HUMANITAS
SAN PIO X

La protesi inversa di spalla: il ruolo del sottoscapolare

Marco NERI [1], Matteo Libroia [1]

[1] *U.O. Ortopedia e Traumatologia*

Humanitas Casa di Cura San Pio X, Milano, Italia

XIV Congresso Nazionale SICSeG, Bologna 24-26 Maggio 2018

"Reverse Total Shoulder Arthroplasty:
A Review of Results According to Etiology"

Bryan Wall, Laurent Nové-Josserand, Daniel P. O'Connor, T. Bradley Edwards and Gilles Walch

J Bone Joint Surg Am. 2007;89:1476-85

"Patients with repair of the subscapularis had greater improvement in the amount of **internal rotation** (from L5 to L4) than did those without repair (from the sacrum to L5)".

"With the numbers studied, repair of the subscapularis **was not related to the occurrence of postoperative complications** ($p = 0.123$) or dislocations ($p = 0.115$)".

J Shoulder Elbow Surg (2009) 18, 892-896

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Subscapularis insufficiency and the risk of shoulder dislocation after reverse shoulder arthroplasty

T. Bradley Edwards, MD*, Matthew D. Williams, MD, Joanne E. Labriola, MD, Hussein A. Elkousy, MD, Gary M. Gartsman, MD, Daniel P. O'Connor, PhD

Fondren Orthopedic Group, Houston, TX

Hypothesis: Dislocation is the most common serious complication after reverse shoulder arthroplasty. One theorized cause is subscapularis insufficiency because the tendon cannot be repaired at the time of surgery. There are no documented risk assessments of reverse total shoulder arthroplasty dislocation related to this cause. The study objective was to quantify the risk of postoperative dislocation after reverse total shoulder arthroplasty in patients with a subscapularis tendon that was irreparable at the time of surgery.
Method: A prospective evaluation was done of 138 consecutive reverse arthroplasties performed through a deltopectoral approach by a single surgeon (average follow-up, 36 months).
Results: The subscapularis was reparable in 62 patients and irreparable in 76 at the conclusion of the procedure. Seven postoperative dislocations occurred; all dislocations were in patients whose subscapularis was irreparable ($P = .012$). Dislocations were more likely in patients with complex diagnoses, including proximal humeral nonunion, fixed glenohumeral dislocation, and failed prior arthroplasty.
Conclusions: This report documents that an irreparable subscapularis tendon at the time of reverse total shoulder arthroplasty using a deltopectoral approach results in a statistically significant risk for postoperative dislocation.
Level of Evidence: Level IV, Case Series, Treatment Study

Keywords: Subscapularis; irreparable; reverse; shoulder; arthroplasty; complication; instability; dislocation

Paul Grammont[8] first reported his modern design for a reverse shoulder prosthesis in 1987. The reverse shoulder was initially designed for end-stage rotator cuff arthropathy and pseudoparalysis with inability to elevate the arm. The development and improvement of Grammont's original design has led to the reverse shoulder prosthesis becoming an important tool in the treatment of difficult shoulder pathologies.[4,5,13-15] The exciting treatment possibilities and results offered by the reverse prosthesis has led to an explosion of its use. However, the excitement must be tempered by the higher complication rate of reverse shoulder arthroplasty compared with unconstrained shoulder arthroplasty. Studies of reverse total shoulder arthroplasty (TSA) that included more than 30 patients have reported overall complication rates of 10% to 47%, with dislocation rates of 0% to 9%.[3,5,6,9,10,14-17] In these studies, dislocations accounted for up to 44% of all complications.

Causes of reverse TSA dislocation are often discussed and include the number of prior procedures, surgical approach, bone deficiency, subscapularis insufficiency, mechanical factors, and trauma. The literature contains no risk assessments of reverse TSA dislocation based on known possible causes. Many patients requiring reverse TSA do not have a sufficient subscapularis tendon to repair

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doi:10.1016/j.jse.2008.12.013

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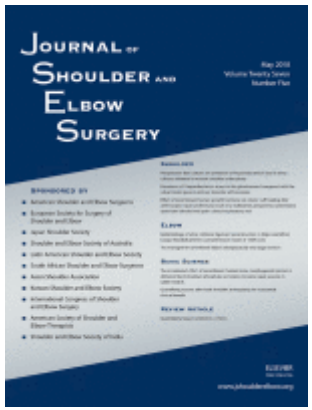
J Shoulder Elbow Surg (2009) 18, 892-896

What Are the Instability and Infection Rates After Reverse Shoulder Arthroplasty?

George J. Trappey IV, Daniel P. O'Connor, T. Bradley Edwards

September 2011, Volume 469, Issue 9, pp 2505–2511

"Patients with an **irreparable subscapularis tendon had a higher rate of instability** (14 of 123 [12%]) compared with patients with a repairable subscapularis tendon (one of 161 [less than 1%])".

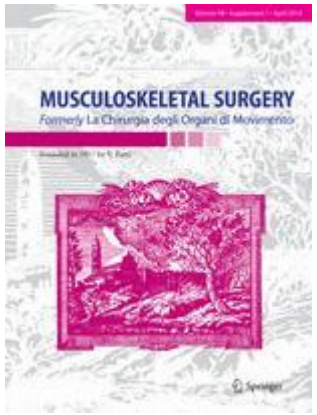


Complication rates, dislocation, pain, and postoperative range of motion after reverse shoulder arthroplasty in patients with and without repair of the subscapularis

Jason C. Clark, MD, Joseph Ritchie, BS, Frederick S. Song, MD, Michael J. Kissenberth, MD, Stefan J. Tolan, MD, Nathan D. Hart, MD, Richard J. Hawkins, MD

January 2012, Volume 21, Issue 1, Pages 36–41

"nonrepair of the subscapularis **did not have a significant effect on the risk of any complication, dislocation, infection, disassociation, or function**"

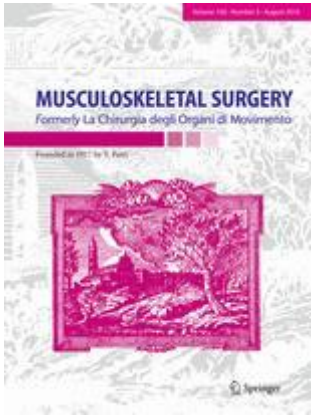


Reverse shoulder arthroplasty without subscapularis repair for the treatment of proximal humeral fractures in the elderly

F. A. Grassi, I. Zorzolo

April 2014, Volume 98, Supplement 1, pp 5–13

“Subscapularis repair **does not seem a critical factor for preventing implant dislocation**, but its influence on functional results needs further investigation”.



The influence of subscapularis tendon reattachment on range of motion in reversed shoulder arthroplasty: a clinical study

F. A. de Boer, P. M. van Kampen, P. E. Huijsmans

August 2016, Volume 100, Issue 2, pp 121–126

In reverse shoulder arthroplasty, **no significant differences** on range of motion, functional outcome scores or strength were found between subscapularis repair or no repair, whether the tendon healed at follow-up or not.

SCOPO DEL LAVORO

Identificare se ci siano o meno vantaggi quando il sottoscapolare è riparato al termine di un intervento di protesi inversa di spalla

Studio clinico sperimentale controllato a doppio cieco randomizzato

MATERIALI E METODI

Tra il 2014 ed il 2015, abbiamo operato 44 pazienti (30 donne, 14 uomini)

Gruppo A) 22 Pazienti a cui abbiamo riparato il sottoscapolare (RS)

Gruppo B) 22 Pazienti a cui non abbiamo riparato il sottoscapolare (NRS)

Il follow-up medio è stato di 24 mesi

Abbiamo utilizzato un solo tipo di protesi inversa con componente glenoidea diametro 38 e componente omerale medializzata

La disinserzione e la reinserzione del sottoscapolare è stata eseguita tramite la via chirurgica deltoideo-pettorale

Il grado di movimento (ROM), il Constant score ed il punteggio UCLA sono stati inclusi nella valutazione clinica pre e post-operatoria.

Radiologicamente c'era una grave artrosi che è stata studiata con radiografie, TAC e RMN secondo le classificazioni di Hamada e Walch

MATERIALI E METODI

Criteri di inclusione: omartrosi

Criteri di esclusione: revisione di protesi, chirurgia precedente, fratture, tumori

RISULTATI

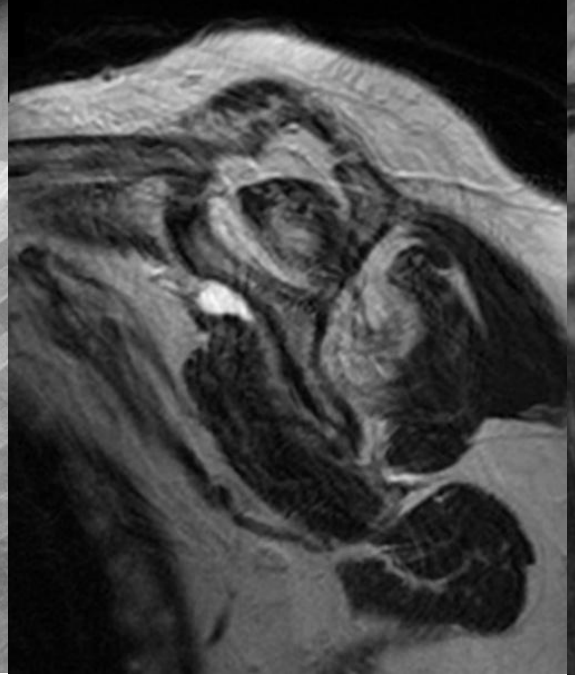
In media i risultati pre-operatori sono stati:
UCLA score: 5 Constant score: 16

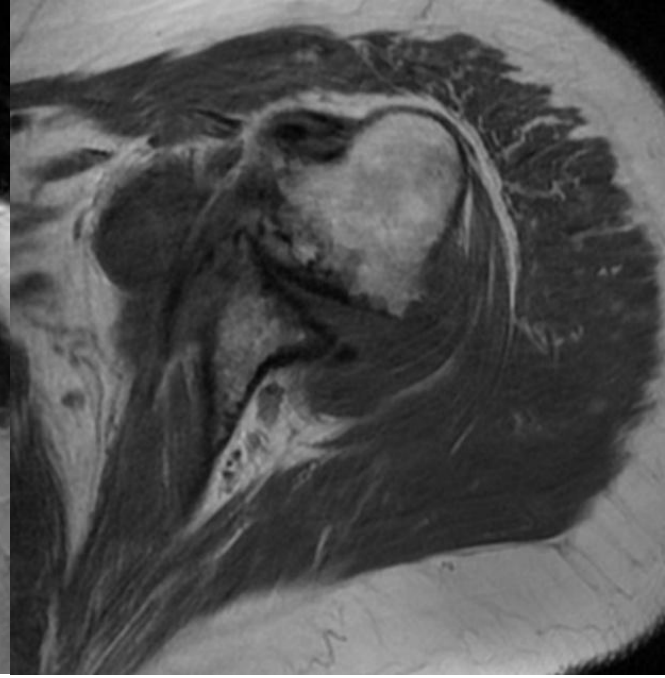
Flessione attiva: 63° ER1: 10° ER2: 50° IR D10

In media risultati post-operatori del gruppo A sono stati:
UCLA score: 30 Constant score: 72
Flessione attiva: 140° ER1: 20° ER2: 50° IR: L1

In media risultati post-operatori del gruppo B sono stati:
UCLA score: 33 Constant score: 74

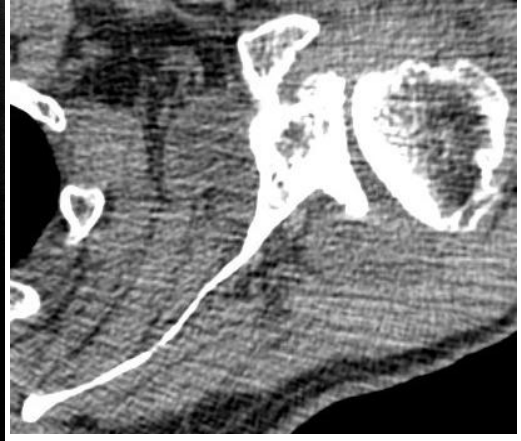
Flessione attiva: 140° ER1: 30° ER2: 80° IR: gluteo

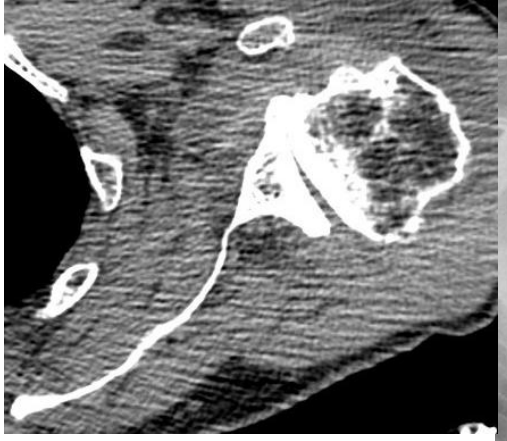




DONNA, 62 ANNI, RSA CON RIPARAZIONE SSC

HUMANITAS
SAN PIO X





DONNA, 78 ANNI, RSA SENZA RIPARAZIONE SSC

RISULTATI

Il tempo chirurgico è stato più lungo nel gruppo A di circa 10 minuti: 50 minuti nel gruppo B e 60 minuti nel gruppo A ($p<0.05$).

Si è osservato un caso di lussazione della protesi nel gruppo A e un caso di lussazione nel gruppo B.

Nessun caso di infezione nei due gruppi.

RISULTATI

Dopo l'intervento si è osservato, quindi, in entrambe i gruppi un significativo miglioramento sia del Constant score che del UCLA score

Si è osservato un miglioramento del movimento su tutte le traiettorie in entrambe i gruppi ($p<0.001$) con nessuna significativa differenza in entrambe i gruppi

CONCLUSIONI

La riparazione del sottoscapolare non è necessaria

al termine dell'intervento di protesi inversa di spalla

I risultati finali sono simili nei due gruppi sia per il dolore che per il movimento e la percentuale di complicanze

“Reverse total shoulder arthroplasty”

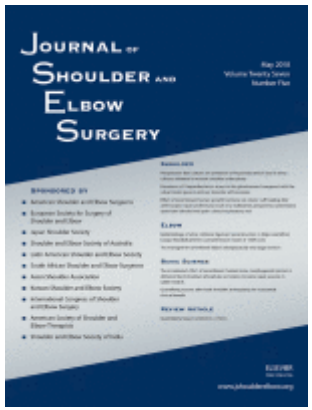
Filippo Familiari, Jorge Rojas, Mahmut Nedim Doral, Gazi Huri, Edward G. McFarland

Efort Open Reviews | volume 3 | p58-69 | FEBRUARY 2018

“**Dislocation after RTSA** is a major concern. The incidence of post-operative instability has been reported to be in the range **of 2% to 31%.**

Patient risk factors for dislocation include body mass index > 30, male sex, previous surgery and subscapularis deficiency.

“Surgical factors contributing to instability include inadequate soft-tissue and deltoid tensioning, malpositioned implants, mechanical impingement, insufficiency of the subscapularis”



Sonographic assessment of the subscapularis after reverse shoulder arthroplasty: impact of tendon integrity on shoulder function

Nicolas J. Dedy, Conor J. Gouk, Fraser J. Taylor, Michael Thomas, S.L. Ezekiel Tan

Article in Press, 2018

"**Internal rotation** scores were significantly higher in the intact and mildly attenuated tendon group than in the absent tendon group".

"Subscapularis integrity did not appear to have a measurable effect on patient outcome as measured by standard scores but was important for internal rotation ability after RSA".

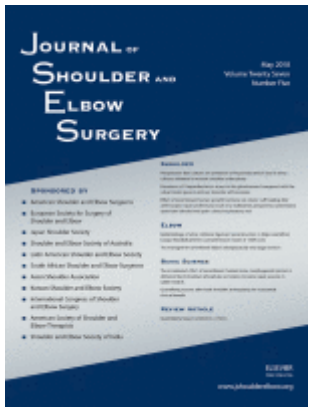
GRAZIE

Clinical Outcomes After Reverse Shoulder Arthroplasty With and Without Subscapularis Repair: The Importance of Considering Glenosphere Lateralization

Werner, Brian, C., MD; Wong, Alexandra, C., BS; Mahony, Gregory, T., BA; Craig, Edward, V., MD, MPH; Dines, David, M., MD; Warren, Russell, F., MD; Gulotta, Lawrence, V., MD

March 1, 2018 – Volume 26 – Issue 5 – p e114-e119

"The combination of subscapularis repair and glenosphere implant lateralization in RSA translates to significantly less clinical improvement".



Glenosphere size in reverse shoulder arthroplasty: is larger better for external rotation and abduction strength?

Andreas M. Müller, Marian Born, Christian Jung, Matthias Flury,
Christoph Kolling, Hans-Kaspar Schwyzer, Laurent Audigé

J Shoulder Elbow Surg (2018) 27, 44–52

The use of a 44-mm glenosphere over its smaller 36-mm counterpart in the setting of a 155° inclination of the humeral component may lead to a clinically moderate but significant increase of external rotation and abduction strength at midterm follow-up.

However, there is no indication that observations on radiographs and overall shoulder function measured clinically and subjectively differ between the 2 groups