

LA REVISIONE DELLA PROTESI INSTABILE



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Traumatologia. Università degli studi di Verona**



TSA COMPLICATIONS

✓ GLENOID LOOSENING	20.4%
✓ ROTATOR CUFF TEAR	15.4%
✓ DISLOCATION/INSTABILITY	11.8%
✓ PAIN/STIFFNESS	12.9%
✓ INFECTION	9%
✓ HUMERAL LOOSENING	5.1%



SOMERSON JS, JSES 2018

TABLE II Complications of Anatomic TSAs in Studies Published from 2006 to 2015*

Complication	No. of Shoulders	Percentage of All Complications	Percentage of All Shoulders
Component loosening	135	39.1	4.0
Glenoid	130	37.7	3.9
Humerus	5	1.4	0.1
Glenoid wear	78	22.6	2.3
Instability	35	10.1	1.0
Rotator cuff tear	31	9.0	0.9
Periprosthetic fracture	23	6.7	0.69
Intraoperative	19	5.5	0.57
Postoperative	4	1.2	0.12
Neural injury	21	6.1	0.63
Infection	17	4.9	0.51
Hematoma	3	0.9	0.09
Deltoid injury	1	0.3	0.03
Deep venous thrombosis	1	0.3	0.03

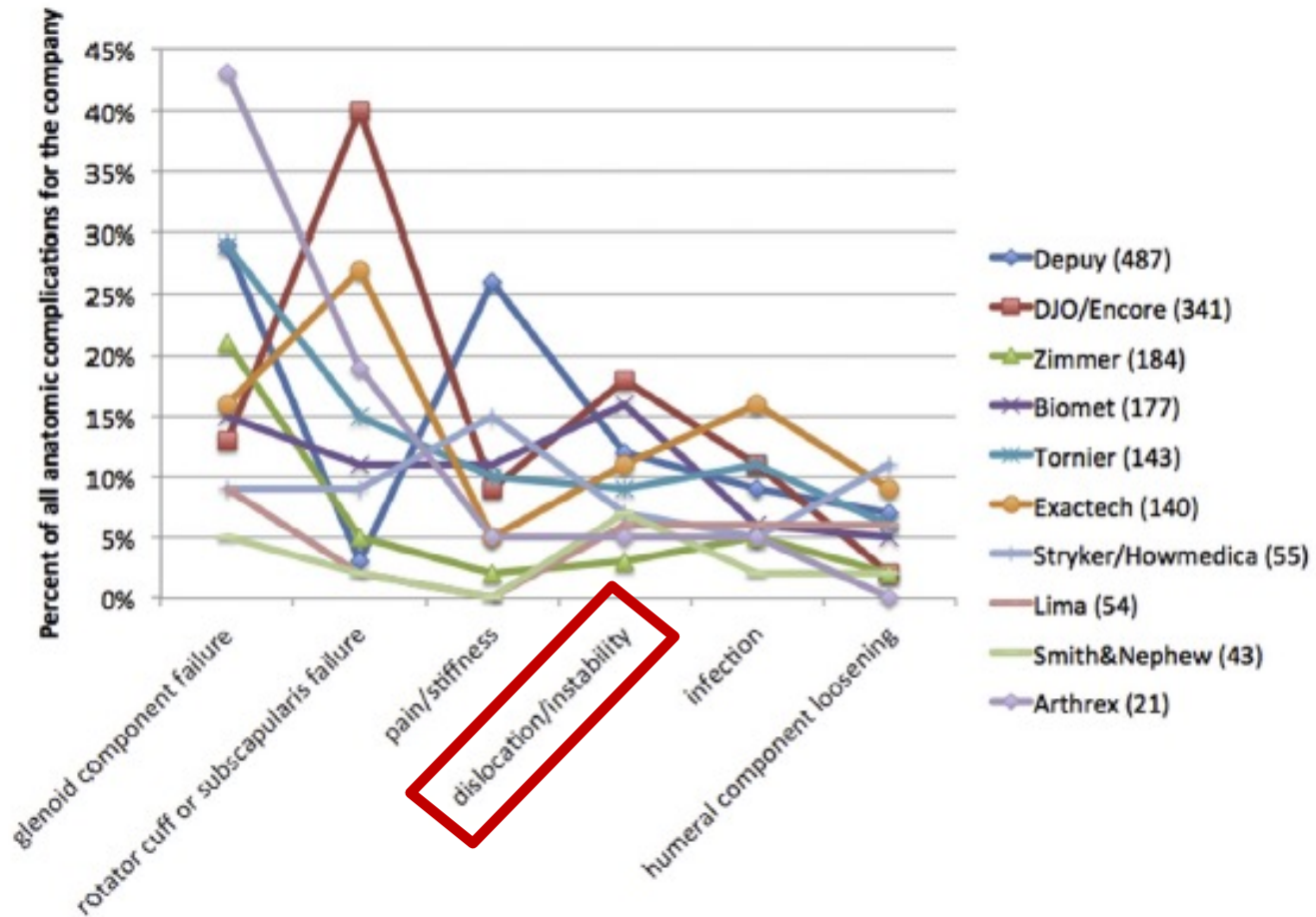
*The 33 studies included a total of 3,360 shoulders (studies with mixed types of arthroplasty were excluded).

Table III Primary failure modes among the 1673 anatomic shoulder arthroplasties in order of percentage of all anatomic failure modes sorted by frequency

Mode of failure	No. (%) (n = 1673)
Glenoid component failure	341 (20.4)
Rotator cuff/subscapularis failure	257 (15.4)
Pain/stiffness	215 (12.9)
Dislocation/instability	197 (11.8)
Infection	151 (9.0)
Humeral component loosening	85 (5.1)
Problem with modular head	68 (4.1)
Humeral component malposition	47 (2.8)
Problem with humeral preparation	42 (2.5)
Packaging/availability problem	40 (2.4)
Problem with humeral insertion	40 (2.4)
Problem with glenoid insertion	34 (2.0)
Failed PROMOS inclination set*	28 (1.7)
Humeral fracture on insertion	21 (1.3)
Problem with glenoid preparation	20 (1.2)
Disassembly of polyethylene from glenoid metal back	19 (1.1)
Humeral fracture	17 (1.0)
Difficulty removing humeral component	11 (0.7)
Glenoid fracture	11 (0.7)
Hematoma	6 (0.4)
Fracture of prosthesis	5 (0.3)
Tuberosity non union/fracture	5 (0.3)
Metal allergy	3 (0.2)
Acromial/spine fracture	2 (0.1)
Miscellaneous	8 (0.5)

*Smith & Nephew Inc., Memphis, TN, USA.

BOHSALI KI, JBJS 2017



SOMERSON JS, JSES 2018

FOR **ANATOMIC SHOULDER** ARTHROPLASTY, THE PERCENTAGE DISTRIBUTION OF THE 6 MOST COMMON FAILURE MODES FOR ANATOMIC ARTHROPLASTY FOR EACH COMPANY VARIED SUBSTANTIALLY AMONG THE 10 COMPANIES WITH AT LEAST 20 REPORTS IN THE ANALYSIS.

J Shoulder Elbow Surg (2017) 26, e243–e251



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SURGERY

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ORIGINAL ARTICLE

The main cause of instability after unconstrained shoulder prosthesis is soft tissue deficiency



Jean Kany, MD^{a,*}, Jijo Jose, DNB^b, Denis Katz, MD^c, Jean-David Werthel, MD^d,
Padmanaban Sekaran, MSc PT^e, Rajkumar S. Amaravathi, DNB^f, Philippe Valenti, MD^d

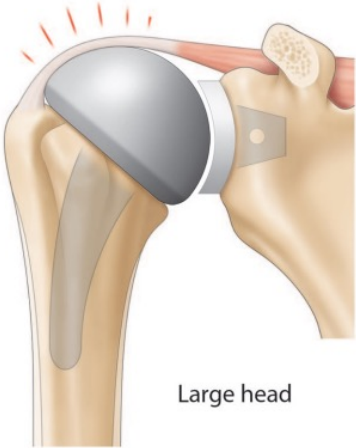
IX Congresso Nazionale A.I.R.

Il Recupero delle geometrie articolari nelle revisioni protesiche

Verona 7-8 marzo 2024

ANTERIOR TSA INSTABILITY

Subscapularis failure

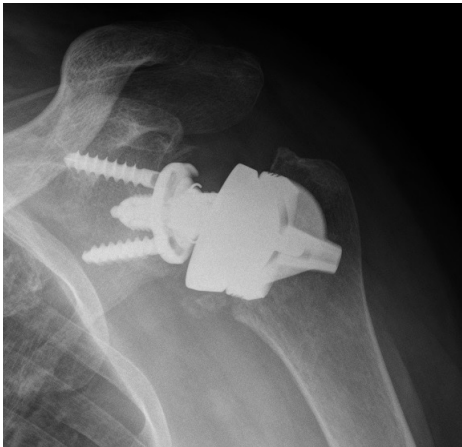


Acute

Chronic

Repair + HH exchange

R.S.A.



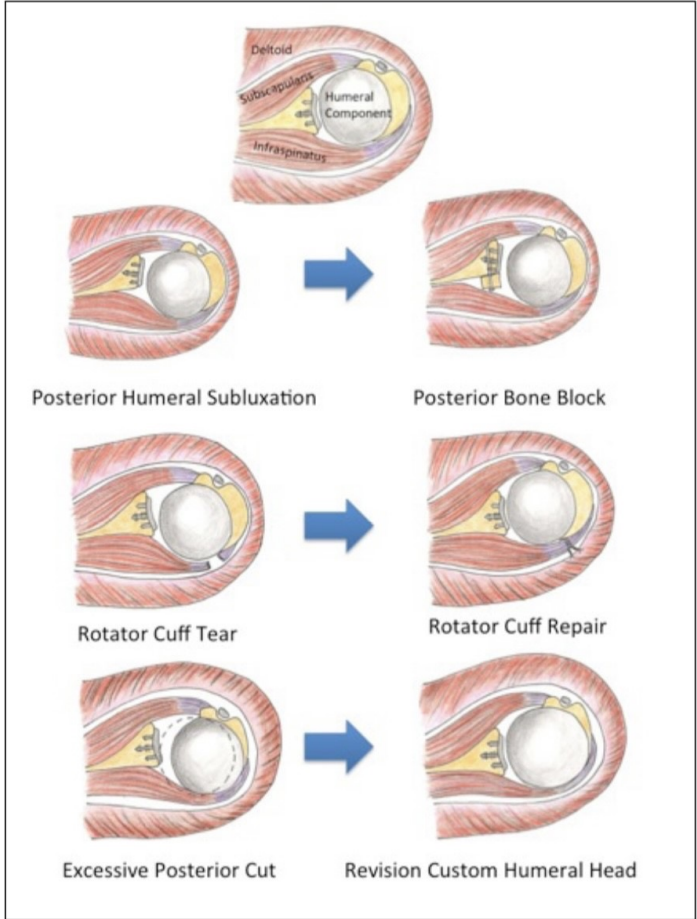
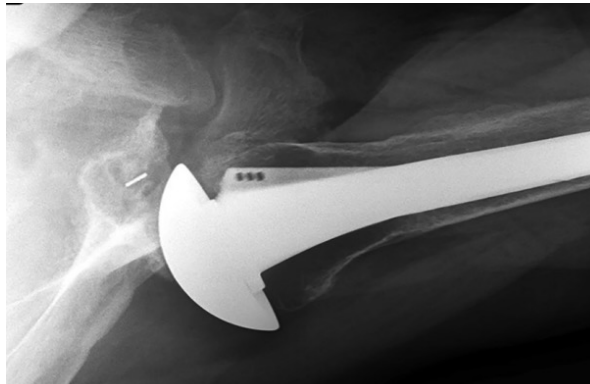
POSTERIOR TSA INSTABILITY



Posterior Capsular Plication

Posterior Bone Block

RSA



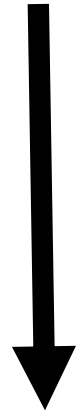
Case Report

Posterior shoulder instability following anatomic total shoulder arthroplasty: A case report and review of management

Access this article online:
Website: www.internationalshoulderjournal.org
DOI: 10.4103/0973-6042.167955
Quick Response Code: 

SUPERIOR TSA INSTABILITY

Rotator cuff failure



Reverse Shoulder Arthroplasty



■ UPPER LIMB

Revision of an unstable hemiarthroplasty or anatomical total shoulder replacement using a reverse design prosthesis

M. P. Abdel,
S. J. Hattrup,
J. W. Sperling,
R. H. Cofield,
C. R. Kreofsky,
J. Sanchez-Sotelo

Cite this article: *Bone Joint J* 2013;95-B:668–72.

Clin Orthop Relat Res (2017) 475:2716–2722
DOI 10.1007/s11999-017-5429-z

Clinical Orthopaedics
and Related Research®
A Publication of The Association of Bone and Joint Surgeons®



CLINICAL RESEARCH

Revision to Reverse Total Shoulder Arthroplasty Restores Stability for Patients With Unstable Shoulder Prostheses

Nicholas M. Hernandez MD, Brian P. Chalmers MD, Eric R. Wagner MD,
John W. Sperling MD, Robert H. Cofield MD, Joaquin Sanchez-Sotelo MD, PhD

S ORIGINAL ARTICLE

Shoulder
& Elbow

Early revision in anatomic total shoulder arthroplasty in osteoarthritis: a cross-registry comparison

Mark T Dillon¹, Richard S Page², Stephen E Graves³,
Michelle F Lorimer⁴, Heather A Prentice⁵, Jessica E Harris⁵,
Elizabeth W Paxton⁵ and Ronald A Navarro⁶

Shoulder & Elbow

2020, Vol. 12(1S) 81–87

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DOI: 10.1177/1758573219842168

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MODULAR SHOULDER REPLACEMENT

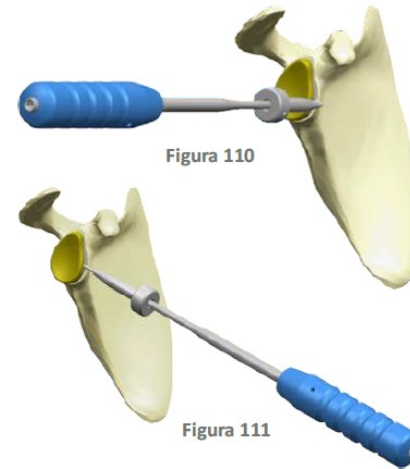


Figura 110

Figura 111

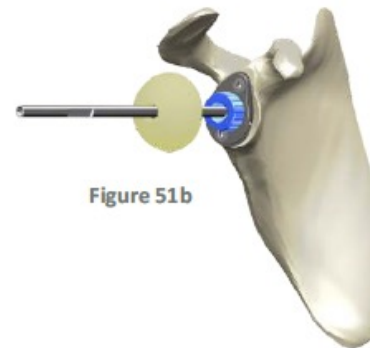
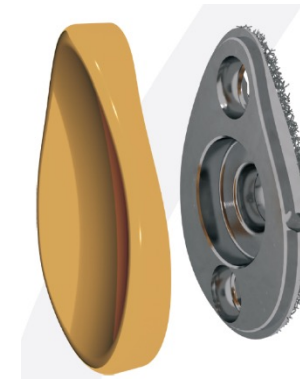


Figure 51b

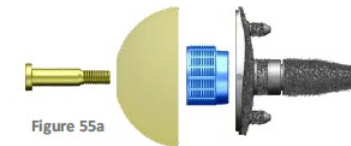


Figure 55a

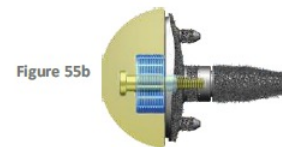
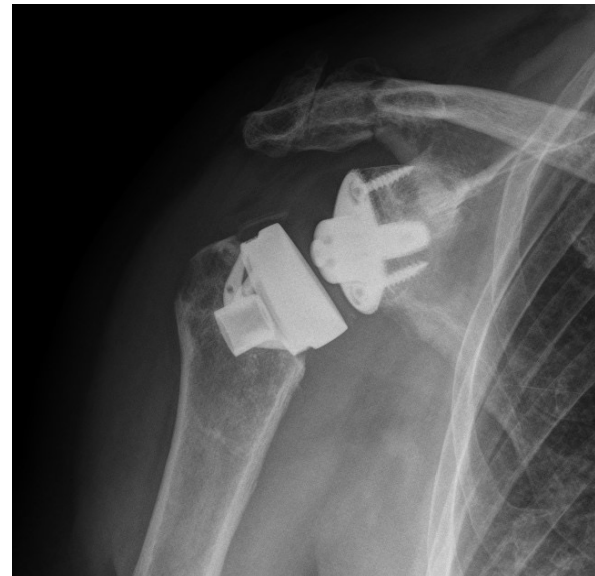


Figure 55b

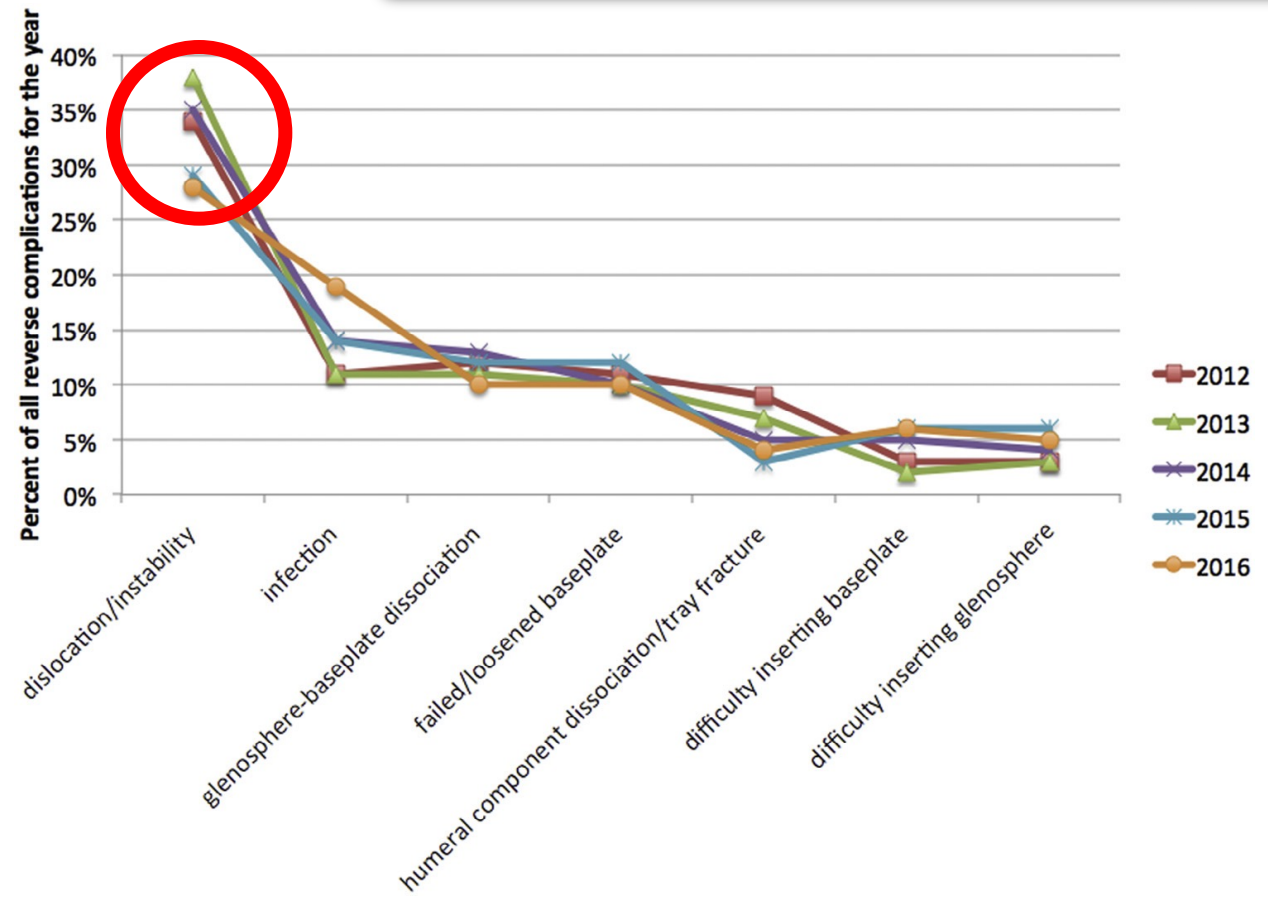
TSA INSTABILITY



RTSA COMPLICATIONS

Table IV Primary failure modes among the 2390 reverse shoulder arthroplasties in order of percentage of all reverse failure modes, sorted by frequency

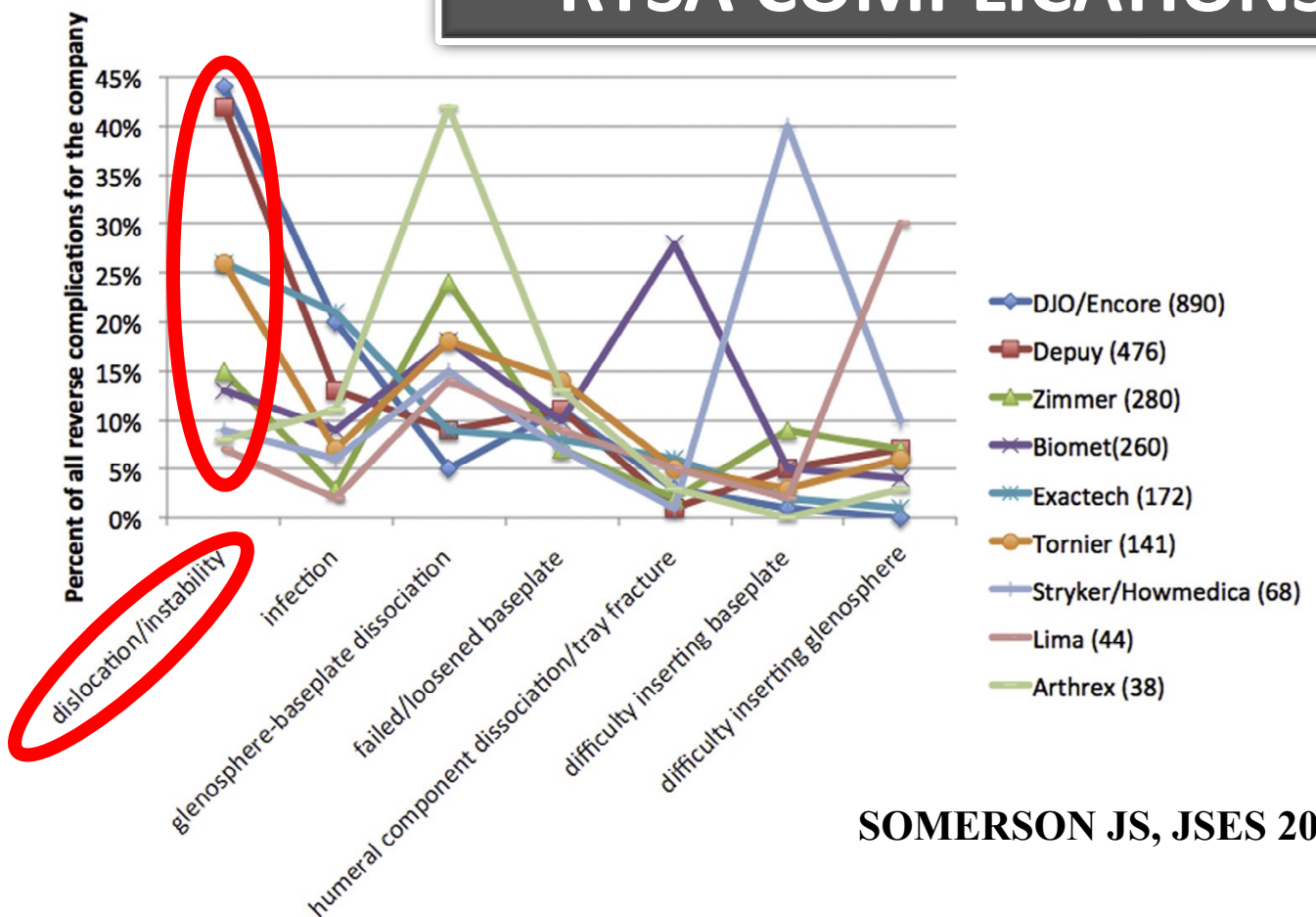
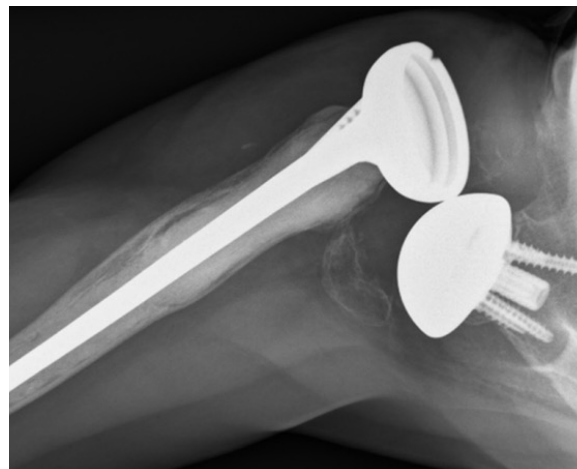
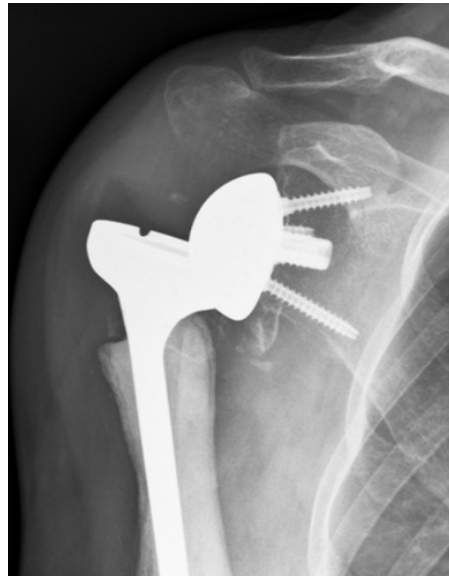
Mode of Failure	No. (%)
Dislocation/instability	764 (32.0)
Infection	330 (13.8)
Glenosphere—baseplate dissociation	292 (12.2)
Failed/loosened baseplate	248 (10.4)
Humeral component dissociation/tray fracture	132 (5.5)
Difficulty inserting baseplate	114 (4.8)
Difficulty inserting glenosphere	100 (4.2)
Humeral component loosening	66 (2.8)
Difficulty seating liner in metal humeral cup	62 (2.6)
Pain/stiffness	61 (2.6)
Liner loosening/fracture/wear	50 (2.1)
Glenoid fracture	33 (1.4)
Humeral fracture	33 (1.4)
Acromial/spine fracture	17 (0.7)
Humeral fracture on insertion	14 (0.6)
Packaging/availability problem	14 (0.6)
Rotator cuff/subscapularis failure	13 (0.5)
Problem with humeral insertion	10 (0.4)
Difficulty seating humeral metal cup on stem	8 (0.3)
Problem with humeral preparation	6 (0.3)
Humeral component malposition	3 (0.1)
Death	3 (0.1)
Fracture of prosthesis	2 (0.1)
Tuberosity non union/fracture	2 (0.1)
Miscellaneous	13 (0.5)



SOMERSON JS, JSES 2018

FOR **REVERSE SHOULDER** ARTHROPLASTY, THE PERCENTAGE DISTRIBUTION OF THE 7 MOST COMMON FAILURE MODES FOR EACH YEAR OF SURGERY REMAINED RELATIVELY CONSISTENT.

RTSA COMPLICATIONS



SOMERSON JS, JSES 2018

FOR **REVERSE SHOULDER** ARTHROPLASTY, THE PERCENTAGE DISTRIBUTION OF THE 7 MOST COMMON FAILURE MODES FOR REVERSE ARTHROPLASTY FOR EACH COMPANY VARIED SUBSTANTIALLY AMONG THE 10 COMPANIES WITH AT LEAST 20 REPORTS IN THE ANALYSIS.



The modern reverse shoulder arthroplasty and an updated systematic review for each complication: part I



Sarav S. Shah, MD^{*}, Benjamin T. Gaal, BA, Alexander M. Roche, BA, Surena Namdari, MD, Brian M. Grawe, MD, Macy Lawler, BS, Stewart Dalton, MD, Joseph J. King, MD, Joshua Helmkamp, BS, Grant E. Garrigues, MD, Thomas W. Wright, MD, Bradley S. Schoch, MD, Kyle Flik, MD, Randall J. Otto, MD, Richard Jones, MD, Andrew Jawa, MD, Peter McCann, MD, Joseph Abboud, MD, Gabe Horneff, MD, Glen Ross, MD, Richard Friedman, MD, Eric T. Ricchetti, MD, Douglas Boardman, MD, Robert Z. Tashjian, MD, Lawrence V. Gulotta, MD

American Shoulder and Elbow Surgeons Multicenter Task Force on Reverse Total Shoulder Arthroplasty Complications, Rosemont, IL, USA



Primary reverse shoulder arthroplasty using contemporary implants is associated with very low reoperation rates

Conclusion: RTSA in younger patients provides significant subjective improvement and substantial gain in overall function, which is maintained up to 10 years. Although the complication rate is high, most can be treated successfully without compromise to clinical outcome. However, it is imperative that the high complication rate is explained to patients, with the risks and benefits carefully considered.

Complications and Intraoperative Fractures in Reverse Shoulder Arthroplasty: A Systematic Review

Geriatric Orthopaedic Surgery
& Rehabilitation
Volume 12: 1–14
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DOI: 10.1177/21514593211059865
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2021


Andrea Dolci, MD¹ , Barbara Melis, MD², Marco Verona, MD¹, Antonio Capone, PhD¹, and Giuseppe Marongiu, MD¹

Table 2. The 10 Most Common Local Complications and Problems.

Rank	Local Complication	N° Cases	Rate, %
1	DISLOCATION	340	<u>2.52</u>
2	INFECTION	262	<u>1.94</u>
3	ACROMIAL POSTOP. FX ^a	149	1.1
4	HUMERAL INTRAOP FX ^a	136	1
5	NERVE LESION	130	.96
6	HUMERAL POST OP FX ^a	123	.91
7	GLENOID LOOSENING	120	.89
8	HUMERAL LOOSENING	82	.61
9	HEMATOMA	68	.50
10	GLENOID INTRAOP. FX ^a	51	.37

^aFX: fracture.



Table III Complications classified as major medical, shoulder/surgical, or infectious

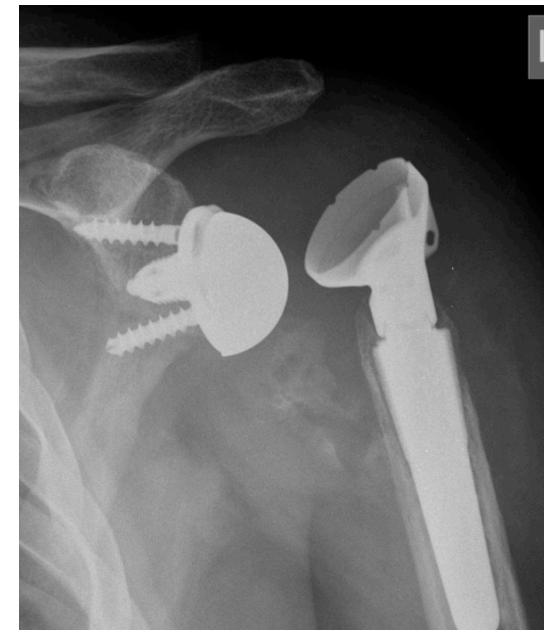
Complications	n	%
Major medical	4	0.07
PE	2	0.03
Sepsis/septic shock	2	0.03
COPD exacerbation	1	0.02
Ventricular tachycardia	1	0.02
Shoulder/surgical	306	5.25
Fracture		2.26
Acromial fracture	17	0.29
Acromial stress fracture	15	0.26
Scapular spine fracture	26	0.45
Scapular body fracture	11	0.19
Glenoid fracture	5	0.09
Humeral shaft fracture	5	0.09
Scapular neck fracture	4	0.07
Greater tuberosity of humerus fracture	3	0.05
Periprosthetic fracture	45	0.77
Implant related		1.38
Glenoid loosening	41	0.70
Humeral prosthesis loosening	21	0.36
Glenoid component dissociation	13	0.22
Disassociation of humeral bearing	6	0.10
Instability		0.93
Instability	14	0.24
Dislocation	40	0.69
Nerve injury		0.38
Nerve palsy other than axillary	11	0.19
Neurapraxia of axillary nerve	11	0.19
Other	18	0.31
Infection	67	1.15
Deep infection	48	0.82
Infection (not specified)	14	0.24
Superficial infection	5	0.09
Unspecified	91	1.56

PE, pulmonary embolism; COPD, chronic obstructive pulmonary disease.

Outcomes and complications of primary reverse shoulder arthroplasty with minimum of 2 years' follow-up: a systematic review and meta-analysis

Joseph W. Galvin, DO^a, Ryan Kim, MD^b, Alexander Ment, BA^c, Joseph Durso, MD^a, Patrick M.N. Joslin, MS^b, Jacie L. Lemos, BS^d, David Novikov, MD^b, Emily J. Curry, MPH^b, Maxwell C. Alley, MD^b, Stephen A. Parada, MD^e, Josef K. Eichinger, MD^f, Xinning Li, MD^{b,*}



INSTABILITY 0,5% - 9%



RTSA COMPLICATIONS

Article

Survivorship of Reverse Shoulder Arthroplasty According to Indication, Age and Gender

Mikaël Chelli ¹, Pascal Boileau ¹, Peter Domos ², Philippe Clavert ³, Julien Berhouet ⁴, Philippe Collin ⁵, Gilles Walch ⁶ and Luc Favard ^{4,*}

- **Instability (2-5%)**
- **Infection (1.5-3%)**
- **Humeral and glenoid loosening (1.6-1.4%)**
- **Acromial and scapular spine fracture**
- **Periprosthetic fracture**
- **Neurological damage**

2022



IMPLANT DESIGN

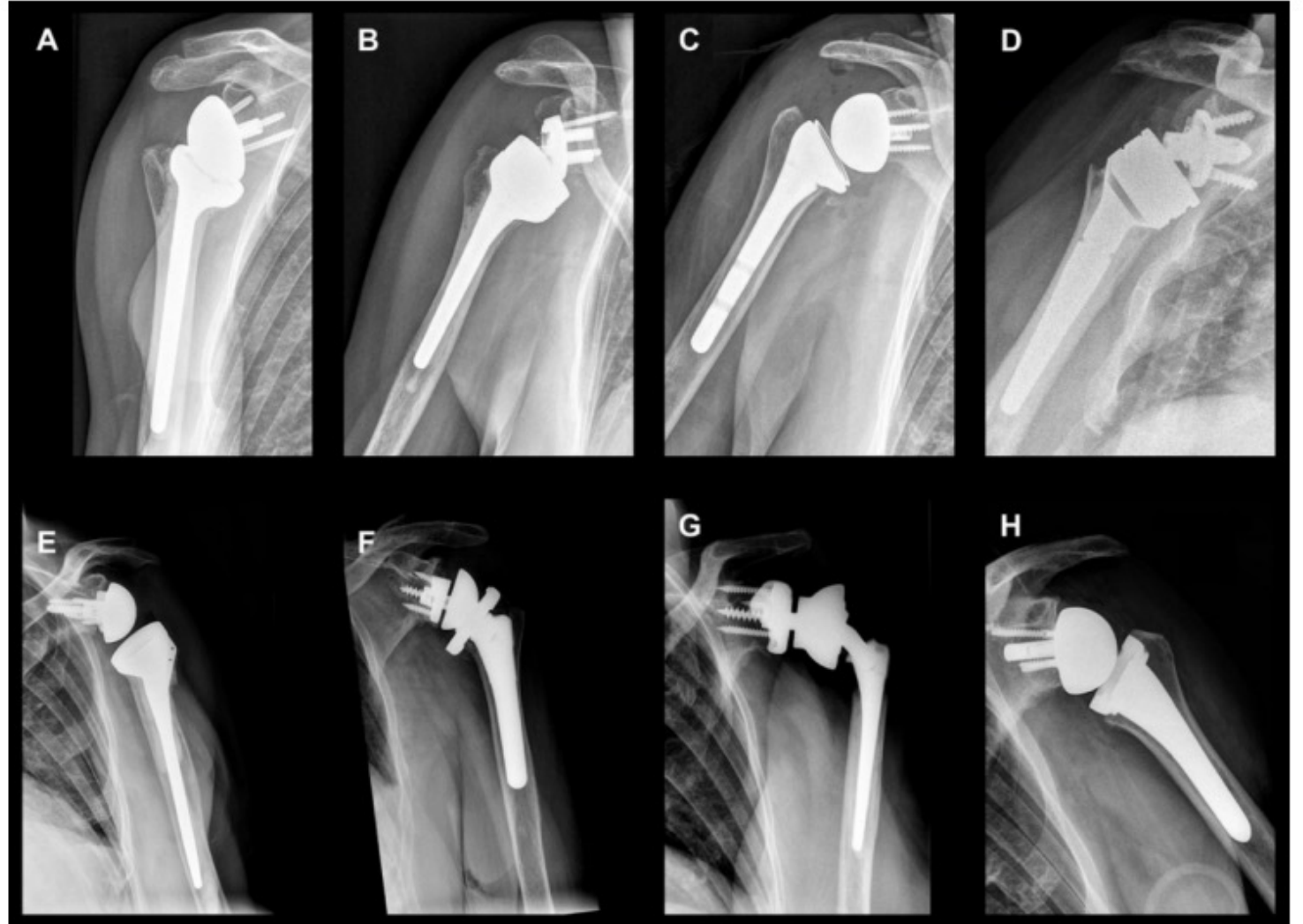
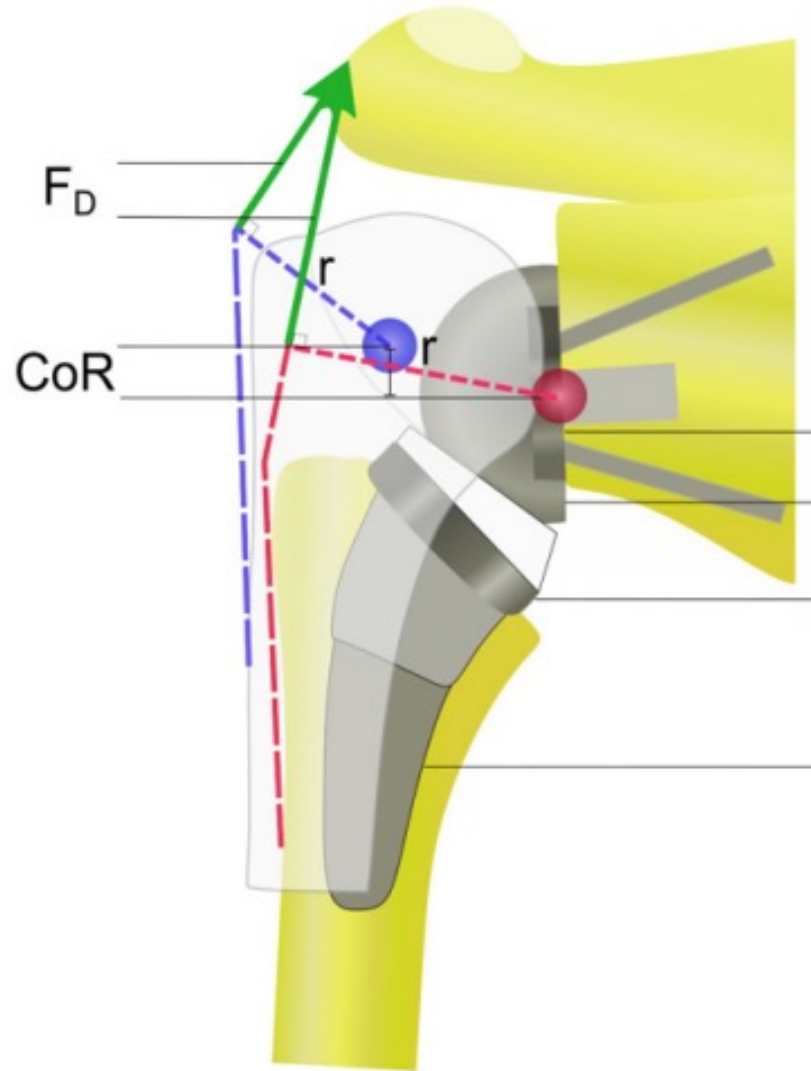


Table 3 Glenoid lateral offset (LO) and lateralization of the different implants included in the study

Manufacturer	Implant	Glenoid LO	Glenoid Lat	Sphere LO	Sphere Lat	Baseplate LO	Baseplate Lat	Glenoid lateralization class
Arthrex	Univers 155°	7.6	-2	7.6	0	0	-2	MG
Tomier	Aequalis	7.6	-2	7.6	0	0	-2	
Tomier	Aequalis II	7.6	-2	7.6	0	0	-2	
Mathys	Affinis Reverse	9.1	-0.5	7.6	0	1.5	-0.5	
DePuy	DeltaXtend	9.5	-0.1	8 ^a	+0.4	1.5	-0.5	
DePuy	Delta III	9.6	0	7.6	0	2	0	
Tomier	Ascend Flex 127.5°	10.3	+0.7	10.3	+2.7	0	-2	
Tomier	Ascend Flex 132.5°	10.3	+0.7	10.3	+2.7	0	-2	
Tomier	Ascend Flex 137.5°	10.3	+0.7	10.3	+2.7	0	-2	
Zimmer	Trabecular Metal	11.5	+1.9	9	+1.4	2.5	+0.5	
Medacta	Shoulder System 155°	11.6	+2	7.6	0	4	+2	
Arthrex	Univers 135°	12.7	+3.1	12.7	+5.1	0	-2	
Exactech	Equinox	12.9	+3.3	10.9 ^a	+3.3	2	0	
Zimmer	Inverse Reverse	13.6	+4	7.6	0	6	+4	
Fx Solutions	Humelock Reverse	13.8	+4.2	10.3	+2.7	3.5	+1.5	
Fx Solutions	Easytech	13.8	+4.2	10.3	+2.7	3.5	+1.5	
Lima	SMR	14	+4.4	9	+1.4	5	+3	
Medacta	Shoulder System 145°	14.3	+4.7	10.3	+2.7	4	+2	
Tomier	Aequalis II + BioRSA	14.6	+5	7.6	0	7 ^b	+5	LG
Strkyer	ReUnion RSA	14.7	+5.1	12.7	+5.1	2	0	
Biomet	Comprehensive	14.8	+5.2	9.8	+2.2			
Aston	Duocentric	15.3	+5.7	10.3	+2.7			
Biomet	TESS	16	+6.4	9	+1.4			
FH Ortho	Arrow II	16.1	+6.5	7.6	0			
FH Ortho	Arrow	16.3	+6.7	7.6	0			
DJO	Altivate	16.7	+7.1	12.7	+5.1			
Tomier	Ascend Flex 132.5° + BioRSA	17.3	+7.7	10.3	+2.7			
Lima	SMR Stemless	17.9	+8.3	12.9	+5.3			

International Orthopaedics
<https://doi.org/10.1007/s00264-019-04365-3>

REVIEW ARTICLE

Lateralization in reverse shoulder arthroplasty: a descriptive analysis of different implants in current practice

Jean-David Werthel^{1,2} · Gilles Walch³ · Emilie Vegehan² · Pierrick Deransart⁴ · Joaquin Sanchez-Sotelo⁵ · Philippe Valenti²




RESEARCH

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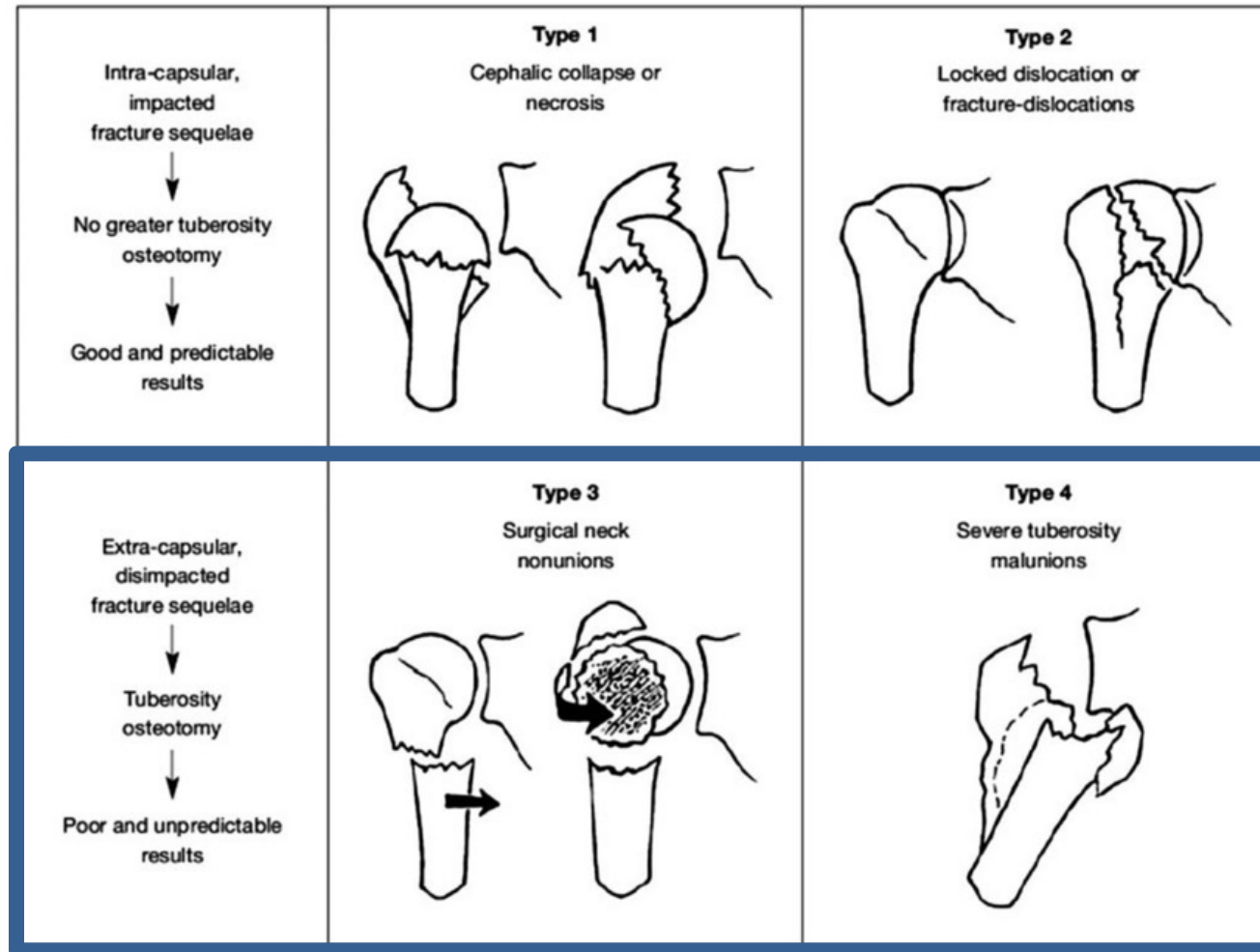


Factors that increase the rate of periprosthetic dislocation after reverse shoulder arthroplasty

Chethan Reddy¹, Nikit Venishetty^{2*} , Hunter Jones³, Varatharaj Mounasamy⁴ and Senthil Sambandam⁴

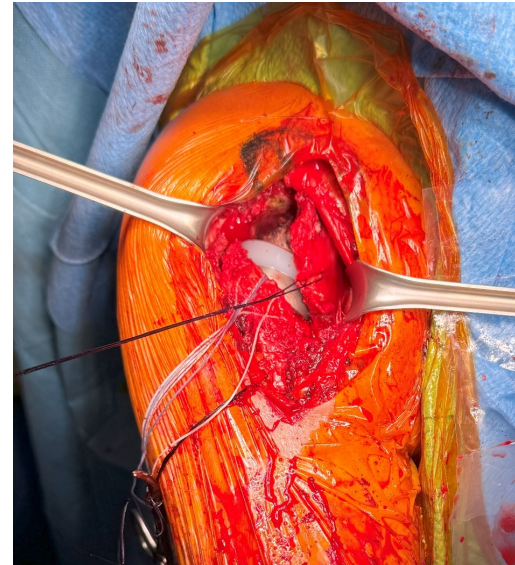
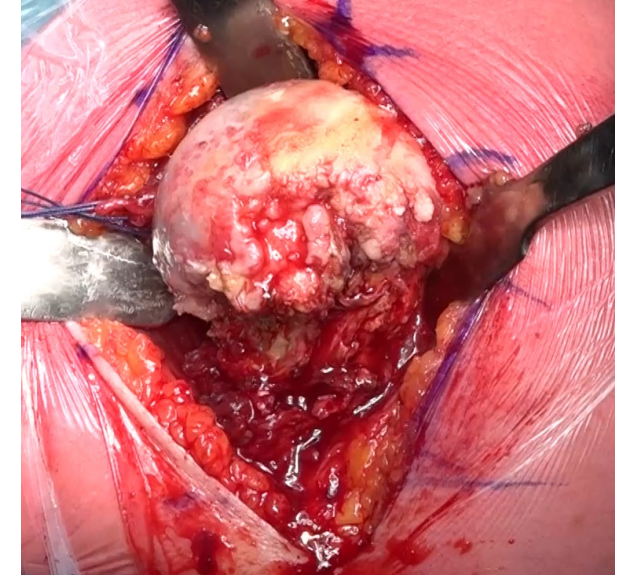
Variable	Periprosthetic Dislocation Group (n = 1,000)	Control Group (n = 58,925)	Significance
Tobacco-Related Disorder	129 (12.90%)	9,515 (16.15%)	0.003
Elective Admission	899 (90.10%)	54,505 (92.50%)	0.01
Obesity	246 (24.60%)	11,718 (19.89%)	<0.001
Super Obesity	16 (1.60%)	497 (0.84%)	0.014
Morbid Obesity	126 (12.60%)	4,724 (8.02%)	<0.001
Diabetes Without Complications	142 (14.20%)	8,515 (14.45%)	0.43
Diabetes With Complications	^a (0.10%)	117 (0.20%)	0.41
Liver Cirrhosis	14 (1.40%)	293 (0.50%)	<0.001
Parkinson's Disease	27 (2.70%)	663 (1.13%)	<0.001
CKD	82 (8.20%)	4,687 (7.95%)	0.41
Dialysis	^a (3.00%)	97 (0.16%)	0.23
Organ Transplant	^a (0.40%)	152 (0.26%)	0.26

RTSR in fracture sequelae



Risck factors for instability

- ✓ Obesity (BMI >30)
- ✓ Soft-tissue deficiency

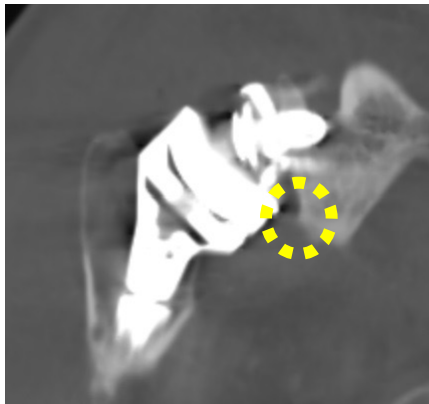


Risck factors for instability



Patients at risk for instability

- ✓ Shortened humerus (proximal bone loss)
- ✓ Excessive glenoid medialization: . Glenoid bone-defect



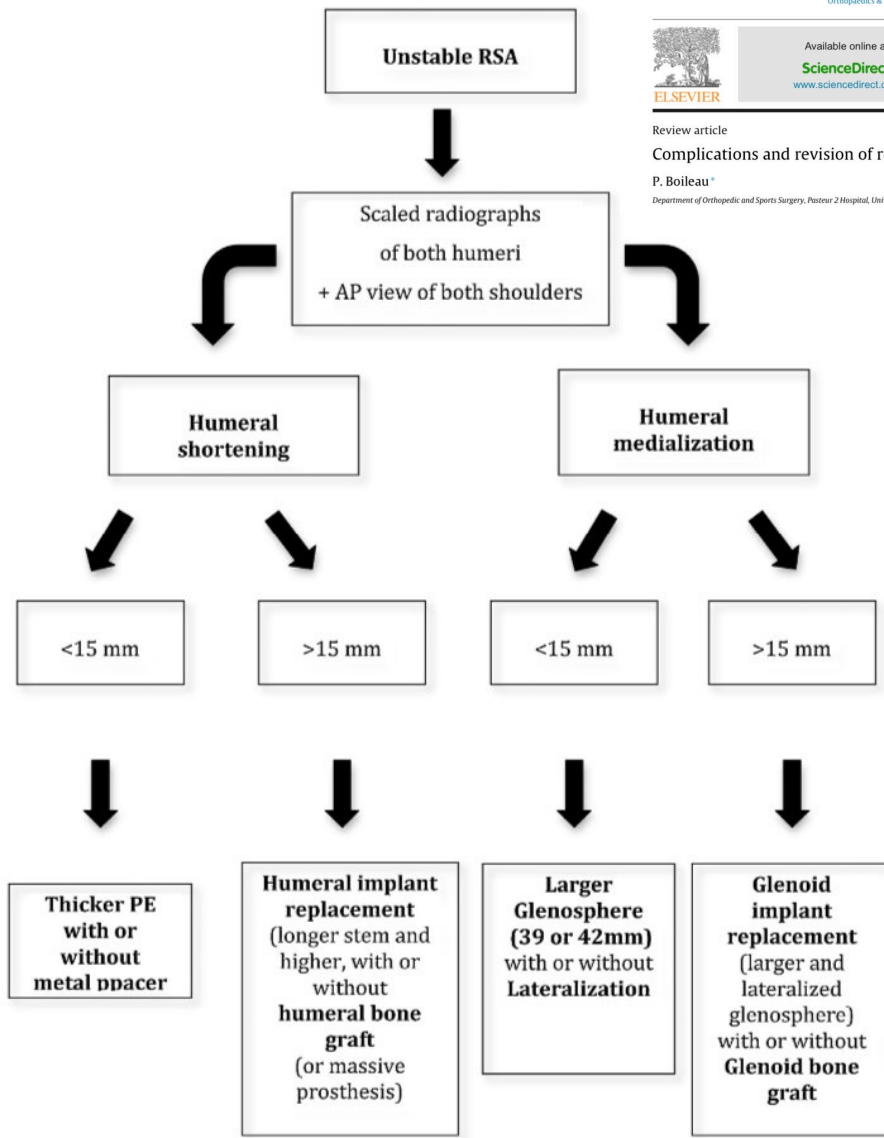
. Small glenosphere

- ✓ Implant malposition in vertical and/or horizontal plane

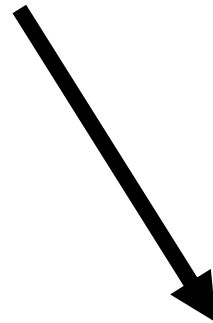
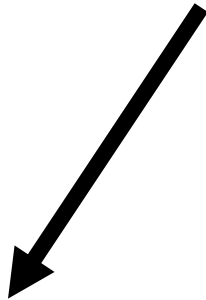
Reverse Shoulder Arthroplasty Instability Classification			
I	Loss of Compression	a	Undersized implants
		b	Loss of deltoid contour
		c	Humeral height loss
		d	Subscapularis deficiency
		e	Acromial/scapular fracture
		f	Deltoid dysfunction
II	Loss of Containment	a	Mechanical failure
		b	Alteration of D/R ratio (Humerosocket depth)
III	Impingement	a	Soft tissue or bony impingement
		b	Prosthetic malalignment
		c	Body habitus

TREATMENT OPTIONS

1. Glenoid side only-procedures
2. Humeral side only-procedures
3. Humeral-glenoid procedures
4. Hemiarthroplasty (CTA)
5. Custom Made



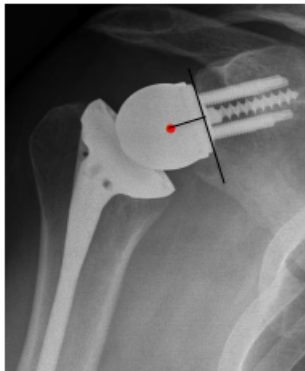
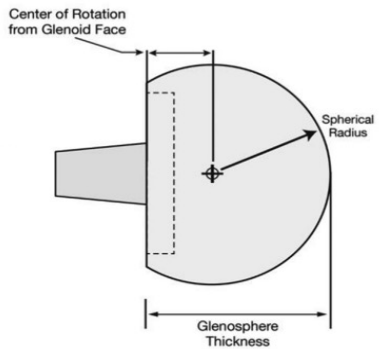
Glenoid-side procedure



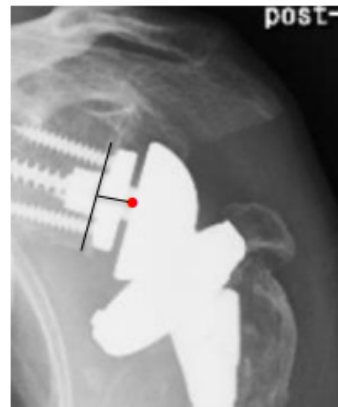
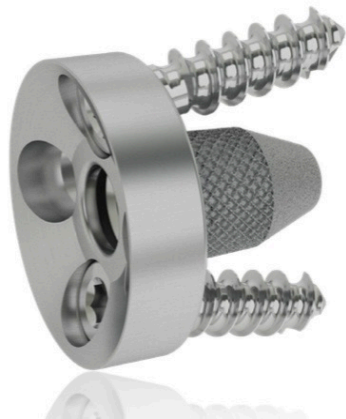
Glena con off-set lateralizzante (senza rimozione MB)

Augmented Glenoid (Base-plate) dopo rimozione MB

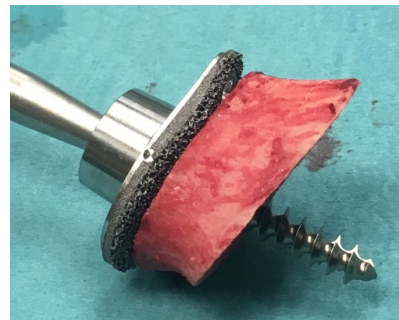
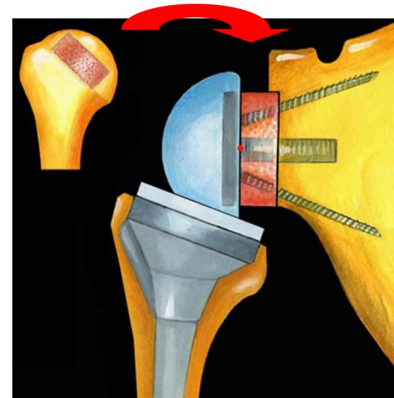
Bone graft (Bio-RSA) dopo rimozione MB



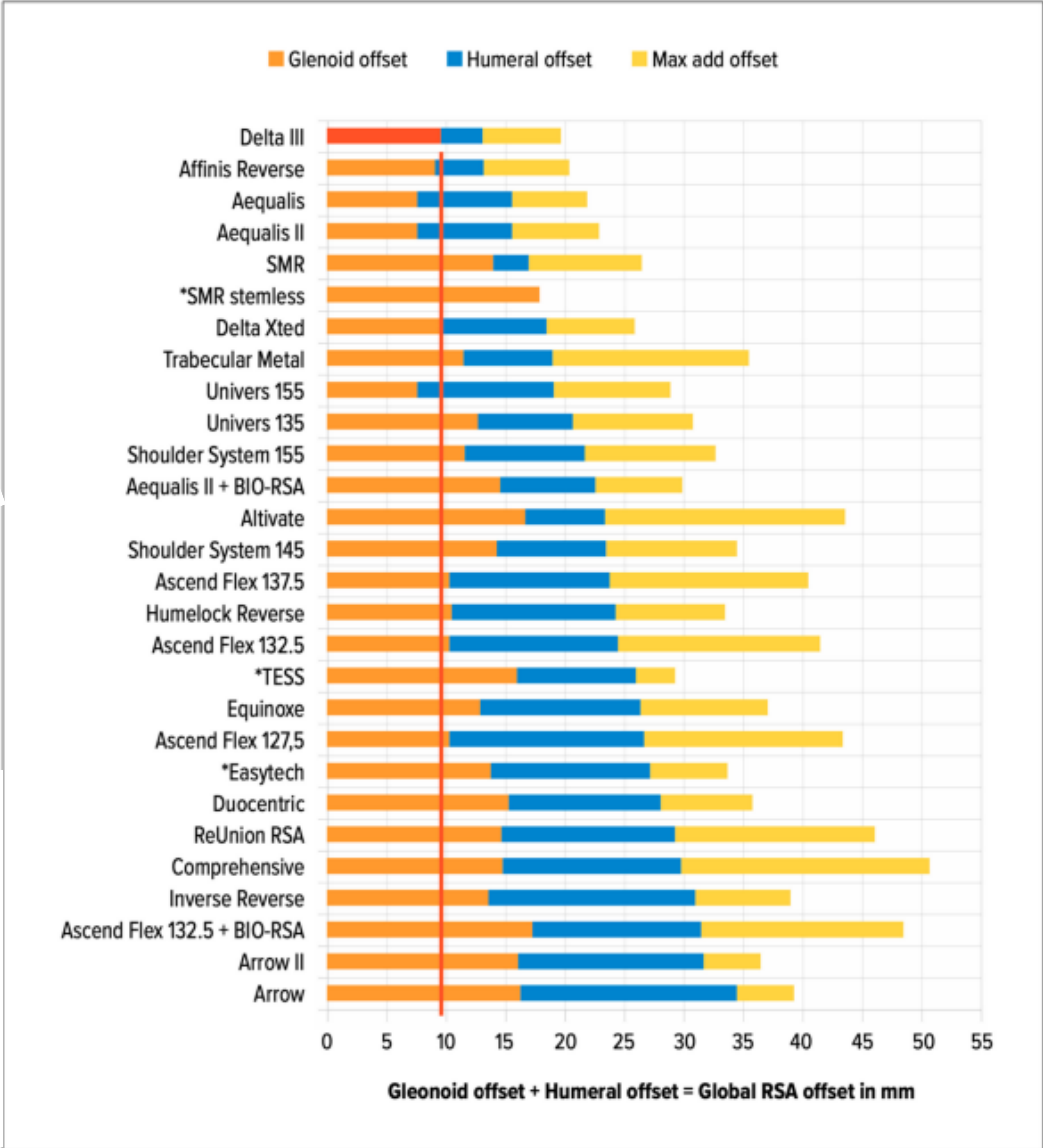
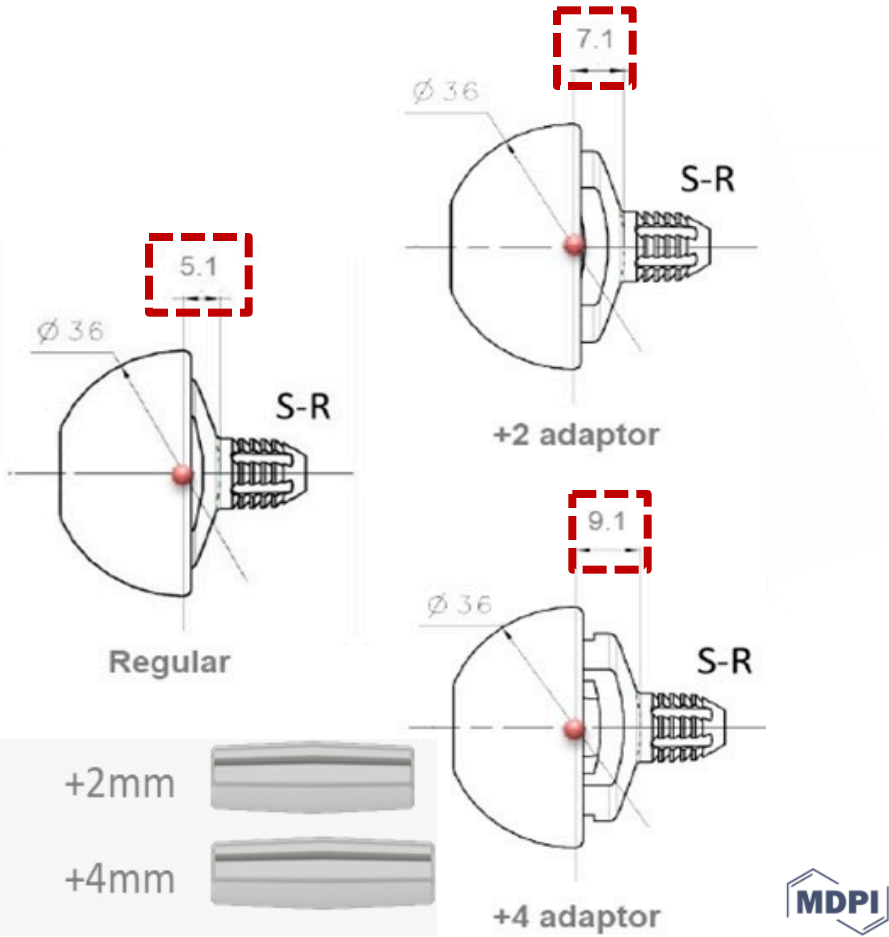
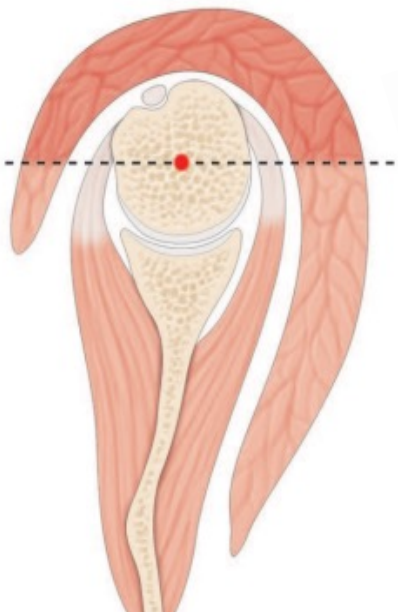
Within the sphere



Within the baseplate

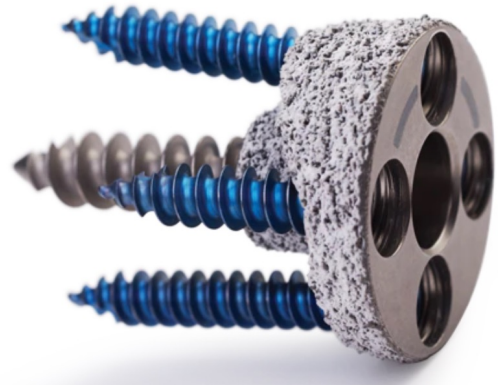


Glenoid configuration

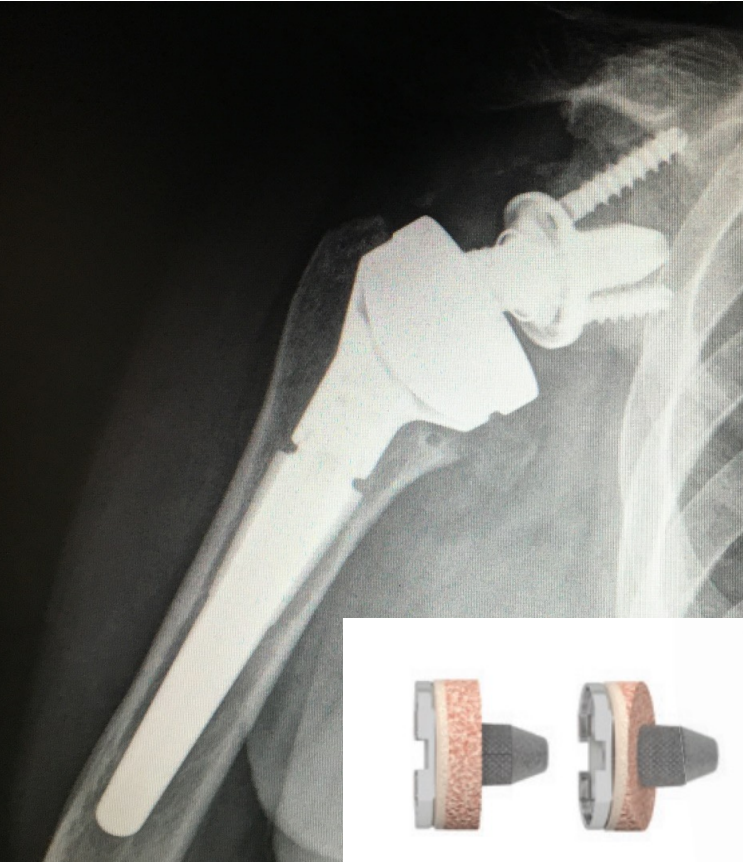


Review
Lateralization in Reverse Shoulder Arthroplasty

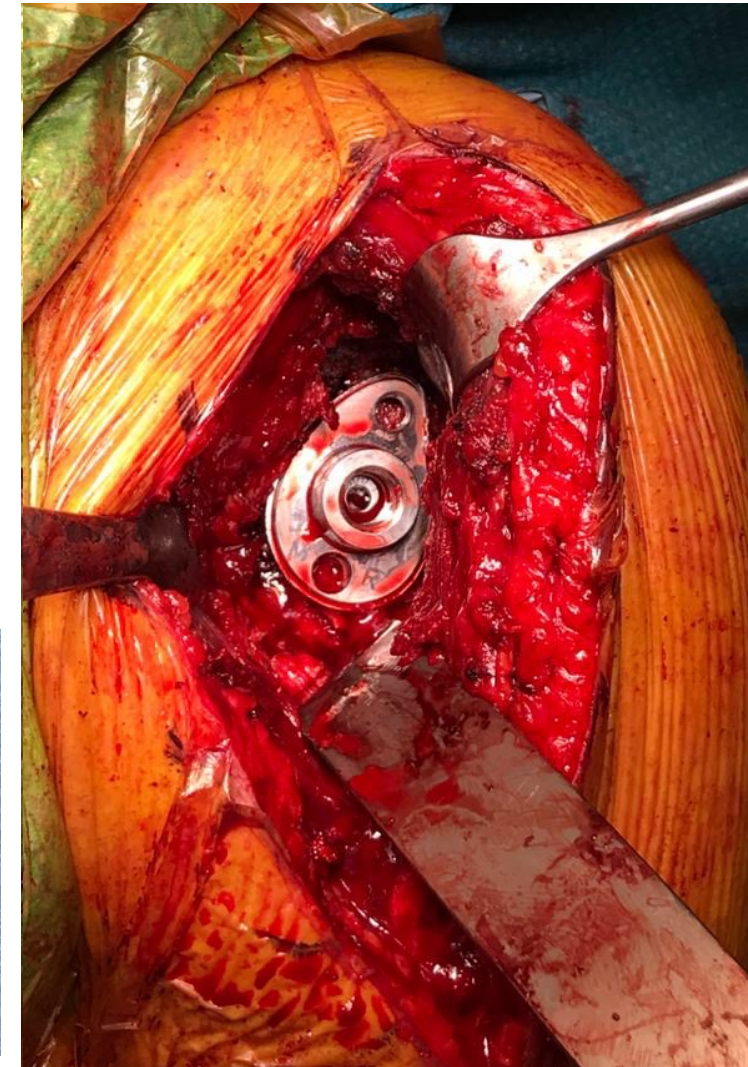
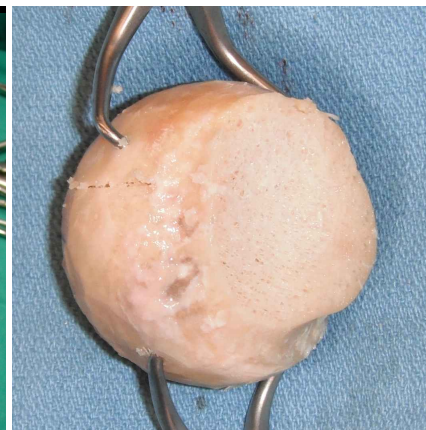
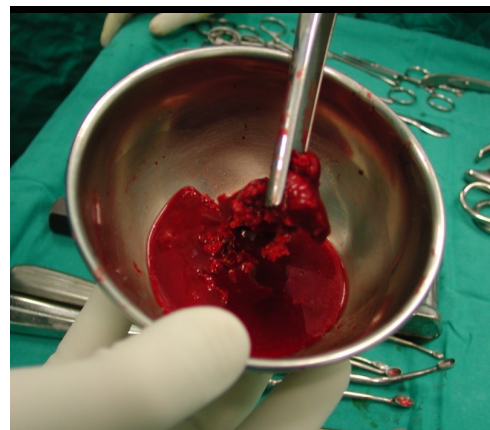
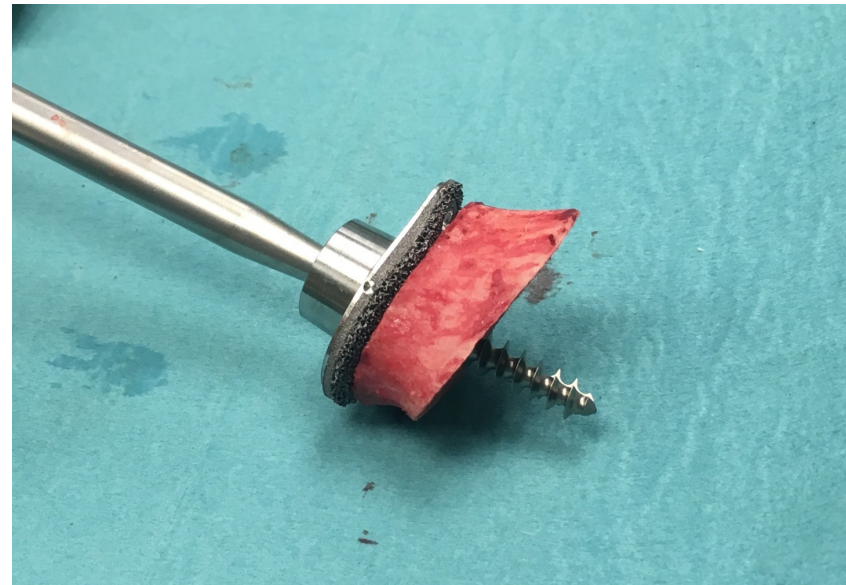
Glenoid configuration Offset (metal)



Glenoid configuration Offset (bone-graft)

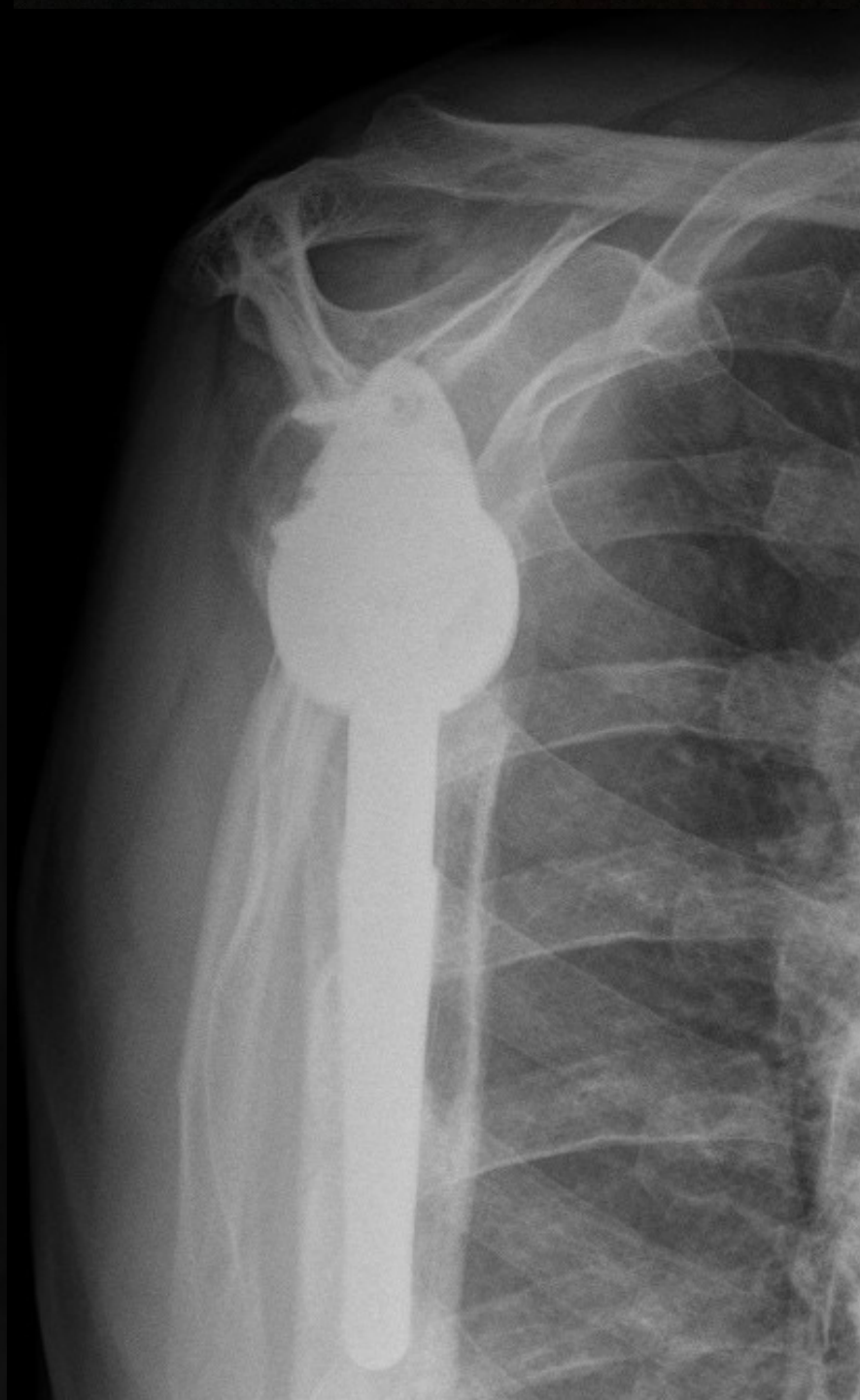


Glenoid-side procedure





3 anni



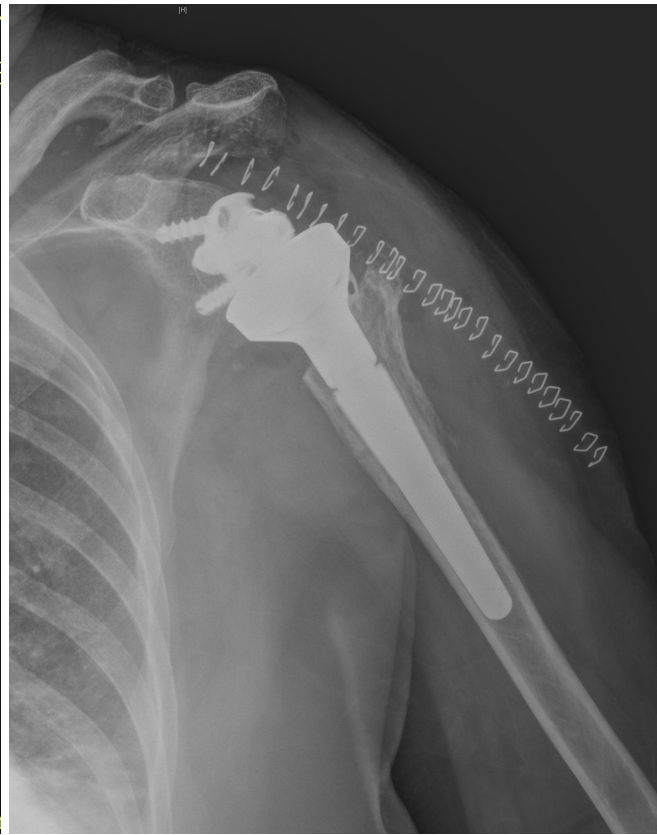
Glenoid and humeral side procedure



Glenoid and humeral side procedure

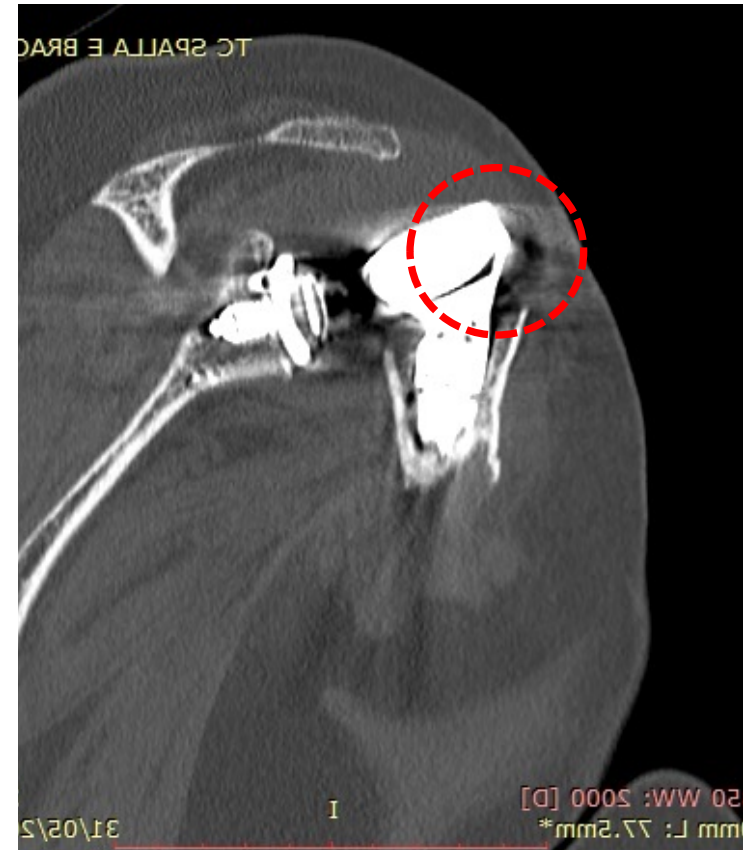
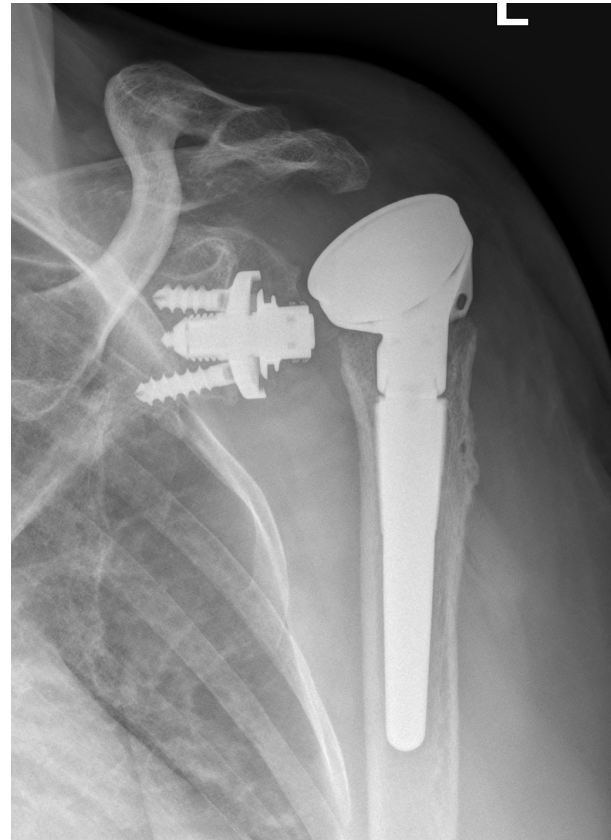


Glenoid and humeral side procedure

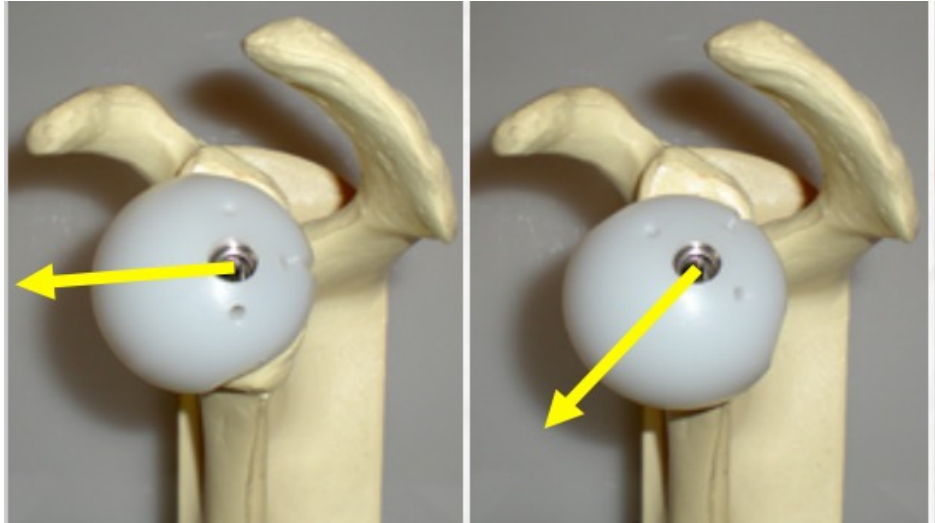


Glenoid and humeral side procedure

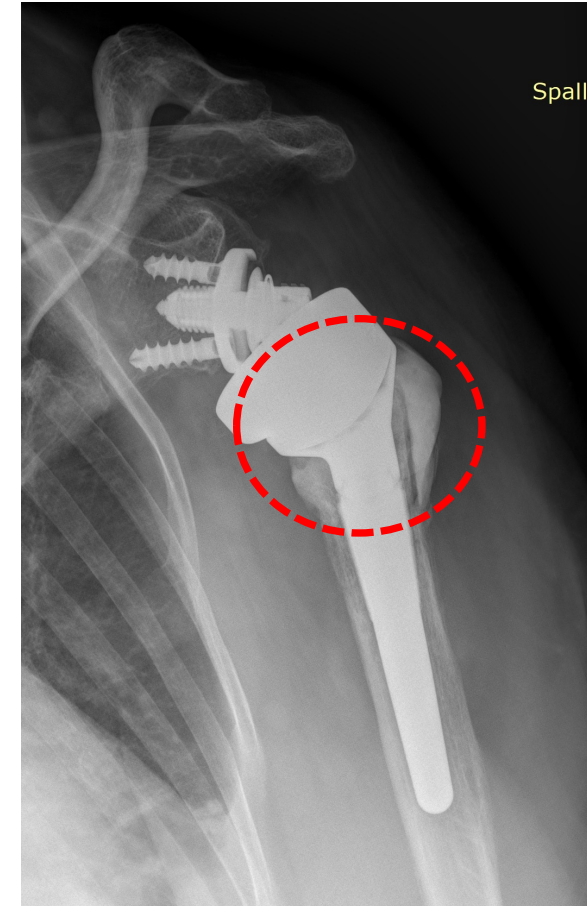
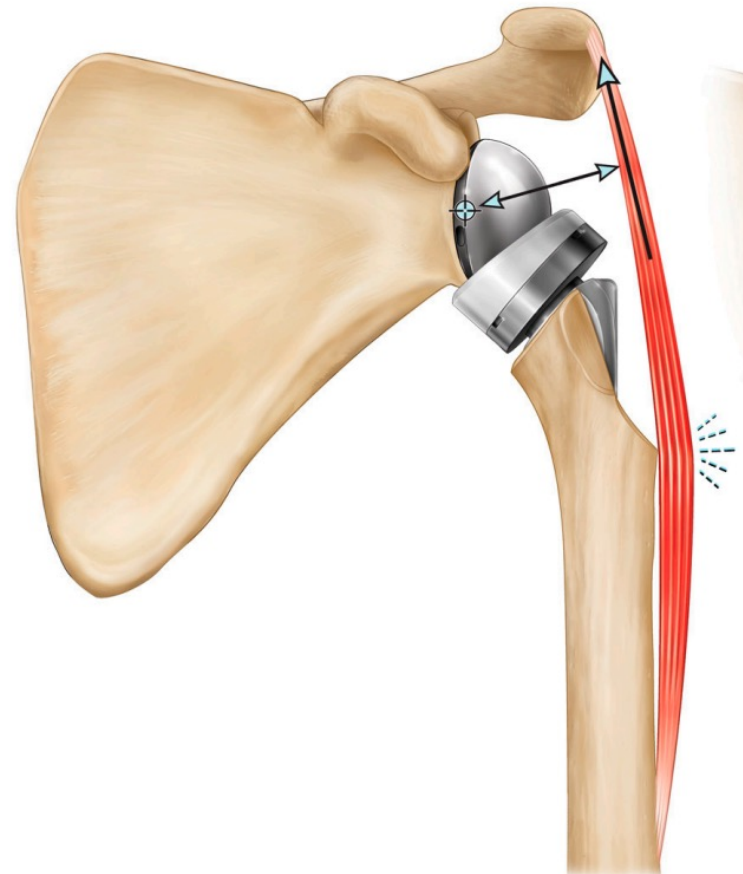
4 settimane
dopo



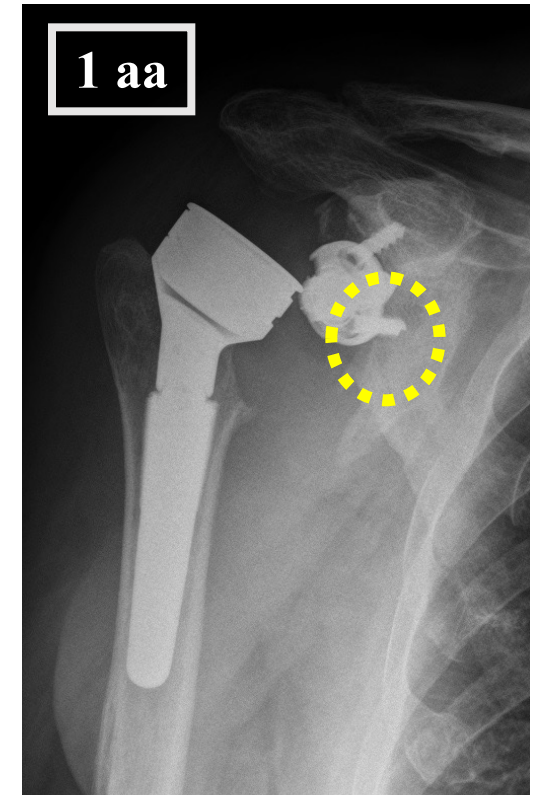
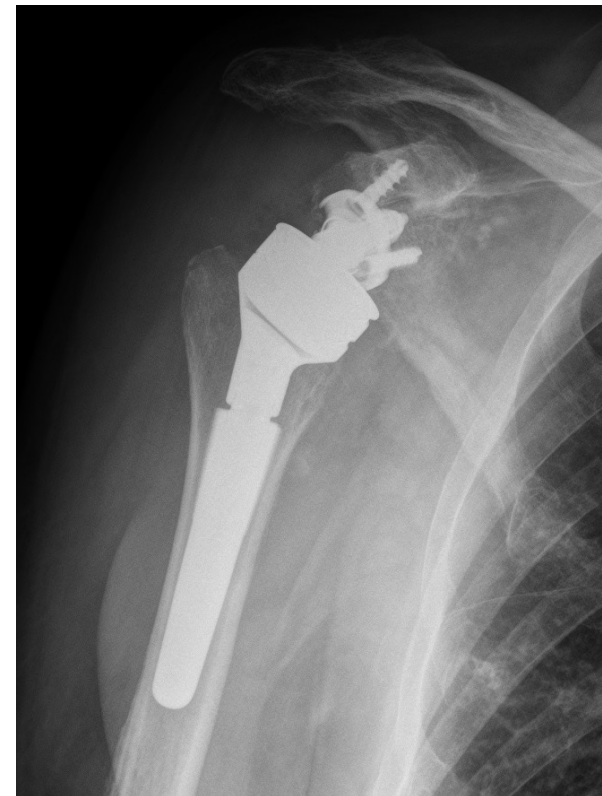
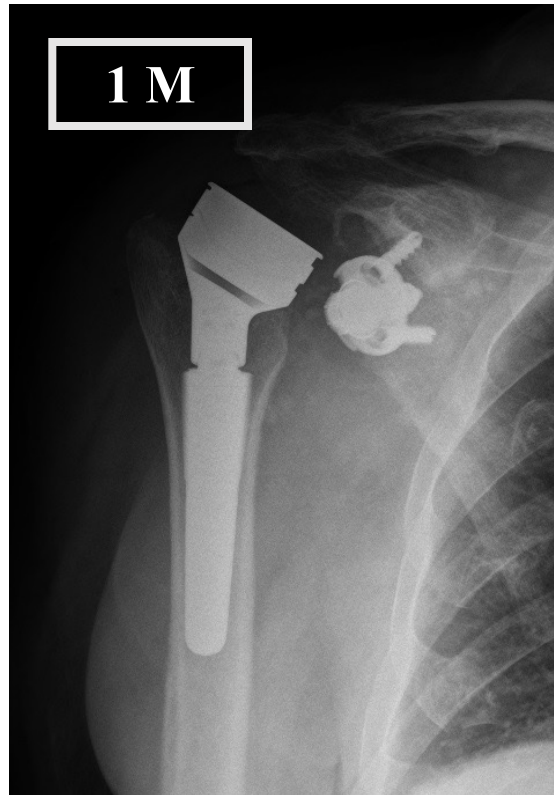
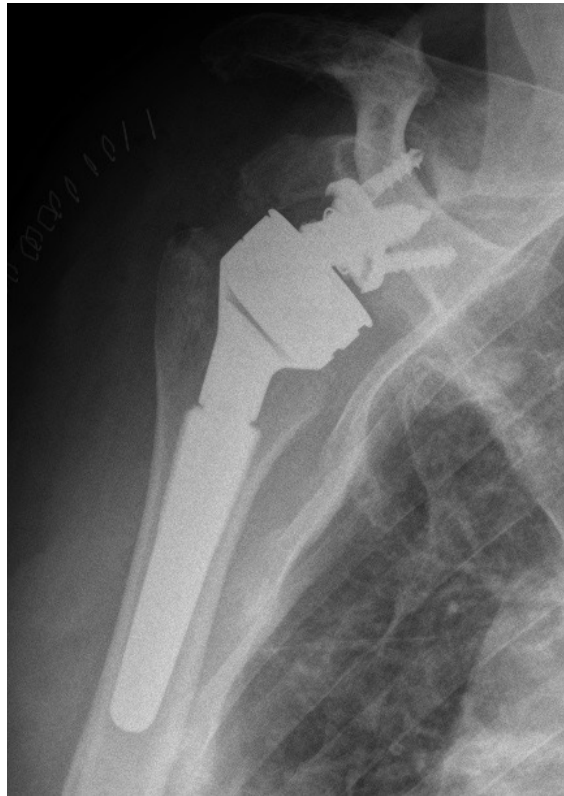
Glenoid and humeral side procedure

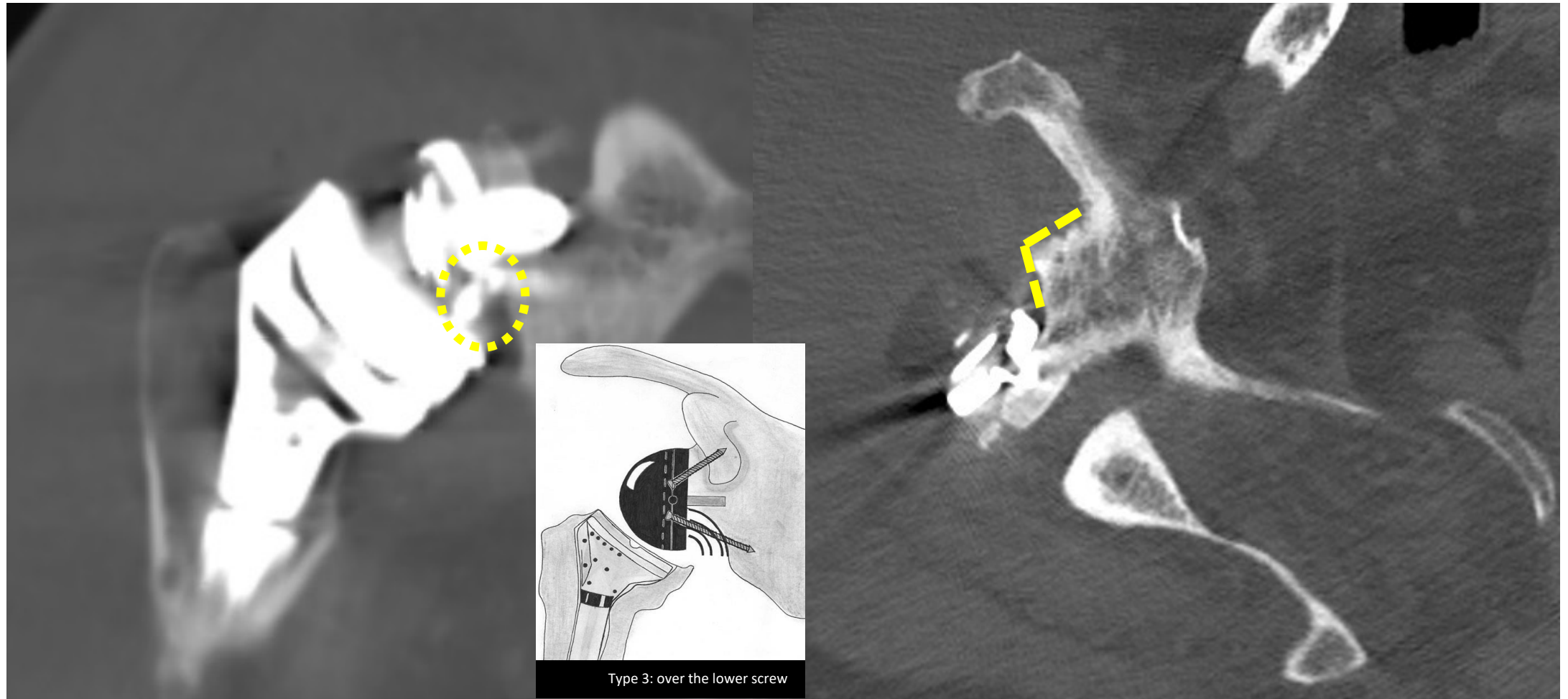


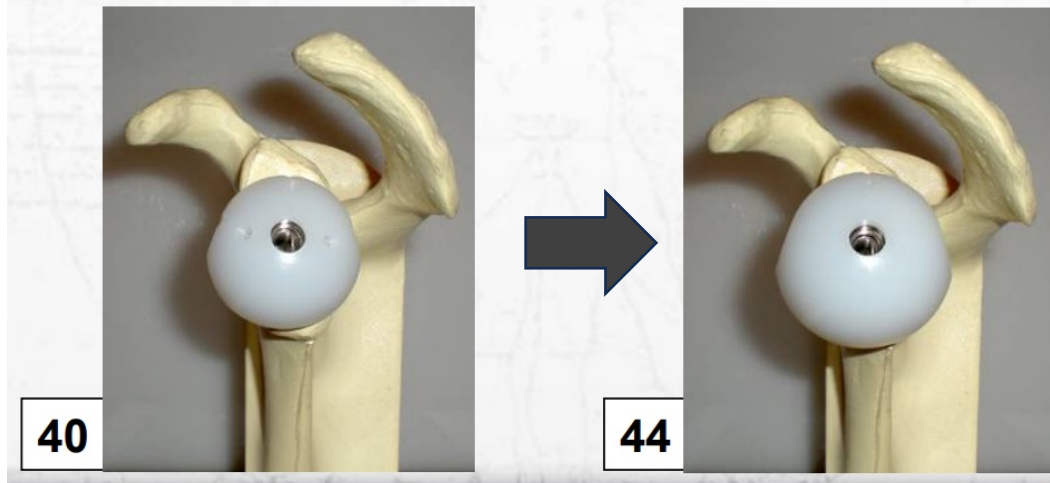
Lateralizing liner (+4mm)



Glenoid and humeral side procedure







CONCLUSIONI

- **Corretta valutazione della causa dell'instabilità protesica**
- **Corretta tecnica chirurgica**

Grazie

