

# Outcomes after thrombolytic treatment for digit preservation in high grade frostbite injury



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## INTRODUCTION

- Frostbite to the fingers results from prolonged exposure to temperatures below two degrees Celsius. Injury severity correlates to both the temperature and length of exposure. Frostbite injury is caused by both a direct cold injury to cells and secondary injury due to local ischemia.
- the use of thrombolytic medications have been explored to minimize secondary ischemic injury through breakdown of microthrombi and improved digital perfusion.
- We hypothesized that early use of thrombolytic therapy would decrease (improve) the level of amputation in patients who present with severe frostbite injury

## MATERIALS & METHODS

- Retrospective case review.
- All patients with compromised digits and Grade III/IV frostbite presenting to ED reviewed over two winters.
- Patients received standard care and direct arterial TPA infusion if candidate.
- Digits analyzed bone final zone of injury and amputation. Classified by zone. Compared to those treated conservatively.

Figure 1: Clinical Zones of Frostbite Injury

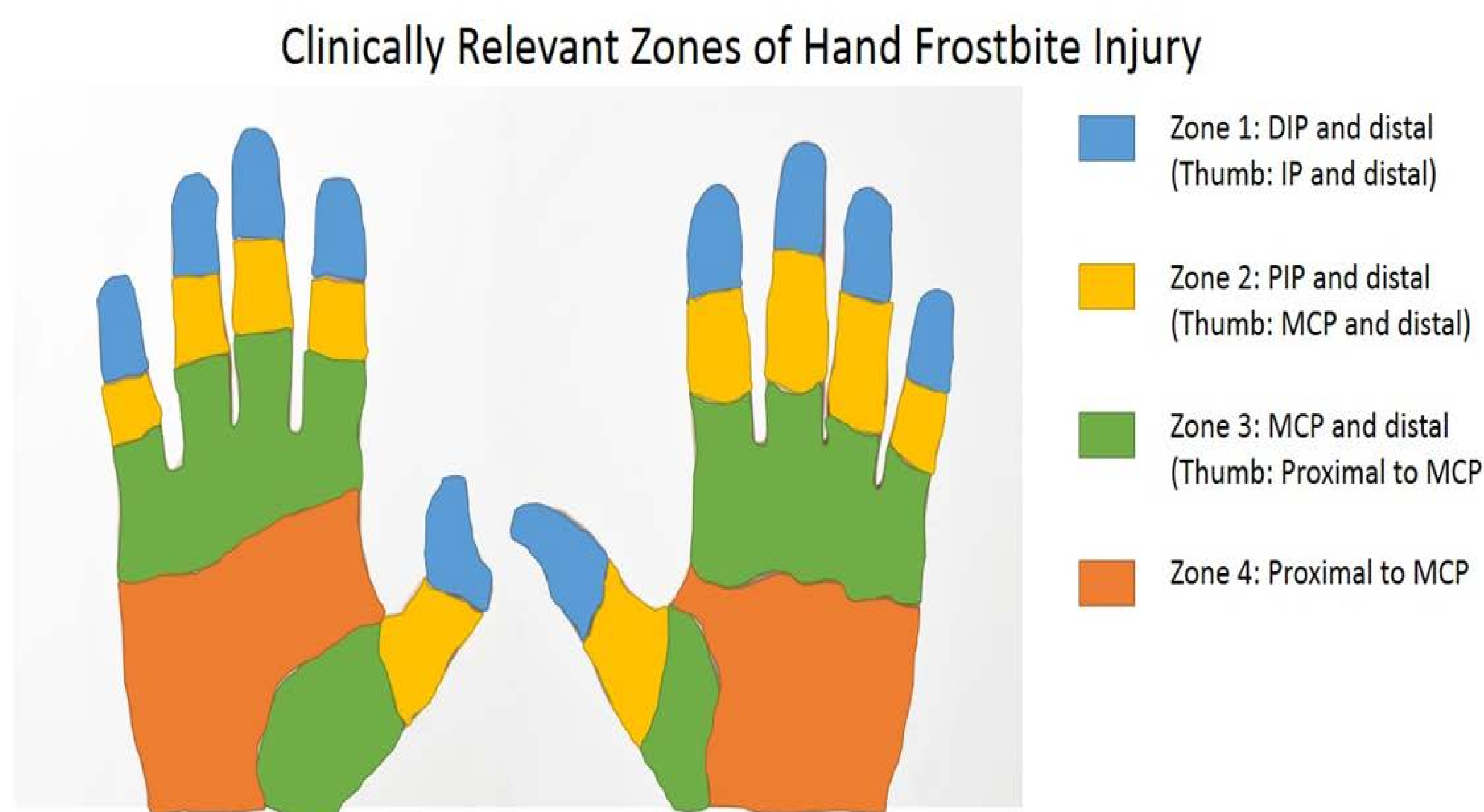


Figure 1 Continued

Finger Zone	Level	Thumb Zone	Level
1	DIP and Distal	1	IP and Distal
2	PIP to DIP	2	MCP to IP
3	MCP to PIP	3	Proximal to MCP
4	Proximal to MCP		

## RESULTS

- 21 patients and 185 digits evaluated
- 8 patients treated with TPA, 13 treated conservatively
- TPA digits improved average of 1.83 levels – Conservative 0.04 levels
- TPA thumbs improved average of 2.0 level – Conservative 0.32
- There was a significant difference in level of final injury

Figure 2: Pre and Post TPA Angiogram

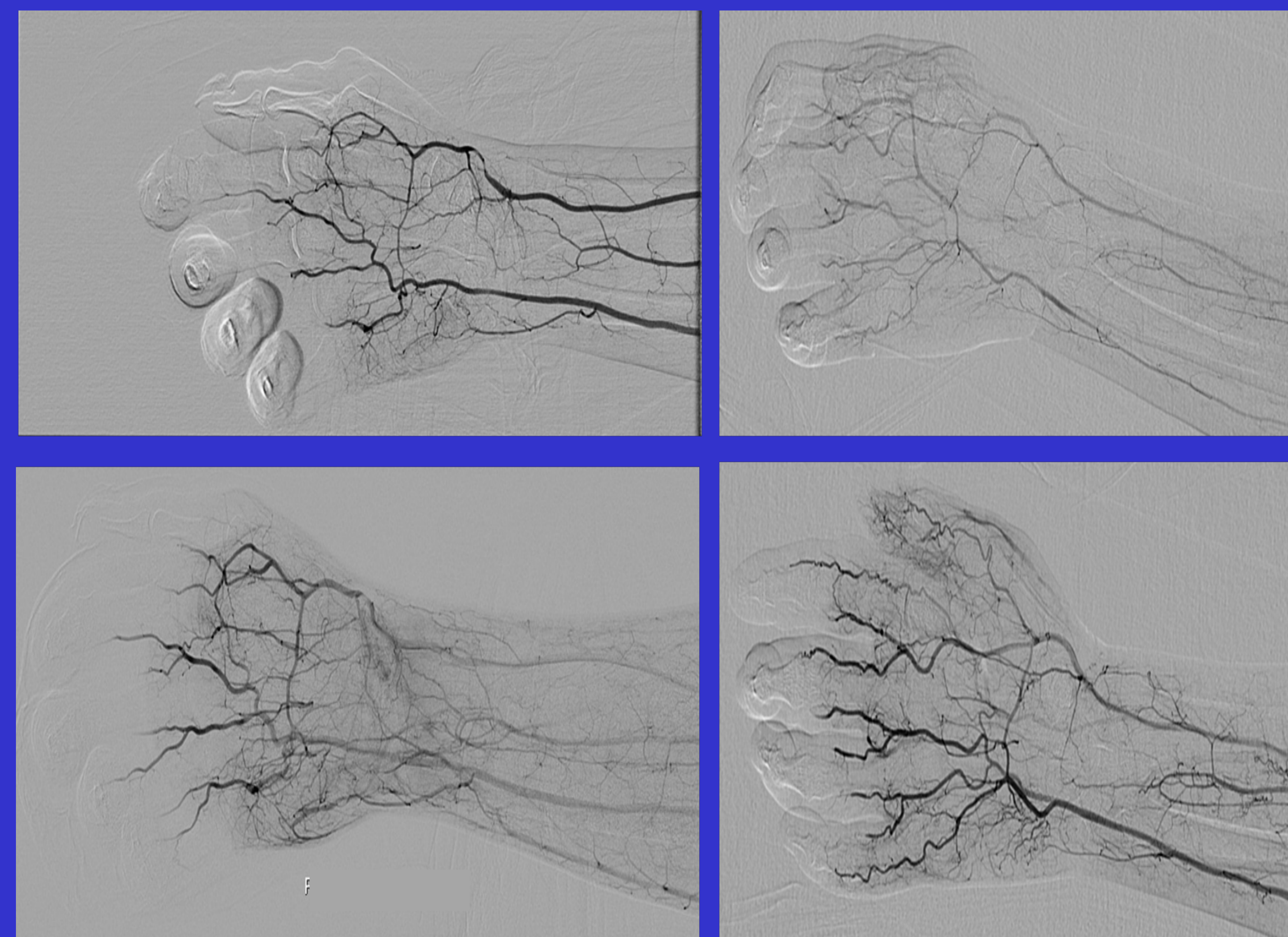


Figure 3: TPA Digit Outcomes

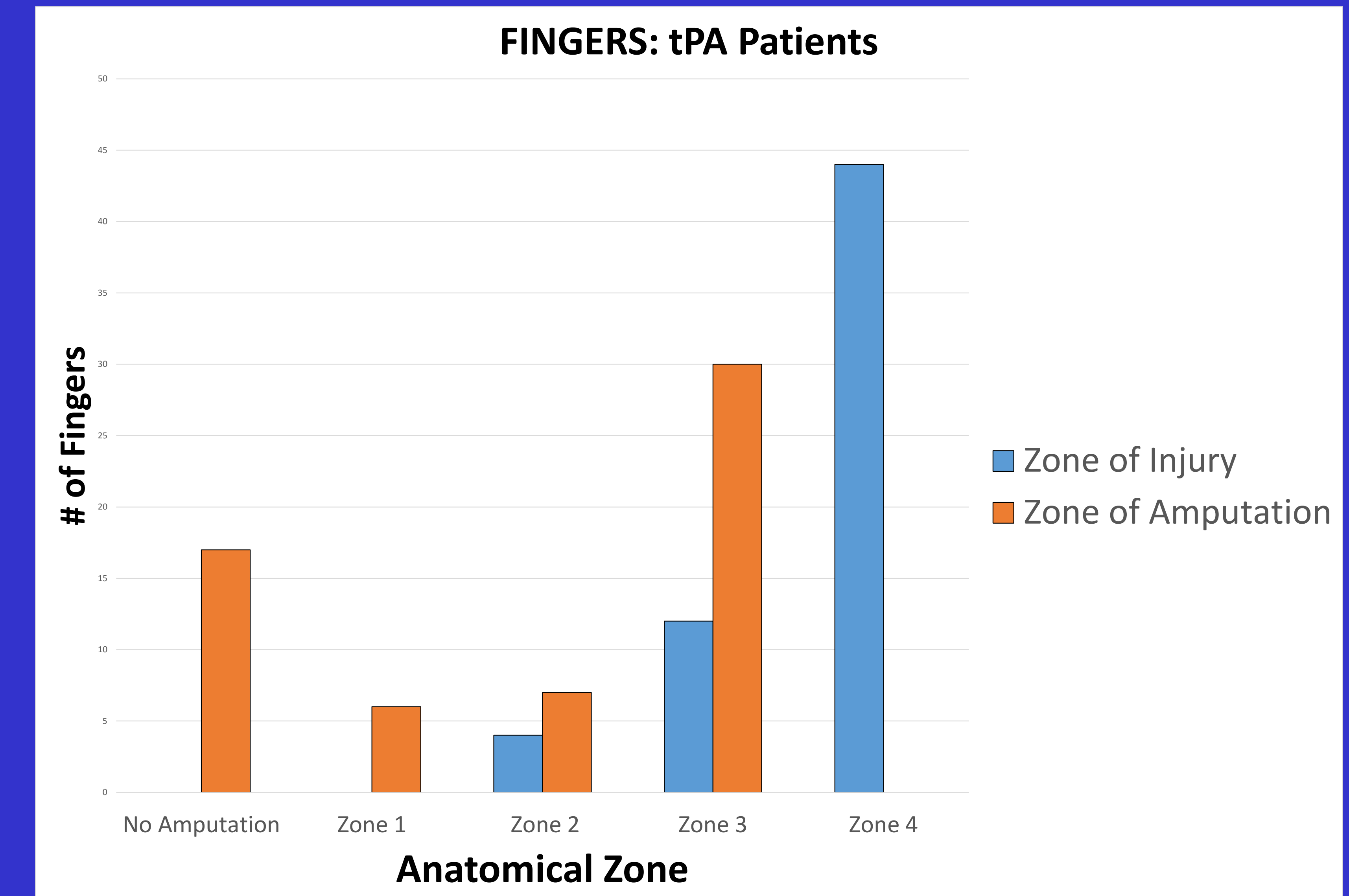
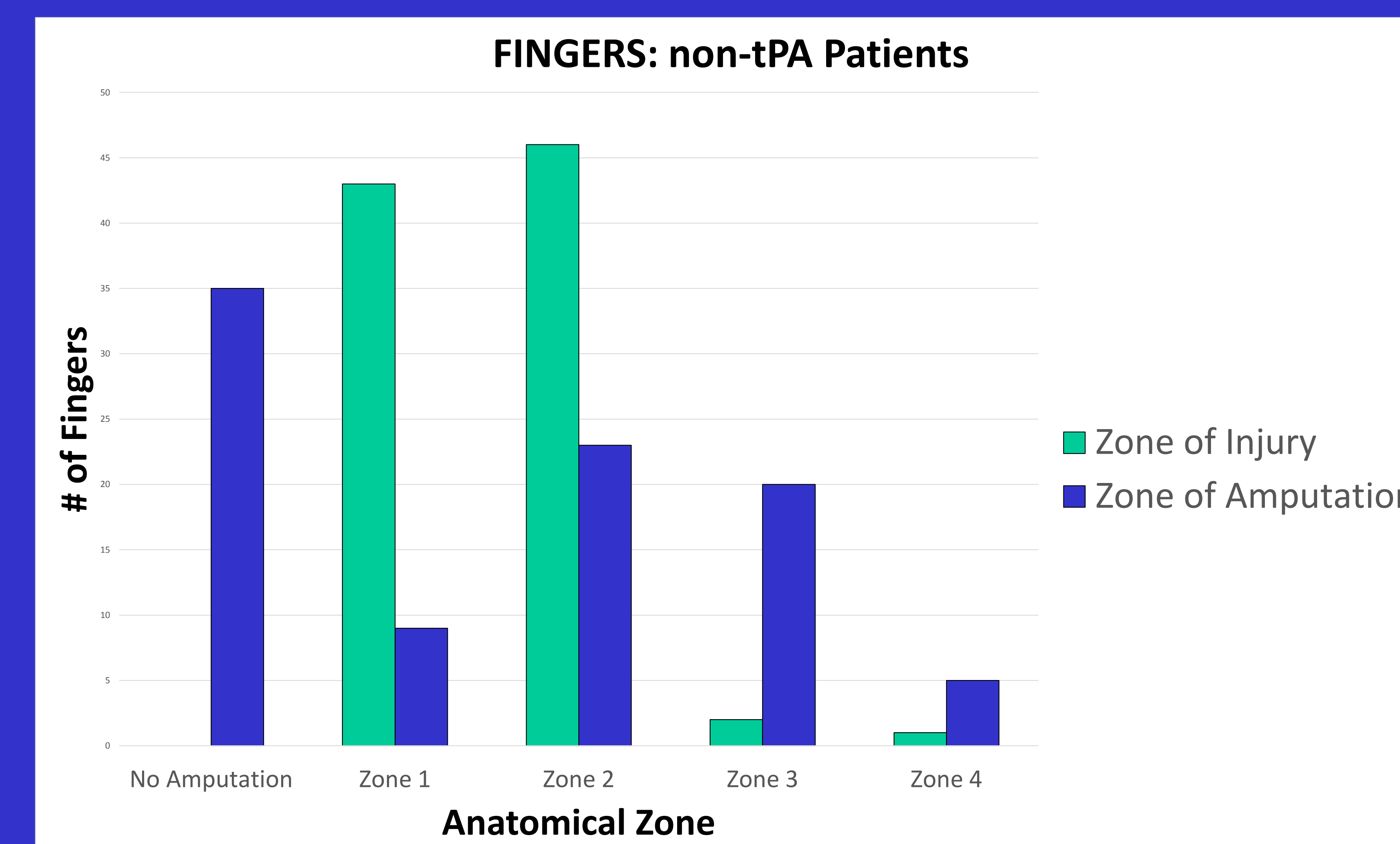


Figure 4: Non – TPA Digit Outcomes



## DISCUSSION/CONCLUSION

- TPA may improve final zone of injury in severe frostbite.
- Conservative therapy helps prevent progression of tissue damage.
- TPA mechanism likely related to minimizing ischemic tissue injury.
- Severe frostbite injury patients who receive TPA may have improved outcomes compared to conservative therapy.