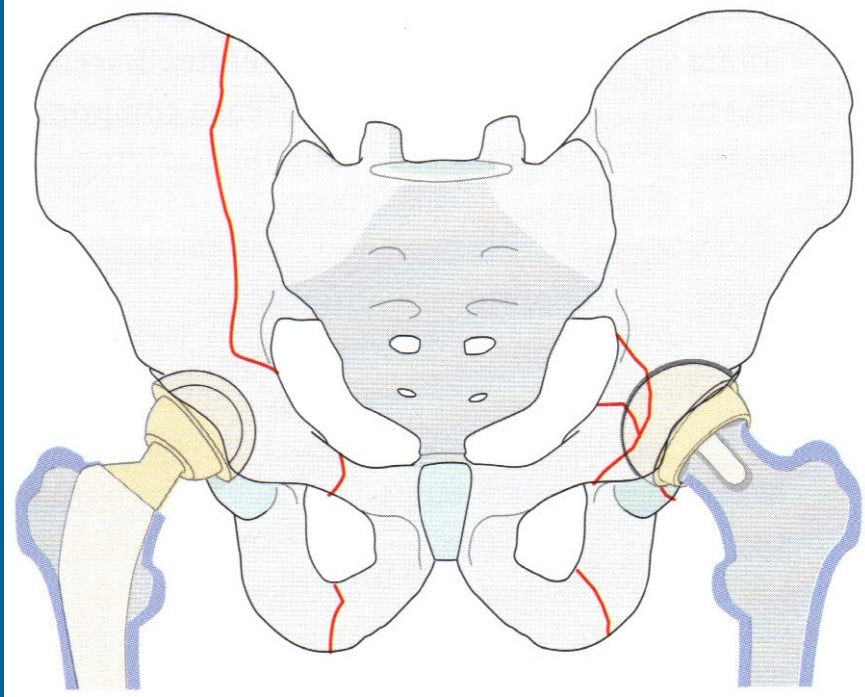
"Dividing the bone between two implants."

"The fracture involves a long bone that supports two prostheses, both proximal and distal to the fracture site."

"Type D is a fracture affecting one bone which supports two replacements."



## Typ D / Interprosthetic / Intercalary (speciella fall)



**Patella:** ej typ D

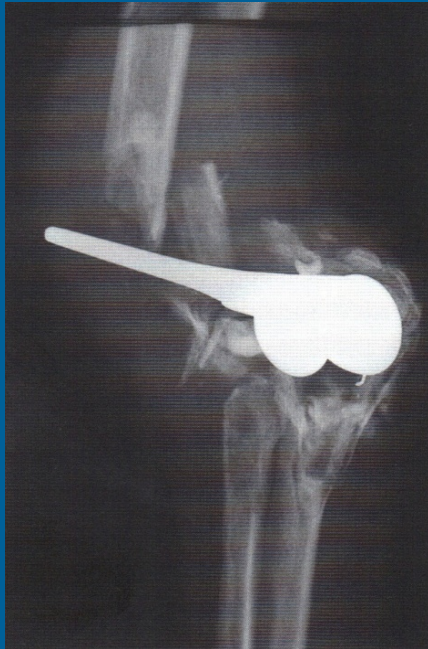
**Handledspotes:** mellan caput radii protes och handledspotes

**Talus:** typ D vid talonavicular protes



# TYP E – Poly-peri-prosthetic

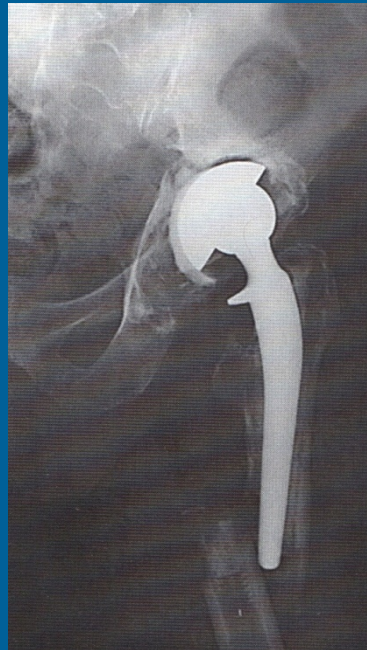
II.1-E / II.2-E



II-E ?

Armbåge typ E: (ej radius)  
# humerus + ulna

IV.6-E / IV.3-E



IV-E ?

V.3-E / V.4-E



V-E ?

KNÄ = 3 BEN

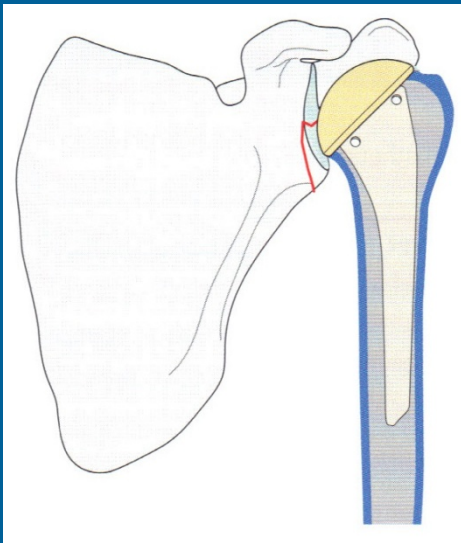
FEMUR typE:  
# femur + tibia/patella

TIBIA typ E:  
# tibia + femur/patella

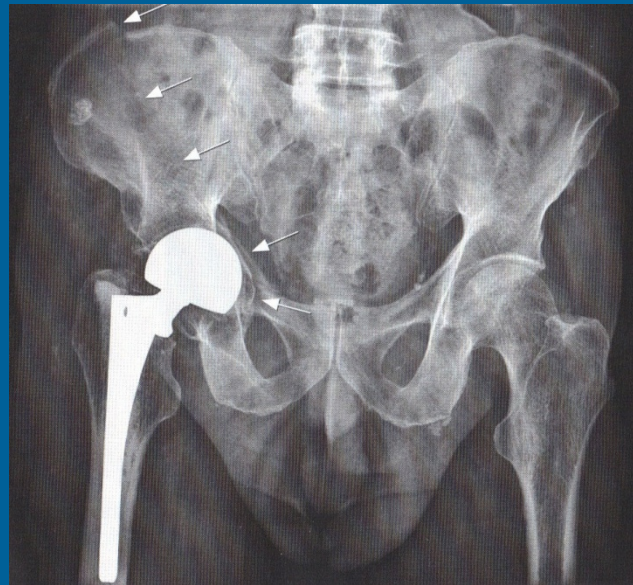
PATELLA typ E:  
# patella + femur/tibia

# TYP F – Facing/Articulating with a hemiarthroplasty

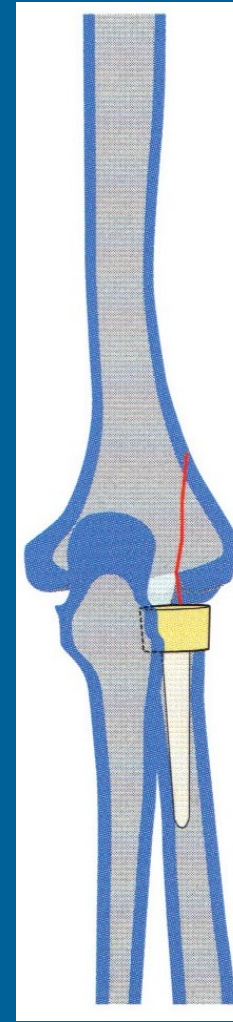
I.14-F



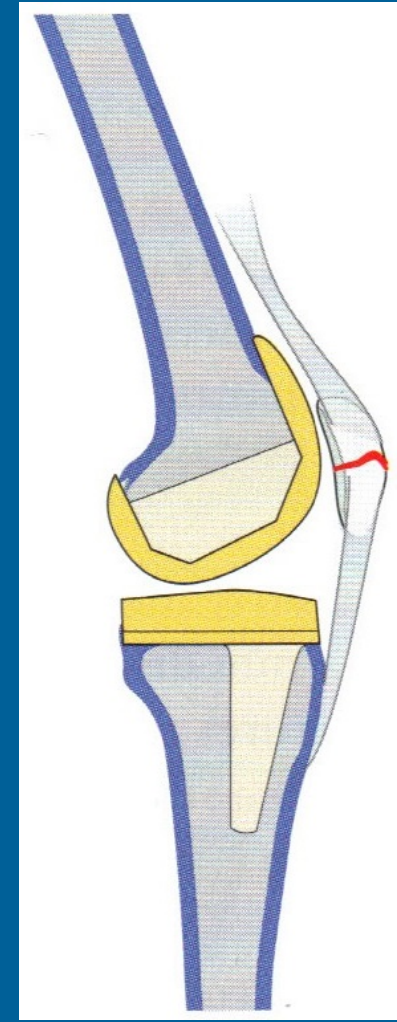
IV.6-F

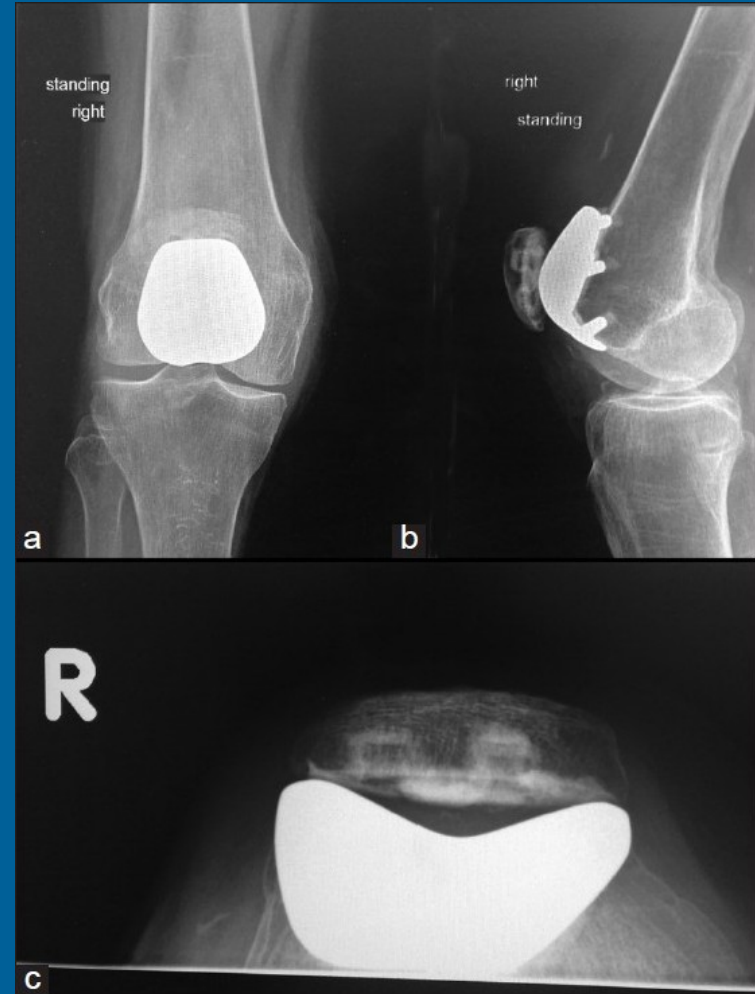
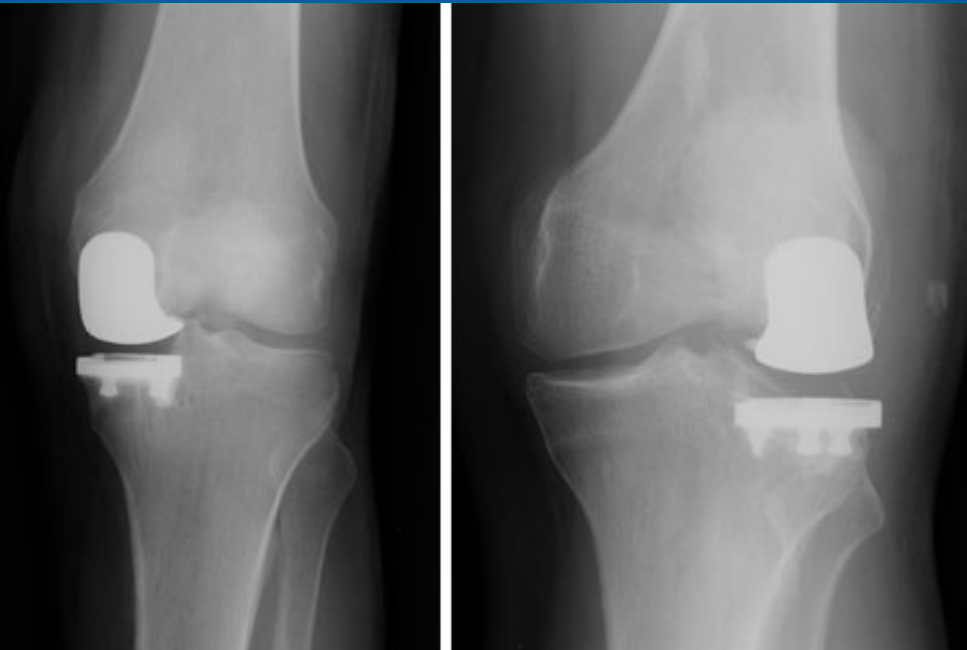


II.1-F



V.34-F



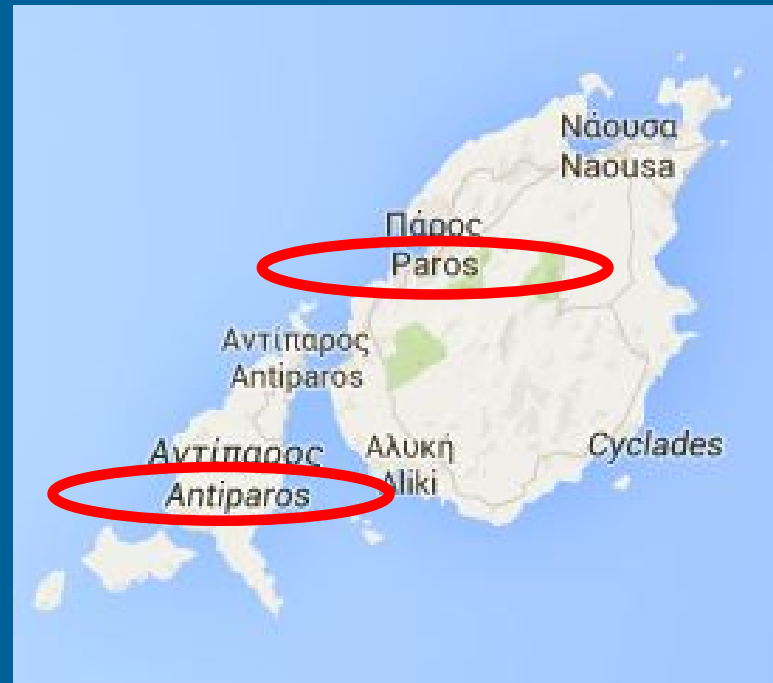


# TYP F – Facing/Articulating with a hemiarthroplasty

## “anti-prosthetic fracture”

**anti** ['æntɪ] I s motståndare II *adj*  
oppositionell [*an* ~ *group*]; *be* ~ vara  
motståndare (fientligt stämd)

From Ancient Greek ἀντί  
(*antí*, “against”)  
Opposite of, reverse.



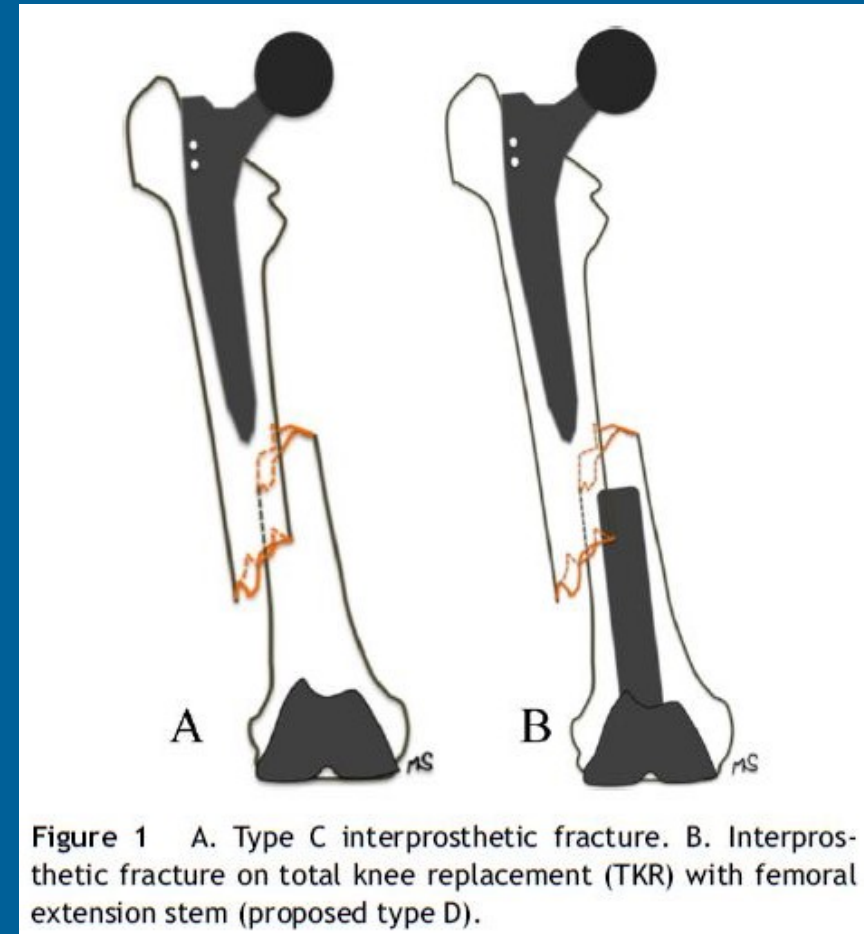
## Vancouver classification + D-E-F

M. Soenen et al  
"Interprosthetic femoral fractures: Analysis of 14 cases. Proposal for an additional grade in the Vancouver and SoFCOT classifications"

*Orthopaedics & Traumatology: Surgery & Research* (2011) 97, 693-698

**E = poly-peri-protes fraktur**

**F = anti-protes fraktur**



# LITERATUR

- **Classification.**, In: *Periprosthetic Fracture Management*. 2013. Vol 1. New York: Thieme: 10001
- **Classification of the hip.** *Orthop Clin North Am*. 1999 Apr;30(2):215-220
- The reliability and validity of the Vancouver classification of femoral fractures after hip replacement. *J Arthroplasty* 2000; 15: 59-62
- **European validation of the Vancouver classification of periprosthetic proximal femoral fractures.** *J Bone Joint Surg [Br]* 2008; 90-B: 1576-1579
- **The Unified Classification System (UCS): Improving our understanding of periprosthetic fractures.** *Bone Joint J* 2014;96-B: 713-716
- **Field testing the classification system for periprosthetic fractures of the femur, tibia and patella in association with knee replacement.** *Bone Joint J* 2014;96-B: 1669-73