Open Reduction Internal Fixation and Reverse Shoulder Arthroplasty are Associated with Lower Risk of Mortality Following Proximal Humerus Fracture Compared to Nonoperative Management

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Disclosures

Albert Lin, MD, FAAOS (Pittsburgh, PA)

AAOS: Board or committee member

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Introduction

- Proximal humerus fractures (PHFs) are the third most common fracture among older adults.
- PHFs represent 5-6% of all fractures, but optimal management of PHFs remains debated.
- Significant research has examined the mortality rates and risk factors associated with mortality following hip and distal radius fractures, but a there is a paucity of literature investigating this data following PHFs.

Purpose

- **Purpose**: To evaluate long-term mortality following proximal humerus fractures treated nonoperatively, with open reduction internal fixation (ORIF), and with reverse shoulder arthroplasty (RSA).

- **Hypothesis**: We hypothesized that operative management with ORIF and RSA would be associated with lower long-term mortality compared to nonoperative treatment.

Methods

- Retrospective cohort study at a single institution between 2010-2023 of patients seen by the two senior author orthopaedic surgeons.
- Three cohorts based on treatment modality: **1) Nonoperative treatment, 2) Open reduction internal fixation (ORIF), 3) Reverse shoulder arthroplasty (RSA)**
- 90-day, 1-year, and 5-year mortality calculated
- Univariate Cox regression evaluated treatment impact on survival; Log-rank test compared survival distributions among treatment groups.

Results

- A total of **417 patients** (mean age 68.0 ± 16.1) presented with PHFs and were included:
  - **251 treated nonoperatively (60.2%)**
  - **112 treated with ORIF (26.9%)**
  - **54 treated with RSA (12.9%)**

- Overall mortality rate for entire cohort: **12.7%**
  - 90-day mortality rate: **1.68%**
  - 1-year mortality rate: **3.36%**
  - 5-year mortality rate: **10.55%**

Results

- ORIF and RSA showed **lower hazard of mortality** compared to nonoperative treatment (Table 1)

Table 1. Hazard Ratios Comparing Risk of Mortality Between ORIF, RSA and Nonoperative Treatment.

Variable	Hazard Ratio	95% CI	*P* value
ORIF (compared with nonoperative)	0.45	0.21-0.98	**0.045**
RSA (compared with nonoperative)	0.32	0.15-0.70	**0.004**

Results

- Kaplan-Meier survival estimates show patients treated with **ORIF and RSA have longer survival** compared to those treated nonoperatively (Figure 1).

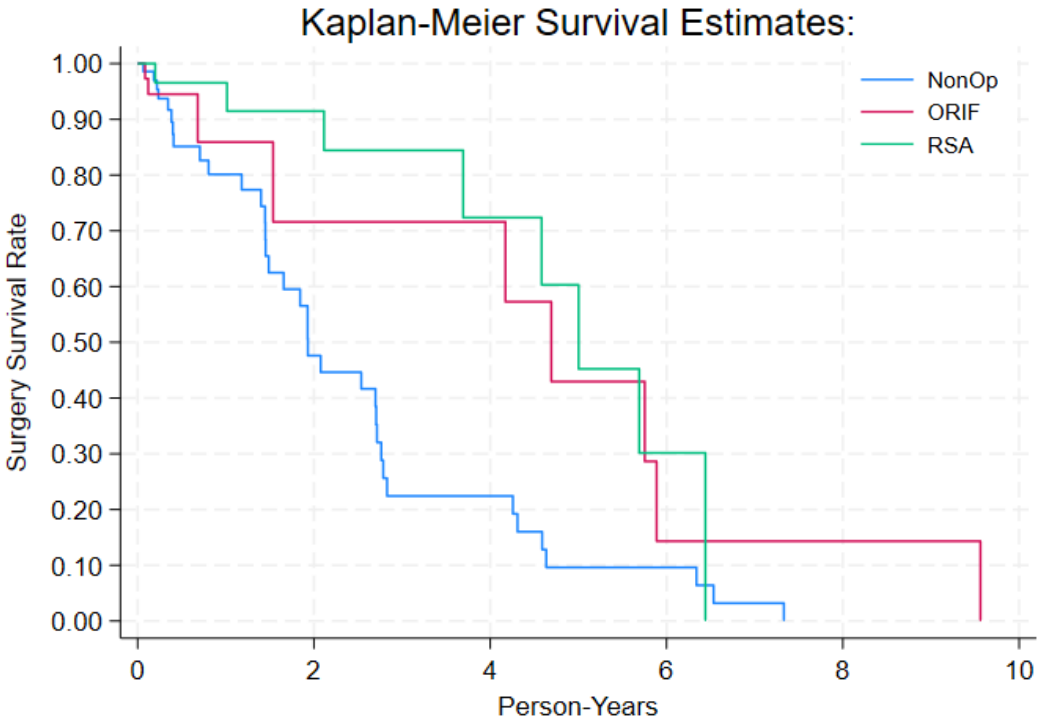

Figure 1. Kaplan-Meier survival curve for three treatment modalities.

Conclusion

- Operative treatment for PHFs with ORIF or RSA is associated with lower long-term mortality compared to nonoperative treatment.
    - Kaplan-Meier survival curve indicates better long-term survival for patients undergoing ORIF or RSA versus nonoperative treatment.

- Proximal humerus fractures carry a significant mortality risk, similar to or higher than other upper extremity fractures such as distal radius fractures.

- Further analyses are needed to investigate patient-specific factors that influence treatment decision-making for patients presenting with proximal humerus fractures.

References

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