My approach to failed hemi-prosthesis

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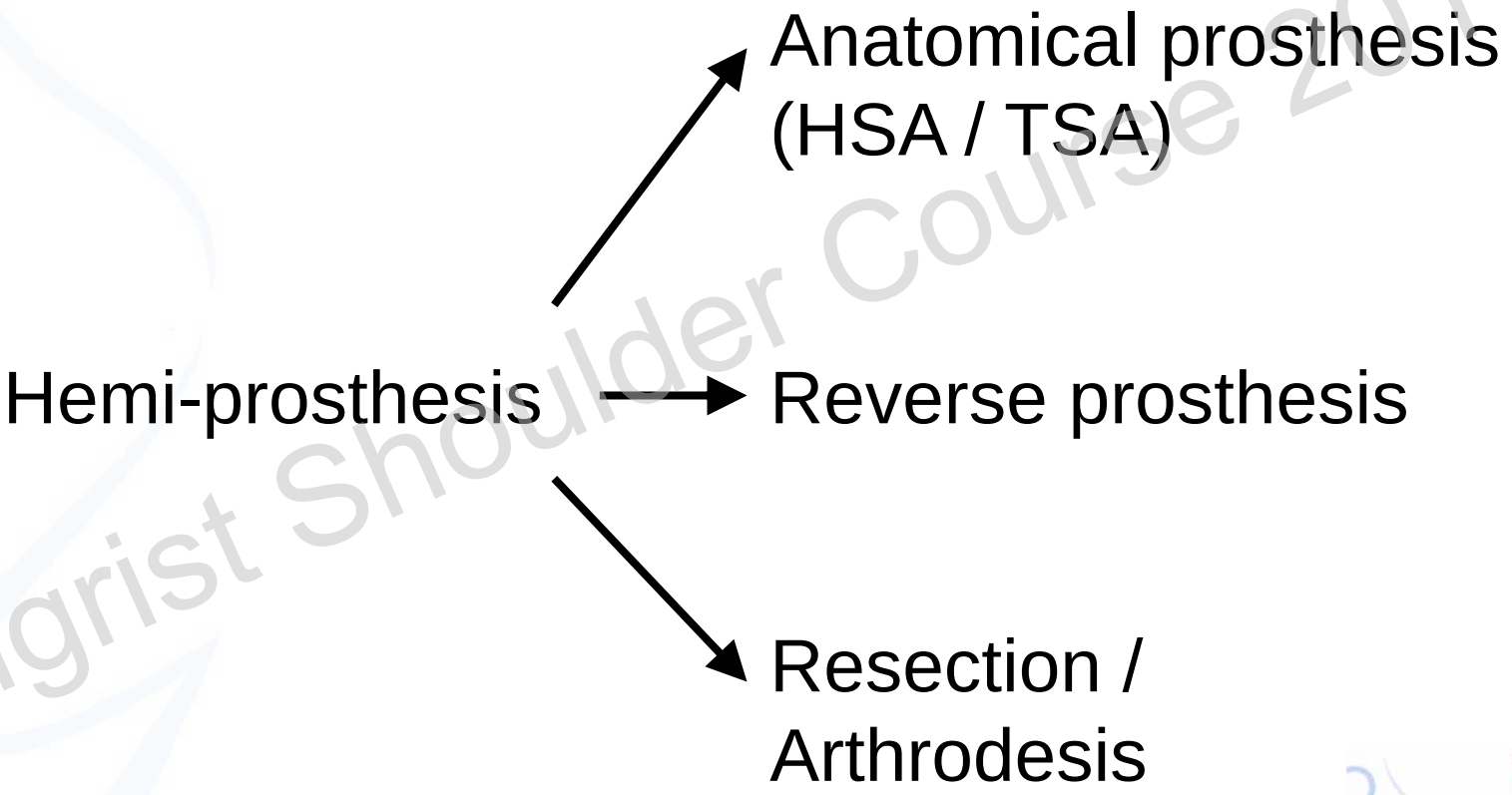
Disclosures

Consultant to Arthrex
Royalties from Arthrex

Consultant to Zimmer

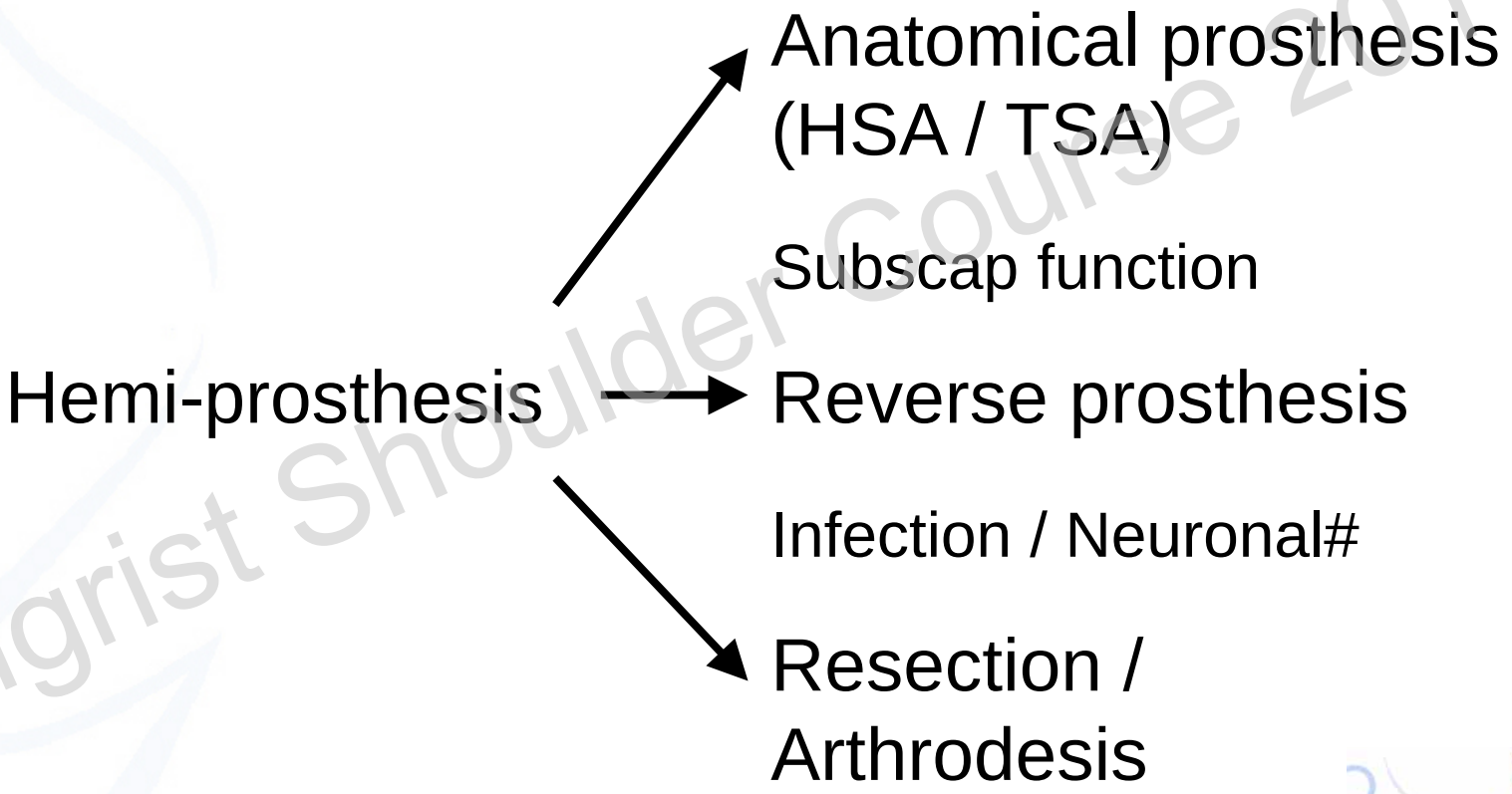
Revision of failed HSA

Pathways



Revision of failed HSA

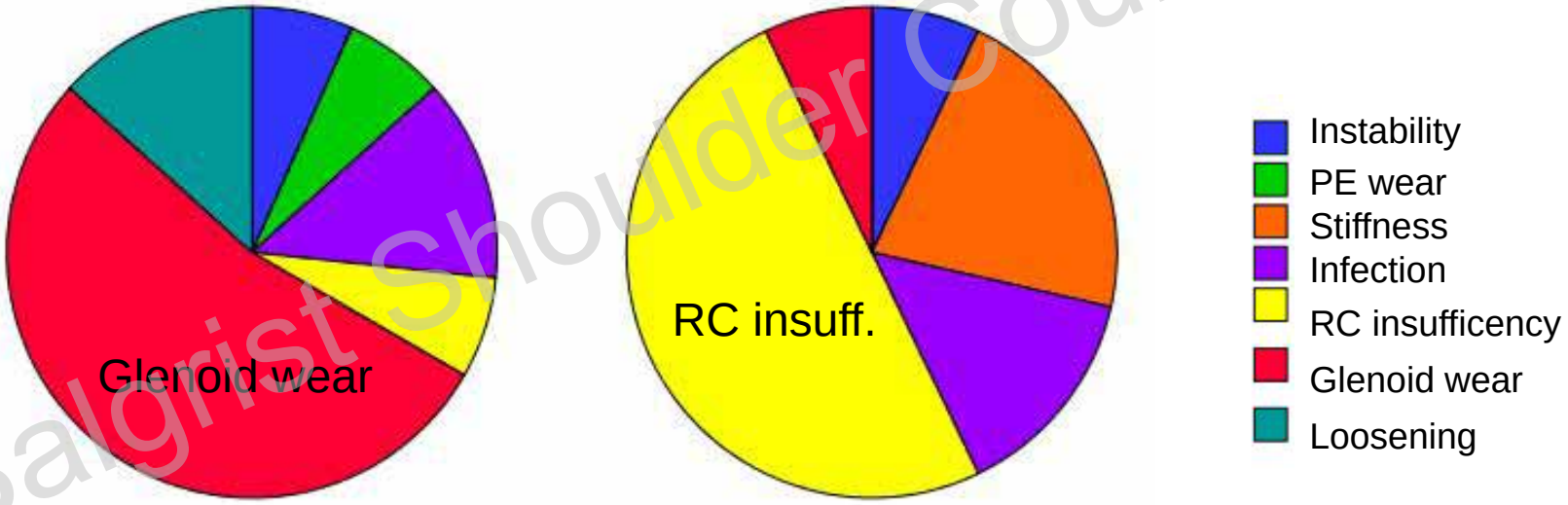
Pathways



Revision of failed HSA

Indications for revision in 50 HSA / TSA patients

Arthritis (n = 26) Fracture (n = 24)



Mueller 2016

Revision of failed HSA

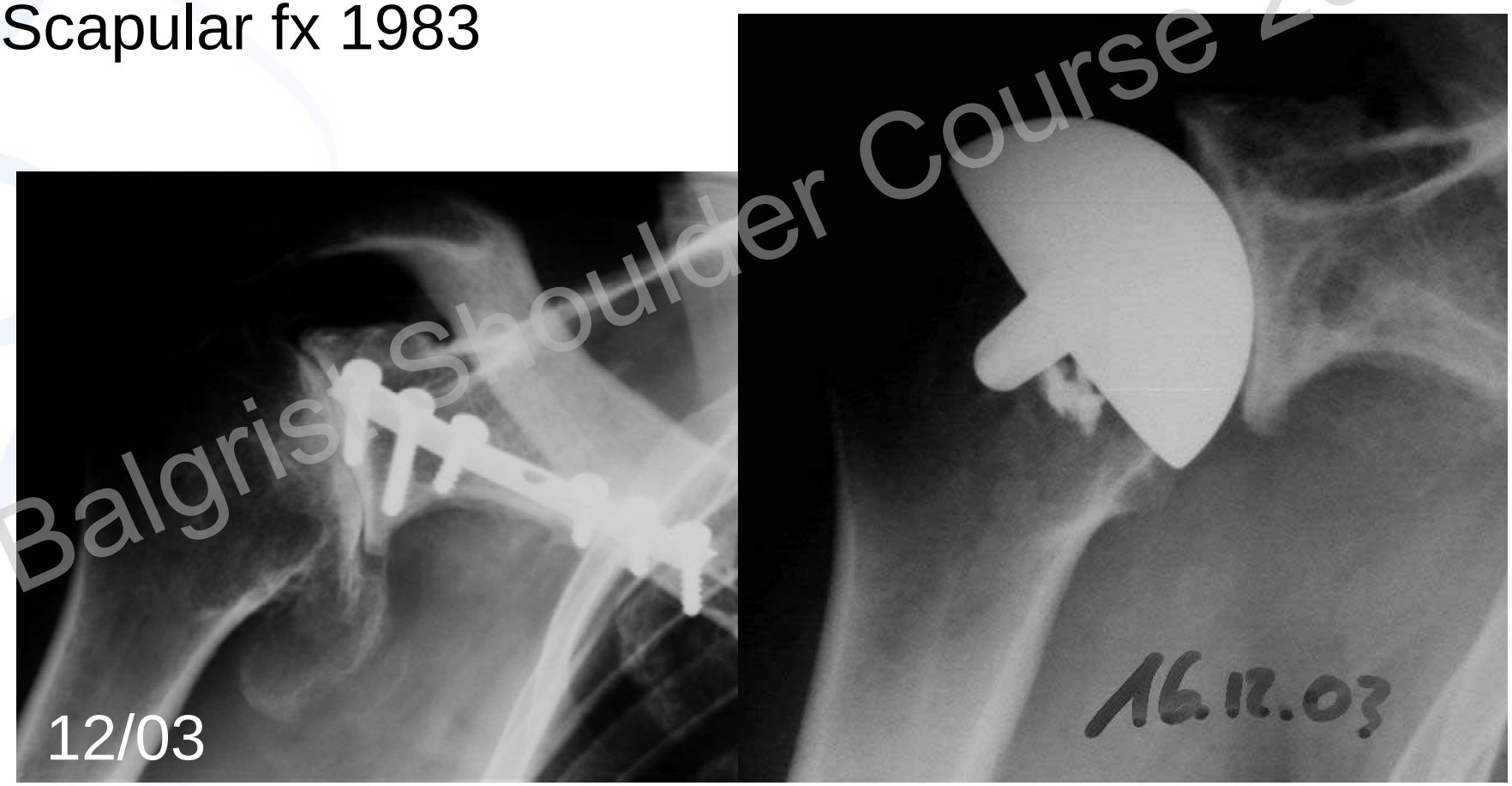
Indications

1. Glenoid wear
2. Infection
3. Instability
4. Tubercle / Cuff insufficiency
5. Humeral loosening

-> *Revision*

Glenoid Wear

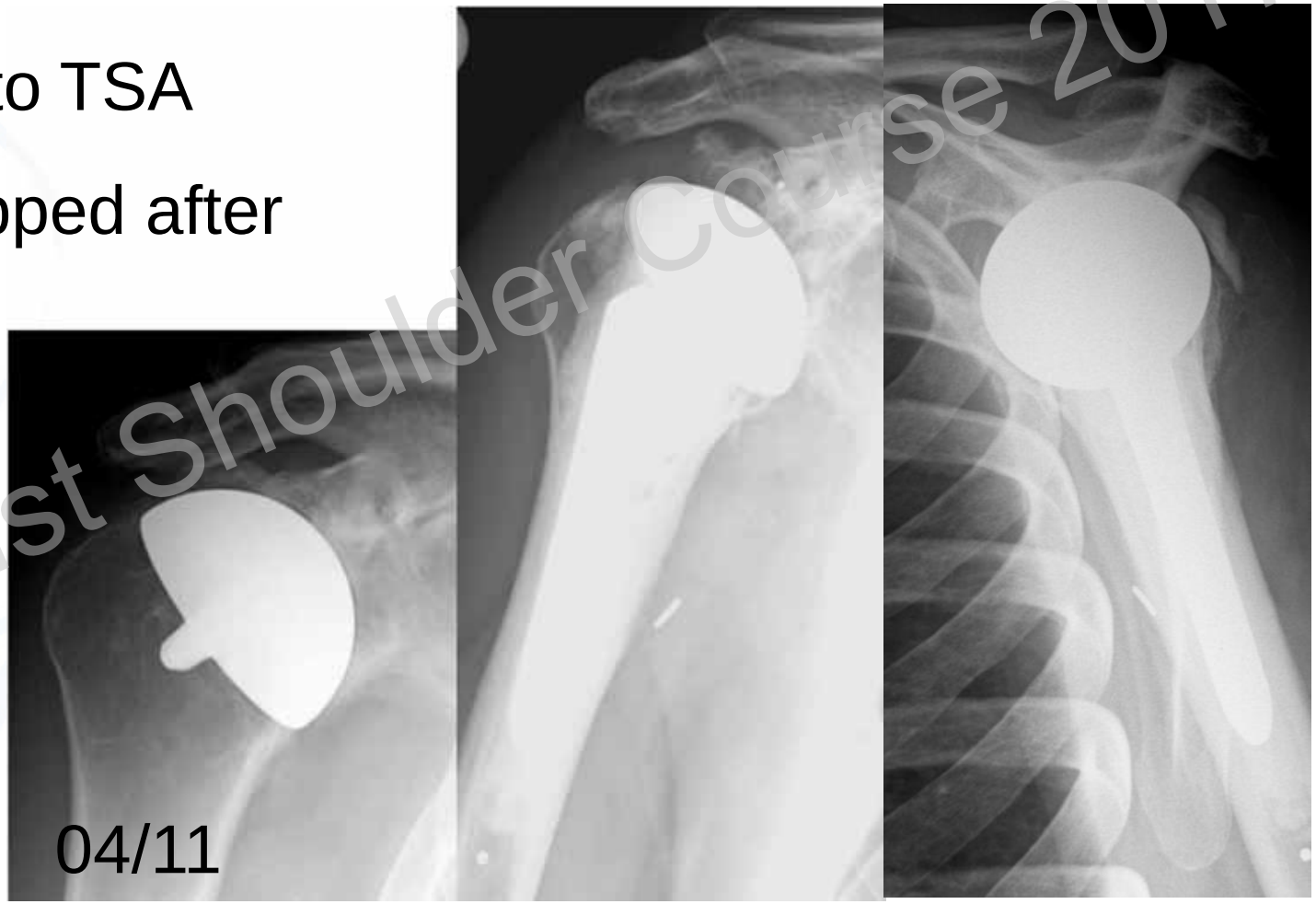
m 58 a
Scapular fx 1983



Glenoid Wear

m 58 a
Revision to TSA

„Pain stopped after 20 years“



Glenoid Wear

Cups tend
to be too big
and in varus

Glenoid Wear

No-one likes to ream the footprint

Revision of failed HSA

Outcome: Cup Revision (n = 107/1210)

Danish arthroplasty register 2006 – 2013
9% revisions to a stemmed prosthesis

- HSA (n = 39) WOOS 48 <-> 75 for primary
- TSA (n = 31) WOOS **74** <-> 93 for primary
- RSA (n = 30) WOOS 68 <-> 77 for primary

41% unacceptable because of WOOS < 50

Rasmussen et al. JBJS-A 2016

Revision of failed HSA

Glenoid Wear

m 68a
4-part fx

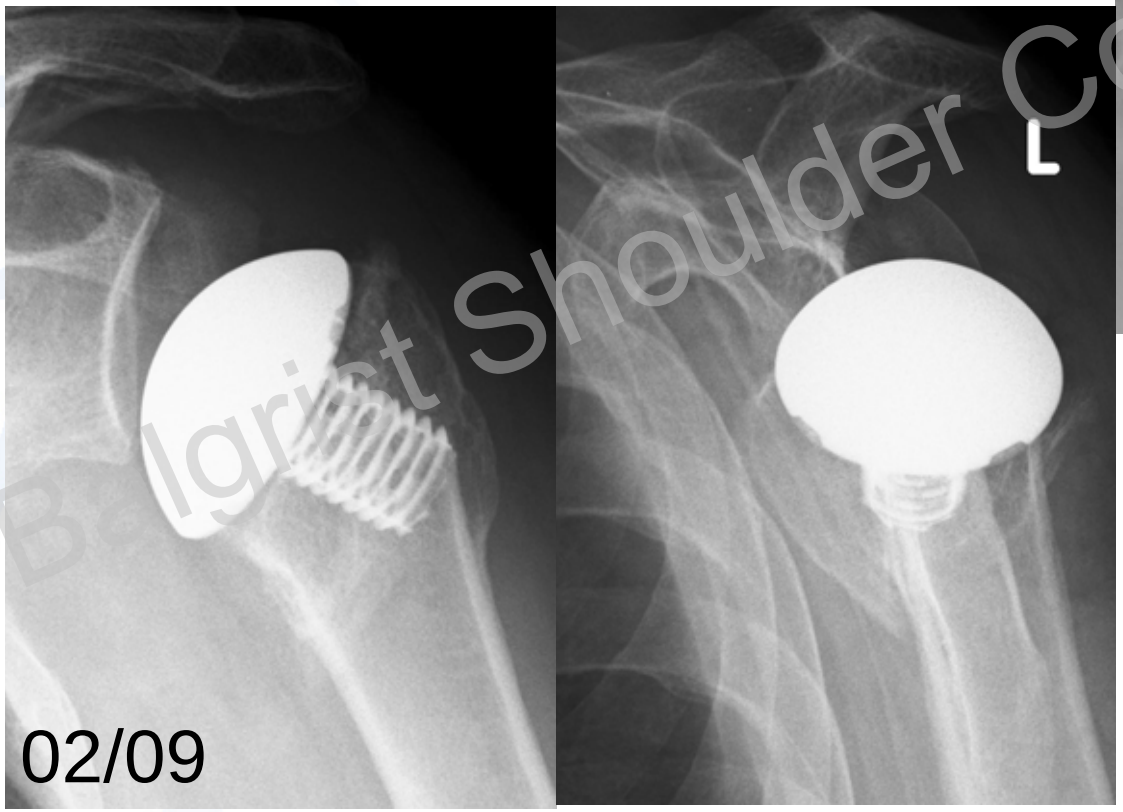
12/06

11/08

Revision of failed HSA

Glenoid Wear

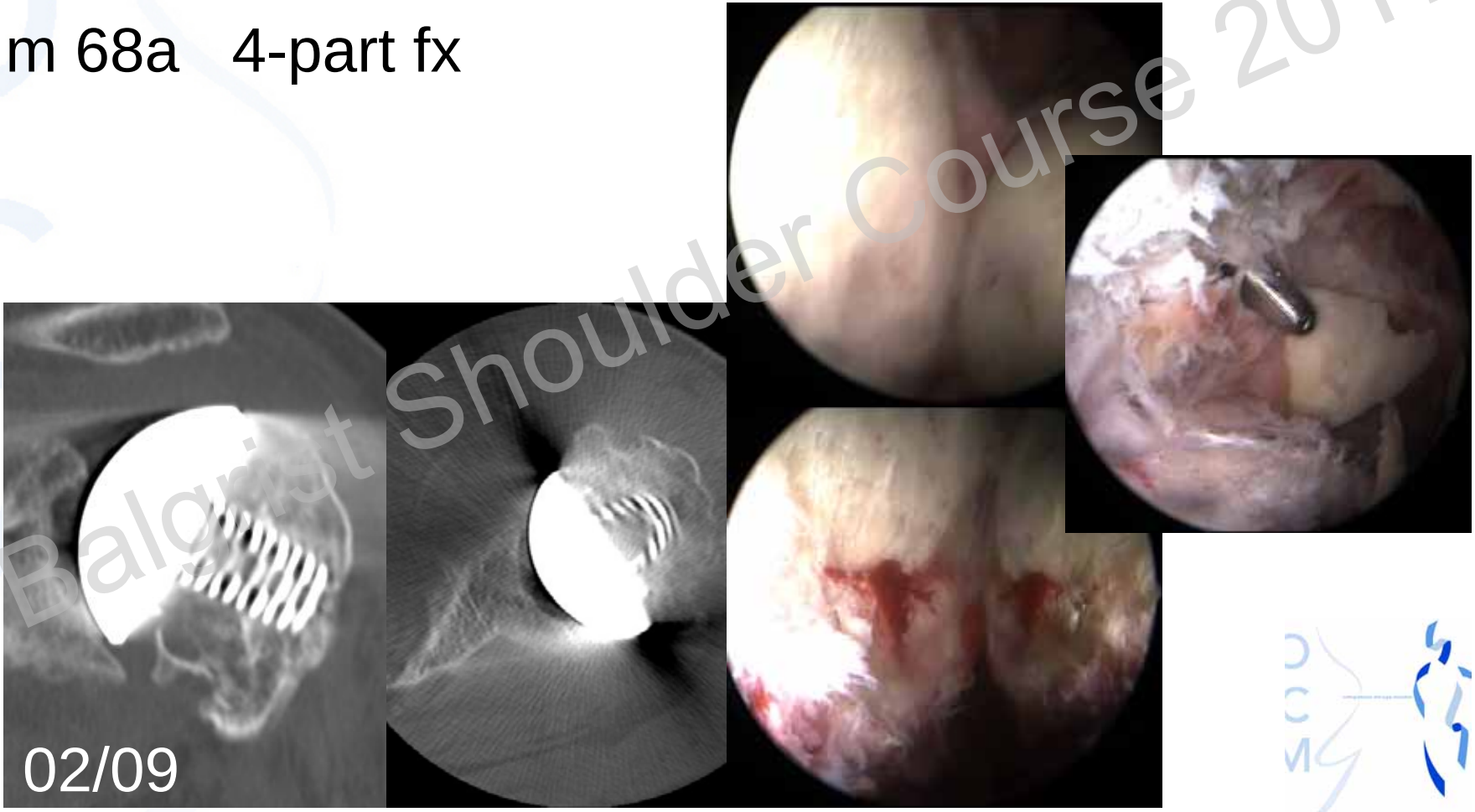
m 68a 4-part fx



Revision of failed HSA

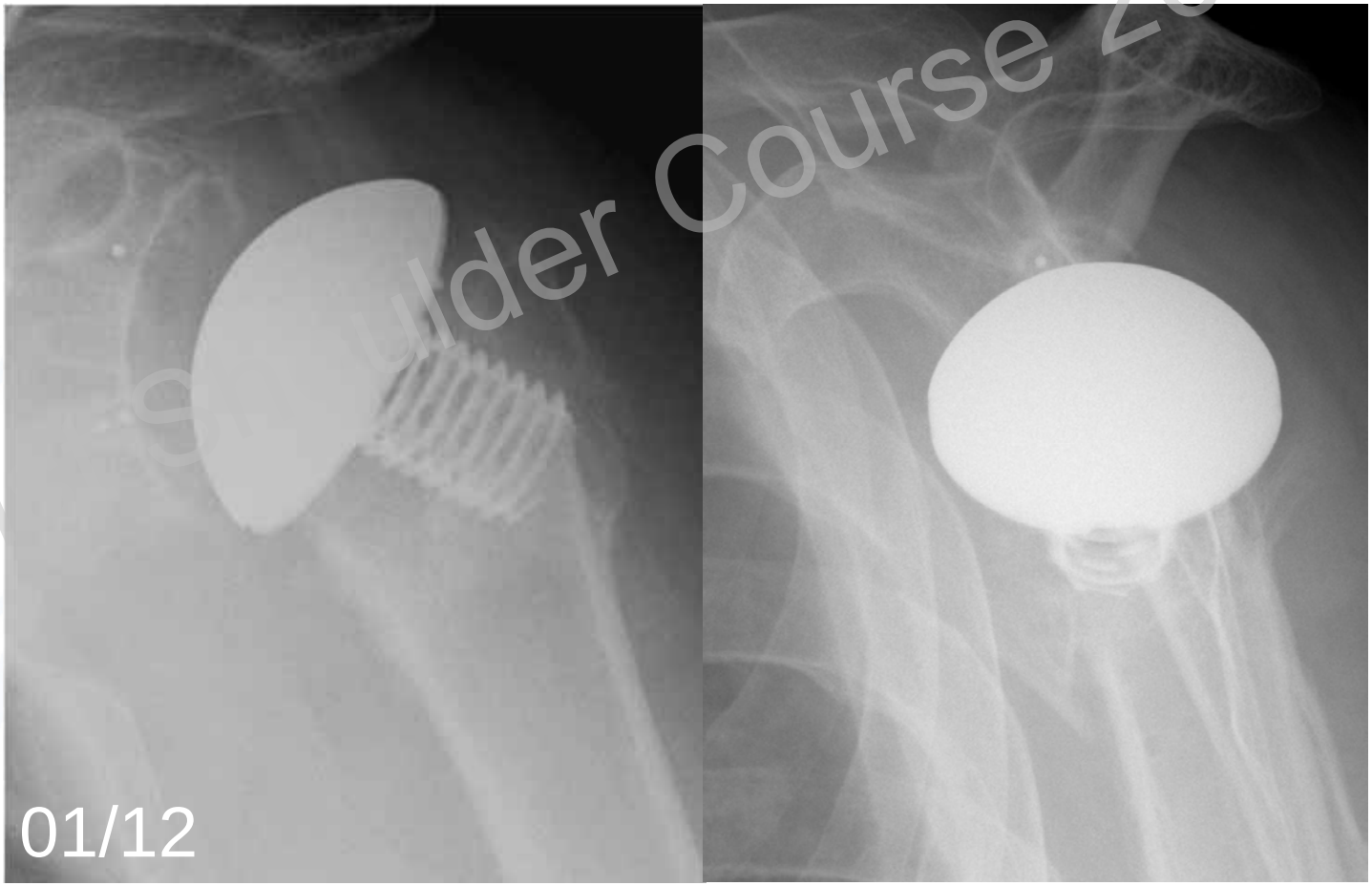
Glenoid Wear

m 68a 4-part fx



Glenoid Wear

Revision to TSA



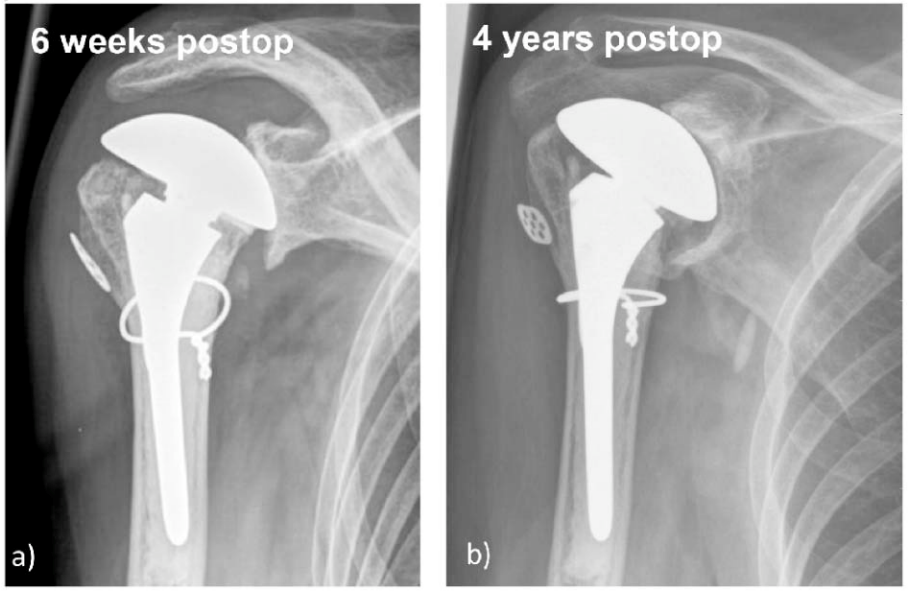
Revision of failed HSA

Risk factors for glenoid erosion (n = 118)

- Glenoid cysts (~ 3x more frequent in women)
- Fatty infiltration of cuff muscles
- Rheumatoid arthritis

No influence: age, glenoid & head size

Herschel et al.
JSES 2016



Revision of failed HSA

Outcome: Glenoid Wear (n = 34/770)

Glenoid wear after HSA 5.1%
(48% of revisions of HSA; Cofield 1991)

Pain and stiffness

Revision Ø 18 months after HSA!!

Revision in 32 / 34 cases (CS 29 -> 49)

Aequalis Multicenter Study 2001

Revision of failed HSA

Outcome: Glenoid Wear (n = 10)

Revision to TSA

Active ROM: Flexion 109° ERO 36°

Pain VAS 2.5

CS 51

Mueller 2016

Revision of failed HSA

Indications

1. Glenoid wear
2. Infection
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4. Tubercle / Cuff insufficiency
5. Humeral loosening

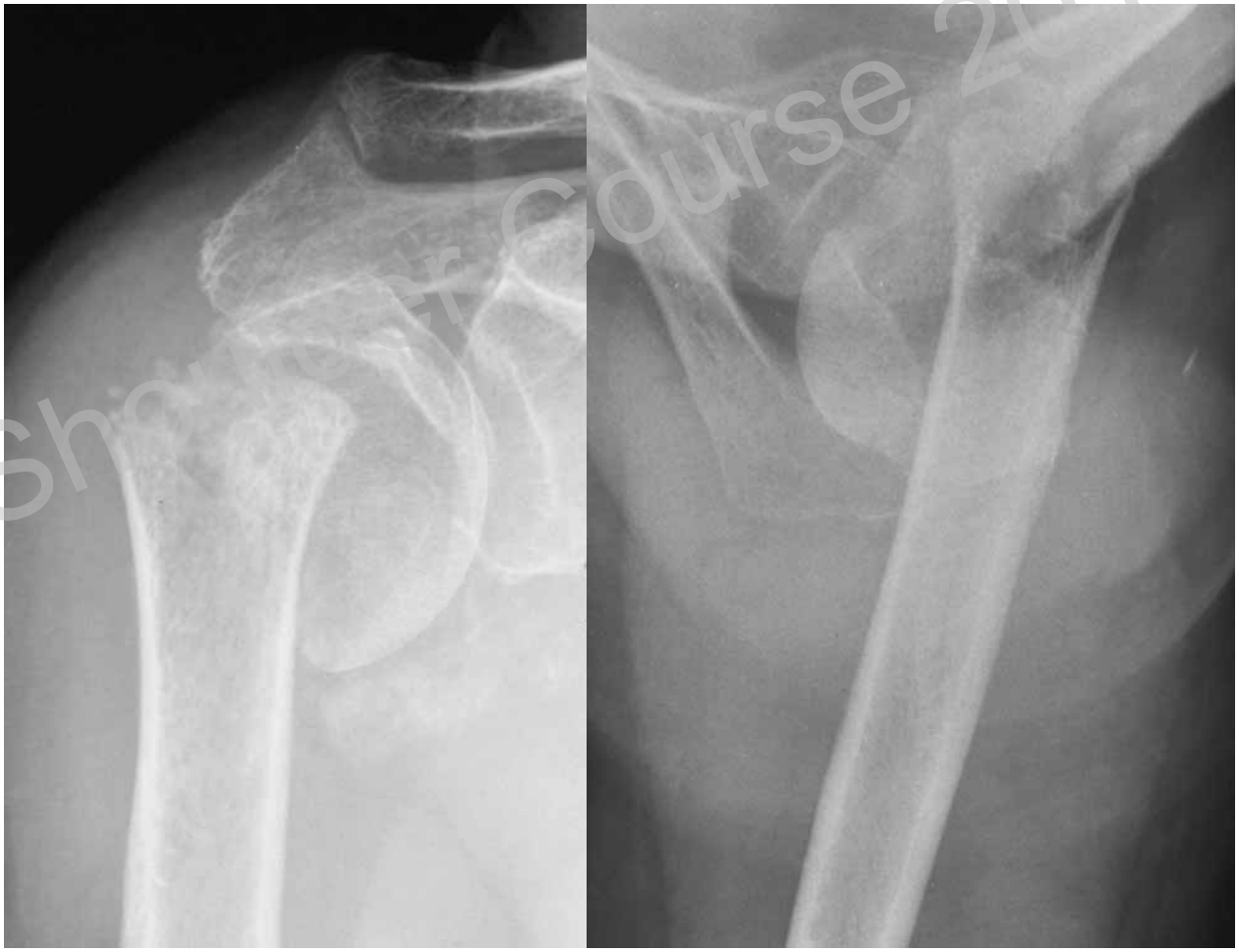
-> *Revision*

Revision of failed HSA

Anterior Instability

f 77a

HSA for Boileau type 3??



Revision of failed HSA

Anterior Instability

f 77a

postop

anterior

dislocation

Revision of failed HSA

Anterior Instability

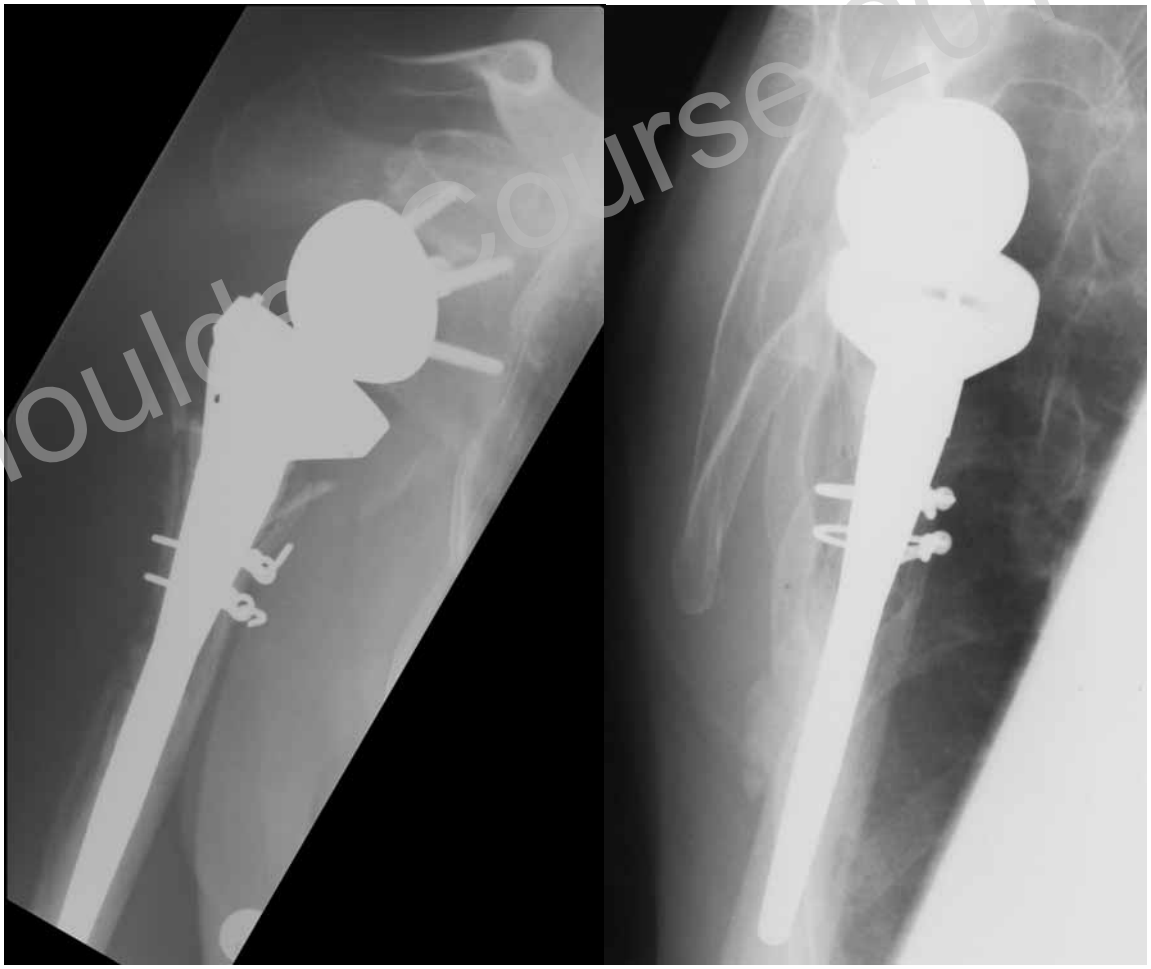
f 77a

Revision,
Redislocation

Revision of failed HSA

Anterior Instability

Revision to RSA



Revision of failed HSA

Results of pect major transfer

30 patients in 3 groups

- Good for cuff defect (7/11)
- Good for failed instability surgery (7/11)
- Bad for failed arthroplasty (1/8)

Elhassan et al. JBJS Br 2008

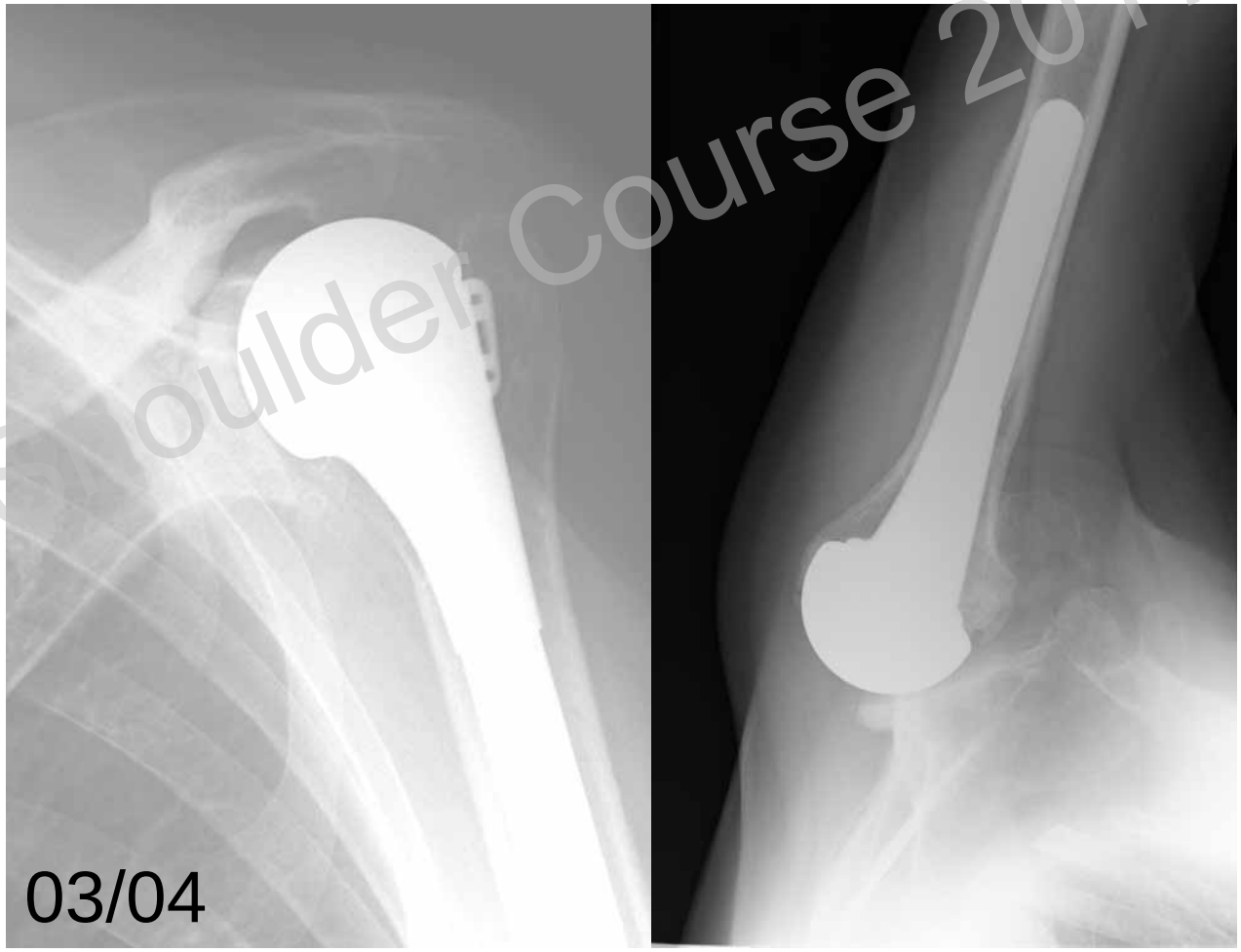
Posterior Instability

m 77a

Too low

Retrotorsion
0 deg

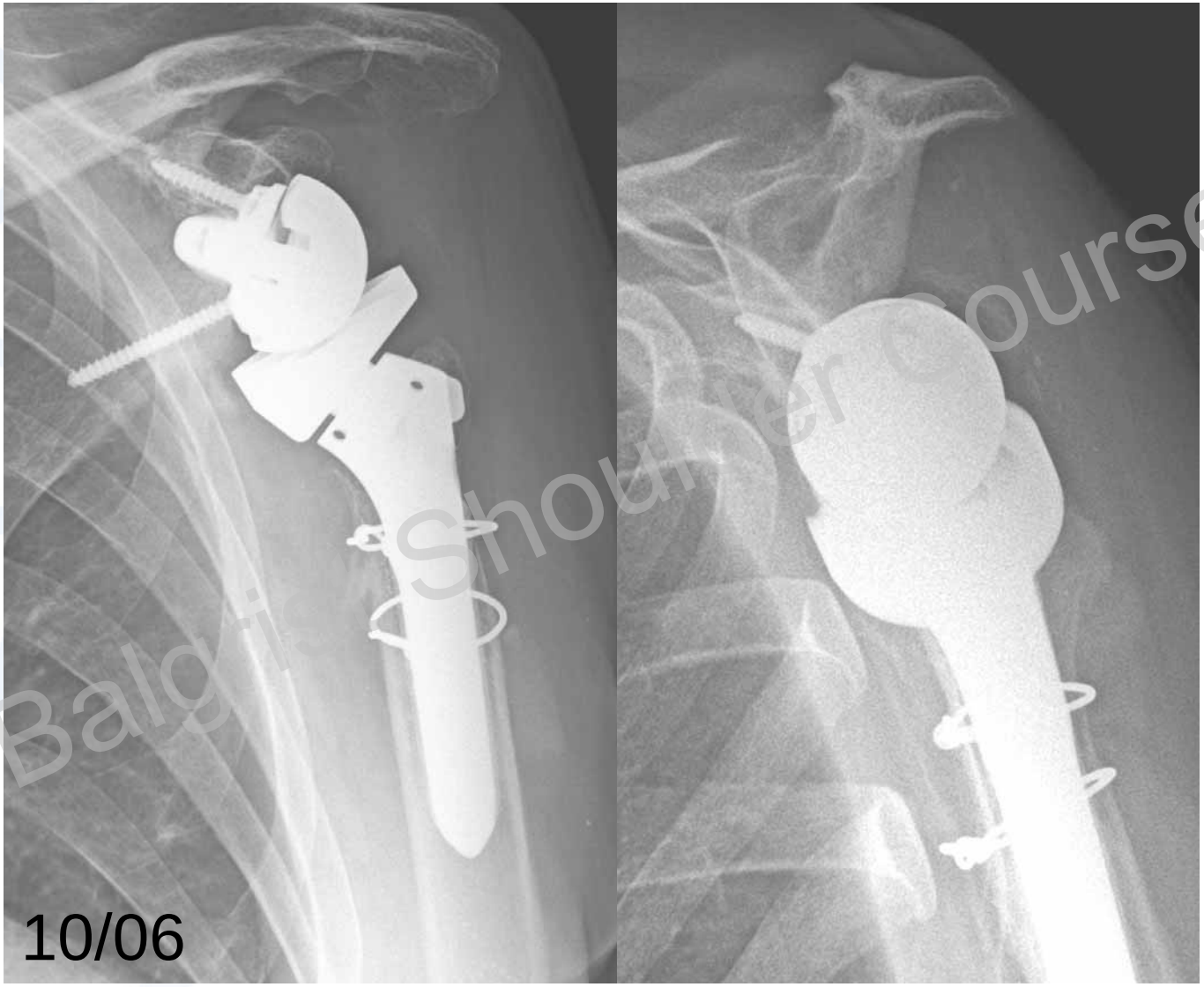
Glenoid
type C



Revision of failed HSA

Rocking horse phenomenon

Revision of failed HSA



2nd revision to TSA w/o stem revision

Active ROM

ABD 120°
ERO 0°
IRO S1

CS 48

Type B3/C glenoid:
Primary RSA
Asymmetric bone block

Revision of failed HSA

Indications

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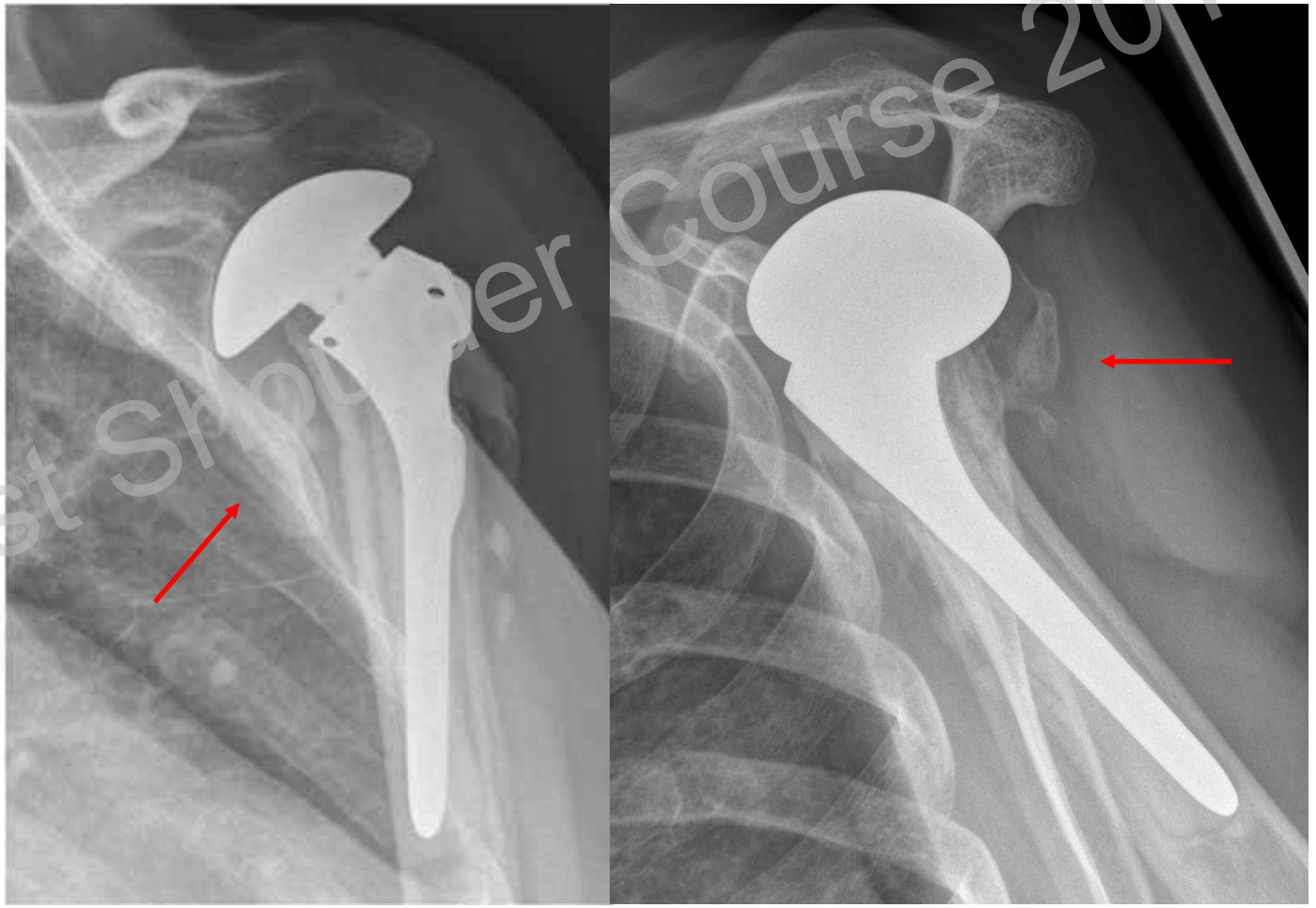
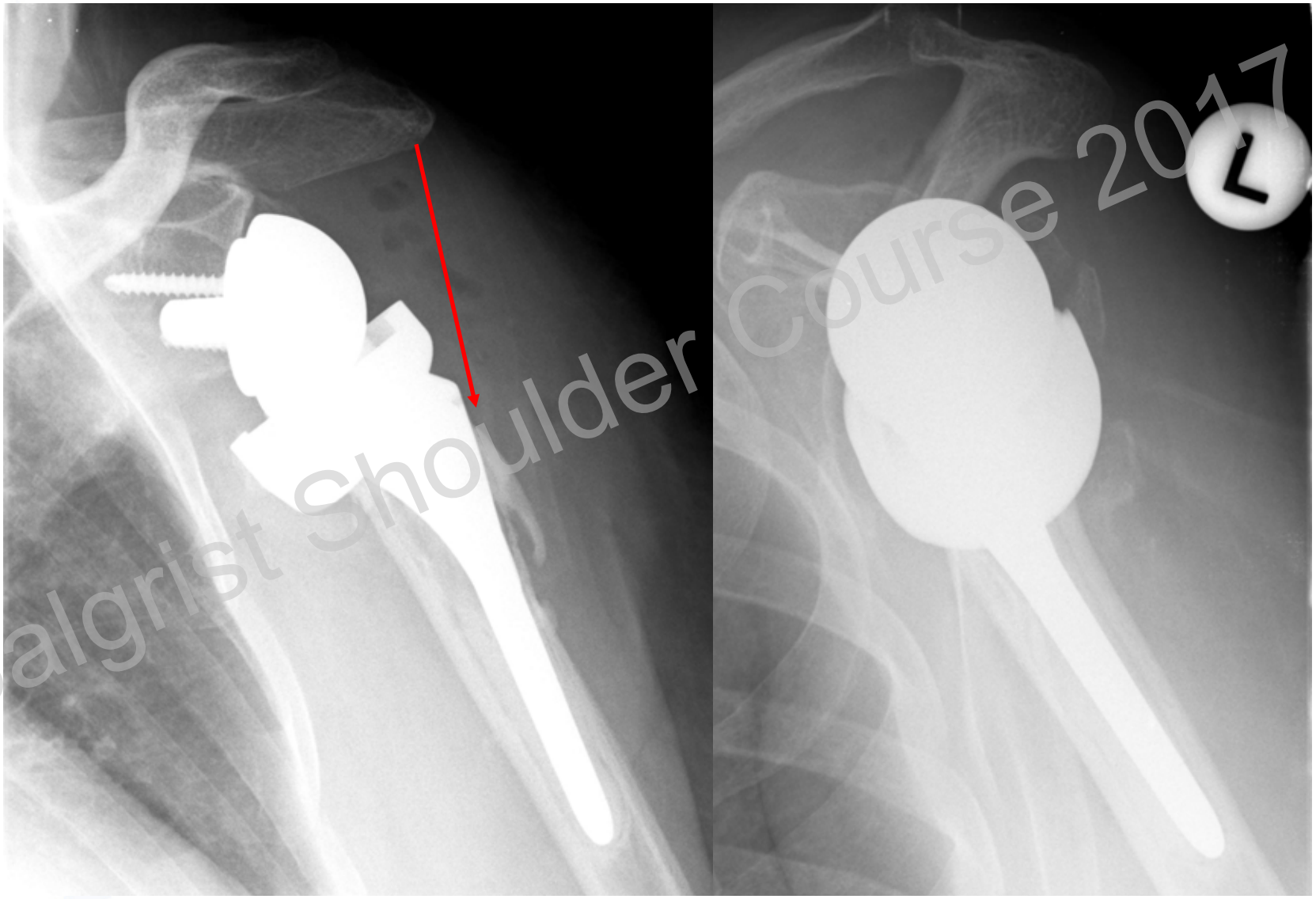
-> *Revision*

Nonfunctional tubercles

w 68a



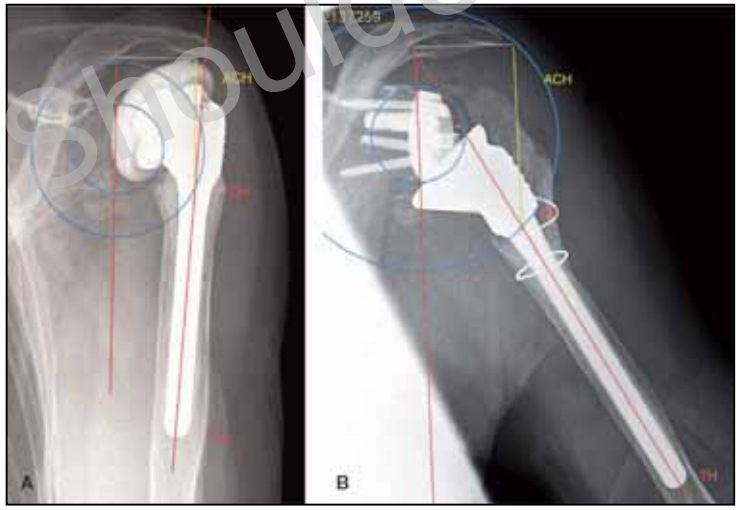
Revision of failed HSA



Revision of failed HSA

Revision to reverse shoulder arthroplasty with retention of the humeral component

14 patients Ø 70a FU Ø 2,5a
CS 9 -> 41 **Lengthening 2.6 cm**



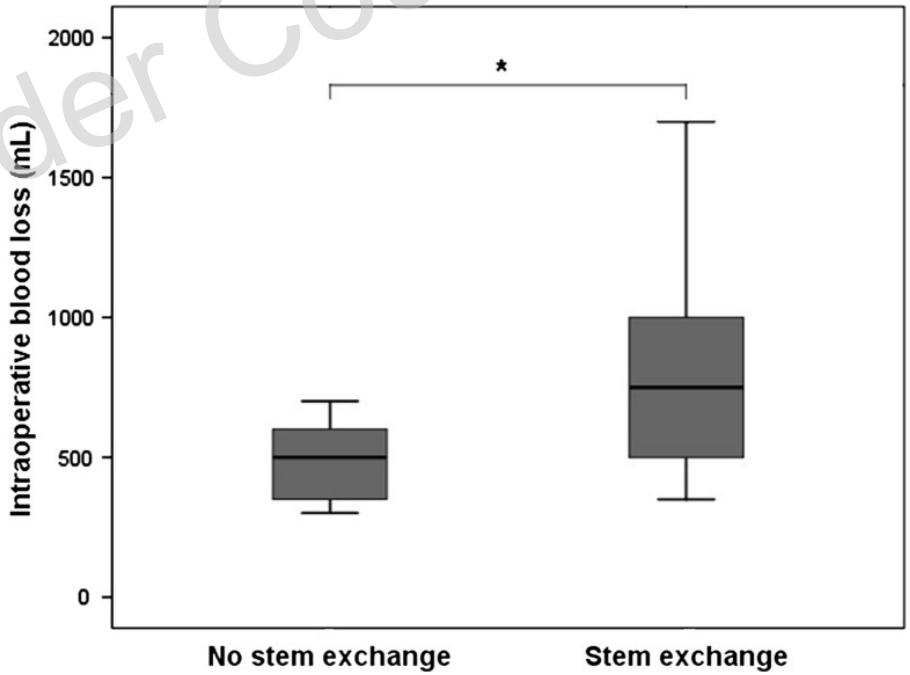
Werner et al. Acta Orthop 2013

Revision of failed HSA

Conversion of Stemmed Hemi- or Total to Reverse Total Shoulder Arthroplasty: Advantages of a Modular Stem Design

56 patients
13 no stem exchange
CS 30 -> 48

43 stem exchange
CS 24 -> 45



Wieser et al. CORR 2015

Revision of failed HSA

Conversion of Stemmed Hemi- or Total to Reverse Total Shoulder Arthroplasty: Advantages of a Modular Stem Design

56 patients
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CS 30 -> 48

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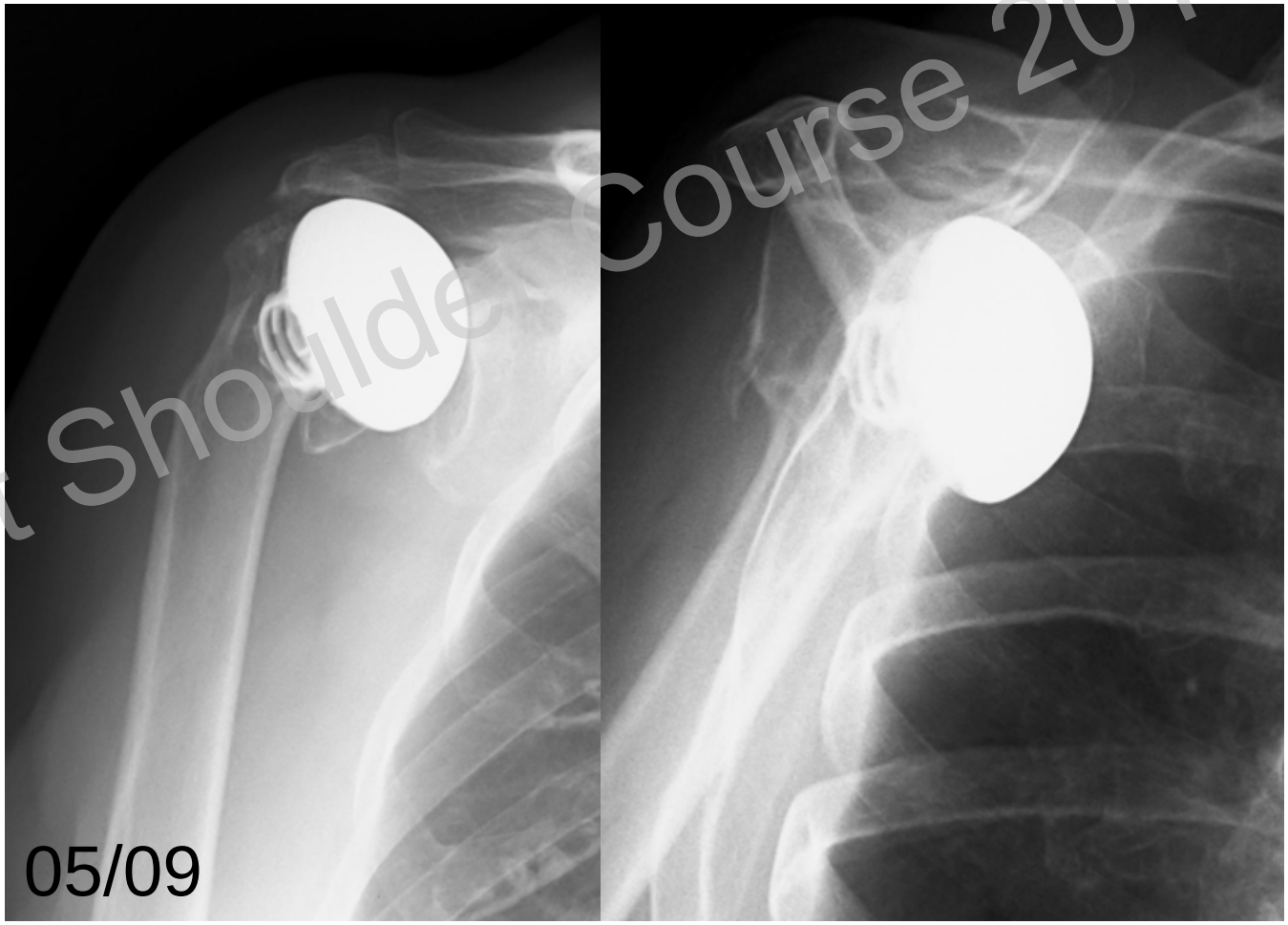
Wieser et al. CORR 2015

Revision of failed HSA

Cuff insufficency

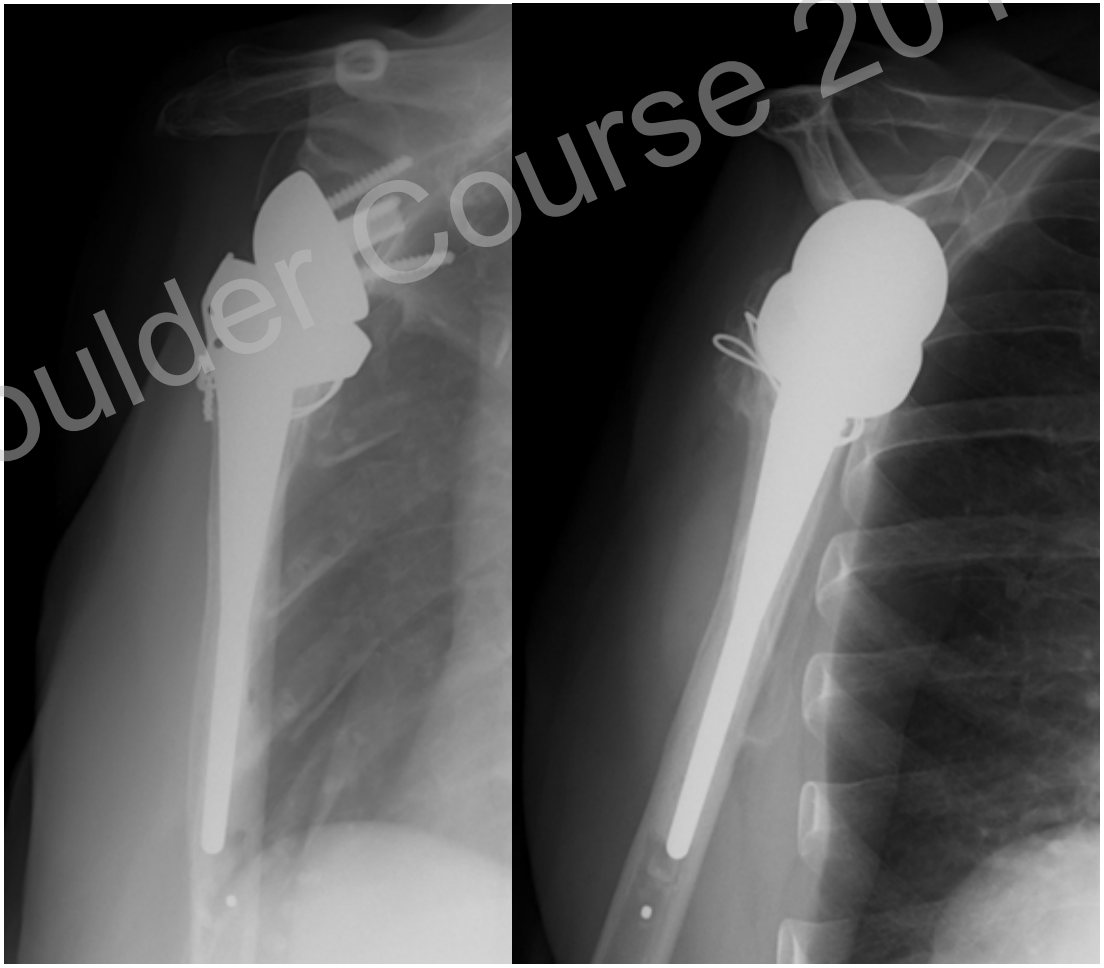
w 78a



Revision of failed HSA

Cuff insufficency

w 78a



01/11

Revision of failed HSA

Outcome: TSA versus RSA (n = 19)

Failed stemmed HSA

Follow-up Ø 41 months

4 erosions, 2 malpositions, 12 cuff failures

- TSA (n = 7) CS 52
- RSA (n = 12) CS 31

Hartel et al. Int JSS 2015

Revision of failed HSA

Indications

1. Glenoid wear
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5. Humeral loosening

-> *Revision*

Revision of failed HSA

Humeral Loosening

f 75 a
Fracture HSA

Loosening
and fracture
3.5a later

Revision of failed HSA

Humeral Loosening

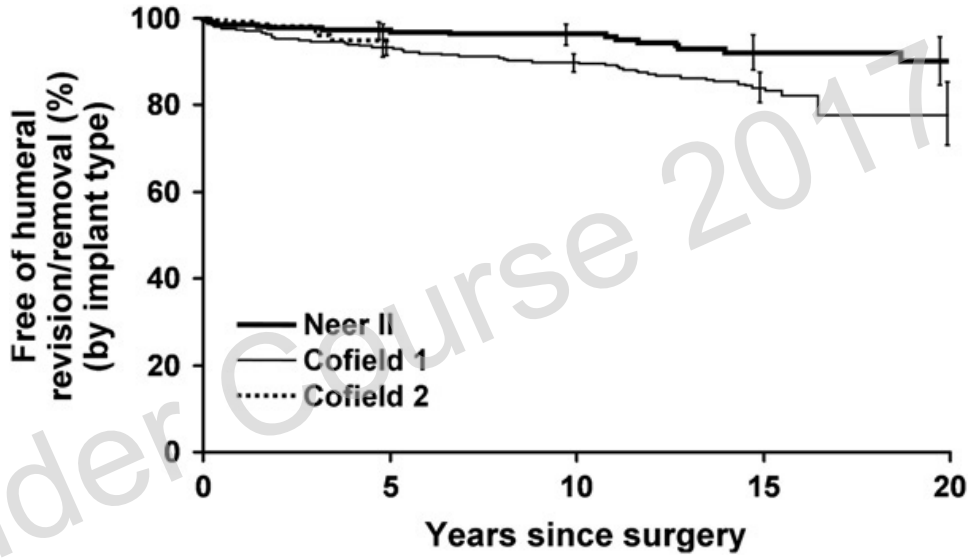
Uncemented revision stem + plate

Healing after two months

Revision of failed HSA

1584 patients 10 y f/u

96.2 % cemented
91.2 % uncemented
relative risk 2.7



Risk: Posttraumatic men < 65 years

„Only 2% aseptic loosenings in 20 years"

Cil et al. JSES 2010

Revision of failed HSA

m 54a

Fracture sequelae type 1

Revision of failed HSA

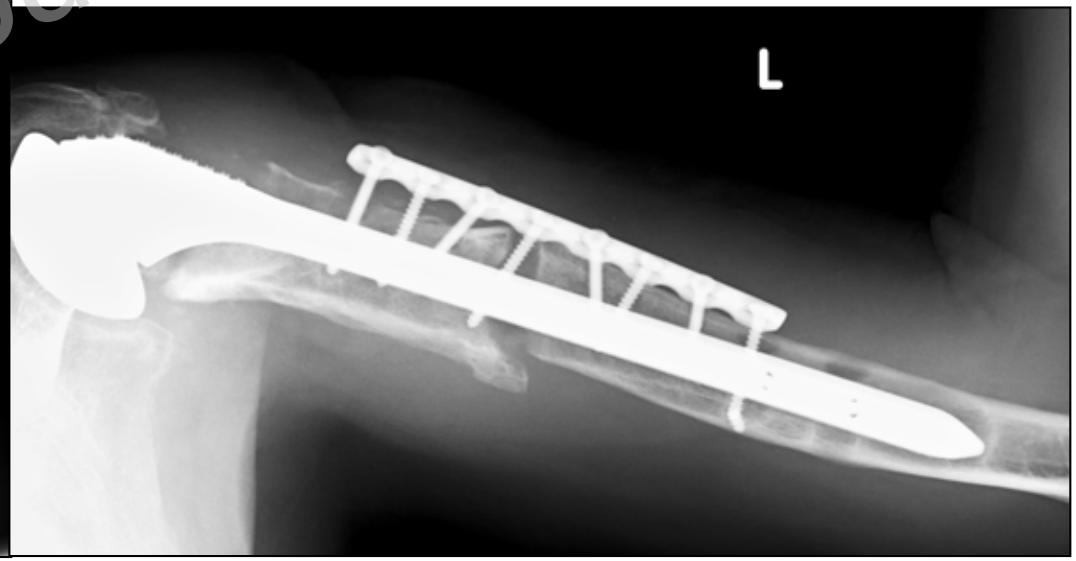
m 54a

Fracture sequelae type 1

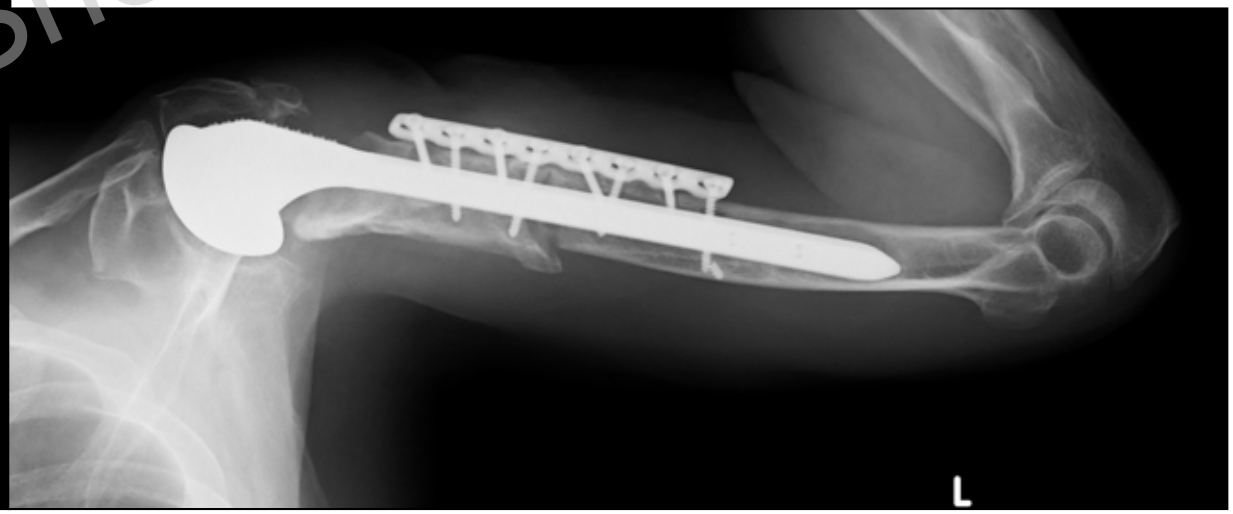
Revision of failed HSA

Revision

Long fracture stem
New distal locking screws
Additional plate



Revision of failed HSA

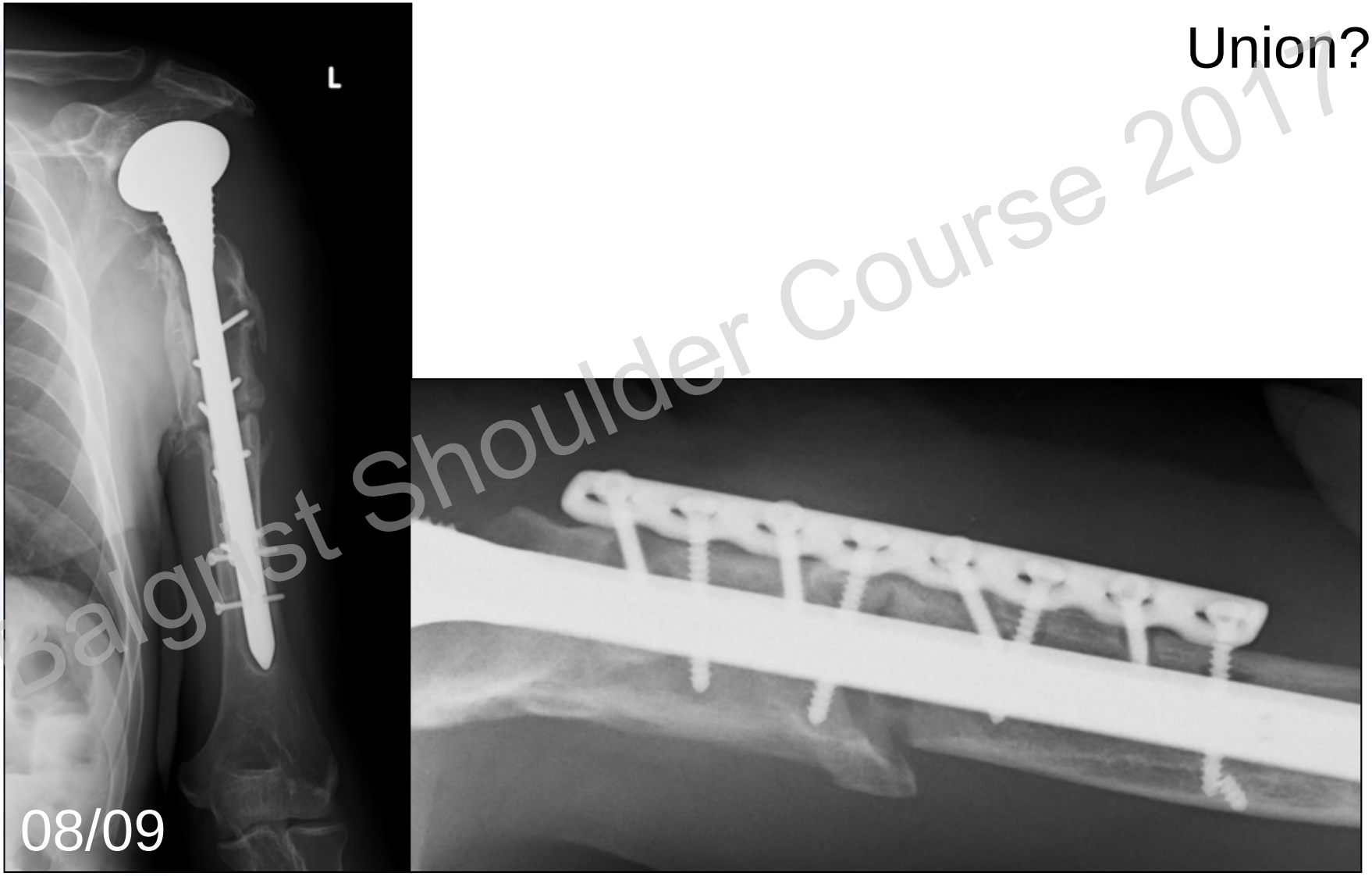


Revision

Long fracture stem
New distal locking screws
Additional plate

Revision of failed HSA

Union?



Revision of failed HSA

Revision of failed HSA

Revision of failed HSA

Change to Biomet uncemented Hemi

Conclusion

1. Glenoid wear -> Intact Subscap? -> Secondary Glenoid +/- Bone block
   -> Defect Subscap? -> RSA
2. Infection -> 1 / 2 stage revision
3. Instability -> RSA
4. Cuff insufficiency -> Refixation Tubercles / Cuff RSA
5. Humeral loosening -> Revision
6. Neuronal damage -> No revision

Always suspect infection! (29% of revisions; Kelly CORR 2009)

Thank you!

orthopädische chirurgie münchen

E-Mail dated 20.05.15

Dear Prof. Dr. Wiedemann,
you implanted a glenoid prosthesis (5-824.1) and a humeral head prosthesis (5-824.0) into my right shoulder on 19.12.2001.

Sofar no problems.

On TV, however, I saw the journal \„Rounds\" made by WDR. They said, that it makes sense to re-evaluate a prosthesis after 5 to 10 years. In addition, I remember you promised for such a prosthesis a life span of 8 years plus. This is why I would like to ask you: Should I see you for a checkup? Your grateful patient …

Cases

Findings

Active elevation right/left 110/130 deg
External rotation 40/60 deg
Internal rotation L3/L5
Passive glenohumeral rotation 90/130 deg
Smooth crepitus
No pain!

Cases

Explanation

Waste of PE
Humeral head grinds on the rim of the metal back ->
Definite metallosis
Probably no subscap tendon left

Therapy?

Waste of PE
Humeral head grinds on the rim of the metal back ->
Definite metallosis
Probably no subscap tendon left

- Simple change of inlay?
- One-stage revision to cemented total?
- Two-stage revision including bone graft to the glenoid?
- Revision to reverse?
- Else?

Blood test

Cobalt 8,8	(Normal < 1 µg/l)
Chrome 5,22	(Normal < 0,5 µg/l)

Therapy

Patient refused revision
Blood test to be repeated in one year