

Hand Tendon and Nerve Injuries

The tendons and nerves on the palm side of the hand sit in narrow channels close to the skin. Cuts and lacerations often involve more than one structure.

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What you're feeling

You may notice a sudden loss of movement or sensation in your hand or fingers. This often happens after an injury, such as a cut, crush, or high-impact trauma. You might find that your fingers do not straighten or bend as they should. Simple tasks like holding a coffee cup, turning a doorknob, or typing can become difficult or impossible. If the injury involves both tendons and nerves, you may experience weakness alongside numbness or tingling.

Pain can vary depending on the specific structures involved. You might feel sharp pain at the site of the injury, or a dull ache that worsens with activity. In some cases, a painful neuroma may develop. This is a sensitive scar tissue on a nerve that can cause shooting pains or extreme sensitivity to touch. You may also notice swelling or stiffness in the hand and wrist, especially if tendinopathy is present. These conditions are diagnosed through your history and physical examination, helping us understand the source of your discomfort.

Symptoms often flare up after using your hand for prolonged periods. You might feel increased pain or weakness at the end of the day. Morning stiffness is also common, making it hard to grip objects immediately upon waking. If you have a nerve injury, you may experience changes in sensation that affect your ability to feel temperature or texture. These changes can make daily routines challenging. It is important to recognize these signs early. Prompt referral to an upper extremity specialist can help optimise your recovery and restore function.

What's actually happening

Your hand relies on a delicate balance of nerves and tendons to work smoothly. Nerves act like electrical wires, sending signals from your brain to tell your muscles when to move. Tendons are the strong cords that connect those muscles to your bones, pulling them to create motion. When these systems are injured, the communication breaks down. You might feel numbness, weakness, or a loss of grip strength because the signals cannot reach their destination or the cords cannot pull effectively.

In some cases, the injury involves both the nerves and the tendons together. This can happen after trauma or in conditions like rheumatoid arthritis. When one part fails, it often stresses the other. For example, if a nerve is damaged, the muscles it controls may weaken, making it harder for your tendons to grip objects tightly. This is why you might find it difficult to hold items with smaller circumferences. The hand is complex, and even if your wrist strength or range of motion is slightly reduced, your hand can still function well if the core structures are managed correctly.

Sometimes, the problem is not just a break in the wire or cord, but a change in how they slide. Pulleys are small rings of tissue that hold tendons close to the bone, acting like guide ropes. If these pulleys become inflamed or damaged, the tendon can bowstring away from the bone. This changes how force is applied, making simple tasks like making a fist slower and less powerful. Sensation is also critical here. For thumb or fingertip repairs, restoring feeling is often the most important goal, accounting for a significant portion of your recovery success. Without proper sensation, protecting your hand becomes much harder.

Your surgeon will examine these structures carefully to understand exactly where the breakdown is occurring. This involves checking your grip, your sensation, and how your tendons move under the skin. Accurate diagnosis ensures that the repair addresses the root cause, whether that is rerouting a tendon to restore thumb movement or repairing a nerve to bring back feeling. The goal is always to limit stiffness and preserve as much natural mobility and function as possible for your daily life.

What we can do about it

Dr Kieran Hirpara, an upper-limb surgeon at Mater Private Hospital Rockhampton, starts with the least invasive options that suit your condition. Patients are generally referred to our clinic by their GP; if a physiotherapist has suggested you see us, you will still need a referral from your GP in order to be eligible for the Medicare rebate. A clinic assessment (history, examination, and imaging where needed) establishes the diagnosis. For degenerative or long-standing problems we usually try non-operative care – activity change, physiotherapy or hand therapy, splinting, and injections – and consider surgery when that has not given enough improvement. For structural or acute problems, surgery may be recommended straight away, without a preceding non-operative trial.

You can start with self-management and physiotherapy. Resting the injured area and using ice can help reduce swelling. A physiotherapist will guide you through gentle movements to keep your joints flexible. They will also teach you exercises to strengthen the muscles around the injury. This approach aims to restore normal motion and function. You should give this conservative care a fair chance to work before considering other options.

If pain persists, your surgeon may discuss medical management. This can include pain medication or anti-inflammatory drugs to help with discomfort. In some cases, we may recommend an injection. Cortisone injections can reduce inflammation and pain for a period of time. Hyaluronic acid or platelet-rich plasma (PRP) injections may also be used to support healing. These treatments do not cure the injury but can provide relief while you recover.

Surgery is considered when conservative care has not provided enough improvement or when the injury is severe. For example, if a tendon is torn, we may repair it directly or use a tendon transfer to restore movement.

If a nerve is damaged, we might explore nerve repair or use a nerve graft. In cases of radial nerve palsy, tendon transfers offer an important alternative to microsurgical nerve reconstruction. This is particularly useful when early return to work and daily activities is important. We will discuss the best option for you based on your specific injury and goals.

What to expect

Your recovery depends on the specific injury and the treatment chosen. If you have a nerve injury, sensation may not return fully. Only 24% of repaired nerves regain sensory recovery close to or equivalent to estimated pre-injury levels. Nerve recovery is a slow process. Follow-up time and age significantly influence the outcome. You may see significant improvements in your total score throughout the follow-up period.

If your nerve injury is severe, your surgeon may recommend a tendon transfer. This procedure uses healthy tendons to restore function when nerve repair is not possible or does not result in useful function. Tendon transfer offers an important alternative to microsurgical nerve reconstruction. It is particularly useful when early professional and social reintegration is important. On pooled analysis, tendon transfers had higher rates of superior clinical outcomes as compared with nerve transfers and nerve grafts for isolated radial nerve palsy.

You can expect some stiffness and swelling after surgery. These are common short-term adverse outcomes. Major complications such as nerve injury or deep infection are uncommon. Most patients are satisfied with the result of complex reconstruction despite the high prevalence of postoperative complications. Your surgeon will create a rehabilitative protocol individualized to fit your tendon pathology and surgery. Early rehabilitation following hand tendon repair is beneficial.

If you leave an injury untreated, long-term disability is more likely, especially if fractures are present. Primary tendon repair yields nearly normal restoration if performed early in a sharp wound. Delayed repair often requires grafts with far from perfect results. Secondary reconstruction remains an important and useful technique for complicated flexor tendon injuries or those that have failed primary repair. Your surgeon will discuss which option offers the best chance for you to regain function.

When to see someone

See your GP if you have persistent pain, weakness, or instability that does not improve with rest. Ask for a specialist review if your hand locks, gives way, or if symptoms interfere with sleep or work. Sudden worsening of symptoms also warrants prompt attention. The presence of fractures is associated with a higher incidence of nerve and tendon injuries. Involvement of these structures is linked to an increased risk of long-term disability. Patients with an injury pattern that may lead to nerve injury warrant prompt referral to an upper extremity specialist in an effort to optimise outcomes.

In more depth

This section goes further than you need for your own treatment decisions. Tendon and nerve repair in the hand is worth the extra reading because the operation is only half the treatment – what happens in the following weeks determines the result as much as the repair itself, and the evidence there has become quite specific.

MOVING EARLY BEATS PROTECTING

After a flexor tendon repair, two things compete. Move the finger and the repair may rupture; keep it still and the tendon scars to its sheath, so it heals intact but cannot glide – a stiff finger with a healed tendon inside it.

Across **569** patients, the **early active motion group obtained greater total active motion** than the early passive motion group. The qualification matters as much as the finding: a **higher risk of rupture** was noted in the active flexion-and-extension subgroup where the repair used only a **2-strand core suture** [1].

That is the trade stated precisely. Early active movement produces better final motion, but it demands a repair strong enough to withstand it. This is why the number of strands crossing the repair is discussed at all – it is not technical detail for its own sake, but what determines whether the safer, better rehabilitation can be used.

THE RELATIVE MOTION APPROACH, AND WHERE ITS EVIDENCE ACTUALLY APPLIES

Relative motion orthoses hold the injured finger in slightly different alignment from its neighbours, unloading the repair while allowing the hand to be used. It is a considerable advance in tolerability over immobilising a hand for six weeks.

The evidence base is uneven, and worth knowing accurately. There is now **good evidence that the relative motion approach is safe in zones V-VI extensor tendon repairs**, but **limited evidence for zones IV and VII extensor and for flexor tendon repairs** [2].

So an approach well supported for extensor repairs on the back of the hand is not, on current evidence, equally established for flexor repairs in the finger. Where it is used there, it is reasonable extrapolation rather than demonstrated practice.

FOR NERVES, THE TECHNIQUE MATTERS LESS THAN THE GAP

Digital nerve repair has attracted a range of techniques – direct suture, autograft taken from elsewhere, processed allograft, and synthetic conduits.

Across **625** repairs, **all available techniques have reasonable outcomes**, and where there is a gap – excluding direct repair – **autograft and allograft performed comparably** [3].

The decisive variable is therefore whether the nerve ends can be brought together without tension. If they can, direct repair is done. If they cannot, the gap must be bridged, and the current evidence does not compel taking a nerve from elsewhere in the patient to do it – which spares a donor site and the numb patch that comes with it.

WHY RECOVERY IS MEASURED IN MONTHS

Both tissues heal on a biological timetable that no technique shortens. A repaired tendon is at its weakest around three weeks, when the initial fibrin has been resorbed and new collagen has not yet matured – which is precisely when the finger feels better and people are most tempted to use it.

Nerves regenerate by growing axons down the remaining sheath at roughly a millimetre a day. From a cut at the base of a finger, reaching the fingertip therefore takes several months, and sensation returns gradually and imperfectly – often as an unpleasant hypersensitivity before it becomes useful feeling. That sequence is expected recovery, not a complication.

REFERENCES

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