Outcomes Related to Injury Characteristics of Zone 1 and 2 Digit Amputations Treated with Revision Amputation

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HYPOTHESIS

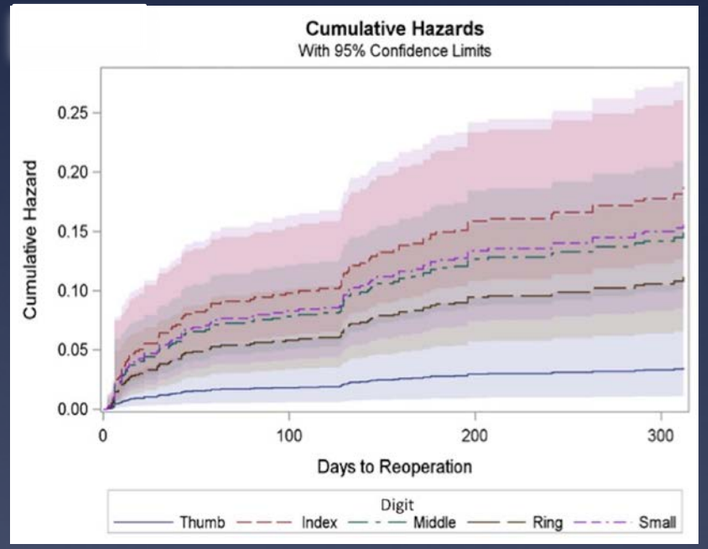
Revision amputation is the most common treatment for non-replantable finger amputations in the United States. Though the digit amputated and zone of injury confer differing results for replantation, no study has assessed the effect of the specific digit and zone on the success of revision amputation. Predicting the outcome of revision amputation based on injury patterns would allow for improved patient education and counseling and increased focus on prevention of secondary revision.

METHODS

After IRB approval, our institution's emergency department (ED) database was retrospectively examined for all patients presenting with flexor tendon zone-1 and -2 traumatic finger and thumb amputations from January 2010 to December 2015. Each patient was reviewed for demographic information, medical comorbidities, injury characteristics, site of initial definitive management (ED versus OR), and complications requiring unplanned secondary revision amputation. Conditional Cox Proportional Hazard regression with sandwich estimation, where fingers where nested within patients, was used to model hazard of revision relative to zone of injury and specific digit amputated. Significance was established at $p<.05$ and all interval estimate were calculated for 95% confidence.

RESULTS

537 patients with 677 digits were initially treated with primary revision amputation. 481 patients with 586 amputations were initially revised in the ED, while 56 patients with 91 amputations were initially revised in the OR. 74 patients with 83 amputations (78 zone 1, 5 zone 2) treated with primary revision amputations required secondary revision amputations within 1 year of index procedure. In reference to the thumb, the index, middle and small figures had an increased risk of 5.3 (P=.0059), 4.3 (P=0.0173), and 4.5-fold (P=0. .0211), respectively. Ring finger had an increased risk of 3.2-fold, though this only approached significance (P=0.0677). No increased risk in revision was observed for injury at zone 1 compared zone 2 (P=0.4827)



Risks of Unplanned Secondary Revision Amputation Censored at 1 year from Primary Revision Amputation			
	Hazard Ratio	**Confidence Interval**	**P Value**
Verdan Zones			
Zone 1 vs Zone 2	1.423	(0.532-3.808)	0.4827
Digit			
Thumb	1*		
Index	5.332	(1.618-17.566)	0.0059†
Middle	4.26	(1.292-14.049)	0.0173†
Ring	3.171	(0.919-10.938)	0.0677
Small	4.497	(1.253-16.134)	0.0211†
*Reference † A statistically significant variable			

SUMMARY

-Amputations of the index, middle, and small fingers in zone-1 and -2 are at an increased risk of unplanned secondary revision

-We were unable to show a difference in the risk of secondary revision between amputations in zone-1 and zone-2

-Patients presenting with digit amputations may be counseled on their risk of unplanned secondary reoperation based on the specific digit amputated.