Reverse Total Shoulder Arthroplasty Versus Nonoperative Treatment for Geriatric Proximal Humerus Fractures

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Introduction

- Proximal humerus fractures (PHF) are the third most common fractures in the geriatric population, with a recent escalation in incidence due to the increased lifespan of the general population.[1-3]
- Reverse total shoulder arthroplasty (RTSA) for PHF in elderly patients has been shown to be an effective treatment modality.
- RTSA has been associated with better functional outcomes and fewer complications than open reduction and internal fixation (ORIF) as well as hemiarthroplasty (HA).[1,2,4,5]
- Recent studies have questioned the superiority of RTSA over nonoperative treatment.[1,3]
- The purpose of this study was to compare outcomes after RTSA and nonoperative treatment of PHF.

Methods

- A retrospective case matched review of 71 PHFs who underwent either RTSA or nonoperative treatment between August 2016 and August 2019 was conducted.
- RSTA (N=45, 1 bilateral) were compared to patients who met operative criteria but did not undergo surgery due to age or other risk factors (N=26).
- Patients were matched based on age and Neer classification.
- Prior to RSA, 2 patients (4.5%) failed previous open reduction internal fixation, 8 (18.2%) failed nonoperative treatment, and 2 (4.5%) had RSA delayed due to medical contraindications to surgery.

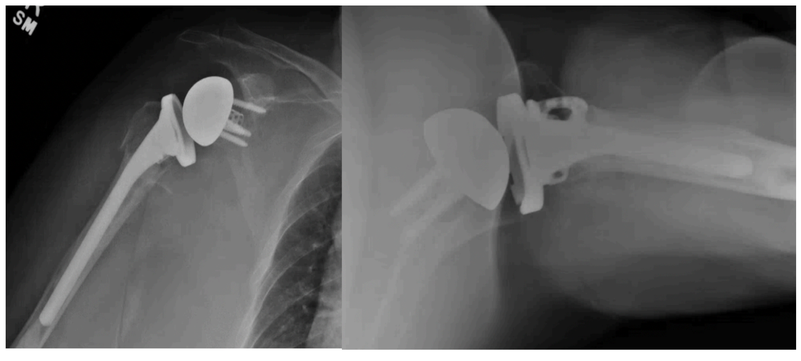


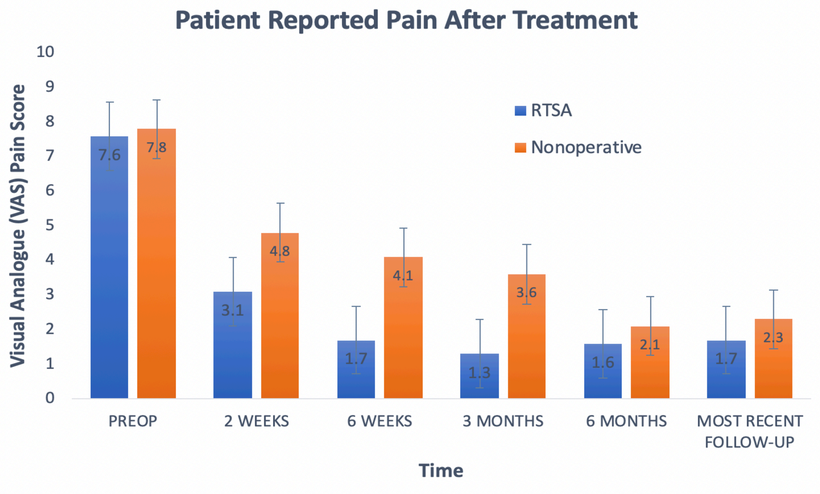
Figure 1. AP and axial radiographs after reverse total shoulder arthroplasty in a patient with a 3-part proximal humerus fracture.

Results

Table 1. Patient Demographic and Medical Data.

Variable	RTSA (N=45, 1 bilateral)	Nonoperative (N=26)
Mean Age	69.3 ± 9.2 years (range=47-89)	73.4±9.55years (range = 55-90)
Gender		
Male	4 (8.9%)	6 (23.1%)
Female	41 (91.1%)	20 (76.9%)
Mean BMI	29.9±6.5 kg/m^2	31.3±7.6 kg/m^2
Mean CCI	3.8±1.9 (range = 1-9)	
Neer Classification		
2-part	5 (10.9%)	4 (15.4%)
3-part	17 (37%)	18 (69.2%)
4-part	23 (50%)	4 (15.4%)
Unknown	1 (2.1%)	

- Mean VAS pain scores decreased from 7.6±2.7 (range=0-10) to 1.7±2.1 (range=0-7) after RTSA (p<0.0001).
- Mean VAS scores decreased from 7.8±2.4 (range=2-10) to 2.3±2.8 (range=0-8) (p<0.0001) in nonoperative patients.
- RTSA patients had significantly lower VAS scores in comparison to nonoperative patients at 6 weeks (1.7±2.6 vs 4.1±3.2, **p=0.01**) and 3 months (1.3±2.3 vs 3.6±3.2, **p=0.01**) postoperatively.
- There was no statistically significant difference in VAS scores at the time of most recent follow-up between the two cohorts (p=0.39).



- There was no difference in mean American Shoulder and Elbow Surgeons score after RTSA (69.4±18.7) compared to nonoperative patients (62±20.7) (p=0.34).

Results

- RTSA patients had better forward flexion than nonoperative patients (109.5±32.5° vs 92.3±29.7°, **p=0.05**) at the most recent follow-up.
- There was no difference in abduction (p=0.27) and external rotation (p=0.44) at the most recent follow up.

Table 2. Range of Motion.

	RTSA: Flexion	Nonop: Flexion	RTSA: Abduction	Nonop: Abduction	RTSA: External Rotation	Nonop: External Rotation
6 Weeks	63.9±32.2°	55.8±16.4°	52.9±23.6°	58±14.7°	3.9±12.8°	12.9±14.6°
3 months	90.3±32.1°	78.8±26.9°	70±19°	65.6±18.6°	7.7±14.1°	20.7±20.2°
6 Months	110.4±29.5°	104.6±29°	80.5±15°	72.2±16.9°	20±21.3°	21.4±17.3°
Most Recent Follow-Up	109.5±32.5°	92.3±29.7°	80.9±21.4°	75.5±14.7°	20.1±24.9°	24.7±15.8°

- 7 patients (15.6%) experienced complications after RTSA:
  - 1 hand paresthesia
  - 3 cases of heterotopic bone ossification
  - 2 aseptic hardware loosenings requiring revision
  - 1 incidence of severe pain and elevated inflammatory markers requiring open shoulder biopsy (negative cultures)

Conclusion

- Geriatric patients with PHF have significant improvement in pain and function after both RTSA and nonoperative treatment.
- Patients who undergo RTSA have a greater increase in overhead motion and experience a more rapid improvement in pain, with significantly lower pain scores in the early postoperative period.
- However, RTSA does come with a greater risk of complications.
- Prospective randomized studies need to be conducted to better evaluate the utility of RTSA in the geriatric population.

References

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