

The Snuffbox: The Effect of Smokeless Tobacco Use on Scaphoid Fracture Healing

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INTRODUCTION: Smoking has been demonstrated to be a risk factor for nonunion of scaphoid fractures, but it is unclear if chewing tobacco confers similar risk. The purpose of this study was to evaluate rates of bone-related complications after nonsurgical management of scaphoid fractures in smokeless tobacco users compared to matched controls and compared to smokers.

METHODS: A retrospective cohort study was conducted using a large insurance database. For patients who underwent nonsurgical management of scaphoid fractures, 212 smokeless tobacco users and 6,048 smokers were matched 1:4 with controls (n = 848 and 24,192, respectively), and 212 smokeless tobacco users were matched 1:4 with 848 smokers. Rates of bone-related complications within 2 years of initial injury were compared using multivariable logistic regression.

RESULTS: From weeks 12 through 104 following initial injury, compared to controls who do not use tobacco, the smokeless tobacco cohort demonstrated significantly higher rates of nonunion (5.7% vs. 2.7%, OR: 2.07). Compared to controls who do not use tobacco, the smoking cohort demonstrated significantly higher rates of nonunion (4.3% vs. 2.6%, OR: 1.91), repair of nonunion (1.5% vs. 0.9%, OR: 1.87), and 4 corner fusion and proximal row carpectomy (0.3% vs. 0.1%, OR: 3.17). Smokeless tobacco use was significantly underdiagnosed in the adult male population of unilateral scaphoid fractures with two years of follow up found in the database (372 of 25,704, 1.45%) relative to Centers for Disease Control estimates for adult male smokeless tobacco use (4.5%) (p<0.001).

DISCUSSION AND CONCLUSION: Given the higher rates of nonunion diagnoses following nonsurgical management in this population, surgeons should consider asking all patients with scaphoid fractures if they use smokeless tobacco or smoke and consider adding this to the patient's intake history to further identify patients at risk for nonunions. Tobacco cessation counseling is indicated for all tobacco users, including smokeless with scaphoid fractures.

Table 1: Demographics of smokeless cohort versus matched controls, smoking cohort versus matched controls, and smokeless cohort versus matched smoking cohort

	Controls for Smokeless (n=848)			Smokeless (n=212)			Controls for Smoking (n=24,192)			Smoking (n=6,048)			Matched Smokeless (n=548)			Matched Smokers (n=212)					
	n	%	p	n	%	p	n	%	p	n	%	p	n	%	p	n	%	p			
Female	432	50.9		106	50.0		12,108	49.9		3,040	50.1		274	50.0		137	50.0		61	50.0	
Age (years) Mean ± SD	43.2 ± 18.2		0.87	43.2 ± 18.2		0.60	43.2 ± 18.2		0.60	43.2 ± 18.2		0.60	43.2 ± 18.2		0.60	43.2 ± 18.2		0.60	43.2 ± 18.2		0.60
Female	85	39.9%		21	9.9%		1,508	6.2%		2,829	46.8%		69	12.6%		31	6.9%		10	4.7%	
ACL injury, SD	5.8 ± 4.3		0.00	8.8 ± 3.8		0.00	8.8 ± 3.8		0.00	8.8 ± 3.8		0.00	8.8 ± 3.8		0.00	8.8 ± 3.8		0.00	8.8 ± 3.8		0.00
Obesity	289	34.1%		73	34.4%		4,688	19.4%		1,838	30.4%		206	37.6%		12	5.6%		52	24.5%	
Diabetes	289	34.1%		73	34.4%		4,747	19.6%		1,868	30.9%		201	36.6%		69	32.0%		18	8.5%	
Hypertension	417	49.1%		124	58.5%		6,790	28.1%		2,875	47.5%		451	82.1%		128	59.9%		39	18.4%	
CCPD	289	34.1%		59	27.8%		3,524	14.6%		2,392	39.6%		211	38.5%		58	26.9%		10	4.7%	
Chronic Kidney Disease	147	17.3%		29	13.7%		2,244	9.3%		628	10.4%		63	11.5%		28	12.7%		10	4.7%	
Chronic Heart Disease	211	24.9%		39	18.4%		3,337	13.8%		947	15.7%		148	27.0%		39	18.4%		10	4.7%	
Rheumatoid Arthritis	22	2.6%		5*	2.4%		673	2.8%		154	2.5%		13	2.4%		5*	2.3%		1	0.5%	

Table 2: Fracture pattern of smokeless cohort versus matched controls, smoking cohort versus matched controls, and smokeless cohort versus matched smoking cohort

	Controls for Smokeless (n=848)			Smokeless (n=212)			Controls for Smoking (n=24,192)			Smoking (n=6,048)			Matched Smokeless (n=548)			Matched Smokers (n=212)					
	n	%	p	n	%	p	n	%	p	n	%	p	n	%	p	n	%	p			
Scaphoid Fracture Pattern	111	13.1%		30	14.2%		1,833	7.6%		467	7.7%		100	18.2%		29	13.7%		8	3.8%	
Nonimplanted Distal	98	11.0%		21	9.9%		1,333	5.5%		324	5.4%		61	11.1%		21	9.9%		6	2.8%	
Nonimplanted Middle	98	11.6%		21	9.9%		1,333	5.5%		324	5.4%		61	11.1%		21	9.9%		6	2.8%	
Nonimplanted Proximal	98	11.6%		21	9.9%		1,333	5.5%		324	5.4%		61	11.1%		21	9.9%		6	2.8%	
Displaced Distal	40	4.6%		14	6.6%		1,333	5.5%		400	6.6%		37	6.7%		12	5.5%		3	1.4%	
Displaced Middle	54	6.4%		12	5.7%		1,333	5.5%		300	4.9%		46	8.4%		15	7.1%		4	1.9%	
Displaced Proximal	13	1.5%		5*	2.4%		1,333	5.5%		139	2.3%		24	4.4%		14	6.4%		5*	2.3%	
Unspecified Fracture Pattern	216	25.5%		126	59.4%		17,484	72.3%		5,184	85.5%		441	80.4%		126	58.4%		22	10.4%	

*No proximal patient identified. The Proximal fracture only displays exact patient counts when broken here at least 11 patients. If defined here are smaller than 11 patients, the defined here is automatically displayed as "0". See when the Proximal fracture calculator statistics. It utilizes the actual number of patients rather than the automatically displayed "0".

Table 3: Complications of smokeless cohort versus matched controls, smoking cohort versus matched controls, and smokeless cohort versus matched smoking cohort

	Controls for Smokeless (n=848)			Smokeless (n=212)			Controls for Smoking (n=24,192)			Smoking (n=6,048)			Matched Smokeless (n=548)			Matched Smokers (n=212)					
	n	%	p	n	%	p	n	%	p	n	%	p	n	%	p	n	%	p			
Complication	23	2.7%		12	5.7%		2,071 (8.6%)	3.4%		626	10.4%		263	47.9%		30	13.7%		11	5.2%	
Nonunion	14	1.7%		5*	2.4%		800 (3.3%)	1.3%		222	3.7%		89	16.2%		18	8.1%		3	1.4%	
Repair of nonunion	5*	0.6%		2*	0.9%		100 (0.4%)	0.2%		28	0.5%		11	2.0%		1	0.5%		1	0.5%	
4 Corner / PRC	5*	0.6%		2*	0.9%		100 (0.4%)	0.2%		28	0.5%		11	2.0%		1	0.5%		1	0.5%	
DRS	5*	0.6%		2*	0.9%		100 (0.4%)	0.2%		28	0.5%		11	2.0%		1	0.5%		1	0.5%	

*No proximal patient identified. The Proximal fracture only displays exact patient counts when broken here at least 11 patients. If defined here are smaller than 11 patients, the defined here is automatically displayed as "0". See when the Proximal fracture calculator statistics. It utilizes the actual number of patients rather than the automatically displayed "0".