Content available at: https://www.ipinnovative.com/open-access-journals

Indian Journal of Orthopaedics Surgery

Journal homepage: https://ijos.co.in/

Original Research Article

Mutilating hand injuries: Challenging frontier our experience

Gowrishankar Saravanamurthy[1], Khalid Alawadi[2], Chaitanya Gangadhar Dodakundi[3], Nebojsa Jovanovic[2], Basem Saraj[3], Mohamed Fathi Seidam[3], Abdelhakim Marei[3], Hamed Badawi[3]*

[1]Dept. of Orthopaedics, Rashid Hospital, Dubai, United Arab Emirates
[2]Dept. of Orthopaedics, Rashid Hospital, Dubai, United Arab Emirates
[3]Dept. of Orthopaedics Hand and Reconstructive Microsurgery, Rashid Hospital, Dubai, United Arab Emirates

Abstract

Background: Mutilating hand injuries are severe multi-structural traumas that commonly result from high-energy mechanisms such as industrial accidents, kitchen equipment entrapment, road traffic collisions, gunshot wounds, and agricultural machinery injuries. These injuries involve extensive tissue trauma and simultaneous damage to multiple structures, posing significant challenges in restoring hand function and aesthetics.

Aim: This study aimed to present our approach to managing mutilating hand injuries at Rashid Hospital, Dubai, United Arab Emirates.

Materials and Methods: We conducted a retrospective cohort study of 214 patients (including 34 severe cases) who sustained mutilating hand injuries between January 2017 and January 2020. The inclusion criteria encompassed severe soft tissue defects, extensive damage to the digits, metacarpus, or carpus, and amputations. Surgical management followed a structured protocol, including debridement, selective replantation, and soft tissue coverage with split-thickness skin grafts or pedicled/free flaps. Postoperative care included multidisciplinary monitoring, antibiotic therapy, and early rehabilitation. The key parameters assessed were injury extent, number of surgeries, treatment patterns, hospital stay, and complications.

Results: The most common injury was single-finger amputation (48 cases), followed by multiple-finger amputations (21 cases). Severe cases underwent 2–4 surgeries per patient, with hospital stays of 5–19 days. Wound coverage varied and included secondary closure, skin grafts, pedicled and free flaps, and replantation. Complications included infections (35% in severe cases), replantation failure, and joint stiffness. Tailored interventions, early debridement, and structured reconstruction optimized early functional outcomes.

Conclusion: A multistage, individualized surgical approach facilitates functional restoration in patients with mutilating hand injuries. Despite the descriptive nature of this single-center study, our findings highlight the importance of early debridement, revascularization, and soft tissue coverage. Further prospective studies with standardized functional outcome measures are required to validate these results.

Keywords: Mutilating hand injuries, Amputation, Reconstructive surgery, Severe hand injury, Debridement

Received: 14-08-2025; **Accepted:** 10-10-2025; **Available Online:** 20-11-2025

1. Introduction

The hand is a highly complex organ with mechanical and sensory components, including bones, joints, tendons, muscles, skin, and sensory nerves.[1] These structures work together to enable prehension, the ability to grasp and manipulate objects by integrating sensation and motor response.[2] Damage to any component impairs function; for example, an insensate hand in leprosy is as functionally compromised as a paralyzed but a sensate hand in poliomyelitis.[3]

"Mutilating hand injuries" are severe, multi-structural traumas. They commonly result from high-energy mechanisms, including industrial accidents, kitchen equipment entrapment, road traffic collisions, gunshot wounds, and agricultural machinery injury.[4,5] These injuries involve extensive tissue trauma, edema, and simultaneous damage to multiple structures, often leading to a poorer prognosis than clean-cut injuries. The wide variability in severity and tissue involvement makes standardized treatment protocols challenging, although fundamental surgical principles can guide management. Although relatively uncommon, mutilating hand injuries represent a significant burden owing to their complexity and impact on hand function, with incidence rates varying based on industrial exposure and regional factors.

*Corresponding author: Hamed Badawi
Email: sgs2901@yahoo.com

https://doi.org/10.18231/j.ijos.12883.1760085363

Successful reconstruction requires a thorough understanding of the factors influencing decision-making and outcomes. A structured treatment plan with defined goals facilitates functional and psychological recovery, whereas multiple surgical failures may result in suboptimal results. The primary objective is to restore hand function and enable an early return to work.[6] This study focuses on the surgical management of mutilating hand injuries, emphasizing intraoperative assessment and the selection of appropriate reconstructive techniques to optimize the functional outcomes.

2. Materials and Methods

This retrospective cohort study evaluated patients who sustained mutilating hand injuries and underwent reconstructive procedures at Rashid Hospital, Dubai, between January 2017 and January 2020. The inclusion criteria encompassed severe soft tissue defects, extensive damage to the functional structures of the digits, metacarpus, or carpus, and amputations of the hand. Pediatric hand injuries and polytrauma cases involving multiple organ systems were excluded from the study.

All patients initially presented with trauma at our hospital, and only those with fully documented treatment records were included. Data collection involved retrieving injury photographs taken upon arrival in the operating room and intraoperative findings documented in the medical records. Data were extracted from electronic medical records and operative reports and cross-verified by two independent reviewers. Cases with incomplete documentation or missing key variables were excluded from the analysis to maintain dataset integrity.

Each patient's treatment course was evaluated from the initial trauma care through all necessary surgical interventions until the final recorded in- or outpatient visit was completed. We assessed key parameters, including the extent of the injured tissue and the number of surgical procedures performed. Additional parameters included treatment patterns, mean hospital stay duration and complications during hospitalization. Based on these criteria, 34 patients with severe injuries, were analyzed and each case was discussed in a multidisciplinary team meeting before undergoing the reconstruction for a functional hand.

Although the sample size analyzed may seem relatively small, it represents a substantial cohort for such a specific and severe category of trauma patients. Mutilating hand injuries are relatively uncommon, making large-scale prospective studies difficult to conduct.

3. Results

Each case required an individualized approach to reconstruction. The most frequently injured structure was a single amputated finger (48 cases), followed by multiple finger amputations (21 cases). The remaining cases are summarized in **Table 1**. Surgical interventions ranged from simple suturing to more complex procedures. These included multiple finger stump closures and replantation combined with soft-tissue coverage. **(Figure 1)**

Table 1: Demographic and clinical characteristics of patients

	Minimum	**Maximum**	**Mean ± SD**
Age (n=34)	21	57	35.21 ± 10.11
Age groups (years)		Frequency (%)	
21 to 30		12 (35.3%)	
31 to 40		10 (29.4%)	
41 to 50		9 (26.5%)	
51 to 57		3 (8.8%)	
Total		34 (100%)	
Diagnosis		Frequency (%)	
Crush injury hand		16 (47.1%)	
Degloving injury		7 (20.6%)	
Multiple traumatic amputation		9 (26.5)	
Severe crush injury		1 (2.9%)	
Traumatic amputation		1 (2.9%)	
Total		34 (100%)	
Mode of Injury		Frequency (%)	
Grinder machine injury		23 (67.6%)	
Heavy machine injury		10 (29.4%)	
Quad bike injury		1 (2.9%)	
Total		34 (100%)	
	n	**Minimum**	**Maximum**	**Mean ± SD**
Hospital stay	34	9	31	16.82 ± 5.385
1st surgery from the time of injury(hrs)	34	2	12	5.69 ± 2.555
Number of surgeries taken to cover the wound	34	1	4	2.62 ± 1.181

(a)

(b)

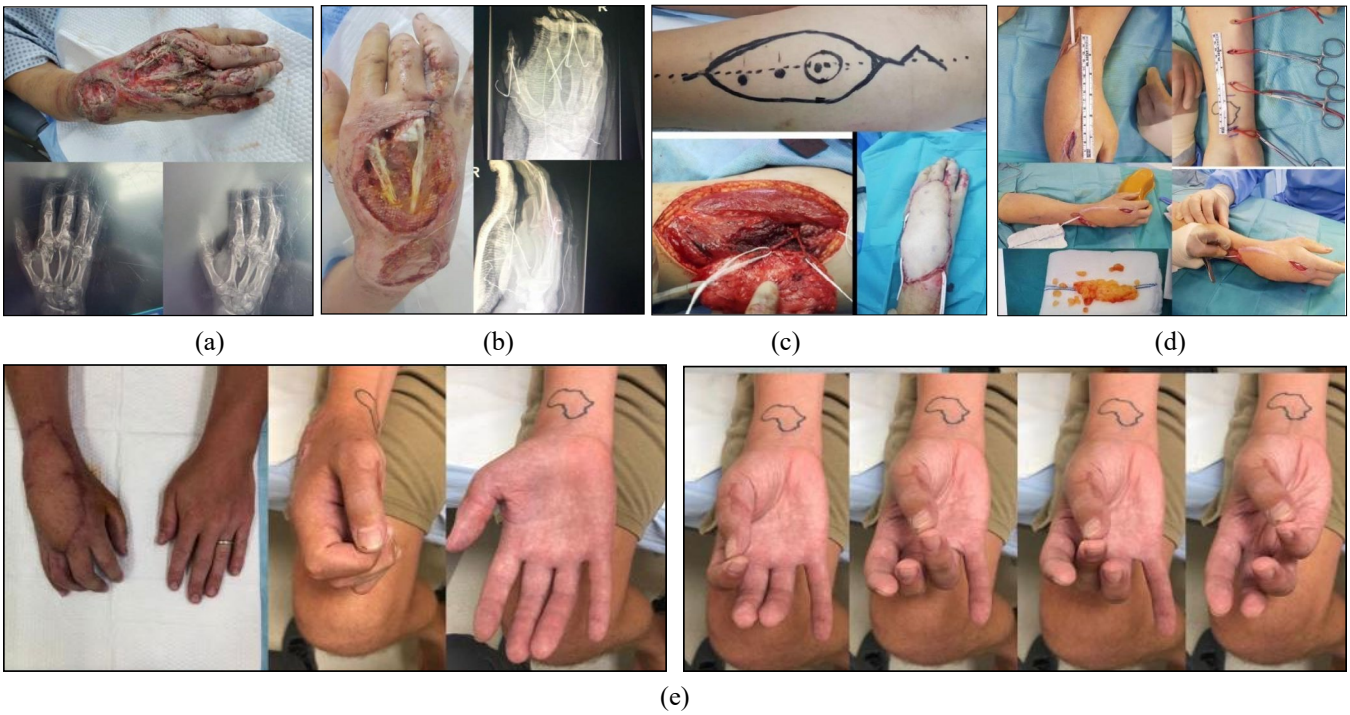
(c)

Figure 1: (a) Degloving injury right hand – avulsion of the skin integument with critical vascularity of the fingers, (b) After initial debridement of the hand, (c) 6 months post rehabilitation

Among the cases, 34 were classified as severe degloving injuries, including finger and wrist-level amputations requiring replantation. These cases required 2–4 surgeries per patient, all performed within a single hospital admission, with reconstructive procedures typically performed 1–3 days after the initial surgery. **(Figure 2)** The mean hospital stay ranged from 5 to 19 days, with a mean duration of 16.90 ± 5.794 days. **(Table 2)**

Table 2: Distribution of patients based on treatment, complications, and outcomes

Treatment	Frequency (%)
Free flap	5 (14.7%)
Pedicled flap	6 (17.6%)
Replantation	9 (26.5%)
Secondary closure	4 (11.8%)
Skin grafting	10 (29.4%)
Total	34 (100%)
Complications	Frequency
No complications	20 (58.8%)
Infection	12 (35.3%)
Non-viable finger	2 (5.9%)
Total	34 (100%)
Complication management	Frequency
No Complications	20 (58.8%)
Amputation of the finger	4 (11.8%)
Debridement	2 (5.9%)
Debridement + skin graft	2 (5.9%)
Intravenous Antibiotics	6 (17.6%)
Total	34 (100%)
Outcome	Frequency
Expat - travelled back to home country	19 (55.9%)
Fair	8 (23.5%)
Good	2 (5.9%)
Stiff	5 (14.7%)
Total	34 (100%)



(a) (b) (c) (d)

(e)

Figure 2: (a) Degloving injury dorsum right hand, (b) Post debridement status, (c) Underwent ALT (Anterolateral thigh) free flap, (d) Flap debulking + extensor tendon reconstruction, (e) Post rehabilitation

Wound coverage in severe cases included secondary closure (4 cases), free flap (5 cases), pedicled flap (6 cases), replantation (9 cases), and skin grafting (10 cases). The most common complication was infection, followed by replantation failure and postoperative stiffness. Among the patients with severe cases, 12 developed infections; 6 were managed with intravenous antibiotics, 2 required debridement, 2 underwent debridement with skin grafting, and 2 underwent amputation. Replantation failure occurred in four of nine cases, two due to non-viable fingers and two due to secondary infection. **(Table 3), (Figure 3)**

Table 3: Mean hospital stays, time to first surgery, and number of surgeries based on complications

	Complications	n	Minimum	Maximum	Mean ± SD
Hospital Stay	No complications	20	9	31	16.90 ± 5.794
	Infection	12	10	28	17.17 ± 5.167
	Non-viable finger	2	12	16	14.00 ± 2.828
1st surgery from the time of injury(hrs)	No complications	20	2	10	5.55 ± 2.528
	Infection	12	3	12	5.71 ± 2.734
	Non-viable finger	2	5	9	7.00 ± 2.828
Number of surgeries taken to cover the wound	No complications	20	1	4	3.05 ± 0.999
	Infection	12	1	4	2.17 ± 1.193
	Non-viable finger	2	1	1	1.00 ± 0.000

(a) (b)

(c)

Figure 3: (a) Traumatic amputation multiple fingers, (b) Replantation of the fingers, (c) Reconstruction of the fingers – for tripod grasp

Table 4: Association between the number of surgeries and patient outcomes

No of surgeries taken to cover the wound		Outcome				Total
		Expat - travelled back to home country	Fair	Good	Stiff	
1	Count (%)	7 (36.8%)	0 (0.0%)	0 (0.0%)	2 (40.0%)	9 (26.5%)
2	Count (%)	2 (10.5%)	2 (25.0%)	0 (0.0%)	1 (20.0%)	5 (14.7%)
3	Count (%)	4 (21.1%)	2 (25.0%)	2 (100%)	2 (40.0%)	10 (29.4%)
4	Count (%)	6 (31.6%)	4 (50.0%)	0 (0.0%)	0 (0.0%)	10 (29.4%)
Total	Count (%)	19 (100%)	8 (100%)	2 (100%)	5 (100%)	34 (100%)
Chi-square value- 12.28; p value-0.198						

Table 5: Association between complications and patient outcomes

Complications		Outcome				Total
		Expat - travelled back to home country	Fair	Good	Stiff	
No Complications	Count (%)	10 (52.6%)	6 (75.0%)	1 (50.0%)	3 (60.0%)	20 (58.8%)
Infection	Count (%)	8 (42.1%)	2 (25.0%)	1 (50.0%)	1 (20.0%)	12 (35.3%)
Non-viable finger	Count (%)	1 (5.3%)	0 (0.0%)	0 (0.0%)	1 (20.0%)	2 (5.9%)
Total	Count (%)	19 (100%)	8 (100%)	2 (100%)	5 (100%)	34 (100%)
Chi-square value- 3.74; p value-0.711						

The outcomes also varied according to the number of surgeries performed. Among the 9 patients who underwent a single surgery, 7 (36.8%) were expatriates who returned to their home countries, and 2 (40.0%) developed joint stiffness, while none had fair or good outcomes. Of the 5 patients who underwent 2 surgeries, 2 (25.0%) achieved fair outcomes, and 1 (20.0%) developed joint stiffness, with no patients achieving good outcomes. Among the 10 patients who underwent 3 surgeries, 4 (21.1%) were expatriates, 2 (25.0%) had fair outcomes, 2 (100%) achieved good outcomes, and 2 (40.0%) experienced joint stiffness. Among the 10 patients who underwent 4 surgeries, 6 (31.6%) were expatriates, and 4 (50.0%) had fair outcomes, with none experiencing good outcomes or joint stiffness. The Chi-square statistic for the association between the number of operations and outcomes was 12.28, with a p-value of 0.198, indicating that there was no statistically significant association. **(Table 4)**

The outcomes also varied based on the presence or absence of complications. Among the 20 patients who had uncomplicated cases, 10 (52.6%) were expatriates who returned to their home countries, 6 (75.0%) had fair outcomes, 1 (50.0%) achieved a good outcome, and 3 (60.0%) experienced joint stiffness. Among the 12 patients with infections, 8 (42.1%) were expatriates, 2 (25.0%) had fair outcomes, 1 (50.0%) achieved a good outcome, and 1 (20.0%) developed joint stiffness. Of the 2 patients with non-viable fingers, 1 (5.3%) was an expatriate and 1 (20.0%) experienced joint stiffness, with no patients achieving fair or good outcomes. The Chi-square value for the association between complications and outcomes was 3.74, with a p-value of 0.711, indicating that there was no statistically significant association. **(Table 5)**

4. Discussion

This study uniquely contributes a sizable cohort analysis from a Middle Eastern tertiary center, highlighting the predominance of single-finger amputations, alongside detailed infection management protocols tailored to high-risk industrial injuries. The findings of this study align with previous reports, indicating that finger amputations constitute the most common form of mutilating hand injuries.[7,8] The observed predominance of single-finger amputations and involvement of the radial digits is consistent with the findings of Hazani *et al.* and Matsuzaki *et al.,* who highlighted the relationship between injury pattern and functional prognosis.[9,10] These observations underscore the importance of early recognition of injury severity and targeted reconstructive strategies to optimize the outcomes. In this study, after the initial repair and reconstruction of vital structures damaged by the injury, priority was given to ensuring stable and definitive skin coverage for the affected hand in cases of soft tissue deficiency. The options for skin coverage ranged from simple split-thickness skin grafts to more complex flap procedures, including both pedicled and free flaps **Figure 1a–b and Figure 2a–b**. The selected skin cover must provide a gliding surface for the underlying tendons to facilitate hand movement and functionality. Flaps were typically used in cases where tendons or vasculature were exposed due to severe tissue loss. Various flap options include the radial forearm flap, lateral arm flap, and groin flap. Free flaps used in reconstruction include the gracilis, rectus abdominis, latissimus dorsi, and serratus anterior flaps. In one case, and in another, a free flap **Figure 2c** was employed to achieve soft tissue coverage, showcasing the versatility and importance of flap-based reconstruction in managing mutilating hand injuries.

Functional outcomes after revascularization and replantation are influenced by multiple factors, including

patient age, injury mechanism, ischemia time, contamination, tissue loss, and compliance with rehabilitation.[11–13] Understanding these variables is essential for surgical decision-making and predicting potential recovery, particularly in cases of multiple-finger or complex upper extremity amputations. This study supports the existing literature suggesting that replantation of viable digits, even in severe injuries, can restore functional grasp, such as a tripod grip, when tailored to the patient's injury pattern.[12–13]

The aggressive, multistage approach observed in this cohort, comprising early debridement, skeletal stabilization, staged soft tissue coverage, and timely replantation, aligns with the principles described by Neumeister and Brown, Aszmann *et al.,* and other reconstructive hand surgeons.[6,14–16] Our experience suggests that performing reconstructive procedures 1–3 days after the initial surgery can optimize tissue viability while minimizing the risk of complications, supporting a shift toward early and intensive salvage strategies. Severe degloving injuries and multi-digit amputations present particular challenges, with a higher risk of complications, such as infection, replantation failure, and stiffness. The observed infection rate highlights recognized risk factors, including extensive tissue loss, contamination, prolonged operative time, and delayed ischemia, consistent with the literature on complex limb reconstruction.[17–21] Our unit's proactive infection prevention measures, including early and thorough debridement, standardized antibiotic protocols, and close collaboration with infectious disease specialists, align with best-practice recommendations and emphasize the value of multidisciplinary management.

Overall, the discussion of reconstructive techniques, timing, and complication management demonstrates that tailored, multistage interventions can achieve meaningful functional restoration in severe hand injuries. Although these findings are descriptive, they reinforce established surgical principles and provide insights into practical approaches for optimizing outcomes in complex hand trauma. The majority of patients in this study were expatriates who returned to their home countries after initial management, leading to loss to follow-up. Consequently, there was a limited opportunity to assess long-term recovery from mutilating hand injuries. The high prevalence of finger amputations emphasizes the need for targeted prevention strategies and specialized treatment approaches. The findings of this study demonstrate the necessity of a comprehensive treatment strategy that incorporates both simple procedures and complex reconstructive techniques to achieve optimal functional outcomes. Future research should incorporate long-term follow-up data and psychosocial rehabilitation to provide a more holistic understanding of patient outcomes.

The relatively high infection rate observed in our cases (35%) warrants further investigation. Although a sub analysis was not performed, several potential risk factors may have contributed to this outcome. Extensive soft tissue loss and contamination, particularly in industrial or crush-related injuries, are well-established predictors of infection.[22,23] Prolonged surgical duration and multiple operative stages may also increase the risk of bacterial colonization, as reported in previous studies on complex limb reconstruction.[24] In addition, delayed presentation and ischemia in replantation cases may further predispose patients to infection and tissue necrosis.[25] These factors highlight the importance of meticulous surgical techniques, early debridement, and strict adherence to infection control protocols in managing mutilating hand injuries. Literature underscores the importance of early and aggressive management of mutilating hand injuries to restore hand function and improve overall outcomes.[4] Techniques such as microsurgical free tissue transfers have demonstrated high success rates, with 88.7% of patients reportedly returning to work following such procedures.[25] This aligns with the present study's implication that although multiple surgeries may not significantly enhance outcomes, timely surgical intervention and the application of effective techniques can positively impact recovery. For less severe injuries, a more conservative approach involving simpler procedures is recommended to reduce the risk of prolonged recovery times and complications.[25] This recommendation is supported by Ozcelik et al., who found that despite advances in surgical techniques, the complexity of hand injuries often leads to variable outcomes, emphasizing the need for tailored treatment strategies based on the specifics of each case.[24]

Our findings support early-stage reconstructive approaches with multidisciplinary collaboration, demonstrating the feasibility and outcomes specific to our demographic context.

5. Limitations and Future Directions

This study had several limitations. Its retrospective design inherently restricts the ability to control for confounding factors, and the single-center nature of the study limits the generalizability of the findings to other institutions and populations.

The scope of this study was further constrained by its demographic context. A large proportion of patients were expatriate workers who returned to their home countries after the initial treatment, resulting in incomplete follow-up data and limiting the ability to evaluate long-term functional and psychosocial outcomes. This demographic reality poses a common challenge in regions with highly mobile populations. Furthermore, standardized functional outcome measures, such as the Disabilities of the Arm, Shoulder, and Hand (DASH) score, were not used.

The primary objective of this study was to document surgical management strategies and immediate postoperative complications rather than assess long-term functional recovery. Consequently, direct comparisons with studies using standardized outcome instruments are limited.

Future multicenter, prospective studies incorporating standardized evaluation tools, such as the DASH score, along with long-term follow-up assessments, are warranted to validate and expand these findings.

7. Conclusion

In conclusion, this retrospective study provides descriptive insights into the spectrum of surgical management strategies for mutilating hand injuries. These findings highlight the importance of timely debridement, skeletal stabilization, revascularization, and soft tissue coverage for achieving early functional restoration. However, these observations are based on a single-center retrospective cohort and should be interpreted with caution. Further multicenter prospective studies using standardized functional outcome measures are needed to validate and expand these results.

8. Source of Funding

None.

9. Conflict of Interest

None.

10. Ethical No.

MBRU IRB-2023-229

11. Acknowledgement

None.

References

1. Lahiri A. Managing Mutilating Hand Injuries. *Clin Plast Surg*. 2019;46(3):351–7. https://doi.org/10.1016/j.cps.2019.02.009
2. Kalsi-Ryan S, Beaton D, Curt A, Duff S, Jiang D, Popovic MR, et al. Defining the Role of Sensation, Strength, and Prehension for Upper Limb Function in Cervical Spinal Cord Injury. *Neurorehabilitation and Neural Repair*. 2014;28(1):66–74. https://doi.org/10.1177/1545968313490998
3. Chung KC. Repairing and Reconstructing the Hand and Wrist. *Clin Plast Surg*. 2019;46(3):351–57. Available from: https://www.plasticsurgery.theclinics.com/article/S0094-1298(19)30019-7/fulltext
4. Agarwal R, Agarwal D, Agarwal M. Approach to mutilating hand injuries. Journal of Clinical Orthopaedics and Trauma. 2019;10(5):849–52. http://dx.doi.org/10.1016/j.jcot.2019.08.004
5. Alphonsus CK. Principles in the management of a mangled hand. *Indian J Plast Surg*. 2011;44(2):219–26. https://doi.org/10.4103/0970-0358.85343
6. Neumeister MW, Brown RE. Mutilating hand injuries: principles and management. *Hand Clin.* 2003;19(1):1–15. https://doi.org/10.1016/s0749-0712(02)00141-5
7. Kawaiah A, Thakur M, Garg S, Kawasmi SH, Hassan A. Fingertip injuries and amputations: A review of the literature. *Cureus*. 2020;12(5). https://doi.org/10.7759/cureus.8291
8. Borne A, Porter A, Recicar J, Maxson T, Montgomery C. Pediatric traumatic amputations in the United States: A 5-year review. *J Pediatr Orthop*. 2017;37(2):e104-e7. https://doi.org/10.1097/bpo.0000000000000693
9. Hazani R, Buntic RF, Brooks D. Patterns in blast injuries to the hand. *HAND*. 2008;4(1):44-9. https://doi.org/10.1007/s11552-008-9125-z
10. Matsuzaki H, Narisawa H, Miwa H, Toishi S. Predicting functional recovery and return to work after mutilating hand injuries: Usefulness of campbell's hand injury severity score. *J Hand Surg Am*. 2009;34(5):880–85. https://doi.org/10.1016/j.jhsa.2009.02.009
11. del Pinal F. Severe mutilating injuries to the hand: guidelines for organizing the chaos. Journal of plastic, reconstructive & aesthetic surgery. 2007 Jul 1;60(7):816-27. Available from: http://dx.doi.org/10.1016/j.bjps.2007.02.019
12. Stanger K, Horch RE, Dragu A. Severe mutilating injuries with complex macroamputations of the upper extremity–is it worth the effort?. *World J Emerg Surg*. 2015;10(1):30. https://doi.org/10.1186/s13017-015-0025-6
13. Sugun TS, Ozaksar K, Ada S, Kul F, Ozerkan F, Kaplan I, Ademohlu Y, Kayalar M, Bal E, Toros T, Bora A. Long-term results of major upper extremity replantations. Acta Orthop Traumatol Turc. 2009;43(3):206-13. https://doi.org/10.3944/AOTT.2009.206
14. Aszmann OC, Vujaklija I, Roche AD, Salminger S, Herceg M, Sturma A, et al. Elective amputation and bionic substitution restore functional hand use after critical soft tissue injuries. *Sci Rep*. 2016;6(1):34960. https://doi.org/10.1038/srep34960
15. Buncke GM, Buntic RF, Romeo O. Pediatric mutilating hand injuries. *Hand Clin*. 2003;19(1):121–31. https://doi.org/10.1016/s0749-0712(02)00076-8
16. Vitaz TW, Oishi M, Welch WC, Gerszten PC, Disa JJ, Bilsky MH. Rotational and transpositional flaps for the treatment of spinal wound dehiscence and infections in patient populations with degenerative and oncological disease. *J Neurosurg Spine*. 2004;100(1):46–51. https://doi.org/10.3171/spi.2004.100.1.0046
17. Ilenghoven D, Ibrahim S, Mohd Yussof SJ. Harnessing the degloved palm in crush injury management. *Cureus*. 2024. https://doi.org/10.7759/cureus.63386
18. Zhou F, Zhang X, Zhang Y, Xiang G, Luo P, Hu W, et al. Comprehensive management of degloving soft tissue injuries of the extremity: A 12-year retrospective study. *Injury*. 2024;55(12):111939. https://doi.org/10.1016/j.injury.2024.111939
19. Gur E, Tiftikcioglu YO, Kuybulu TF, Durukan K, Yegin ME, Ozkayin N. Emergency and delayed microsurgical salvage of traumatic lower extremities. *J Surg Med.* 2023;7(4):288-94. https://doi.org/10.28982/josam.7613
20. Çoban YK, Öcük Ö, Bekircan K. Wrapping degloved fingers with a distal-based radial forearm perforator flap: a repair method for multiple digital degloving injury. Ulus Travma Acil Cerrahi Derg. 2017;23(6):525–7. https://doi.org/10.5505/tjtes.2017.57227
21. Singh M, Li H, Nuutila K, Collins KC, Wall J, Riviello R, et al. Innovative Techniques for Maximizing Limb Salvage and Function. *J Burn Care Res*. 2017;38(3):e670-e7. https://doi.org/10.1097/BCR.0000000000000442
22. Kuşcu B, Gurbuz K, Dogar F. Reconstruction techniques for upper extremity crush injuries with massive tissue loss and open fractures: a prospective study. *Eur Rev Med Pharmacol Sci*. 2024;28(12):3810-3821. https://doi.org/10.26355/eurrev_202406_36457
23. Hartung M. Degloving injury of the foot. Case study. *Radiopaedia.org.* 2023. https://doi.org/10.53347/rID-160082 (Accessed 7 Aug 2025)
24. Tsantes AG, Papadopoulos DV, Goumenos S, Petrou E, Trikoupis IG, Roustemis A, et al. Prevalence, microbiological features, and risk factors for periprosthetic joint infections in oncologic patients following tumor resection and megaprosthetic reconstruction. *J Bone Jt Infect*. 2025;10(5):337–45. https://doi.org/10.5194/jbji-10-337-2025
25. Harbour PW, Malphrus E, Zimmerman RM, Giladi AM. Delayed digit replantation: What is the evidence? *J Hand Surg Am.* 2021;46(10):908–16. https://doi.org//10.1016/j.jhsa.2021.07.007

Cite this article: Saravanamurthy G, Alawadi K, Dodakundi CG, Jovanovic N, Saraj B, Seidam MF, et al. Mutilating hand injuries: Challenging frontier our experience. *Indian J Orthop Surg.* 2025;11(3):241–248.