Robert Wilk, Damian Kusz

Schemat zaopatrywania złamań bliższego końca kości ramiennej u osób starszych

Treatment algorithm for proximal humeral fractures in the elderly

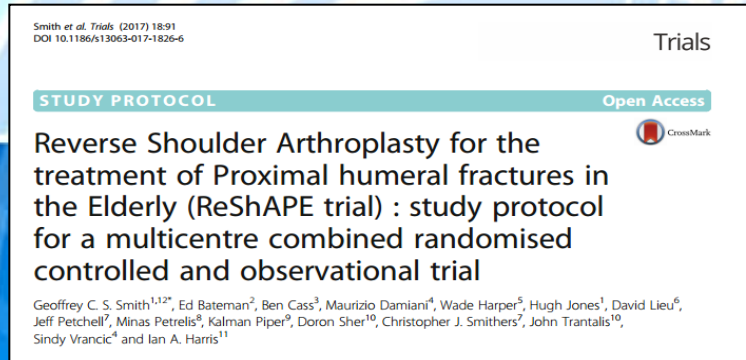
Katedra i Klinika Ortopedii i Traumatologii Narządu Ruchu SUM

Department of Orthopaedics and Traumatology Medical University of Silesia

Incidence

- Humeral neck fractures account for 5% of fractures of the appendicular skeleton
- Third commonest osteoporotic fracture
- Incidence of 6.6 per 1000 person/years

Katowice
299 012 inhabitants
Upper Silesian Industrial Region
About 3 mln inhabitants


Smith *et al. Trials* (2017) 18:91
DOI 10.1186/s13063-017-1826-6

Trials

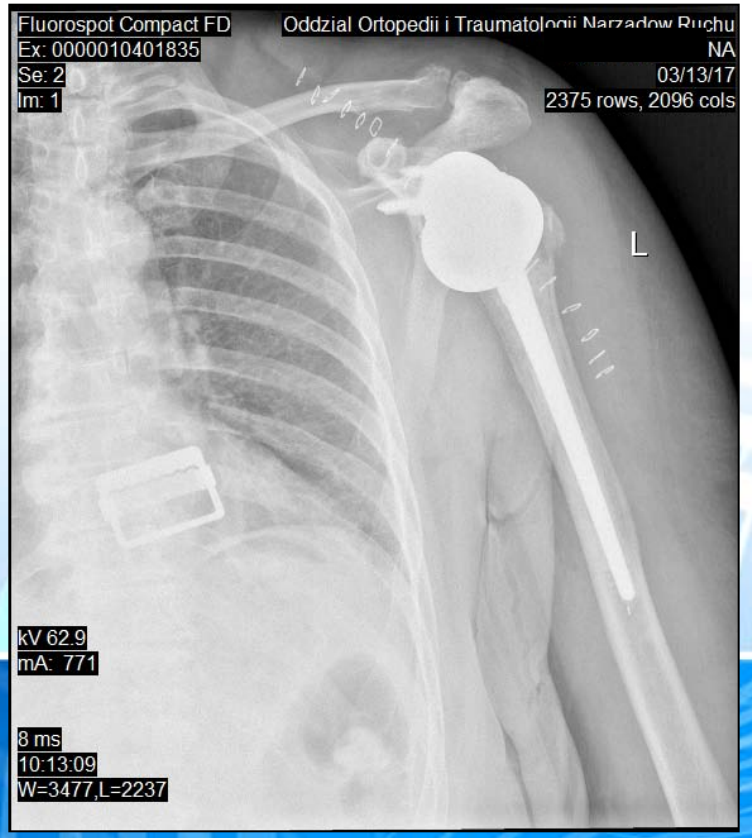
STUDY PROTOCOL Open Access

Reverse Shoulder Arthroplasty for the treatment of Proximal humeral fractures in the Elderly (ReShAPE trial) : study protocol for a multicentre combined randomised controlled and observational trial

Geoffrey C. S. Smith[1,12*], Ed Bateman[2], Ben Cass[3], Maurizio Damiani[4], Wade Harper[5], Hugh Jones[1], David Lieu[6], Jeff Petchell[7], Minas Petrelis[8], Kalman Piper[9], Doron Sher[10], Christopher J. Smithers[7], John Trantalis[10], Sindy Vrancic[4] and Ian A. Harris[11]

Possibilities

- Conservative treatment
- Surgery
  - K- wires
  - Locking plate
  - Nail
  - Prosthesis
    - Hemiarthroplasty
    - TSA
    - RTSA



worldwide tendency

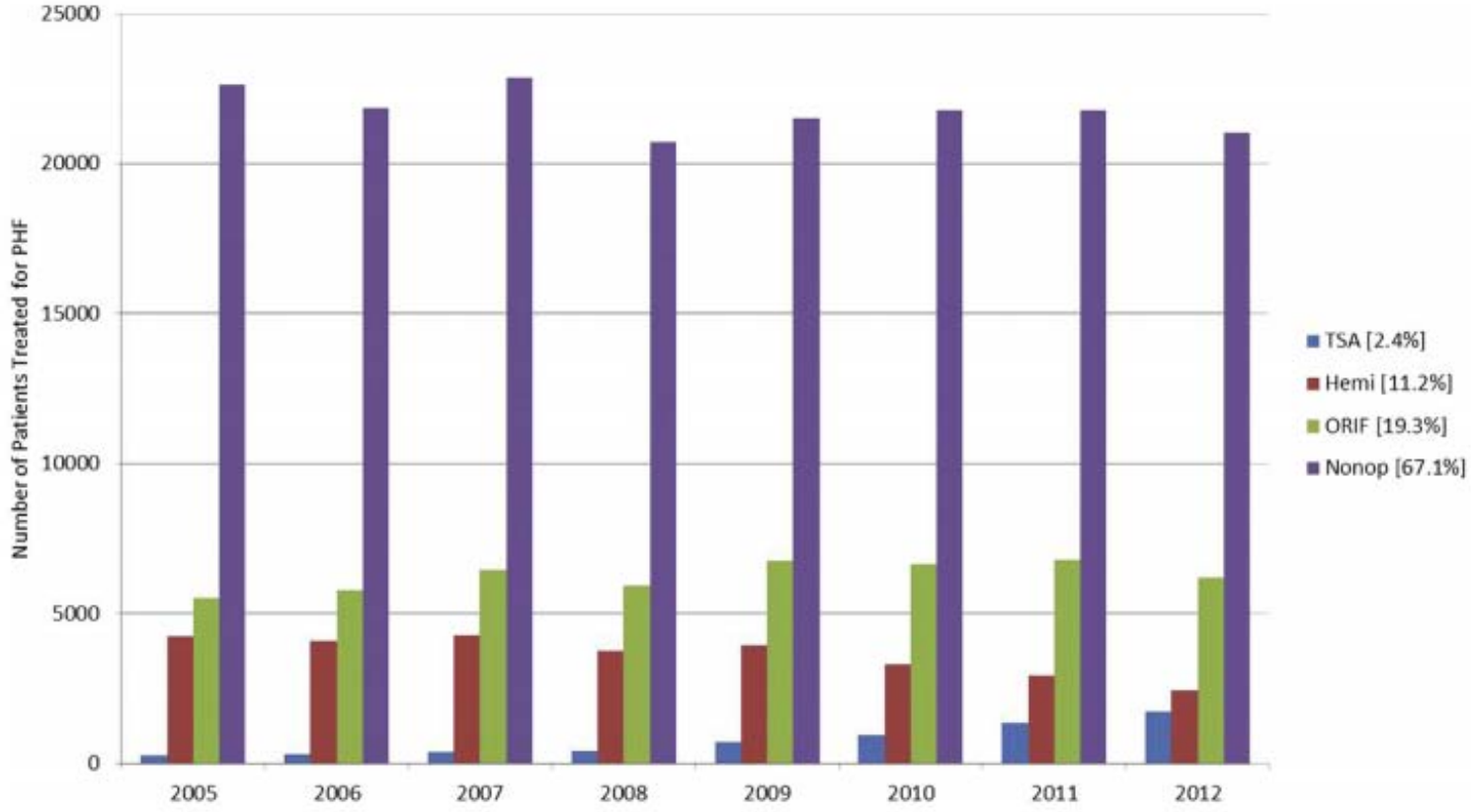


Figure 1 Treatment type for proximal humerus fracture by year.

J Shoulder Elbow Surg (2016) 25, 256-261
ELSEVIER
Journal of Shoulder and Elbow Surgery

Proximal humerus fragility fractures: recent trends in nonoperative and operative treatment in the Medicare population

Richard J. Han, MD[a], David C. Sing, BS[b], Brian T. Feeley, MD[a], C. Benjamin Ma, MD[a], Alan L. Zhang, MD[a,*]

worldwide tendency

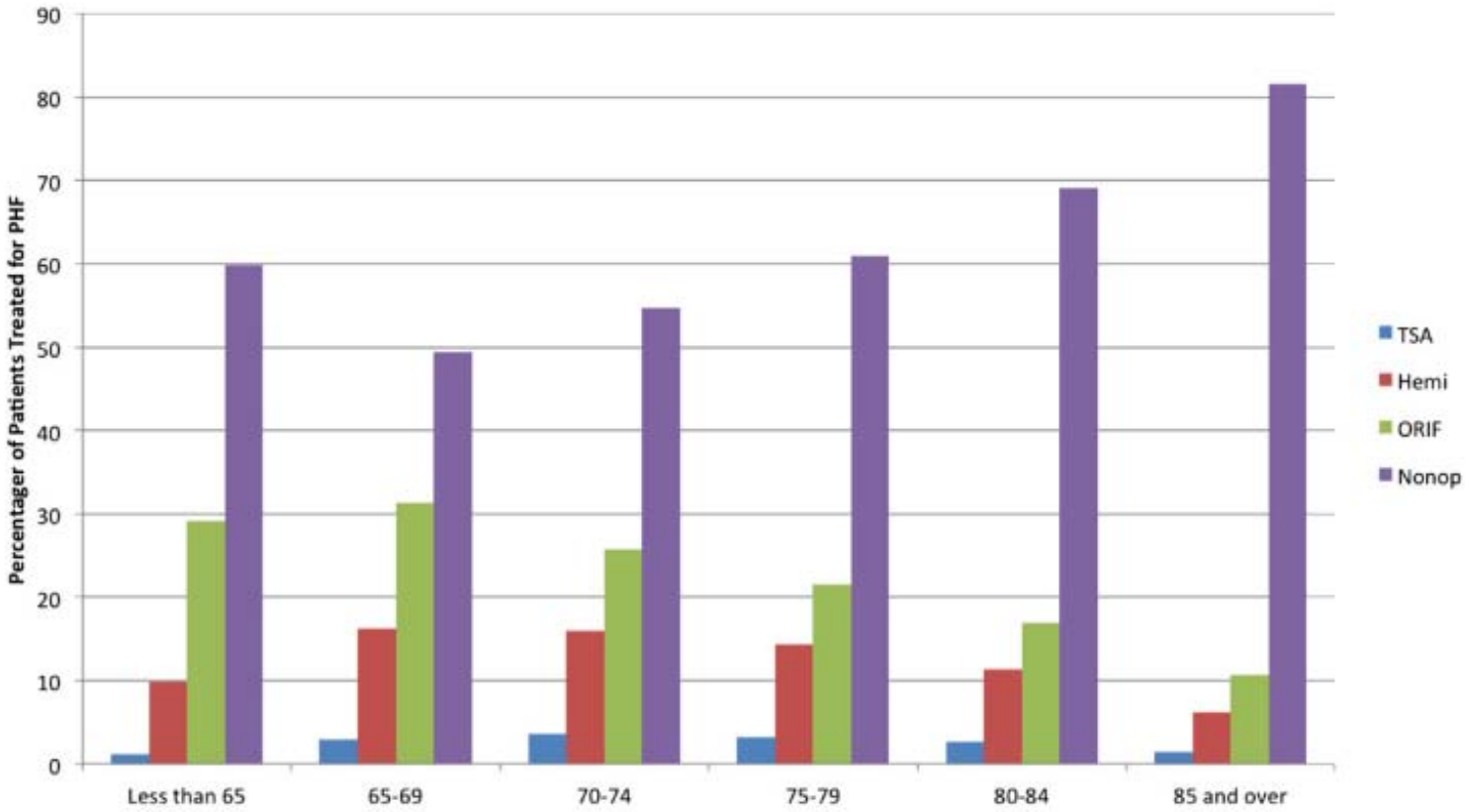


Figure 2 Treatment type for proximal humerus fracture by age.

J Shoulder Elbow Surg (2016) 25, 256-261
ELSEVIER
Journal of Shoulder and Elbow Surgery

Proximal humerus fragility fractures: recent trends in nonoperative and operative treatment in the Medicare population

Richard J. Han, MD[a], David C. Sing, BS[b], Brian T. Feeley, MD[a], C. Benjamin Ma, MD[a], Alan L. Zhang, MD[b,*]

Conservative treatment

Up to 85% of proximal humeral fractures are minimally displaced and are usually treated nonoperatively with most having a good outcome <u>regardless of comminution !!!</u>

Court-Brown CM, Garg A, McQueen MM. The epidemiology of proximal humeral fractures. Acta Orthop Scand. 2001;72(4):365–71.
Gaebler C, McQueen MM, Court-Brown CM. Minimally displaced proximal humeral fractures: epidemiology and outcome in 507 cases. Acta Orthop Scand. 2003;74(5):580–5.

Conservative treatment

In general, excellent results have been achieved with short-term immobilization **(< 2 weeks)** in a sling and early physical therapy.

Surgery ??

Conclusion This study shows that it is safe and justifiable to consider surgical treatment of a severely dislocated proximal humerus fracture in selected patients aged 75 and older.

Sixty-four patients were treated surgically
There were no postoperative deaths within 3 months

J Orthopaed Traumatol (2014) 15:111–115
DOI 10.1007/s10195-013-0273-8

ORIGINAL ARTICLE

Proximal fractures of the humerus in patients older than 75 years of age: should we consider operative treatment?

Marjolein de Kruijf · J. P. A. M. Vroemen · K. de Leur · E. A. M. van der Voort · D. I. Vos · L. Van der Laan

choice

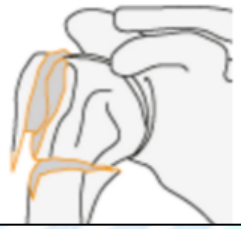
One patient = one surgery max. !!!

Angular stable plate

Objective: The objective of the study was to evaluate functional outcome, patient self-assessment, and radiographic outcome at 1 year in displaced three- and four-part proximal humeral fractures (OTA group 11-B2 and 11-C2).

Design: Randomized controlled trial.

11-B2
without metaphyseal impaction



11-C2
impacted with marked displacement

Results: At 12 months, mean Constant scores favored conservative treatment by 2.4 points (nonsignificant; $P = 0.62$). There was no significant difference in mean patient self-assessment. However, radiographic outcomes were significantly better for surgically treated patients.

Conclusion: There is no evidence of a difference in functional outcome at 1-year follow-up between surgical treatment and conservative treatment of displaced proximal humeral fractures in elderly patients.

ORIGINAL ARTICLE

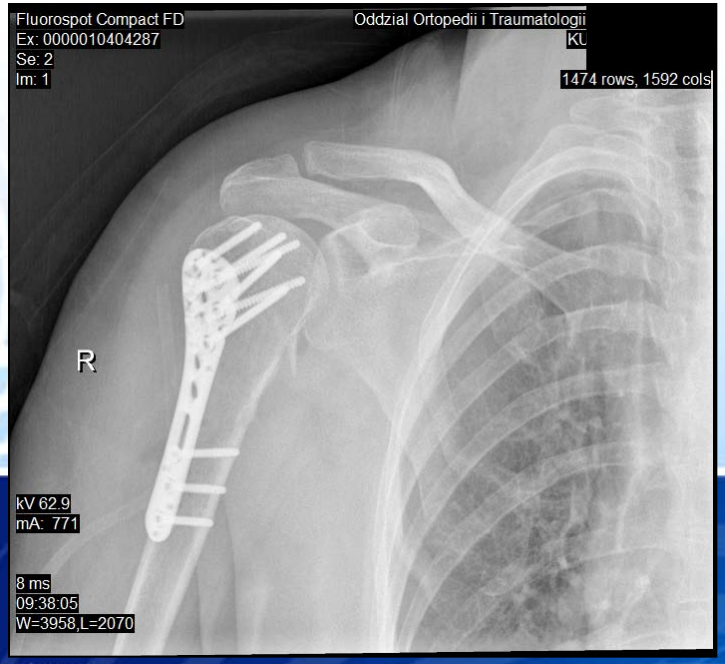
(*J Orthop Trauma* 2012;26:98–106)

Surgical Treatment With an Angular Stable Plate for Complex Displaced Proximal Humeral Fractures in Elderly Patients: A Randomized Controlled Trial

Tore Fjalestad, MD, Margrethe Ø. Hole, PT,† Inger Anette Hynås Hovden, MD,‡ Judith Blücher, MD,§ and Knut Strømsøe, MD, PhD**

Angular stable plate

Conclusion: The results of our study indicate an advantage in functional outcome and HRQoL in favor of the locking plate compared to nonoperative treatment in elderly patients with a displaced 3-part fracture of the proximal humerus, but at the cost of additional surgery in 30% of the patients.
Level of evidence: Level I, Randomized Controlled Trial, Treatment Study.



J Shoulder Elbow Surg (2011) 20, 747-755

ELSEVIER

Journal of Shoulder and Elbow Surgery

www.elsevier.com/locate/ymse

SHOULDER

Internal fixation versus nonoperative treatment of displaced 3-part proximal humeral fractures in elderly patients: a randomized controlled trial

Per Olerud, MD[a,*], Leif Ahrengart, MD, PhD[a], Sari Ponzer, MD, PhD[a], Jenny Saving, MD[a], Jan Tidermark, MD, PhD[a,b]

Angular stable plate

- number of complications, with rates of up to 36%, are reported.

- the chances to surgically restore shoulder function after failed ORIF were limited in collective.


J Shoulder Elbow Surg (2013) 22, 542-549
ELSEVIER
Journal of Shoulder and Elbow Surgery
www.elsevier.com/locate/ymse

Locking plate fixation of fractures of the proximal humerus: analysis of complications, revision strategies and outcome

Bernhard Jost, MD*, Christian Spross, MD, Holger Grehn, MD, Christian Gerber, MD, FRCSEd (Hon)

Angular stable plate

Neer 3- and 4-part proximal humeral fractures in older patients with initial varus angulation of the humeral head had a significantly worse clinical outcome and higher complication rate than similar fracture patterns with initial valgus angulation

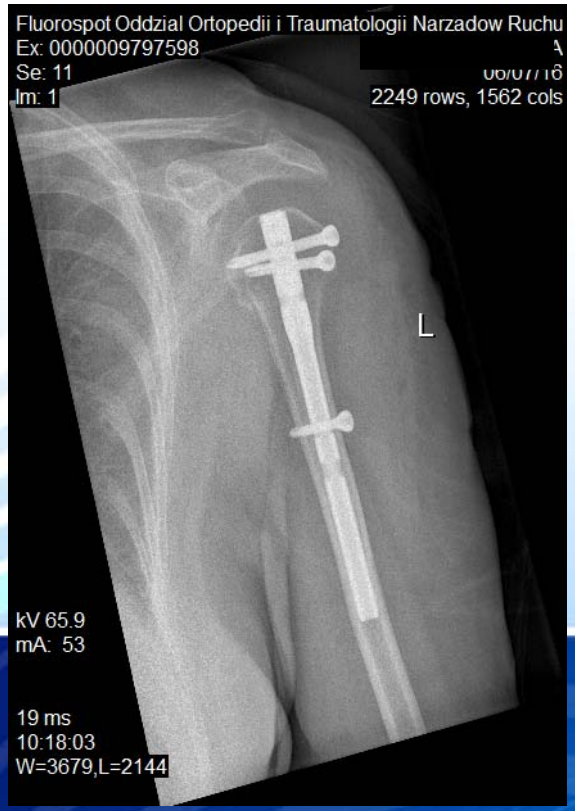
ORIGINAL ARTICLE

Locked Plating of 3- and 4-Part Proximal Humerus Fractures in Older Patients: The Effect of Initial Fracture Pattern on Outcome

Brian D. Solberg, MD, Charles N. Moon, MD,† Dennis P. Franco, MD,† and Guy D. Paiement, MD†*

Intramedullary nail

Conclusions: Patients who were managed with locked angular-stable intramedullary nailing of two-part surgical neck proximal humeral fractures via an articular entry point had reliable fracture-healing, favorable clinical outcomes, and little residual shoulder pain.



Angular-Stable Locked Intramedullary Nailing of Two-Part Surgical Neck Fractures of the Proximal Part of the Humerus

A Multicenter Retrospective Observational Study

Armodios M. Hatzidakis, MD, Michael J. Shevlin, MD, Duane L. Fenton, PA-C, Douglas Curran-Everett, PhD, Robert J. Nowinski, DO, and Edward V. Fehringer, MD

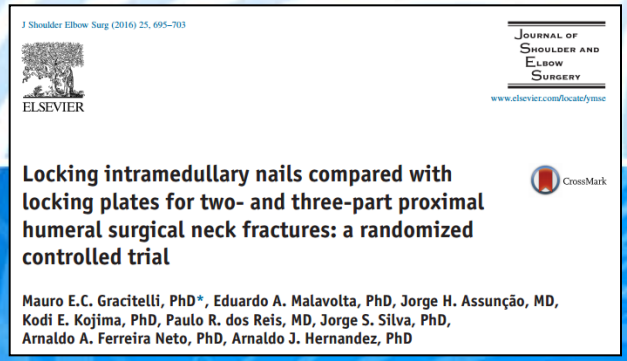
Plate vs. Nail

Results: There was no significant mean treatment group difference in the Constant-Murley score at 12 months (70.3 points for the nail group vs. 71.5 points for the plate group; $P = .750$) or at individual follow-up assessments. There were no differences in the 3-, 6- and 12-month Disabilities of the Arm, Shoulder and Hand scores, visual analog scale scores, and range of motion, except for the medial rotation at 6 months. The neck-shaft angle was equivalent between the groups at 12 months. There were significant differences over 12 months in total complication rates ($P = .002$) and reoperation rates ($P = .041$). There were no significant differences for the rotator cuff tear rate ($P = .672$).

Conclusion: Fixation of PHFs with locking plates or locking intramedullary nails produces similar clinical and radiologic results. Nevertheless, the complication and reoperation rates were higher in the nail group.

Level of evidence: Level I; Randomized controlled trial; Treatment study

More patients exhibited complications
in the nail group (34%)
than in the plate group (21%)


J Shoulder Elbow Surg (2016) 25, 695–703

ELSEVIER

Journal of Shoulder and Elbow Surgery

www.elsevier.com/locate/ymse

Locking intramedullary nails compared with locking plates for two- and three-part proximal humeral surgical neck fractures: a randomized controlled trial

Mauro E.C. Gracitelli, PhD*, Eduardo A. Malavolta, PhD, Jorge H. Assunção, MD, Kodi E. Kojima, PhD, Paulo R. dos Reis, MD, Jorge S. Silva, PhD, Arnaldo A. Ferreira Neto, PhD, Arnaldo J. Hernandez, PhD

	PHN	Plate
	58*	153*
	Number	Number
Complication risk (95% CI)[‖]	21% (11.2–33.4)	31% (24.1–39.4)

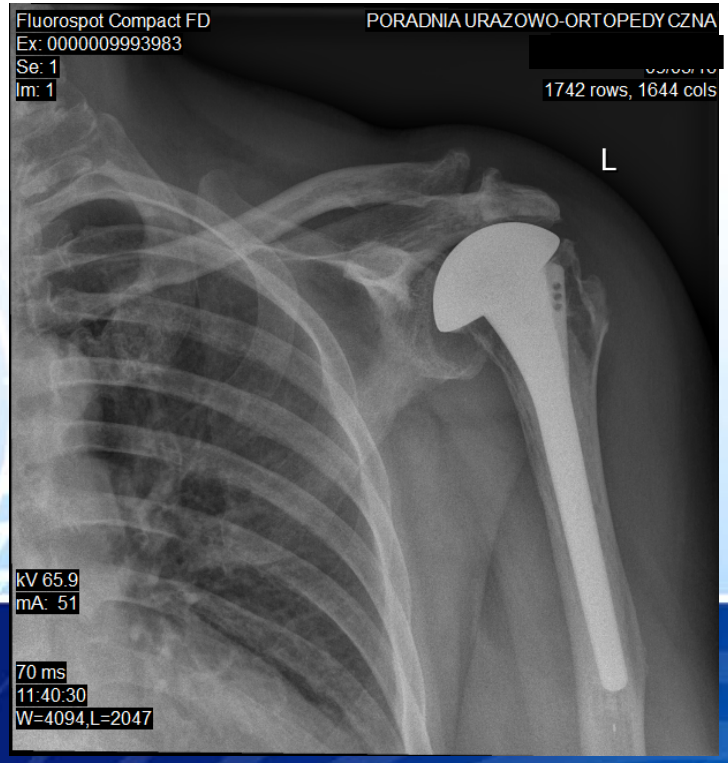
Clin Orthop Relat Res (2012) 470:602–609
DOI 10.1007/s11999-011-2056-y
Clinical Orthopaedics and Related Research®
A Publication of The Association of Bone and Joint Surgeons®

CLINICAL RESEARCH

Similar Outcomes for Nail versus Plate Fixation of Three-part Proximal Humeral Fractures

Gerhard Konrad MD, Laurent Audigé PhD,
Simon Lambert MD, Ralph Hertel MD,
Norbert P. Südkamp MD

Conclusions The clinical outcome of hemiarthroplasty was influenced by factors reflecting function and conditions of the rotator cuff. Anatomical reconstruction and bone union of the tuberosities need to ensure clinical success in hemiarthroplasty.



Conclusion

The factors which reflect the qualitative and functional status of the rotator cuff influence postoperative outcomes. Anatomical reconstruction of the tuberosities and functional reconstruction of the rotator cuff are important for improving postoperative outcomes. The indications for RTSA should be considered in patients with poor bone quality and in whom repair and healing of the greater and lesser tuberosities cannot be expected.

International Orthopaedics (SICOT) (2015) 39:1115–1119
DOI 10.1007/s00264-015-2758-y

ORIGINAL PAPER

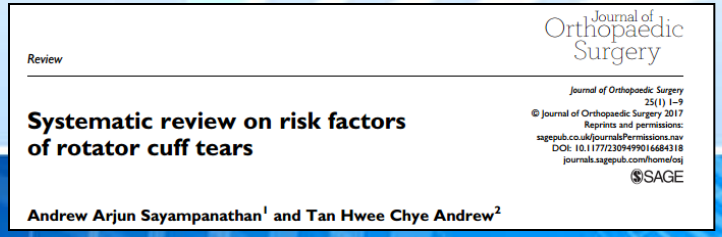
The outcome of hemiarthroplasty for proximal humeral fractures is dependent on the status of the rotator cuff

Hiroshi Hashiguchi[1] · Satoshi Iwashita[1] · Atsushi Ohkubo[1] · Shinro Takai[2]

RCTs increased markedly after 50 years of age and that these findings were present in more than 50% of dominant shoulders in the seventh decade of life and in 80% of participants over 80 years of age

Milgrom C, Schaffler M, Gilbert S, et al.
Rotator-cuff changes in asymptomatic adults.
J Bone and Joint Surgery, Britain 1995; 77: 296–296

a 50% likelihood of a bilateral RCT at 66.0 years of age ($p < 0.01$)


Review

Journal of Orthopaedic Surgery

Systematic review on risk factors of rotator cuff tears

Journal of Orthopaedic Surgery
25(1) 1–9

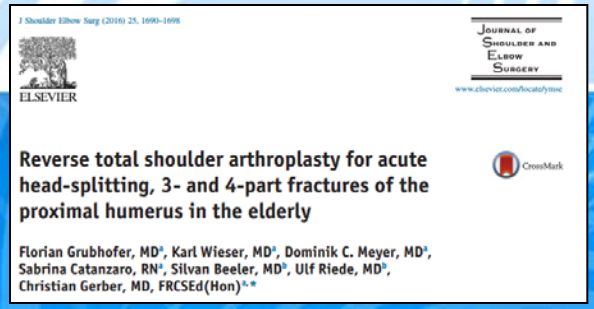
DOI: 10.1177/2309499016684118
journals.sagepub.com/home/osj
SAGE

Andrew Arjun Sayampanathan[1] and Tan Hwee Chye Andrew[2]

hemiarthroplasty

Nonunion, malunion, and resorption or migration of the greater tuberosity are the most common complications and ultimately lead to inconsistent and mainly disappointing functional results.

Therefore, a current trend from hemiarthroplasty toward RTSA is reported for complex humeral fractures in the elderly.



reverse total shoulder arthroplasty

Conclusion

RTSA for acute head-splitting, 3-part, and 4-part fractures of the proximal humerus in elderly patients with osteoporotic bone yielded very satisfactory subjective and objective outcomes with acceptable complication and revision rates in our study population. In case of secondary displacement of the greater tuberosity after RTSA, revision surgery may need to be considered because of the otherwise definitely impaired functional outcome.

J Shoulder Elbow Surg (2016) 25, 1690–1698
ELSEVIER
Journal of Shoulder and Elbow Surgery
www.elsevier.com/locate/ymse

Reverse total shoulder arthroplasty for acute head-splitting, 3- and 4-part fractures of the proximal humerus in the elderly

Florian Grubhofer, MD[a], Karl Wieser, MD[a], Dominik C. Meyer, MD[a], Sabrina Catanzaro, RN[a], Silvan Beeler, MD[b], Ulf Riede, MD[b], Christian Gerber, MD, FRCSEd(Hon)[a,*]

HA vs. RSA

Results: The analysis included 1 Level I study, 1 Level II study, 3 Level III studies, and 2 Level IV studies. Reverse shoulder arthroplasty was more favorable than hemiarthroplasty in forward elevation ($P < .001$), abduction ($P < .001$), tuberosity healing ($P = .002$), Constant score ($P < .001$), American Shoulder and Elbow Surgeons score ($P < .001$), and Disabilities of the Arm, Shoulder and Hand score ($P = .001$). Only external rotation ($P = .85$) was not in favor of reverse shoulder arthroplasty.

Conclusions: The available literature suggests that reverse shoulder arthroplasty performed to address complex proximal humeral fractures might result in more favorable clinical outcomes than hemiarthroplasty performed for the same indication.

Level of evidence: Level IV, Meta-Analysis.


J Shoulder Elbow Surg (2016) 25, 330-340

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Journal of Shoulder and Elbow Surgery

www.elsevier.com/locate/ymse

REVIEW ARTICLE

Hemiarthroplasty versus reverse shoulder arthroplasty for treatment of proximal humeral fractures: a meta-analysis

Dave R. Shukla, MD*, Steven McAnany, MD, Jun Kim, MD, Sam Overley, MD, Bradford O. Parsons, MD

RSA vs. HA vs. ORIF

Conclusion

In this small case-control study with short-term follow-up, RTSA appears to provide range of motion superior to that of HA and ORIF. RTSA predictably restored active elevation >90° in all patients within 4 months, without the need of formal outpatient therapy. RTSA realized significant cost savings to Medicare compared with ORIF and HA.

J Shoulder Elbow Surg (2014) 23, 197-204
ELSEVIER
Journal of Shoulder and Elbow Surgery
www.elsevier.com/locate/ymse

Reverse total shoulder arthroplasty for acute proximal humeral fracture: comparison to open reduction–internal fixation and hemiarthroplasty

Peter N. Chalmers, MD[a,*], William Slikker III, MD[a], Nathan A. Mall, MD[b], Anil K. Gupta, MD[a], Zain Rahman, MA[a], Daniel Enriquez, MA[a], Gregory P. Nicholson, MD[a]

tuberosity

Conclusion

After reverse shoulder arthroplasty for 4-part proximal humerus fracture in elderly patients, tuberosity healing in an anatomic position was achieved in only 37% of patients. However, patients who underwent reverse shoulder arthroplasty for comminuted proximal humerus fracture obtained satisfactory functional outcomes regardless of tuberosity healing. There were no significant differences in functional outcomes or ROM between the 2 groups, with the exception of external rotation, which was better in the healed tuberosity group. Therefore, tuberosity healing did not seem to be a prerequisite for satisfactory outcomes after conventional reverse shoulder arthroplasty for 4-part proximal humerus fracture.

J Shoulder Elbow Surg (2016) ■■, ■■–■■
ELSEVIER
JOURNAL OF SHOULDER AND ELBOW SURGERY
www.elsevier.com/locate/ymse

ORIGINAL ARTICLE

Reverse shoulder arthroplasty for four-part proximal humerus fracture in elderly patients: can a healed tuberosity improve the functional outcomes?

Yong-Min Chun, MD, PhD[a], Doo-Sup Kim, MD, PhD[b], Doo-Hyung Lee, MD, PhD[c], Sang-Jin Shin, MD, PhD[d,*]

J Shoulder Elbow Surg (2016) ■■, ■■–■■

ELSEVIER

JOURNAL OF SHOULDER AND ELBOW SURGERY

www.elsevier.com/locate/ymse

ORIGINAL ARTICLE

Nonoperative management versus reverse shoulder arthroplasty for treatment of 3- and 4-part proximal humeral fractures in older adults

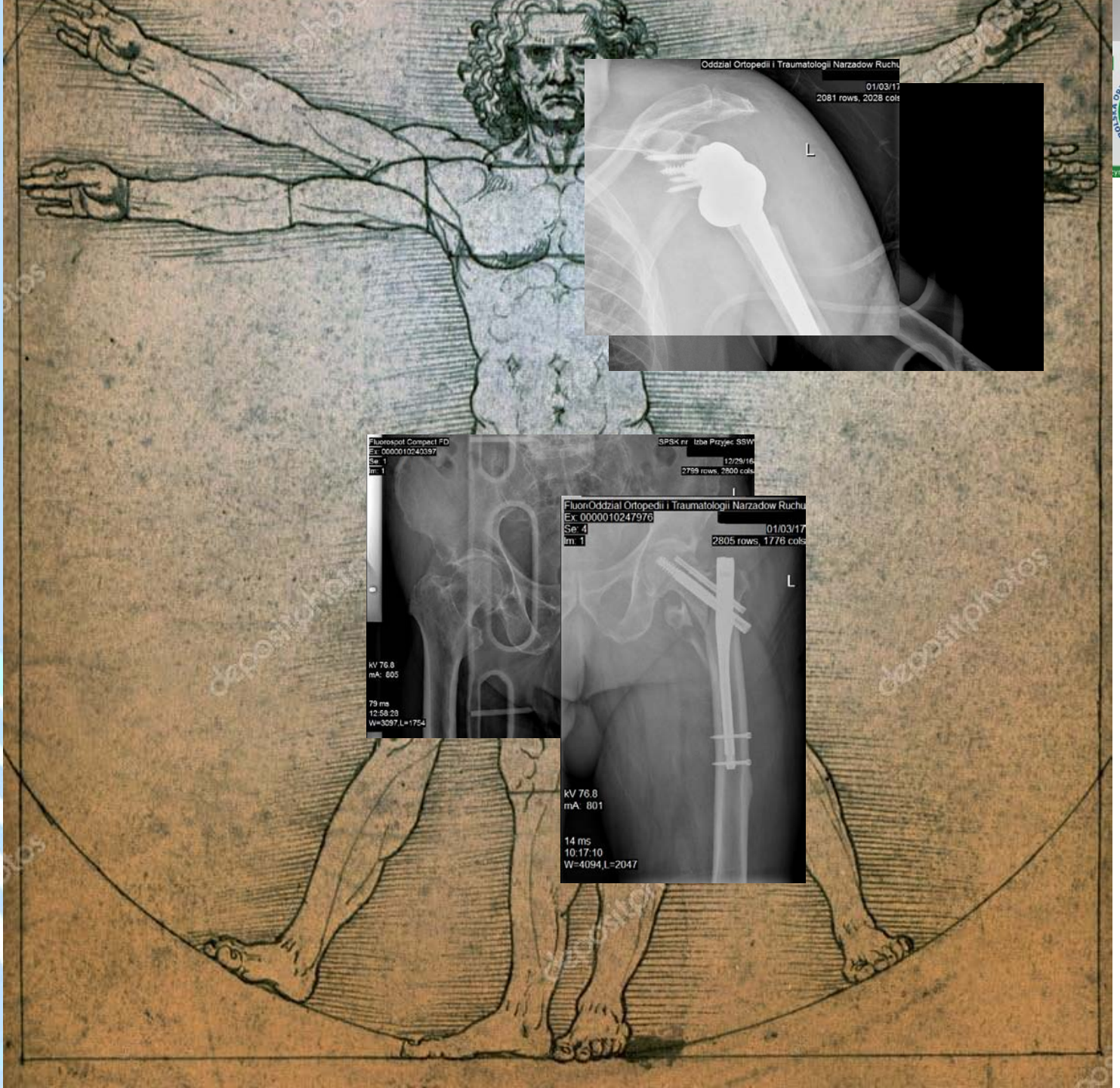
Troy A. Roberson, MD[a], Charles M. Granade, PharmD[b], Quinn Hunt, BS[b], James T. Griscom, BS[b], Kyle J. Adams, BS[c], Amit M. Momaya, MD[a], Adam Kwapisz, MD[c], Michael J. Kissenberth, MD[a], Stefan J. Tolan, MD[a], Richard J. Hawkins, MD[a], John M. Tokish, MD[a,*]

Conclusions

This is the first study to compare nonoperative management versus RSA in the treatment of displaced 3- and 4-part fractures of the proximal humerus in the older adult. This study suggests that there are no clinical benefits in early-term to midterm follow-up of RSA over nonoperative treatment. In addition, no differences were noted for those patients who received RSA in a delayed fashion, suggesting a trial of nonoperative management will not compromise the outcomes of a delayed RSA.

Take home massage

- Your treatement should depend on patient condition and expectations
- Non or slight displaced - nonoperative with with short-term immobilization **(< 2 weeks)**
- 2 parts fracture – ORIF/CRIF
- 3 or 4 parts fracture – rather RSA, even delayed
- Hemiarthoplasty – **non recomeded in elderly**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Robert Wilk, Damian Kusz

Schemat zaopatrywania złamań bliższego końca kości ramiennej u osób starszych

Treatment algorithm for proximal humeral fractures in the elderly

Thank you for the attention