

Fingertip Injuries

title: "Fingertip Injuries" slug: fingertip-injuries region: hand audience: patient mesh_terms: ["Finger Injuries", "Amputation, Traumatic", "Surgical Flaps", "Fingers", "Plastic Surgery Procedures", "Hand Injuries", "Replantation", "Nails"] article_count: 549 model_used: Qwen3.6-35B-A3B-Q8_0.gguf generated_at: '2026-06-16T19:34:33+00:00' key_articles: - title: "Fingertip Injuries in Children: Epidemiology, Financial Burden, and Implications for Prevention" ref_num: 1 evidence_tier: paper evidence_level: 4 doi: 10.1177/1558944716670139 year: 2016 - title: "COMPLICATIONS OF FINGERTIP INJURIES" ref_num: 2 evidence_tier: paper evidence_level: 5 doi: 10.1016/s0749-0712(21)01040-4 year: 1994 - title: "Antibiotic Prophylaxis in the Management of Distal Fingertip Amputation and Crush Injury" ref_num: 3 evidence_tier: paper evidence_level: 3 doi: 10.1016/j.jhsg.2023.07.010 year: 2023 - title: "Management of partial fingertip amputation in adults: Operative and non operative treatment" ref_num: 4 evidence_tier: paper doi: 10.1016/j.injury.2017.10.042 year: 2017 - title: "Parallelogram flap versus homodigital island flap in the treatment of fingertip defects with bone exposure: a prospective controlled study" ref_num: 5 evidence_tier: paper evidence_level: 2 doi: 10.1186/s13018-022-03214-1 year: 2022 - title: "Functional Reconstruction of Subtotal Thumb Metacarpal Defect With a Vascularized Medial Femoral Condyle Flap: Case Report" ref_num: 6 evidence_tier: case_report evidence_level: 4 doi: 10.1016/j.jhsa.2014.06.002 year: 2014 - title: "Digital avulsion injuries: epidemiology and factors influencing finger preservation" ref_num: 7 evidence_tier: paper evidence_level: 4 doi: 10.1007/s00402-020-03576-3 year: 2020 - title: "Fingertip repair methods: choices for different fingers and sides emphasizing sensation" ref_num: 8 evidence_tier: paper evidence_level: 5 doi: 10.1177/1753193419876496 year: 2019 - title: "Pediatric Fingertip Injuries: Association With Child Abuse" ref_num: 9 evidence_tier: paper evidence_level: 3 doi: 10.1016/j.jhsg.2019.09.001 year: 2020 - title: "Finger amputations and pulp defects distal to the distal interphalangeal joint" ref_num: 11 evidence_tier: paper evidence_level: 5 doi: 10.1177/1753193419873554 year: 2019 - title: "Comparative assessment of fingertip replantation in paediatric and adult patients within a single institution" ref_num: 13 evidence_tier: paper evidence_level: 4 doi: 10.1177/17531934211002476 year: 2021 - title: "Severe hand injuries resulting from Samurai sword assaults: a Dublin case series" ref_num: 14 evidence_tier: paper evidence_level: 4 doi: 10.1177/1753193410381576 year: 2010 - title: "The Biomechanical Impact of Digital Loss and Fusion Following Trauma" ref_num: 15 evidence_tier: paper evidence_level: 5 doi: 10.1016/j.hcl.2016.07.003 year: 2016 - title: "Patient-Reported Outcomes and Functional Assessment After Treatment of Open Fingertip Injuries" ref_num: 16 evidence_tier: paper evidence_level: 4 doi: 10.1177/175899830701200302 year: 2007 - title: "Retrospective Analysis of Functional Outcome of Distal Fingertip Replants Without Heparin" ref_num: 17 evidence_tier: paper evidence_level: 4 doi: 10.1016/j.jhsg.2024.02.018 year: 2025 - title: "Prevalence,

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Overview

- Fingertip injuries in children are common and result in significant burden [1].
- Most fingertip injuries in children are preventable [1].
- Most fingertip injuries in children occur at home, often involving a door or window [1].
- Injuries to the fingertip must be treated with the same care as other hand surgery [2].
- Treatment of fingertip injuries should provide coverage to the tip of the finger with good quality skin [2].
- Treatment of fingertip injuries should aim for the best sensibility possible [2].
- The incidence of infection after distal fingertip amputation and crush injury is 2.5% [3].
- There is no meaningful difference in infection rates between groups with and without prophylactic antibiotics after distal fingertip injuries [3].
- The low incidence of infection and lack of difference between groups call into question prophylactic antibiotic prescribing after distal fingertip injuries [3].
- The parallelogram flap is a better choice for reconstruction of fingertip injury compared to the homodigital island flap in cases with bone exposure [5].
- Functional reconstruction of subtotal thumb metacarpal defect with a vascularized medial femoral condyle flap allows the patient to regain satisfactory grip and thumb function [6].
- Functional reconstruction of subtotal thumb metacarpal defect with a vascularized medial femoral condyle flap results in minimal donor site morbidity [6].
- Finger survival rate after ring avulsion injuries is mostly influenced by the extent of intrinsic damage [7].
- There is a lack of strong evidence, such as randomized controlled trials, to support clinical experience with very distal finger replantation [11].
- It is highly difficult to conduct well-designed prospective studies for very distal finger replantation [11].
- Paediatric fingertip replantation is recommended whenever possible because of the good outcomes achievable [13].
- Paediatric fingertip replantation is technically demanding [13].

- Minimal requirements for the hand are a stable wrist and 2 opposing sensate digits [15].
- Preservation of thumb-finger pinch and digito-palmar grip takes priority following digital loss and fusion [15].
- There is insufficient evidence to determine the best treatment method for composite defects of the fingertips [19].
- The lack of prospective randomized trials and disparate retrospective case series contributes to insufficient evidence for treating composite fingertip defects [19].
- Specific indications for toe-to-hand transfers in congenital hand anomalies are defined based on the presence or absence of the thumb and fingers [21].
- The extended step-advancement flap is a viable alternative to replantation of the avulsed amputated fingertip [27].

Anatomy & Pathophysiology

- Minimal requirements for hand function include a stable wrist and two opposing sensate digits [15].
- Preservation of thumb-finger pinch takes priority in functional hand requirements [15].
- Preservation of digito-palmar grip takes priority in functional hand requirements [15].
- The hand requires at least two sensate digits that can oppose with some power for functional prehension [26].
- Sensation constitutes 40% of the goal in thumb or fingertip repair [23].
- Length and appearance account for 50% of the goal in thumb or fingertip repair [23].
- A normal hand is not achievable through reconstruction, but improved function in sensibility, movement, communication, emotion, psychological, or aesthetic factors is achievable [28].
- Digit replantation does not restore premorbid hand function but results in adequate hand function [47].
- Basic function can almost always be restored in most severe upper limb injuries using current reconstructive techniques [51].
- Microsurgical toe-to-hand transplantation provides thumb and finger reconstruction superior to conventional techniques in appearance and function for the mutilated hand [48].
- The primary disadvantage of pollicization of the second metacarpal is narrowing of the palm width, which may result in reduced grip strength in manual laborers [46].
- Early placement of the hand in the position of function minimizes late complications such as restricted motion [35].
- The importance of a flexor-tendon graft in the severely injured hand is judged by its contribution to overall function rather than the exact degree of motion obtained [53].

Classification

- Fingertip injuries in children are common and result in a significant burden, yet are mostly preventable [1].
- Most fingertip injuries in children occur at home, specifically involving doors or windows [1].
- Patients presenting with abuse are significantly more likely to have fingertip injuries during childhood compared with those without recorded abuse [9].
- Fingertip injuries in childhood may be indicative of abuse or neglect [9].
- The severity of firework-related hand injuries can range from superficial burns to devastating loss of hand and digits [24].
- The PNB classification separates fingertip injuries into their effect on the pulp, nail, and bone [38].
- The PNB classification provides a three-digit number that accurately describes the injury for documentation, treatment instructions, and referral indications [38].
- The proposed classification for major degloving injuries of the upper limb clarifies decision-making for revascularization [56].
- AV shunting alone is indicated for palm-only injuries in the proposed degloving injury classification [56].
- Combined AV shunting and digital artery revascularization is required for injuries involving digits in the proposed degloving injury classification [56].

Clinical Presentation

- Fingertip injuries in children are common and result in a significant burden [1].
- Most fingertip injuries in children are preventable [1].
- Most fingertip injuries in children occur at home, specifically involving doors or windows [1].
- Patients presenting with abuse are significantly more likely to have fingertip injuries during childhood compared with those without recorded abuse [9].
- Fingertip injuries in childhood may be indicative of abuse or neglect [9].
- Severe hand injuries resulting from Samurai sword assaults can cause devastating loss of function [14].
- The severity of firework-related hand injuries can range from superficial burns to devastating loss of hand and digits [24].
- Patients continued to experience symptoms long-term after treatment of open fingertip injury, particularly cold intolerance or Trauma-Induced Cold Associated Symptoms (TICAS) [16].
- Long-term function was not significantly affected in some cases despite persistent symptoms [16].
- Significant differences in cold intolerance incidence were observed in age and specific digit involved, with a lower incidence in younger patients and the ring finger group [18].

Investigations

- Fingertip injuries in children are common and result in significant burden [1].
- Most fingertip injuries in children are preventable [1].
- Most fingertip injuries in children occur at home, often involving a door or window [1].
- Patients presenting with abuse are significantly more likely to have fingertip injuries during childhood compared with those without recorded abuse [9].
- Fingertip injuries in childhood may be indicative of abuse or neglect [9].

Treatment

- Fingertip injuries in children are mostly preventable, with most occurring at home in a door or window [1].
- Treatment of fingertip injuries requires providing coverage to the tip of the finger with good quality skin and the best sensibility possible [2].
- The low incidence of infection (2.5%) and lack of meaningful difference between groups question the utility of prophylactic antibiotic prescribing after distal fingertip amputation and crush injury [3].
- Management of partial fingertip amputation in adults depends on the degree of injury, employing various operative and non-operative techniques [4].
- The parallelogram flap is a better choice than the homodigital island flap for reconstruction of fingertip injuries with bone exposure [5].
- Functional reconstruction of subtotal thumb metacarpal defects with a vascularized medial femoral condyle flap allows patients to regain satisfactory grip and thumb function with minimal donor site morbidity [6].
- Finger survival rate after ring avulsion injuries is mostly influenced by the extent of intrinsic damage, despite microsurgical advances [7].
- There is a lack of strong evidence, such as randomized controlled trials, to support clinical experience with very distal finger replantation [11].
- Paediatric fingertip replantation is recommended whenever possible due to the good outcomes achievable, despite being technically demanding [13].
- Minimal requirements for hand function include a stable wrist and 2 opposing sensate digits, with preservation of thumb-finger pinch and digito-palmar grip taking priority [15].
- Distal fingertip replants without heparin show favorable functional outcomes [17].
- There is insufficient evidence to determine the best treatment method for composite defects of the fingertips due to the lack of prospective randomized trials and disparate retrospective case series [19].
- Specific indications for toe-to-hand transfers are defined based on the presence or absence of the thumb and fingers [21].
- The extended step-advancement flap is a viable alternative to replantation for preserving finger length in avulsed amputated fingertips [27].

- Age alone should not be an absolute contraindication to finger replantation [34].
- The ulnar artery distal cutaneous descending branch is an ideal free flap design for finger wound coverage due to its simple surgical method and high survival rate [40].
- Split-thickness nail bed flap grafts effectively achieve aesthetic and functional repair of distal partial digit defects combined with soft tissue loss [41].
- Treatment approaches for common hand problems vary significantly between Asian and European surgeons, with Europeans favoring conservative management and spontaneous regeneration for fingertip defects while Asians more frequently utilize flaps and replantation [43].
- Management of thumb tip injuries has evolved with an expanded armamentarium of versatile flaps and less donor site morbidity [45].
- Conservative treatment with semi-occlusive dressings has gained ground for thumb pulp injuries, yielding excellent results in contour and sensibility restoration [45].
- Conservative treatment with semioclusive dressings has become more acceptable for fingertip and thumb tip injuries due to excellent results in restoring contour, sensibility, and aesthetics [54].

Complications

- Fingertip injuries in children are common and result in a significant burden [1].
- Most fingertip injuries in children are preventable [1].
- Most fingertip injuries in children occur at home, specifically involving doors or windows [1].
- Patients presenting with abuse are significantly more likely to have fingertip injuries during childhood compared with those without recorded abuse [9].
- Fingertip injuries in childhood may be indicative of abuse or neglect [9].
- The finger survival rate after ring avulsion injuries is mostly influenced by the extent of intrinsic damage, despite microsurgical advances and high levels of surgical expertise [7].
- Severe hand injuries resulting from Samurai sword assaults can cause devastating loss of function for victims [14].
- Poor results of treatment for fingertip injuries are directly related to the extensive nature of the injury to the fingers [20].
- The low incidence of infection (2.5%) and lack of a meaningful difference between groups call into question prophylactic antibiotic prescribing after distal fingertip amputation and crush injuries [3].
- Patients continued to experience symptoms long-term after treatment of open fingertip injury, particularly cold intolerance or Trauma-Induced Cold Associated Symptoms (TICAS) [16].
- Long-term function was not significantly affected in some cases despite persistent symptoms like cold intolerance after open fingertip injury treatment [16].
- Significant differences in cold intolerance incidence were observed in age and specific digit involved, with a lower incidence in younger patients and the ring finger group after reverse digital artery flap [18].

- Primary terminalization for acute fingertip injuries is associated with excellent long-term patient-reported outcomes [32].
- Primary terminalization for acute fingertip injuries is associated with high levels of satisfaction [32].
- Primary terminalization for acute fingertip injuries is associated with a low rate of complications [32].
- One in three patients report long-term neuropathic pain after primary terminalization for acute fingertip injuries [32].
- In cases where an oblique triangular flap was advanced more than 12 mm, sensory disturbance of the fingertip occurred and did not subside [58].

Recovery

- Fingertip injuries in children are common and result in a significant burden, yet are mostly preventable [1].
- Most fingertip injuries in children occur at home, often involving doors or windows [1].
- The incidence of infection after distal fingertip amputation and crush injury is low (2.5%) [3].
- There is no meaningful difference in infection rates between groups, questioning the utility of prophylactic antibiotic prescribing after distal fingertip injuries [3].
- Sensation recovery is of primary importance for fingertip injuries [8].
- There is a lack of strong evidence, such as randomized controlled trials, to support clinical experience with very distal finger replantation [11].
- It is highly difficult to conduct well-designed prospective studies for very distal finger replantation [11].
- Patients continue to experience symptoms long-term after treatment of open fingertip injuries, particularly cold intolerance or Trauma-Induced Cold Associated Symptoms (TICAS) [16].
- Long-term function is not significantly affected in some cases of open fingertip injury despite persistent symptoms [16].
- Distal fingertip replants performed without heparin show favorable functional outcomes [17].
- Poor results of treatment for finger injuries are directly related to the extensive nature of the injury [20].
- Thumb replantation interventions have positive long-term functional outcomes [22].
- Long-term results of thumb replantation confirm satisfactory outcomes in terms of general upper limb function, handgrip, and pinch strength [44].
- Long-term results of thumb replantation confirm satisfactory outcomes in terms of social and work reintegration [44].
- Delaying digital replantation overnight yields survival results comparable to immediate replantation in selected cases [57].
- Primary terminalization for acute fingertip injuries is associated with excellent long-term patient-reported outcomes [32].
- Primary terminalization for acute fingertip injuries is associated with high levels of satisfaction [32].

- Primary terminalization for acute fingertip injuries is associated with a low rate of complications [32].
- One in three patients report long-term neuropathic pain after primary terminalization for acute fingertip injuries [32].
- Aesthetic and functional outcomes of reconstructed thumbs and fingers using the vascularized half-big toenail flap significantly improve [42].
- Donor site functional morbidity is minimum when using the vascularized half-big toenail flap for aesthetic reconstruction [42].
- The duration of ectopic banking of bony phalanges before thumb reconstruction should be no more than 2 weeks [62].

Key Evidence

- [L4] Fingertip injuries in children are common and result in significant burden, yet are mostly preventable, with most injuries occurring at home in a door or window. ([10.1177/1558944716670139](#))
- [L5] Injuries to the fingertip must be treated with the same care as is used for all other hand surgery, providing coverage to the tip of the finger with good quality of skin and with the best sensibility possible. ([10.1016/s0749-0712\(21\)01040-4](#))
- [L3] The low incidence of infection (2.5%) and lack of a meaningful difference between groups call into question prophylactic antibiotic prescribing after these distal fingertip injuries. ([10.1016/j.jhsg.2023.07.010](#))
- [Paper] However, the precise management of a fingertip injury in adults depends on the degree of injury itself, and a number of operative and non-operative techniques may be successfully employed. ([10.1016/j.injury.2017.10.042](#))
- [L2] This method is a better choice for reconstruction of fingertip injury. ([10.1186/s13018-022-03214-1](#))
- [Case_report] The patient regained satisfactory grip and thumb function with minimal donor site morbidity. ([10.1016/j.jhsa.2014.06.002](#))
- [L4] Despite microsurgical advances and high levels of surgical expertise the finger survival rate after ring avulsion injuries still seems to be mostly influenced by the extent of intrinsic damage. ([10.1007/s00402-020-03576-3](#))
- [L5] Sensation recovery is of primary importance for fingertip injuries. ([10.1177/1753193419876496](#))
- [L3] Patients presenting with abuse are significantly more likely to have fingertip injuries during childhood compared with those without recorded abuse, which suggests that these injuries may be ones of abuse or neglect. ([10.1016/j.jhsg.2019.09.001](#))
- [L5] The authors state there is a lack of strong evidence such as randomized controlled trials to support clinical experience with very distal finger replantation, though they believe it is highly difficult to conduct well-designed prospective studies for this procedure. ([10.1177/1753193419873554](#))
- [L4] Although technically demanding, paediatric fingertip replantation is recommended, whenever possible, because of the good outcomes achievable. ([10.1177/17531934211002476](#))

- [L4] This case series demonstrates the extent and severity of hand injuries that can be caused by sword assaults with devastating loss of function for the victims. ([10.1177/1753193410381576](#))
- [L5] Minimal requirements for the hand are a stable wrist and 2 opposing sensate digits, with preservation of thumb-finger pinch and digito-palmar grip taking priority. ([10.1016/j.hcl.2016.07.003](#))
- [L4] Patients continued to experience symptoms long-term after treatment of open fingertip injury, particularly 'cold intolerance' or 'Trauma-Induced Cold Associated Symptoms' (TICAS), although function was not significantly affected in some cases. ([10.1177/175899830701200302](#))
- [L4] This study suggests favorable functional outcomes for distal fingertip replants without heparin. ([10.1016/j.jhsg.2024.02.018](#))
- [L4] Significant differences were observed in age and specific digit involved, with a lower incidence in younger patients and the ring finger group. ([10.1177/1753193415596438](#))
- [L5] There is insufficient evidence to determine the best treatment method for composite defects of the fingertips due to the lack of prospective randomized trials and disparate retrospective case series. ([10.1016/j.jhsa.2008.07.001](#))
- [L4] The study defines specific indications for toe transfers based on the presence or absence of the thumb and fingers. ([10.1007/s11552-013-9534-5](#))
- [L4] Results confirm and strengthen evidence of positive long-term functional outcomes of thumb replantation interventions. ([10.1016/j.injury.2020.11.006](#))
- [L5] Sensation is the most important factor in thumb or fingertip repair, constituting 40% of the goal, while length and appearance account for 50%. ([10.1177/17531934211051303](#))
- [L4] The severity of firework-related injury can range from superficial burns to devastating loss of hand and digits. ([10.1016/j.jhsa.2014.08.041](#))
- [L5] The hand requires a stable wrist and at least two sensate digits that can oppose with some power for functional prehension. ([10.1016/s0749-0712\(02\)00130-0](#))
- [L4] It is a viable alternative to replantation of the fingertip. ([10.1016/j.jhsa.2010.10.008](#))
- [L4] A normal hand is not achievable but a hand with improved function in terms of sensibility, movement, communication, emotion, psychological or aesthetic factors is achievable. ([10.1177/175899839900400302](#))
- [L4] Primary terminalization for acute fingertip injuries is associated with excellent long-term patient-reported outcomes, high levels of satisfaction, and a low rate of complications, despite one in three patients reporting long-term neuropathic pain. ([10.1177/17531934241247276](#))
- [L3] Age alone should not be an absolute contraindication to finger replantation. ([10.1016/j.jhsa.2011.01.031](#))
- [L4] Early placement of the hand in the position of function minimizes late complications such as restricted motion. ([10.2106/00004623-195436020-00007](#))
- [L5] The PNB classification separates fingertip injuries into their effect on the pulp, nail, and bone, providing a three-digit number that accurately describes the injury for documentation, treatment instructions, and referral indications. ([10.1054/jhsb.1999.0305](#))

- [L4] The simple surgical method and high survival rate make this flap design ideal for finger wound coverage. ([10.1016/j.injury.2009.04.009](#))
- [L4] The outcomes showed that this technique effectively achieves aesthetic and functional repair of a distal partial digit defect. ([10.1016/j.jhsa.2020.02.018](#))
- [L4] The aesthetic and functional outcomes of the reconstructed thumbs and fingers significantly improved, and donor site functional morbidity was minimum. ([10.1016/j.jhsg.2020.05.005](#))
- [L5] Treatment approaches for common hand problems vary significantly between Asian and European surgeons, with Europeans favoring conservative management and spontaneous regeneration for fingertip defects while Asians more frequently utilize flaps and replantation. ([10.1016/j.hcl.2017.04.010](#))
- [L4] The long-term results of thumb replantation confirm satisfactory outcomes in terms of general upper limb function, handgrip and pinch strength, and social and work reintegration. ([10.1016/j.injury.2012.11.009](#))
- [L5] The management of thumb tip injuries has evolved with an expanded armamentarium of versatile flaps and less donor site morbidity, while conservative treatment with semi-occlusive dressings has gained ground for pulp injuries, yielding excellent results in contour and sensibility restoration. ([10.1016/j.jhsa.2014.09.028](#))
- [L4] The primary disadvantage is narrowing of the palm width, which may result in reduced grip strength in manual laborers. ([10.1016/j.jhsa.2016.06.005](#))
- [L1] Digit replant does not restore premorbid hand function but does result in adequate hand function. ([10.1177/1558944719834658](#))
- [L4] In the mutilated hand microsurgical toe-to-hand transplantation provides thumb and finger reconstruction that is superior to conventional techniques in appearance and function. ([10.1016/s0749-0712\(02\)00127-0](#))
- [L4] Even in most severe injuries of the upper limb, basic function can almost always be restored using the current available reconstructive armamentarium. ([10.1016/j.hcl.2016.06.003](#))
- [L4] The importance of a flexor-tendon graft in the severely injured hand is judged by the contribution to the over-all function rather than the exact degree of motion obtained. ([10.2106/00004623-196244070-00008](#))
- [L5] The article provides an update on the most commonly used flaps and semioclusive dressing treatments for fingertip and thumb tip injuries, noting that conservative treatment with semioclusive dressings has become more acceptable due to excellent results in restoring contour, sensibility, and aesthetics. ([10.1016/j.jhsa.2017.01.022](#))
- [L4] The proposed classification clarifies decision-making for revascularization: AV shunting alone is indicated for palm-only injuries, while combined AV shunting and digital artery revascularization is required for injuries involving digits. ([10.1016/j.injury.2013.01.025](#))
- [L4] The results of delaying replantation of digits overnight give results comparable with those of immediate replantation in selected cases. ([10.1016/j.jhsa.2018.03.047](#))
- [L3] In cases where the flap was advanced more than 12 mm, sensory disturbance of the fingertip occurred and did not subside. ([10.1016/j.jhsa.2008.02.022](#))

- [L4] The duration of banking before thumb reconstruction should be no more than 2 weeks. ([10.1016/j.jhsa.2022.06.027](https://doi.org/10.1016/j.jhsa.2022.06.027))

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