

Case Report

Loss of definitive care: the hidden value of emergency temporizing management in a severe occupational crush hand injury

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ABSTRACT

Severe hand injuries are frequently encountered in industrial settings and may lead to substantial long-term functional impairment. Although they are rarely life-threatening, they are often limb- and function-threatening, requiring time, structured, and carefully prioritized management. A 34-year-old male presented with a severe occupational crush injury affecting four digits, sparing of the thumb. The injury associated with partial amputation of the little finger, complete tendon loss in the middle finger with absence of active motion, and partial tendon injury in the ring finger. Neurovascular assessment revealed preserved perfusion with variable functional impairment across the affected digits. Initial emergency management included copious irrigation, debridement, and temporary suturing for hemostasis and soft tissue stabilization. Definitive surgical repair was recommended; however, the patient was subsequently lost to follow-up. This case highlights the important and often underappreciated role of emergency temporizing management in preserving tissue viability and maintaining the potential for functional recovery, particularly when access to definitive surgical care is interrupted.

Keywords: Hand injuries, Crush injuries, Temporizing management

INTRODUCTION

Hand injuries account for a significant proportion of emergency department visits, particularly among industrial workers. Although not always immediately life-threatening, these injuries frequently pose a serious risk to long-term function. Crush injuries represent one of the most complex forms of hand trauma, often involving varying degrees of soft tissue destruction, tendon injury, and potential neurovascular compromise. Because of this complexity, early and well-structured management is essential to preserve tissue viability and optimize functional outcomes.¹

While definitive surgical repair is considered the standard of care, it is not always achieved in real-world settings. Delays in access to specialized care, financial limitations, or loss to follow-up may interrupt the treatment pathway.

In such scenarios, the role of emergency management becomes especially important. It extends beyond immediate stabilization to includes temporizing, function-preserving interventions that help to preserve tissue and maintain the potential for future functional recovery. This case highlights the hidden value of early emergency temporizing management when definitive care is delayed or not achieved.²

CASE REPORT

A 34-year-old male presented to the emergency department after sustaining a workplace injury in which his hand became trapped in an industrial machine. On examination, four digits (index, middle, ring, and little fingers) were involved, while the thumb was spared. The injury was consistent with a high-energy crush mechanism resulting in extensive soft tissue damage.

The little finger demonstrated partial amputation. The middle finger had complete tendon loss with no active flexion or extension. The ring finger exhibited partial tendon injury with a limited range of motion. The index finger had soft tissue injury associated with reduced functional movement. Multiple deep lacerations with areas of devitalized tissue were observed (Figure 1).



Figure 1: Severe multi-digit crush injury involving the index, middle, ring, and little fingers, with sparing of the thumb. Extensive soft tissue damage with contamination and partial amputation of the little finger is evident.

Closer examination by inspection revealed extensive tissue destruction with suspected tendon involvement (Figure 2).



Figure 2: Closer view demonstrating extensive tissue devitalization and exposed structures, with suspected complete tendon loss in the middle finger and partial tendon injury in adjacent digits.

Neurovascular assessment revealed preserved capillary refill in most affected digits, suggesting maintained perfusion, with variable sensory and functional impairment.

Initial emergency management included copious irrigation, debridement of non-viable tissue and simple suturing for hemostasis and temporary soft tissue coverage.

The aim of this intervention was not definitive reconstruction, but rather stabilization, reduction of contamination, and preservation of viable tissue (Figure 3). Although definitive surgical repair was strongly recommended, the patient did not return for further management and was lost to follow-up, likely due to financial limitations.



Figure 3: Post-emergency management following irrigation, debridement, and temporary suturing for hemostasis and soft tissue stabilization.

DISCUSSION

Crush injuries of the hand represent a complex and high-risk form of trauma due to combined involvement of soft tissue, tendon, and potential neurovascular structures. Although these injuries are not typically life-threatening, they are frequently function-threatening and may lead to substantial long-term disability.³

In the present case, the injury involved multi-digits damage, partial amputation, and complete tendon loss features. Such injuries typically require urgent surgical reconstruction to restore function and minimize morbidity. However, this case highlights a critical yet often underrecognized reality in clinical practice: definitive care is not always achieved.⁴

In situations when patients are lost to follow-up or face barriers to accessing surgical care, the quality of initial emergency management becomes a decisive factor in determining outcomes. Early interventions including meticulous irrigation, debridement, and appropriate temporary wound closure play a crucial role to influence outcomes by reducing infection risk, preserving viable tissue, and maintaining the potential for delayed reconstruction.⁵

Importantly, the role of emergency physicians in influencing long-term functional outcomes is often underestimated. This case demonstrates that structured, timely, and function-oriented emergency care can serve as a pivotal intervention, particularly in settings where the continuity of care is disrupted.⁶ In such circumstances, the emergency department may represent

not only the first point of contact, but also the most critical opportunity to optimize patient outcomes.

Furthermore, this case underscores the impact of healthcare access barriers, including financial limitations, which may lead to incomplete treatment and increased risk of permanent disability. Addressing these systemic challenges remains essential to improving both immediate and long-term outcomes in patients with complex hand injuries.

CONCLUSION

Severe hand injuries are not always life-threatening, but they often pose a serious risk to function and may lead to long-term disability. When definitive surgical care is delayed or not achieved, early emergency temporizing management becomes critically important in preserving tissue viability and functional potential. Strengthening early intervention strategies and improving continuity of care are essential to reduce long-term disability.

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