

Talar Neck Fractures with Associated Ipsilateral Foot and Ankle Fractures Have a Higher Risk of Avascular Necrosis

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INTRODUCTION:

The objective of this study was to determine if talar neck fractures with associated ipsilateral foot and/or ankle fractures (TNIFAF) have a higher rate of progression to avascular necrosis (AVN) of the talus compared to isolated talar neck (ITN) fractures. The authors hypothesized that TNIFAF would have a higher rate of progression to AVN in comparison to ITN fractures. Understanding this relationship would be beneficial to both the clinician and the patient in treatment planning and prognostication.

METHODS:

A retrospective review of patients who sustained talar neck fractures at a level I trauma center from 2008-2016 was performed. Radiographs were evaluated and fractures were characterized as ITN or TNIFAF. Fractures were also classified using the Hawkins classification as modified by Canale and Kelly and Vallier. The primary outcome was the development of AVN, while secondary outcomes included nonunion and collapse. The presence of AVN, union, and collapse were assessed by two fellowship-trained orthopaedic trauma surgeons and one fellowship-trained orthopaedic foot and ankle surgeon. Demographic data and mechanism of injury (MOI) were also collected. Statistical analysis was performed. Categorical variables are represented as a number and percentage, whereas continuous variables are represented by mean average and standard deviation (SD). Categorical variables were analyzed using a Chi-squared test, and T-test was used to analyze continuous variables. We adopted an alpha (type I error rate) of 0.05 and a beta (type II error rate) of 0.2 (power of 0.8).

RESULTS:

There were 137 fractures in 130 patients with 79 (58%) fractures in the ITN group and 58 (42%) in the TNIFAF group. The average length of follow up was 15.4 months, with a median of 10 months. There were similar Hawkins type proportions between the two groups. AVN was found in 24 (41%) patients in the TNIFAF group, compared to 19 patients (24%) in the ITN group ($p=0.03$). The odds ratio was 2.23, indicating increased odds of developing AVN in patients with TNIFAF. Collapse occurred in 11 patients (8%) and union rate was 84% for the total cohort, with no significant difference between the groups.

DISCUSSION AND CONCLUSION:

This study found a statistically significant higher rate of progression to AVN in TNIFAF in comparison to ITN fractures, while controlling for Hawkins type. This knowledge is beneficial in prognostication, as talar neck fractures with associated ipsilateral foot and/or ankle fracture is a negative prognostic predictor of the development of AVN of the talus.

Figure 1

	Total Cohort (n=137)	ITN (n=79)	TNIFAF (n=58)	Odds Ratio (OR)	P-value
Union	115 (83.9%)	65 (82.3%)	50 (86.2%)	1.35	0.54
AVN	43 (31.4%)	19 (24.1%)	24 (41.1%)	2.23	0.03
Collapse	11 (8.0%)	5 (6.3%)	6 (10.3%)	1.71	0.39

* $p < .05$. ** $p < .01$. *** $p < .001$.

Abbreviations: TNIFAF—Talar neck fracture with ipsilateral Foot and/or Ankle Fracture, ITN—Isolated talar neck fracture, AVN—Avascular Necrosis