



Civilian firearm vs non-firearm humeral shaft fractures: Comparing rates of neurovascular injury, compartment syndrome, infection, and union

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BACKGROUND

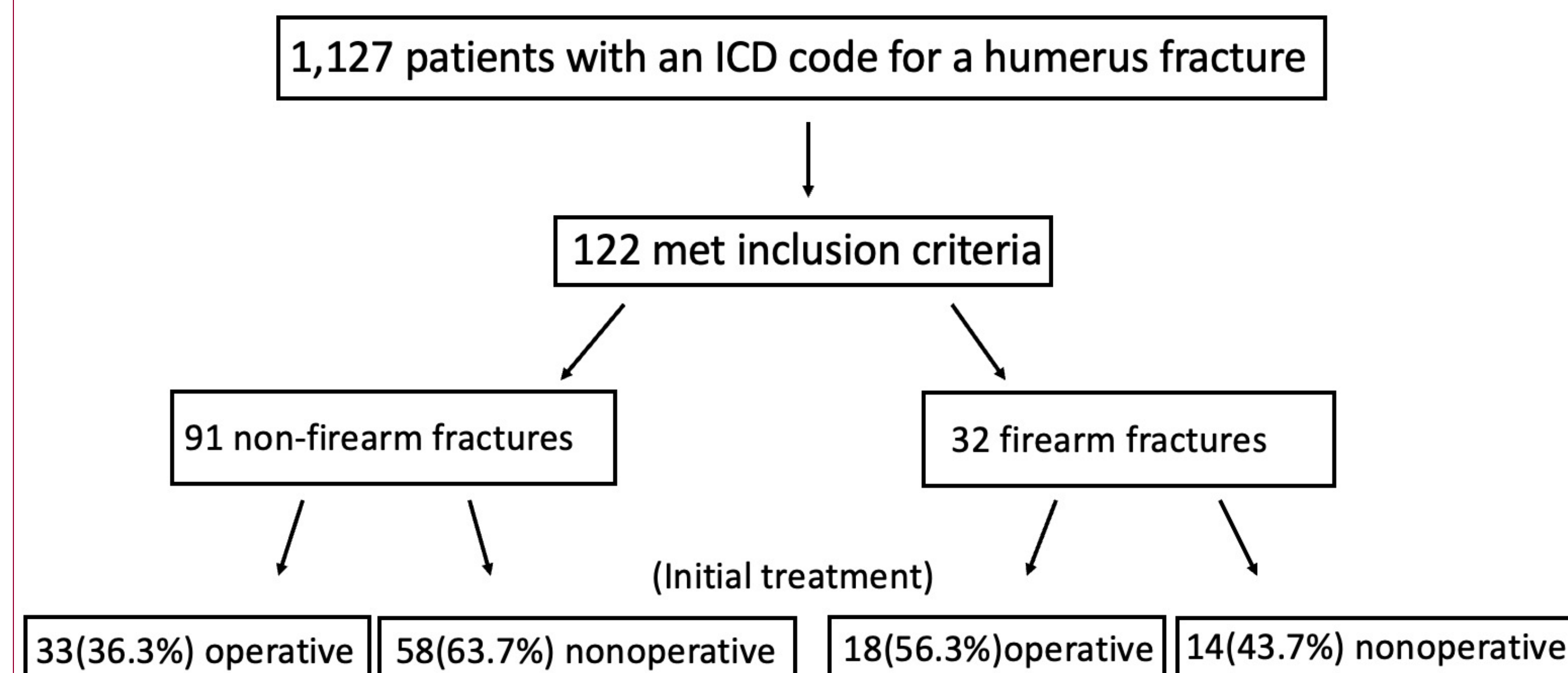
Humeral shaft fractures represent about 1-2% of all fractures and about 14% of all fractures to the humerus. Falls and motor vehicle accidents are the most common etiology. In the United States there are about 115,000 non fatal firearm injuries each year and about 10% of firearm injuries to the extremities involve the humerus. The purpose of this study was to compare civilian firearm and non-firearm humeral shaft fracture rates of neurovascular injury, compartment syndrome, infection, and union when treated nonoperative and operative.

METHODS

- ❖ Retrospective review
- ❖ Single level 1 trauma center (Temple University Hospital)
- ❖ 10 year period (January 1, 2008 to December 31, 2018)
- ❖ Inclusion Criteria
 - Extra-articular humeral shaft fracture
 - ≥ 18 years old
 - ≥ 12 week follow up



RESULTS



	Overall (n=123)	Firearm (n=32)	Non-Firearm (n=91)	P-value
Overall Nerve Injury, N (%)	16 (13.0%)	11 (34.4%)	5 (5.5%)	<.0001
Radial	12 (9.8%)	8 (25%)	4 (4.4%)	
Ulnar	9 (7.3%)	7 (21.9%)	2 (2.2%)	
Median	8 (6.5%)	6 (18.8%)	2 (2.2%)	
Musculocutaneous	1 (0.8%)	0 (0%)	1 (1.1%)	
Combined (≥ 2)	9 (7.3%)	6 (18.8%)	3 (3.3%)	

	Overall (n=123)	Firearm (n=32)	Non-Firearm (n=91)	P-value
Vascular Injury, N (%)	8 (6.5%)	7 (21.9%)	1 (1.1%)	0.0002

	Overall (n=123)	Firearm (n=32)	Non-Firearm (n=91)
Compartment Syndrome	0	0	0

* Prophylactic fasciotomies were performed in 7/8 cases of vascular injury and repair

	Overall (n=123)	Firearm (n=32)	Non-Firearm (n=91)	P-value
Infection, N (%)	7 (5.7%)	5 (15.6%)	2 (2.2%)	0.007
Initial nonoperative	Firearm (n=14)	Non-firearm (n=58)		P-value
Superficial Infection, N (%)	2 (14.3%) *	0	0	0.018
Deep Infection, N (%)	0	0		

	Overall (n=123)	Firearm (n=32)	Non-Firearm (n=91)	P-value
Union, N (%)	107 (87.0%)	28 (87.5%)	79 (86.8%)	0.88
Initial nonoperative treatment	Overall (n=72)	Firearm (n=14)	Non-Firearm (n=58)	P-value
Union, N (%)	58 (80.6%)	12 (85.7%)	46 (79.3%)	0.59
Initial operative treatment	Overall (n=51)	Firearm (n=18)	Non-Firearm (n=33)	P-value
Union, N (%)	49 (96.1%)	16 (88.9%) *	33 (100%)	0.060

	Overall (n=72)	Firearm (n=14)	Non-firearm (n=58)	P-value
Nonop -> op treatment, N (%)	15 (20.8%)	2 (14.3%)	13 (22.4%)	0.59

CONCLUSION

Firearm humeral shaft fractures have:

- ❖ Similar rates of failed nonoperative treatment and rates of union (nonoperative and operative treatment) compared to non-firearm fractures
- ❖ Higher rates of neurovascular injury compared to non-firearm fractures
- ❖ Low rates of deep infection when treated without surgical irrigation and debridement

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