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Femoral Neck Fractures in the Elderly: Repair or Replace?

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INTRODUCTION

Femoral neck fractures [FNF] are among the most common fractures in the elderly population and have a high mortality as well as significant morbidity.(1) There is an ongoing debate on whether osteosynthesis [OS] or arthroplasty [AP] is the best treatment. (1-4) Identifying risk factors for major revision surgery could help to better inform patients and facilitate the (shared) decision-making process. We therefore asked, (1) what is the survival rate of elderly patients with FNF undergoing osteosynthesis compared to arthroplasty, (2) what is the respective revision rate, and (3) what are risk factors for revision?

METHODS

We retrospectively reviewed all consecutive patients aged 70 or older undergoing arthroplasty or osteosynthesis for FNF in one of three hospitals of the same public hospital group consisting of two level 2 rural hospitals and one level 3 main hospital between January 2010 and May 2022. **1277** patients were included for analysis. Patient age for inclusion as elderly was set at 70 years based on internal hospital guideline as well as available data. Survival and revision rates were calculated according to Kaplan-Meier and Cox regression analysis was performed to identify risk factors.

	Risk factors	Hazard ratio (95% CI)	p-value	Cox
HA	OP-duration, per min	1.01 (1.003-1.02)	0.007	Multi-variate
HA	Body Mass Index	1.06 (1.008-1.12)	0.025	Monovariate
HA	Blood loss, per ml	1.001 (1.0002-1.002)	0.022	
OS	Diameter of femoral neck, per mm	0.6 (0.38-0.92)	0.02	

Table 1 Hazard ratios of risk factors for major revision surgery at maximum follow-up (95% confidence interval, OP: operation)

RESULTS

- Cumulative survival rate for maximum follow-up in patients treated with OS is 9.8% (95% confidence interval [CI] -1.6-21.3%) and patients treated with AP is 2.5% (95% CI 0.2-4.9%) for hemiarthroplasty [HA], and 44.41% (95% CI 30.9-58.0 %) for total hip arthroplasty [THA] respectively.
- Cumulative revision rate for major surgery at one year is in OS 10.9% (95% CI 3.3-18.6%) and in AP 2.1% (95% CI 1.6%-3.4%).
- Median age in OS is 82 years, in HA 85 years and in THA 78 years.
- The cumulative survival rate at maximum follow-up is shown in Figure 1, cumulative revision rate with endpoint major revision is shown in Figure 2.
- Several risk factors for major revision surgery were identified for HA and for OS (Table 1). No risk factors were identified for total hip arthroplasty.

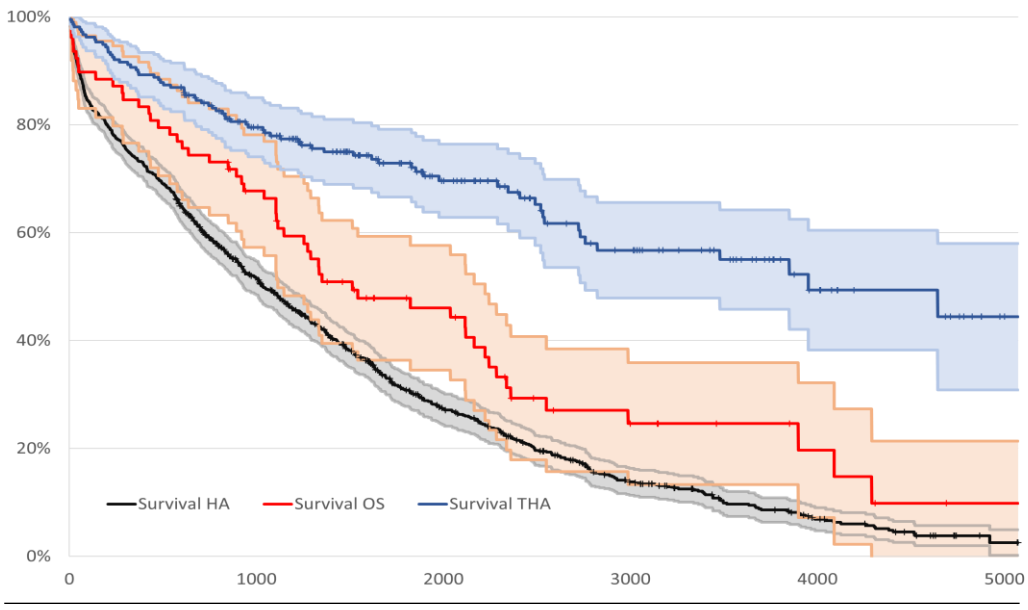

Figure 1: Cumulative survival in OS, HA and THA at max. FUP. There is a significant difference between THA and OS after 1255 days, and between HA and THA after 14 days.

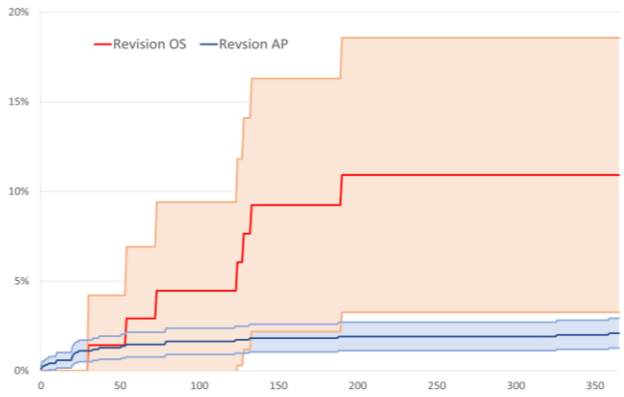

Figure 2: Revision rate according to Kaplan-Meier with endpoint major revision surgery (defined as OS conversion to AP, HA conversion to THA, revision OS/AP or revision for infection) at 1 year. There is a significant difference between AP and OS after 190 days.

CONCLUSION

Survival rate in the elderly population after 3.4 years is significantly higher in THA compared to osteosynthesis. In contrast to this, revision rate at one year is significantly higher in OS compared to AP. From a patient perspective, this suggests that surgical treatment with THA may be associated with longer survival and less risk of revision surgery compared to OS. In OS, increased diameter of the femoral neck may correlate with better outcome regarding major revision surgery. For HA, prolonged OP duration is an independent risk factor for failure and should therefore be minimized.

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