

Documented Cannabis Use is a Risk Factor for Nonunion after Nonsurgical Management of Scaphoid Fractures: A Retrospective Review of 159,998 Patients

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INTRODUCTION:

Our purpose was to assess the potential association between cannabis and nonunion among acute scaphoid fractures initially treated nonsurgically. While nicotine has been established as a predisposing factor for nonunion, the same has not been well-established for cannabis. We hypothesized that cannabis use would not be a risk factor for the development of a scaphoid nonunion.

METHODS:

This is a retrospective, matched cohort study using a (2010-2020) dataset from a national insurance claims database containing information on over 157 million orthopaedic patients across all sites of care in the United States. All patients above the age of 18 who sustained a scaphoid fracture were identified through international classification of diseases (ICD) codes. To identify patients initially treated with nonsurgical management, we excluded patients who were treated acutely with surgery during the first four weeks after their fracture.

Three subgroups were defined: non-cannabis/non-tobacco users, cannabis-only users, and tobacco-only users. Statistical matching was then done to arrive at three cohorts matched for age, gender, and comorbidity burden. Nonunion rates at six months, twelve months, and two years after fracture diagnosis were determined for each subgroup. Rates of surgical intervention for patients who developed a scaphoid nonunion were also determined using current procedural terminology (CPT) codes.

Multivariate analysis was done to assess whether documented cannabis use and documented tobacco use were associated with: 1) risk for scaphoid nonunion; 2) risk for subsequent surgical intervention for a nonunion.

RESULTS:

Of the identified groups, non-cannabis/non-tobacco users were 145,467 patients, tobacco-only users were 13,132 patients, and cannabis-only users were 1,399 patients. Among the matched cohorts, overall nonunion rates were 7.7%, 11.8%, and 10.1%, respectively ($p=0.0013$).

Based on multivariate analysis controlling for age, gender, and comorbidities, cannabis use and tobacco use were individually associated with a greater risk of scaphoid nonunion at six months, one year, and two years after the index fracture (Figure 1). Cannabis use and tobacco use were also individually associated with a greater risk of a subsequent surgical intervention for scaphoid nonunion at each time interval studied (Table 1).

DISCUSSION AND CONCLUSION:

Among 159,998 scaphoid fractures initially treated nonsurgically, the nonunion rate for the cannabis cohort (10.1%) was statistically significantly higher than that of non-cannabis/non-tobacco cohort (7.7%). Cannabis use was also found to be predictive of a subsequent surgical intervention for scaphoid nonunion. These results suggest that cannabis use should be considered a risk factor for nonunion of scaphoid fractures analogous to tobacco and clinical management may be addressed in a similar fashion.

Table 1. Results of multivariate analysis: Assessing if cannabis only users and tobacco only users are predictors of a subsequent surgical intervention for scaphoid nonunion at 6 months, 12 months, and 2 years after fracture diagnosis.

	OR (95% CI)	p-value
Surgery for Nonunion at 6 months		
Non-users (Referent)	-	-
Tobacco Only	2.43 (1.52, 3.98)	0.0003
Cannabis Only	2.14 (1.32, 3.54)	0.0025
Surgery for Nonunion at 12 months		
Non-users (Referent)	-	-
Tobacco Only	2.43 (1.59, 3.80)	<0.0001
Cannabis Only	2.01 (1.28, 3.18)	0.0025
Surgery for Nonunion at 2 years		
Non-users (Referent)	-	-
Tobacco Only	2.52 (1.65, 3.93)	<0.0001
Cannabis Only	2.05 (1.32, 3.24)	0.0018

Risk of Non-Union Diagnosis in the 24-Months Following Scaphoid Fracture

