The Safety of The Henry Approach for Proximal-Third Radial Shaft Fractures

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INTRODUCTION

- The decision to use a volar Henry approach over the dorsal Thompson approach for proximal-third radial shaft fractures is controversial due to the complex neurovascular anatomy of the anterior-proximal forearm.
- The purpose of the study was to identify the incidence of iatrogenic posterior interosseous nerve injury, iatrogenic arterial injury, and postoperative complications using a Henry exposure for proximal radial shaft fractures.
- We hypothesize that the Henry approach is safe for proximal radius fractures despite the controversy surrounding this method.

METHODS

Design: Retrospective cohort study.

Setting: Single Level 1 trauma center.

Population: Adult patients (18+) that underwent ORIF of proximal 1/3rd radial shaft fractures using a Henry (anterior) approach for exposure between January 2007-April 2019.

- Patients were included if a fracture line was present in the proximal 1/3rd of the radial shaft on pre-operative imaging
- Patients with isolated fractures of the radial head/neck were excluded

Primary Outcomes:
1. Postoperative posterior interosseous nerve palsy
2. Iatrogenic artery injury.

Secondary Outcomes: Postoperative Infection, non-union, or wound complication requiring operative intervention

Analysis: Incidence proportion values with 95% CI were calculated for primary and secondary outcomes

- Incidence proportion values were determined based on known follow-up data.
- Patients with unknown or missing follow up information were excluded from the analysis

Table 1: Patient demographics

Patient Characteristic	Total (N=102)
Age	
Mean, 95% CI	38 (35-41)
Sex	
Male	84 (82.4)
Female	18 (17.6)
Mechanism of injury	
Ballistic	28 (27.5)
Non-ballistic	74 (72.5)
Bones involved	
Isolated radius	47 (46.1)
Radius + ulna	55 (53.9)
Open fracture	
Yes	38 (37.3)
No	64 (62.7)
Plate position	
Anterior	53 (52.0)
Lateral	42 (41.2)
Unknown	7 (6.9)
Wound Closure	
Primary closure	87 (85.3)
STSG	12 (11.8)
Delayed primary closure	2 (2.0)
Flap	1 (1.0)
Pre-operative PIN palsy	7 (6.9)
Intra-operative PIN repair	6 (5.9)
Intra-operative arterial repair	3 (2.9)

Table 2: Postoperative outcomes

Characteristic	Total (N=102)	Incidence Proportion (95% CI)
Post-operative PIN palsy	2	2.3 (0.6-8.1)
Iatrogenic arterial injury	0	0
Infection	2	2.2 (0.6-7.5)
Non-union (operative)	2	2.2 (0.6-7.5)
Wound complication	0	0

RESULTS

- Two patients (2%) had a post-operative PIN palsy. One of the two patients did not have a pre-operative nerve exam due to medical status on admission.
- Zero patients had an iatrogenic arterial injury
- Two patients (2%) developed a postoperative infection that required an operative intervention, and two patients (2%) developed an operative non-union of the radius.
- No patients developed a postoperative wound complication

CONCLUSIONS

- Fixation of the proximal-third radial shaft fractures is safely accomplished with the Henry exposure.
- Our data demonstrates that the incidence of postoperative PIN palsy, iatrogenic nerve injury and postoperative complications is low with the Henry exposure.
- Despite the uncertainty surrounding this approach, a surgeon can confidently employ the Henry approach for proximal radius fractures without fear of an increased risk of neurovascular injury or postoperative complications.
- This can easily be extended distally to afford an inter-nervous plane for virtually the entire radius.