CQ HAND + UPPER LIMB
SPECIALIST ORTHOPAEDIC SURGEON

EVIDENCE SUMMARY

Hand Tendon and Nerve Injuries

title: “Hand Tendon and Nerve Injuries” slug: tendon-and-nerve-repair region: hand audience: patient mesh_terms: [“Hand Injuries”, “Nerve Transfer”, “Finger Injuries”, “Fingers”, “Peripheral Nerve Injuries”, “Ulnar Nerve”, “Tendon Transfer”, “Median Nerve”] article_count: 98 model_used: Qwen3.6-35B-A3B-Q8_0.gguf generated_at: ‘2026-06-16T19:27:21+00:00’ key_articles: - title: “Management of Ulnar Nerve Injuries” ref_num: 1 evidence_tier: paper evidence_level: 5 doi: 10.1016/j.jhsa.2014.04.038 year: 2015 - title: “Preserved finger flexion following high median nerve transection: a rare case report and review of literature” ref_num: 2 evidence_tier: case_report evidence_level: 4 doi: 10.1186/s12891-025-08469-3 year: 2025 - title: “Tendon versus nerve transfers – balancing hand function in upper extremity high nerve injuries” ref_num: 3 evidence_tier: paper evidence_level: 5 doi: 10.1177/17531934261416300 year: 2026 - title: “Outcomes in Ballistic Injuries to the Hand: Fractures and Nerve/Tendon Damage as Predictors of Poor Outcomes” ref_num: 4 evidence_tier: paper evidence_level: 4 doi: 10.1177/15589447221092111 year: 2022 - title: “Nerve Transfer Versus Nerve Graft for Reconstruction of High Ulnar Nerve Injuries” ref_num: 5 evidence_tier: paper evidence_level: 4 doi: 10.1016/j.jhsa.2017.01.027 year: 2017 - title: “Distal Sensory Nerve Transfers in Lower-Type Injuries of the Brachial Plexus” ref_num: 6 evidence_tier: paper evidence_level: 4 doi: 10.1016/j.jhsa.2012.02.047 year: 2012 - title: “Experimental sensory reinnervation of the median nerve by nerve transfer in monkeys” ref_num: 7 evidence_tier: paper evidence_level: 5 doi: 10.2106/00004623-197759030-00016 year: 1977 - title: “Exploring 20 years of peripheral nerve injuries of the upper extremity: An analysis of median, radial, and ulnar nerve injuries presenting to US emergency departments” ref_num: 8 evidence_tier: paper evidence_level: 4 doi: 10.1016/j.jht.2026.02.012 year: 2026 - title: “Nerve Transfer for Restoration of Ulnar Fingers Flexion Through Pronator Teres Motor Branch: A Cadaveric Feasibility Study” ref_num: 9 evidence_tier: paper evidence_level: 5 doi: 10.1016/j.jhsg.2025.100844 year: 2026 - title: “Biomechanics and hand trauma: what you need” ref_num: 10 evidence_tier: paper evidence_level: 5 doi: 10.1016/s0749-0712(02)00130-0 year: 2003 - title: “Avulsion Injuries to the Brachial Plexus and the Value of Motor Reinnervation by Ipsilateral Nerve Transfer” ref_num: 11 evidence_tier: paper evidence_level: 5 doi: 10.1054/jhsb.2000.0460 year: 2000 - title: “End-to-side Distal Anterior Interosseous Nerve Transfer in Treatment of Proximal Ulnar Nerve Injuries” ref_num: 12 evidence_tier: paper evidence_level: 4 doi: 10.1016/s0363-5023(11)60008-7 year: 2011 - title: “The Triad of Multiple Metacarpal Fractures and/or Dislocations of the Fingers, Severe Hand Swelling and Clinical Evidence of Acute Median Nerve Dysfunction” ref_num: 13 evidence_tier: paper evidence_level: 4 doi: 10.1177/1753193408087105 year: 2008 - title: “Vascularized Ulnar Nerve Graft for Reconstruction of a Large Defect of the Median or Radial Nerves After Severe Trauma of the Upper Extremity” ref_num: 14

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ref_num: 38 evidence_tier: paper evidence_level: 5 doi: 10.1016/j.jhsa.2014.10.007 year: 2015 - title: “The quadriga phenomenon: a review and clinical relevance” ref_num: 39 evidence_tier: paper evidence_level: 5 doi: 10.1177/1753193411430810 year: 2011 - title: “Flexor-Tendon Reconstruction in Severely Damaged Hands” ref_num: 40 evidence_tier: paper evidence_level: 4 doi: 10.2106/00004623-197153050-00001 year: 1971 - title: “Ulnar Nerve Tendon Transfers for Pinch” ref_num: 41 evidence_tier: paper evidence_level: 5 doi: 10.1016/j.hcl.2016.03.007 year: 2016 - title: “Evaluation of Injured Structures and Circulation of Fingers From Photos Taken in the Emergency Department After Hand Injury” ref_num: 43 evidence_tier: paper evidence_level: 4 doi: 10.1016/j.jhsa.2024.07.009 year: 2024 synthesis_version: “v2” verifier_status: skipped

Overview

- Early neurorrhaphy of acute nerve injuries provides the best outcome [1].
- Distal motor nerve transfers should be considered to preserve hand intrinsic motor function when nerve injuries occur at or above the proximal forearm [1].
- Nerve transfer is favored over nerve grafting in managing high ulnar nerve injuries because of better improvement of motor power and better restoration of grip functions of the hand [5].
- In lower-type injuries of the brachial plexus, transfer of median nerve branches that innervate the palm of the hand to the ulnar proper digital nerve of the little finger predictably restored protective sensation on the ulnar side of the hand [6].
- End-to-side distal anterior interosseous nerve transfer provides significantly better results than a standard more proximal nerve repair in the treatment of proximal ulnar nerve injuries [12].
- Vascularized ulnar nerve grafts should be recommended for reconstruction of the median or radial nerves in selected cases involving large defects after severe trauma of the upper extremity [14].
- High median nerve injuries result in absent thumb and index finger flexion and pulp anesthesia, which do not benefit from nerve grafting but are amenable to nerve transfers [25].
- Tendon transfers remain the primary reconstructive procedure for paralytic injuries of the upper limb until sufficiently powered studies of nerve transfer outcomes are published [36].
- Experimental studies and positive reports from large clinical series suggest that new techniques using foreign nerves for reinnervation are worthy of integration into the management of upper brachial plexus injuries, though many questions regarding timing, donor morbidity, and comparative efficacy remain unanswered [11].
- Clinically, nerve transfer to the median nerve using parts of the ulnar and radial nerves may offer an alternative option for proximal nerve injuries or for free functioning muscle transplantations [16].
- The biomechanical principles, indications and limitations of tendon transfers, nerve transfers and combined approaches are compared, with particular attention to timing, patient selection, and functional goals [3].

Anatomy & Pathophysiology

- Early neurorrhaphy of acute nerve injuries provides the best outcome [1].
- Distal motor nerve transfers should be considered to preserve hand intrinsic motor function when nerve injuries occur at or above the proximal forearm [1].
- High median nerve transection results in a specific clinical presentation of hand function [2].
- Biomechanical principles, indications, and limitations of tendon transfers, nerve transfers, and combined approaches depend on timing, patient selection, and functional goals [3].
- Ballistic injuries to the hand are frequently associated with fractures and neurovascular and tendon injuries [4].
- Upper extremity peripheral nerve injuries involve the median, radial, and ulnar nerves [8].
- A nerve transfer for restoration of ulnar finger flexion through the pronator teres motor branch can be suggested in cases where the hand is partially involved to allow patients to regain or strengthen finger flexion [9].
- Functional prehension requires a stable wrist and at least two sensate digits that can oppose with some power [10].
- Severe hand injuries from sword assaults can cause devastating loss of function [15].
- In combined proximal median and ulnar nerve injuries, restoring ulnar intrinsic function is critical to avoid blunt traditional anticlaw procedures, even if it requires some sacrifice of thumb motors [23].
- Opposition transfers do not require large amounts of strength to achieve thumb positioning; the mechanics and vector of pull are of paramount importance [28].
- An ulnar nerve to musculocutaneous nerve transfer in an ulnar ray-deficient infant with brachial plexus birth palsy resulted in active elbow flexion to 90° at 18 months without motor deficits in the hand [30].
- Opposition is a preparatory position for grasp involving abduction, flexion, and pronation, primarily driven by the thenar intrinsic muscles [31].
- A distally based extensor digiti minimi tendon transfer maximizes adducting force and overcomes reciprocal inhibition to correct a persistently abducted little finger [32].
- There is no significant difference in hand function between border and central finger digital nerve injuries, except for lower grip strength in central finger injuries [33].
- Outcomes for pediatric mutilating hand injuries tend to be better than in adults regarding mobility, sensory return, and appearance [37].
- The quadriga phenomenon is caused by interconnected flexor digitorum profundus tendons and significantly affects clinical situations including strength testing, movement assessment, and rehabilitation exercise selection [39].

Classification

- Early neurorrhaphy of acute nerve injuries provides the best outcome [1].
- Distal motor nerve transfers should be considered to preserve hand intrinsic motor function when nerve injuries occur at or above the proximal forearm [1].
- High median nerve transection presents with preserved finger flexion [2].
- Tendon transfers, nerve transfers, and combined approaches are distinguished by their biomechanical principles, indications, limitations, timing, patient selection, and functional goals [3].
- Ballistic injuries to the hand are frequently associated with fractures and neurovascular and tendon injuries [4].
- Nerve transfer is favored over nerve grafting in managing high ulnar nerve injuries due to better improvement of motor power and better restoration of grip functions [5].
- Transfer of median nerve branches that innervate the palm of the hand to the ulnar proper digital nerve of the little finger predictably restores protective sensation on the ulnar side of the hand in lower-type brachial plexus injuries [6].
- Transfer of the superficial radial or dorsal cutaneous branch of the ulnar nerve, or both, produces successful restoration of innervation of the thumb, index, and long fingers in experimental sensory reinnervation models [7].
- Upper extremity peripheral nerve injuries include median, radial, and ulnar nerve injuries [8].
- Nerve transfer for restoration of ulnar finger flexion through the pronator teres motor branch can be suggested in cases where the hand is partially involved to allow patients to regain or strengthen finger flexion [9].
- Vascularized ulnar nerve grafts should be recommended for reconstruction of median or radial nerves in selected cases with large defects after severe upper extremity trauma [14].
- Diagnosis-specific model instruments for outcome after nerve repair at the wrist or distal forearm level include new test instruments for assessment of tactile gnosis [21].
- Supercharged end-to-side anterior interosseous nerve transfer (SETS) exhibits a remarkable role in treating high ulnar nerve damage by supplying intrinsic muscles and allowing for proximal nerve regeneration [27].
- A reliable tendon prosthesis inserted as one stage in tendon reconstruction is an additional step needed to improve results of flexor-tendon reconstructive surgery in hands with severe damage [40].

Clinical Presentation

- Early neurorrhaphy of acute nerve injuries provides the best outcome [1].
- Distal motor nerve transfers should be considered to preserve hand intrinsic motor function when nerve injuries occur at or above the proximal forearm [1].
- High median nerve transection can present with preserved finger flexion [2].

- Ballistic injuries to the hand are frequently associated with fractures and neurovascular and tendon injuries [4].
- Nerve transfer is favored over nerve grafting in managing high ulnar nerve injuries because of better improvement of motor power and better restoration of grip functions of the hand [5].
- In lower-type injuries of the brachial plexus, transfer of median nerve branches that innervate the palm of the hand to the ulnar proper digital nerve of the little finger predictably restored protective sensation on the ulnar side of the hand [6].
- Transfer of the superficial radial or dorsal cutaneous branch of the ulnar nerve, or both, produced successful restoration of innervation of the thumb and index and long fingers [7].
- Upper extremity peripheral nerve injuries present to emergency departments [8].
- Nerve transfer for restoration of ulnar fingers flexion through the pronator teres motor branch can be suggested in cases where the hand is partially involved to allow patients to regain or strengthen finger flexion [9].
- End-to-side distal anterior interosseous nerve transfer in treatment of proximal ulnar nerve injuries provides significantly better results than a standard more proximal nerve repair [12].
- The triad of multiple metacarpal fractures and/or dislocations of the fingers, severe hand swelling, and clinical evidence of acute median nerve dysfunction can occur [13].
- Severe hand injuries resulting from sword assaults can cause devastating loss of function [15].
- The choice of surgical technique and timing for peripheral nerve injury depends on the type of trauma, site of injury, and time elapsed since injury [17].
- Spontaneous recovery occurs in 70%–88% of radial nerve injuries [17].
- Direct radial to ulnar nerve transfer via an interosseous tunnel safely and effectively restored intrinsic function before terminal muscle degeneration in a patient with combined proximal median and ulnar nerve injury [19].
- The prognosis for recovery of peripheral neuropathies is good unless the nerve has been completely destroyed [22].
- Traumatic neurapraxia in digital nerve injuries of the hand is not uncommon and has a favourable prognosis [29].

Investigations

- Ballistic injuries to the hand are frequently associated with fractures and neurovascular and tendon injuries [4].
- Evaluation based only on a photograph taken in the emergency department was insufficient for the detection of neurovascular bundle injuries, tendon ruptures, and fractures [43].
- The hand requires a stable wrist and at least two sensate digits that can oppose with some power for functional prehension [10].

Treatment

- Early neurorrhaphy of acute nerve injuries provides the best outcome [1].
- Distal motor nerve transfers should be considered to preserve hand intrinsic motor function when nerve injuries occur at or above the proximal forearm [1].
- Nerve transfer is favored over nerve grafting in managing high ulnar nerve injuries because of better improvement of motor power and better restoration of grip functions of the hand [5].
- In lower-type injuries of the brachial plexus, transfer of median nerve branches that innervate the palm of the hand to the ulnar proper digital nerve of the little finger predictably restored protective sensation on the ulnar side of the hand [6].
- Transfer of the superficial radial or dorsal cutaneous branch of the ulnar nerve, or both, produced successful restoration of innervation of the thumb and index and long fingers in experimental sensory reinnervation models [7].
- Nerve transfer using the pronator teres motor branch can be suggested in cases where the hand is partially involved to allow patients to regain or strengthen finger flexion [9].
- Experimental studies and positive reports from large clinical series suggest that new techniques using foreign nerves for reinnervation are worthy of integration into the management of upper brachial plexus injuries [11].
- End-to-side distal anterior interosseous nerve transfer provides significantly better results than a standard more proximal nerve repair in the treatment of proximal ulnar nerve injuries [12].
- Vascularized ulnar nerve grafts should be recommended for reconstruction of the median or radial nerves in selected cases involving large defects after severe trauma of the upper extremity [14].
- Clinically, nerve transfer using parts of the ulnar and radial nerves may offer an alternative option for proximal nerve injuries or for free functioning muscle transplantations [16].
- Distal nerve transfers for the treatment of high ulnar nerve injuries allow for a shorter reinnervation period and improved ulnar intrinsic recovery, which is critical to function of the hand [18].
- The thenar branch of the median nerve may support ulnar nerve regeneration and help prevent intrinsic muscles from irreversible atrophy, though the procedure requires validation by future clinical data [20].
- In devastating combined proximal median and ulnar nerve injuries, some sacrifice of thumb motors may be necessary to restore ulnar intrinsic function and avoid blunt traditional anticlaw procedures [23].
- High median nerve injuries result in absent thumb and index finger flexion and pulp anesthesia, which do not benefit from nerve grafting but are amenable to nerve transfers [25].
- Early nonsurgical management for up to 6 months in adults and 9 months in children has expanded from closed humeral shaft fractures to include operative fractures that do not require nerve exposure, secondary palsies, and distal third humerus fractures [26].
- Supercharged end-to-side anterior interosseous nerve transfer (SETS) exhibits a remarkable role in the treatment of high ulnar nerve damage by supplying intrinsic muscles and allowing for proximal nerve regeneration [27].

- The thenar motor branch (OP branch) consistently reached the deep terminal motor branch of the ulnar nerve without tension, supporting its use to restore pinch after ulnar nerve injuries [35].
- When nonoperative treatment fails, tendon transfers may be used for ulnar nerve injuries, with preferred options including ECRB to AP, APL to first DI, and splint FPL to EPL transfers evaluated on an individual basis [41].

Complications

- Ballistic injuries to the hand are frequently associated with fractures and neurovascular and tendon injuries [4].
- Spontaneous recovery occurs in 70%–88% of radial nerve injuries [17].
- Full recovery of median nerve function was seen in all patients with the triad of multiple metacarpal fractures/dislocations, severe hand swelling, and acute median nerve dysfunction at a mean final follow-up of 7 months [13].
- All patients with the triad of multiple metacarpal fractures/dislocations, severe hand swelling, and acute median nerve dysfunction were able to return to work [13].
- High ulnar nerve injuries can result in loss of ulnar intrinsic motor function [1].
- High ulnar nerve injuries can lead to irreversible atrophy of intrinsic muscles [20].
- Nerve transfers have revolutionized care for peripheral nerve injuries [24].
- Nerve transfers have revolutionized care for peripheral nerve injuries [38].

Recovery

- Early neurorrhaphy of acute nerve injuries provides the best outcome [1].
- Distal motor nerve transfers should be considered to preserve hand intrinsic motor function when nerve injuries occur at or above the proximal forearm [1].
- Ballistic injuries to the hand are frequently associated with fractures and neurovascular and tendon injuries [4].
- Nerve transfer is favored over nerve grafting in managing high ulnar nerve injuries because of better improvement of motor power [5].
- Nerve transfer is favored over nerve grafting in managing high ulnar nerve injuries because of better restoration of grip functions of the hand [5].
- Transfer of the superficial radial or dorsal cutaneous branch of the ulnar nerve, or both, produced successful restoration of innervation of the thumb and index and long fingers in experimental sensory reinnervation studies [7].
- The hand requires a stable wrist for functional prehension [10].

- The hand requires at least two sensate digits that can oppose with some power for functional prehension [10].
- New techniques using foreign nerves for reinnervation are worthy of integration into the management of upper brachial plexus injuries, though many questions regarding timing, donor morbidity, and comparative efficacy remain unanswered [11].
- At a mean final follow-up of 7 months, full recovery of median nerve function was seen in all patients with the triad of multiple metacarpal fractures/dislocations, severe hand swelling, and acute median nerve dysfunction [13].
- All patients with the triad of multiple metacarpal fractures/dislocations, severe hand swelling, and acute median nerve dysfunction were able to return to work [13].
- Nerve transfer to the median nerve using parts of the ulnar and radial nerves may offer an alternative option for proximal nerve injuries or for free functioning muscle transplantations [16].
- The choice of surgical technique and timing for peripheral nerve injury of the upper extremity depends on the type of trauma, site of injury, and time elapsed since injury [17].
- Spontaneous recovery occurs in 70%–88% of radial nerve injuries [17].
- Distal nerve transfers for the treatment of high ulnar nerve injuries allow for a shorter reinnervation period [18].
- Distal nerve transfers for the treatment of high ulnar nerve injuries allow for improved ulnar intrinsic recovery [18].
- Improved ulnar intrinsic recovery is critical to function of the hand [18].
- Direct radial to ulnar nerve transfer via an interosseous tunnel safely and effectively restored intrinsic function before terminal muscle degeneration in a patient with combined proximal median and ulnar nerve injury [19].
- The prognosis for recovery of peripheral neuropathies is good unless the nerve has been completely destroyed [22].
- Nerve transfers have revolutionized care for peripheral nerve injuries [24].
- Additional long-term follow-up and case series are warranted for nerve transfers in peripheral nerve injuries [24].
- Early nonsurgical management for up to 6 months in adults is indicated for radial nerve injuries associated with closed humeral shaft fractures [26].
- Early nonsurgical management for up to 6 months in adults is indicated for radial nerve injuries associated with operative fractures that do not require nerve exposure [26].
- Early nonsurgical management for up to 6 months in adults is indicated for radial nerve injuries associated with secondary palsies [26].
- Early nonsurgical management for up to 6 months in adults is indicated for radial nerve injuries associated with distal third humerus fractures [26].
- Early nonsurgical management for up to 9 months in children is indicated for radial nerve injuries associated with closed humeral shaft fractures [26].

- Scarring from injury or previous surgery compromises results in flexor-tendon grafts in the fingers and thumb [44].
- Joint stiffness compromises results in flexor-tendon grafts in the fingers and thumb [44].
- Nerve damage compromises results in flexor-tendon grafts in the fingers and thumb [44].
- The level of injury does not influence results in flexor-tendon grafts in the fingers and thumb [44].
- Time to operation does not influence results in flexor-tendon grafts in the fingers and thumb [44].

Key Evidence

- [L5] Early neurorrhaphy of acute nerve injuries provides the best outcome, but consideration should also be given to performing distal motor nerve transfers to preserve hand intrinsic motor function when injuries occur at or above the proximal forearm. (10.1016/j.jhsa.2014.04.038)
- [Case_report] This case contributes further to our understanding of the clinical presentation of hand function following high median nerve transection. (10.1186/s12891-025-08469-3)
- [L5] The biomechanical principles, indications and limitations of tendon transfers, nerve transfers and combined approaches are compared, with particular attention to timing, patient selection, and functional goals. (10.1177/17531934261416300)
- [L4] Ballistic injuries to the hand are frequently associated with fractures and neurovascular and tendon injuries. (10.1177/15589447221092111)
- [L4] Nerve transfer is favored over nerve grafting in managing high ulnar nerve injuries because of better improvement of motor power and better restoration of grip functions of the hand. (10.1016/j.jhsa.2017.01.027)
- [L4] In lower-type injuries of the brachial plexus, transfer of median nerve branches that innervate the palm of the hand to the ulnar proper digital nerve of the little finger predictably restored protective sensation on the ulnar side of the hand. (10.1016/j.jhsa.2012.02.047)
- [L5] Transfer of the superficial radial or dorsal cutaneous branch of the ulnar nerve, or both, produced successful restoration of innervation of the thumb and index and long fingers. (10.2106/00004623-197759030-00016)
- [L4] This study provides a critical overview of upper extremity peripheral nerve injuries. (10.1016/j.jht.2026.02.012)
- [L5] This specific procedure can be suggested in cases where the hand is partially involved to allow patients to regain or strengthen fingers flexion. (10.1016/j.jhsg.2025.100844)
- [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)
- [L5] Experimental studies and positive reports from large clinical series suggest that new techniques using foreign nerves for reinnervation are worthy of integration into the management of upper brachial plexus injuries, though many questions regarding timing, donor morbidity, and comparative efficacy remain unanswered. (10.1054/jhsb.2000.0460)

- [L4] It provides significantly better results than a standard more proximal nerve repair. (10.1016/s0363-5023(11)60008-7)
- [L4] At a mean final follow-up of 7 months, full recovery of median nerve function was seen in all patients, and all patients were able to return to work. (10.1177/1753193408087105)
- [L4] This technique should be recommended for reconstruction of the median or radial nerves in selected cases. (10.1016/j.jhsa.2005.03.017)
- [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] Clinically, this technique may offer an alternative option for proximal nerve injuries or for free functioning muscle transplantations. (10.1054/jhsb.2000.0389)
- [L4] The choice of surgical technique and timing depends on the type of trauma, site of injury, and time elapsed since injury, with spontaneous recovery occurring in 70%–88% of radial nerve injuries. (10.1177/17531934241240867)
- [L5] Distal nerve transfers for the treatment of high ulnar nerve injuries allow for a shorter reinnervation period and improved ulnar intrinsic recovery, which is critical to function of the hand. (10.1016/j.hcl.2015.12.009)
- [Case_report] Direct radial to ulnar nerve transfer via an interosseous tunnel safely and effectively restored intrinsic function before terminal muscle degeneration in a patient with combined proximal median and ulnar nerve injury. (10.1016/j.jhsa.2014.04.013)
- [L4] The thenar branch of the median nerve may support ulnar nerve regeneration and help prevent intrinsic muscles from irreversible atrophy, but the report is preliminary and the procedure should be validated by future clinical data. (10.1177/1753193416675069)
- [L5] The paper reviews the developmental process of a diagnosis-specific Model instrument for outcome after nerve repair at wrist or distal forearm level, including a new test instrument for assessment of tactile gnosis. (10.1016/s0749-0712(03)00003-9)
- [L3] The prognosis for recovery is good unless the nerve has been completely destroyed. (10.2106/00004623-197658010-00011)
- [Letter] The authors acknowledge the concerns regarding potential thumb function loss but emphasize the critical need to restore ulnar intrinsic function to avoid blunt traditional anticlaw procedures, suggesting that some sacrifice of thumb motors may be necessary in devastating combined proximal median and ulnar nerve injuries. (10.1016/j.jhsa.2014.10.067)
- [Letter] The original authors state that nerve transfers have revolutionized care for peripheral nerve injuries and that additional long-term follow-up and case series are warranted. (10.1016/j.jhsa.2014.07.058)
- [L4] High median nerve injuries result in absent thumb and index finger flexion and pulp anesthesia, which do not benefit from nerve grafting but are amenable to nerve transfers. (10.1016/j.hcl.2015.12.008)
- [L5] Early nonsurgical management for up to 6 months in adults and 9 months in children has expanded from closed humeral shaft fractures to include operative fractures that do not require nerve exposure, secondary palsies, and distal third humerus fractures. (10.5435/jaaos-d-17-00325)

- [L4] SETS exhibit a remarkable role in the treatment of high ulnar nerve damage by supplying intrinsic muscles and allowing for proximal nerve regeneration. (10.1186/s12891-024-07650-4)
- [L5] Opposition transfers do not require large amounts of strength to achieve the goal of thumb positioning; the mechanics and vector of pull are of paramount importance. (10.1016/j.hcl.2016.03.005)
- [L4] Traumatic neurapraxia in digital nerve injuries of the hand is not uncommon and has a favourable prognosis. (10.1007/s00402-007-0299-6)
- [Case_report] The procedure resulted in active elbow flexion to 90° at 18 months without motor deficits in the hand. (10.1016/j.jhsa.2010.06.014)
- [L5] Opposition is a preparatory position for grasp involving abduction, flexion, and pronation, primarily driven by the thenar intrinsic muscles. (10.1016/j.hcl.2011.09.004)
- [L4] The novel tendon transfer technique maximizes adducting force and overcomes reciprocal inhibition, resulting in normal finger position at 9 months. (10.1177/1753193411421096)
- [L3] No significant difference was seen in hand function between border and central finger injuries, except for lower grip strength in central finger injuries. (10.1177/17531934241286116)
- [L4] The OP branch consistently reached the deep terminal motor branch of the ulnar nerve without tension, supporting its use to restore pinch after ulnar nerve injuries. (10.1177/17531934251389494)
- [L5] Tendon transfers remain the primary reconstructive procedure for paralytic injuries of the upper limb until sufficiently powered studies of nerve transfer outcomes are published. (10.1177/1753193419864838)
- [L5] The treatment of mutilating hand injuries in children is challenging but outcomes tend to be better than in adults regarding mobility, sensory return, and appearance. (10.1016/s0749-0712(02)00076-8)
- [L5] The authors welcome interest in their work on nerve transfers for complex injuries, stating that while no perfect strategies exist, nerve transfers have revolutionized care and that additional long-term follow-up and case series are warranted. (10.1016/j.jhsa.2014.10.007)
- [L5] The quadriga phenomenon, caused by interconnected flexor digitorum profundus tendons, significantly affects clinical situations including strength testing, movement assessment, and rehabilitation exercise selection; understanding its anatomy and biomechanics improves diagnosis and treatment. (10.1177/1753193411430810)
- [L4] The authors conclude that a reliable tendon prosthesis inserted as one stage in tendon reconstruction is the additional step needed to improve the results of flexor-tendon reconstructive surgery in hands with severe damage. (10.2106/00004623-197153050-00001)
- [L5] When nonoperative treatment fails, tendon transfers may be used, with preferred options including ECRB to AP, APL to first DI, and splint FPL to EPL transfers evaluated on an individual basis. (10.1016/j.hcl.2016.03.007)
- [L4] Similarly, evaluation based only on the photograph was insufficient for the detection of neurovascular bundle injuries, tendon ruptures, and fractures. (10.1016/j.jhsa.2024.07.009)

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