Symptomatic Neuroma Following Initial Amputation for Traumatic Digital Amputation

Margot A. Vlot, MD, Suzanne C. Wilkens, MD, Neal C. Chen, MD, Kyle R. Eberlin, MD

Department of Orthopaedic Surgery, Hand and Upper Extremity Service, Massachusetts General Hospital, Harvard Medical School, Boston, MA.

Introduction

- Neuroma formation after amputation is expected, but most patients do not report symptoms
- Previous studies with small sample sizes reported rates of painful neuroma after upper-extremity amputation from 4% to 25%.
- Specific prognostic factors that predispose to the formation of painful neuroma have not been identified.
- We hypothesized that no factors are independently associated with the development of painful neuroma after traumatic digital amputation.

Methods

- We performed a retrospective review of 1,083 patients who underwent revision amputation for traumatic digital amputation
- Patients who developed a painful neuroma during follow-up were identified with a minimum follow-up of 1 week and a median of 3.3 months.
- We calculated the rate of developing a painful neuroma as a proportion of the total number of patients and performed multivariable logistic regression analysis to identify factors independently associated with its development.

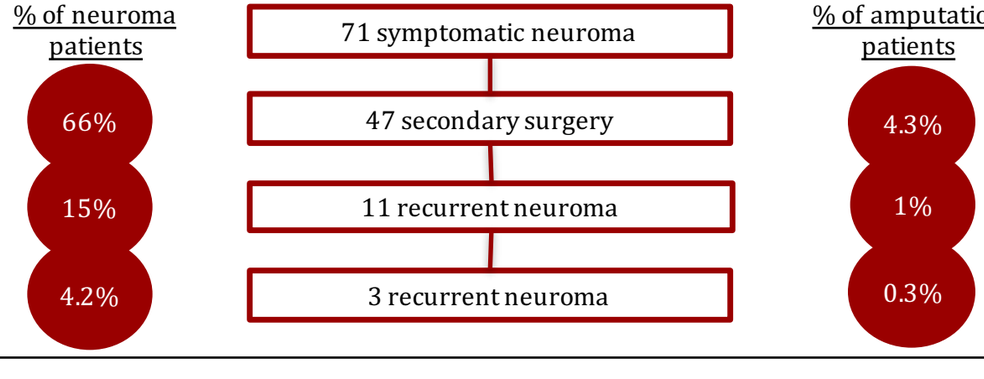

Figure 1. Incidence and recurrence of symptomatic neuroma

Results

- Of 1,083 patients, 71 (6.6%) developed symptomatic neuroma. Mean time to diagnosis was 6.4 months. 11 patients (15%) developed a recurrent neuroma (figure 1).
- A total of 47 patients (66%) underwent surgery for painful neuroma. Mean time to surgical intervention was 11 months.
- Index finger injury and avulsion injury mechanism were significantly associated with a higher risk for symptomatic neuroma (table 1).

	Odds ratio	SE	95% CI	*p* value
Age	0.99	0.01	0.9 - 1.0	*0.12*
Worker's compensation	1.6	0.53	0.8 – 3.1	*0.16*
Type of injury				
Sharp	Reference			
Crush	1.5	0.42	0.8 – 2.6	*0.18*
Avulsion	**2.6**	**0.96**	**1.2 – 5.4**	***0.01***
Burn	0.9	0.99	0.1 – 7.7	*0.92*
Blast	1.4	1.6	0.2 – 12	*0.74*
Amputated digit				
Index finger	**2.2**	**0.62**	**1.2 – 3.8**	***0.01***
Ring finger	1.7	0.55	0.9 – 3.2	*0.11*
Level proximal phalanx	1.4	0.39	0.8 – 2.4	*0.24*
Multiple digits affected	1.3	0.48	0.7 – 2.4	*0.48*

Table 1. multivariable logistic regression analysis n=1,077

Conclusion

Approximately 1 in 15 patients will develop a symptomatic neuroma after traumatic digital amputation and more than half of these patients will undergo revision surgery for neuroma, with a mean time to operative intervention of 11 months.