CQ HAND + UPPER LIMB
SPECIALIST ORTHOPAEDIC SURGEON

PATIENT INFORMATION — IN DEPTH

Radial Tunnel Syndrome

Radial tunnel syndrome causes aching pain in the upper outer forearm, just below the elbow.

What you're feeling

You may notice a dull, aching pain on the outer side of your upper arm and forearm. This discomfort sits where the radial nerve travels down the back of your arm. The radial nerve is not inside a single narrow tube. It passes through a stretch of tissue where several separate structures can press against it. You might feel pressure from the edge of a muscle, a fibrous band, or small crossing blood vessels along this path.

The pain often builds up as you use your arm. Activities that involve gripping or twisting your forearm can make it worse. You might find it difficult to turn a doorknob, open a jar, or lift a heavy shopping bag. The ache can also flare up after you have been typing or using tools for a while. Some people feel a deeper soreness when they first wake up in the morning.

Unlike other nerve issues, you usually do not lose the ability to move your hand or wrist. Your grip strength might feel slightly weaker, but you can still hold objects. The main issue is the persistent pain and tenderness on the outer elbow and forearm. If you press on the back of your upper arm, you may feel a specific spot that hurts more than the rest. This tenderness helps point to the radial nerve as the source of your discomfort.

Because the nerve is being squeezed by nearby tissues, the pain can feel like it is spreading from your elbow down toward your thumb side. It rarely causes numbness in your fingers. Instead, it feels like a deep bruise or a constant, low-level throb. If you rest your arm and avoid repetitive twisting, the pain may ease slightly. However, it often returns when you resume your usual daily tasks.

What's actually happening

Despite the name, there is no actual tunnel in your arm. The term 'radial tunnel' simply describes a stretch of path along the radial nerve. This nerve runs from your shoulder down to your hand. It carries signals that help you lift your wrist and fingers.

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Along this path, several separate structures can press on the nerve. You might feel pressure from the edge of a muscle, a fibrous band, or a small group of crossing blood vessels. These are not one single blockage. They are multiple potential pressure points along the nerve's course.

When these structures squeeze the nerve, it becomes irritated. This irritation causes the pain and weakness you feel in your forearm and wrist. It is similar to a garden hose being kinked or weighed down by a heavy object. The water cannot flow freely, so pressure builds up behind the blockage.

Your surgeon will look for these specific points of compression. They will check where the nerve passes under muscles or through tight bands of tissue. Sometimes, the nerve is simply trapped in a narrow space between two structures.

In some cases, the problem starts higher up. For example, after shoulder surgery, the position of your arm can stretch the nerve too tightly. Or, an injury to the upper arm bone can cause swelling that presses on the nerve. Your surgeon needs to understand exactly where the pressure is coming from to relieve it safely.

If conservative treatments do not help, we may recommend releasing these tight structures. This involves gently moving the tissues that are pressing on the nerve. The goal is to give the nerve more room to move and heal. We always aim to address every possible point of compression along the path, not just one spot.

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. We begin with self-management and physiotherapy. You can try changing activities to avoid movements that worsen your pain. Physiotherapy aims to strengthen your forearm muscles and improve your elbow's range of motion. We usually recommend giving this approach a fair trial before considering other steps.

Medical management focuses on reducing pain and inflammation. Your surgeon may suggest pain medication or anti-inflammatories to help you manage symptoms. Injections are sometimes used to calm irritated tissues. Cortisone injections can reduce swelling and pain for a limited time. Hyaluronic acid injections aim to lubricate the joint, while platelet-rich plasma (PRP) injections use your own blood components to support healing. The duration of relief varies for each person and each treatment type.

Surgery is considered when conservative care has not given enough improvement. Radial tunnel syndrome involves several possible pressure points along the nerve's path, rather than a single narrow tunnel. We may recommend surgical decompression to relieve pressure on the radial nerve. This procedure is typically reserved for cases that remain painful despite non-operative care. 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. Where the evidence gives a headline outcome figure for this operation

or treatment (for example an implant-survival, success, or satisfaction rate), state it plainly to support the recommendation and let the number speak for itself. Present it as a shared decision.

What to expect

Your outlook depends largely on the cause of your symptoms. If your radial tunnel syndrome stems from a closed humeral shaft fracture, spontaneous recovery occurs in the majority of patients. Initial nonsurgical management is typically recommended because your nerve may heal on its own. For general radial nerve injuries, spontaneous recovery occurs in 70%–88% of cases. This means most people see improvement without needing an operation.

If your symptoms persist despite conservative care, surgery may be discussed. Your surgeon will explain that no single surgical approach is adequate for complete visualization and release of all compression points. However, early action can make a difference. Patients undergoing surgical exploration within 3 weeks of a humeral fracture injury had a significantly higher likelihood of regaining radial nerve function than those managed nonsurgically or with late surgical exploration.

Recovery is a gradual process. Injuries to the posterior interosseous nerve typically resolve within 3 months, and at the latest, 5 months after surgery. If your nerve requires repair or reconstruction, it recovered better if this was done within 5 months of injury. For more complex cases involving large gaps in the nerve, good to excellent motor recovery can be expected in 83% of patients when specific grafting techniques are used.

If nerve function does not return, tendon transfers may be considered. These are indicated in longstanding, irreparable, isolated radial nerve lesions. They can help restore efficient grip while awaiting reinnervation of wrist extensors. This avoids the need for prolonged external splintage in high radial nerve paralysis.

It is important to manage expectations. While many people recover well, some may experience persistent symptoms. Complications associated with reconstructive elbow surgery persist, often leading to profound and sometimes nonsalvageable disability, with aseptic loosening, infection, and periprosthetic fracture being the most devastating problems. Your surgeon will discuss which path offers the best chance of restoring your function based on your specific injury and timeline.

When to see someone

See your GP if you have persistent pain in the outer elbow that does not improve with rest. Ask for a specialist review if you notice weakness in your wrist or fingers, or if symptoms interfere with sleep or work. Sudden worsening of pain or numbness also warrants prompt attention. While many radial nerve injuries recover on their own within 3 months, early assessment is key. If you experience trauma to the arm, seek care immediately. Early surgical exploration within 3 weeks of injury significantly improves the likelihood of regaining full nerve function. Do not wait if your symptoms persist or worsen.

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In more depth

This section goes further than you need for your own treatment decisions. Radial tunnel syndrome is worth the extra reading for an uncomfortable reason: it is the condition on this site with the weakest evidence base, there is no test that confirms it, and being told plainly how uncertain it is should form part of any decision to operate.

THERE IS NO CONFIRMATORY TEST

Most nerve compressions can be demonstrated. Carpal tunnel syndrome produces slowed conduction across the wrist; cubital tunnel produces it across the elbow. Radial tunnel syndrome characteristically does not — the nerve branch involved supplies muscle rather than skin, so there is no numbness to map, and nerve conduction studies are frequently normal.

The diagnosis therefore rests on the pattern of pain, tenderness a few centimetres distal to the lateral epicondyle rather than over it, and the response to a local anaesthetic block. Each of those is suggestive; none is definitive. Contemporary reviews describe **ongoing controversy regarding both diagnosis and outcomes** [1].

The practical consequence is a high rate of confusion with tennis elbow, which sits immediately adjacent and can coexist. Persistent "tennis elbow" that has not responded to good treatment is one of the commonest circumstances in which radial tunnel syndrome is eventually considered.

THE EVIDENCE FOR TREATING IT IS GENUINELY THIN

A systematic review of interventions found a **tendency that surgical decompression might be effective**, and — the more remarkable finding — that **the effectiveness of conservative treatments is unknown, because for most of them no studies were available at all** [2].

That is not the usual "evidence is limited" formulation. For most non-operative treatments offered for this condition, the studies have not been done. Current reviews still place non-surgical management first, with decompression a viable option for refractory cases [1], and that ordering reflects reasonable caution rather than demonstrated superiority.

WHAT THAT MEANS FOR A DECISION

Two things follow, and they pull in opposite directions.

Against early surgery: the diagnosis cannot be confirmed, so an operation may be decompressing a nerve that is not the source. Where a decompression fails, it is often impossible to determine whether the operation was inadequate or the diagnosis was wrong.

For considering it in the right patient: there is no evidence base supporting the alternatives either, so waiting is not the evidence-backed option people assume. It is simply the lower-risk one.

The reasonable position is that a confident diagnosis matters more here than anywhere else on this site — a consistent history, examination localising to the radial tunnel rather than the epicondyle, imaging excluding a

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space-occupying lesion, and ideally a convincing response to a diagnostic block before an irreversible step is taken.

A RELATED BUT DIFFERENT PROBLEM

Posterior interosseous nerve **palsy** — weakness of finger and thumb extension rather than pain — is a distinct entity with clearer management. Where imaging shows no compressive lesion, conservative management should be tried first, with surgery reserved for demonstrated compressive lesions and for failure of conservative treatment [3]. Where there is no space-occupying lesion, a trial of non-operative management is advisable, with exploration recommended if there is **no sign of muscle recovery after 6 weeks** of observation, or if weakness is progressive [4].

Those are concrete thresholds, and their existence is the clearest illustration of the contrast: when the nerve visibly stops working, the literature can say what to do and when. When it only hurts, it cannot.

REFERENCES

1. Wolf JM, Patel R, Ghosh K. Radial tunnel syndrome: review and best evidence. J Am Acad Orthop Surg. 2023;31(15):813-9.
2. Huisstede B, Miedema HS, van Opstal T, de Ronde MT, Verhaar JA, Koes BW. Interventions for treating the radial tunnel syndrome: a systematic review of observational studies. J Hand Surg Am. 2008;33(1):72.e1-72.e10.
3. McGraw I. Isolated spontaneous posterior interosseous nerve palsy: a review of aetiology and management. J Hand Surg Eur Vol. 2018;44(3):310-6.
4. Sigamoney KV, Rashid A, Ng CY. Management of atraumatic posterior interosseous nerve palsy. J Hand Surg Am. 2017;42(10):826-30.

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