Patients with End-Stage Renal Disease are at Increased Risk of Postoperative Complications Following Lower Extremity Fracture Surgery

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Introduction

End-stage renal disease (ESRD) leads to multiple systemic effects and patients suffer from multiple comorbidities including fractures. While previous studies have examined complications following hip fracture surgery in ESRD patients, there are no studies evaluating other lower extremity injuries. This study aimed to identify postoperative complication risk in patients with ESRD who had lower extremity fractures.

Methods

We performed a retrospective matched cohort study. Using our database from 2000 to 2015 at two level-one trauma centres, we collected data on patients over age 40, who had lower extremity fractures and surgical fixation. Diagnosis of ESRD was made before the injury. Each ESRD patient was matched by two non-ESRD patients regarding age, gender, American Society of Anaesthesiologists (ASA) score, and AO/OTA fracture classification. Postoperative outcomes were non-union (as defined by the treating surgeon), mechanical failure (radiographic loss of reduction or implant failure requiring revision surgery), and infection (based upon clinical evaluation and requiring either admission for IV antibiotics or surgical treatment). The number of outcome events was compared between the ESRD and non-ESRD cohorts.

Results

A total of 195 patients (65 ESRD patients matched to 130 non-ESRD patients) were identified. Mean age was 69 years old (range 42 to 99 years old). Median follow-up was 31 months (range 12 to 141 months). Patients with ESRD were significantly more likely to have at least one postoperative complications (mechanical failure, non-union, and infection) compared to non-ESRD patients (9/65 vs. 5/130, $p=0.02$). Mechanical failure was significantly more common among ESRD patients compared to non-ESRD patients (8/65 vs. 2/130, $p<0.01$). While there was a slightly higher risk of non-union and infection in the ESRD patients this was not statistically significant.

Conclusion

ESRD was associated with higher rates of complications, especially mechanical failure, after lower extremity fracture surgeries.

Disclosures

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Patient Characteristics

	ESRD (N=65)	Non-ESRD (N=130)
Age - year (SD)	69 +/- 12	69 +/- 12
Female sex - no. (%)	40 (62)	80 (62)
ASA score - no. (%)		
2 - mild systemic disease	4 (6)	8 (6)
3 - severe systemic disease	55 (85)	110 (85)
4 - constant threat to life	6 (9)	12 (9)
AO/OTA classification - no. (%)		
31 - proximal femur	42 (64)	84 (64)
32 - diaphyseal femur	3 (5)	6 (5)
33 - distal femur	3 (5)	6 (5)
41 - proximal tibia/fibula	2 (3)	4 (3)
42 - diaphyseal tibia/fibula	0 (0)	0 (0)
43 - distal tibia/fibula	3 (5)	6 (5)
44 - malleolar	12 (18)	24 (18)
Smoking - no. (%)	11 (17)	23 (18)
Steroid use - no. (%)	10 (15)	7 (5)
Charlson index - no. (%)		
0-1	0 (0)	61 (47)
2-3	9 (14)	45 (35)
4-5	41 (63)	20 (15)
6-7	15 (23)	4 (3)
Follow-up months (median, Interquartile Range)	39 (21-73)	30 (22-48)

Postoperative Complications

	ESRD (N=65)	Non-ESRD (N=130)	RR	P Value
Non-union - no. (%)	3 (5)	2 (2)	3	0.34
Mechanical failure - no. (%)	8 (12)	2 (2)	8	0.003
Post-op infection - no. (%)	4 (6)	3 (2)	2.7	0.22
Composite - no. (%)	9 (14)	5 (4)	3.6	0.02

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