reoperation than both single plating with anterior and superior placement. Therefore, when operative management is indicated for a midshaft clavicle fracture, dual plating may be an excellent treatment alternative in patients at high risk for reoperation.

Category: Shoulder - Fractures

Skin Tenting Associated with Completely Displaced Midshaft Clavicle Fractures in Adolescents: Results from the FACTS Multi-Center Prospective Cohort Study

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All Authors:
Ben E. Heyworth MD UNITED STATES
Eric William Edmonds MD
Philip L. Wilson MD UNITED STATES
Donald Bae MD UNITED STATES
Andrew Pennock UNITED STATES
Ying Li MD UNITED STATES
Henry B. Ellis MD UNITED STATES
Jeffrey J. Nepple MD UNITED STATES
David D Spence MD
Cliff Willimon MD UNITED STATES
Crystal A. Perkins MD UNITED STATES
Nirav Pandya UNITED STATES

Summary:
In this prospective multi-center study, the 12% of adolescent clavicle fracture patients with skin tenting, showed no differences in complications, PROs, or RTS with sling vs. ORIF, suggesting that early fracture settling, enhanced healing capacity, and bony remodeling in adolescents yield equivalent outcomes following non-operative treatment and close early observation.

Data:
Introduction: Skin tenting is a commonly applied relative indication for operative treatment of clavicle fractures. However, the influence of this injury feature and optimal treatment for adolescent patients with skin tenting has been minimally investigated. This study therefore sought to evaluate the outcomes of non-operatively and operatively treated clavicle fractures associated with skin tenting in adolescents. Methods: 10-18 year-old patients with completely displaced midshaft clavicle fractures who received non-operative or operative treatment at eight participating institutions from 2013-2022 were screened for two categories of skin tenting at initial presentation: (1) ‘skin tenting’ or (2) ‘skin-at-risk for necrosis’ (tented, white, hypo-vascular). Demographics, fracture characteristics, and treatment were recorded, and patients were followed for a minimum of one year. Return to sport (RTS) time, validated patient-reported outcomes (PROs: ASES, Quick DASH, Marx shoulder activity, EQ-VAS), and complications were analyzed. Results: 92 of 768 (12%) prospectively enrolled adolescents with completely displaced midshaft clavicle fractures were reported with skin tenting (of either category) and demonstrated greater age, comminution, shortening, and superior displacement, when compared to patients without tenting (Table 1). Of those with tenting, 32 (35%) were treated non-operatively (Non-Op), while 60 (65%) underwent open reduction and internal fixation (ORIF) (Table 2). Three Non-Op patients (9%) converted to ORIF treatment at a mean of 20 days (range, 6-41 days) post-injury, due to increased symptoms or clinical concern. While Non-Op patients were, on average, less than one year younger than ORIF patients (Non-Op 14.5 years; ORIF 15.4 years, p=0.02), there were otherwise no significant differences between treatment cohort characteristics, including sex (p=0.13), shortening (p=0.10), superior displacement (p=0.06), and comminution (p=0.20). The majority of patients provided PROs at 1 or 2 years post-treatment (64%), with no differences in response rates, RTS, PROs, or complications between treatment cohorts (RTS: p=0.70, ASES: p=0.16, Quick DASH: p=0.07, Marx: p=0.26, EQ-VAS: p=0.68, complications: p=0.99). Conclusion: In this prospective multi-center cohort study, 12% of adolescent clavicle fracture patients demonstrated skin tenting, but showed no differences in complications, PROs, or RTS, whether treated non-operatively or operatively. 9% of patients initially treated non-operatively converted to operative treatment, but had comparable outcomes to both overall treatment cohorts. These data suggest that early fracture settling, enhanced healing capacity, and bony remodeling potential unique to younger patients may allow for tolerance of skin tenting without adverse effects when non-operative treatment and close early observation are pursued.