



Radial tunnel syndrome and its rehabilitation: A short review

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Abstract

Radial Tunnel Syndrome (RTS) is a compressive neuropathy of the posterior interosseous nerve (PIN), a deep branch of the radial nerve, characterized primarily by pain in the lateral forearm without significant motor or sensory deficits. It is often confused with lateral epicondylitis due to overlapping clinical features. Early diagnosis and appropriate rehabilitation are essential for symptom relief and functional recovery. This review outlines the anatomy, etiology, clinical features, diagnostic approach, and evidence-based rehabilitation strategies for RTS.

Keywords: Radial tunnel syndrome, posterior interosseous nerve, forearm pain, nerve entrapment, rehabilitation

Introduction

Radial Tunnel Syndrome is an entrapment neuropathy involving the posterior interosseous nerve as it passes through the radial tunnel in the proximal forearm. Unlike posterior interosseous nerve palsy, RTS presents predominantly with pain rather than weakness or paralysis. It is commonly observed in individuals performing repetitive forearm supination, pronation, and wrist extension activities, such as manual laborers and athletes^[1, 2].

Anatomy and Pathophysiology

The radial tunnel extends from the humeroradial joint to the distal edge of the supinator muscle. The posterior interosseous nerve can be compressed at several potential sites, including:

- Fibrous bands anterior to the radial head
- Leash of Henry (radial recurrent vessels)
- Tendinous margin of extensor carpi radialis brevis (ECRB)
- Arcade of Frohse (most common site)
- Distal edge of the supinator muscle^[3, 4]

Compression leads to ischemia, inflammation, and impaired axonal conduction, resulting in pain and functional limitations.

Clinical Features

The hallmark symptom of RTS is deep, aching pain over the lateral proximal forearm, approximately 3–5 cm distal to the lateral epicondyle. Pain is aggravated by resisted forearm supination, middle finger extension, and wrist extension. Unlike PIN palsy, muscle weakness is usually absent, and sensory loss does not occur because the PIN is primarily a motor nerve^[5, 6].

Diagnosis

Diagnosis is primarily clinical, as electrodiagnostic studies are often normal. Key diagnostic features include:

- Tenderness over the radial tunnel
- Pain with resisted middle finger extension (Maudsley's test)
- Pain with resisted supination
- Absence of sensory deficits

Imaging modalities such as MRI and ultrasound may help rule out differential diagnoses or identify space-occupying lesions^[7].

Rehabilitation and Conservative Management

Activity Modification

Avoidance of aggravating activities, ergonomic correction, and temporary rest from repetitive forearm movements are essential in the early phase^[8].

Pain Management

Modalities such as cryotherapy, ultrasound, and transcutaneous electrical nerve stimulation (TENS) may help reduce pain and inflammation.

Splinting

Wrist splints maintaining slight extension can reduce stress on the extensor muscles and decompress the radial tunnel^[9].

Therapeutic Exercises

- Gentle stretching of wrist extensors and supinator muscles
- Nerve gliding exercises for the radial nerve
- Progressive strengthening of forearm and wrist muscles
- Scapular stabilization exercises to improve upper limb biomechanics

Manual Therapy

Soft tissue mobilization, myofascial release, and joint mobilization can reduce local tissue tension and improve nerve mobility^[10].

Surgical Management

Surgical decompression is considered if conservative treatment fails after 3–6 months. The procedure involves releasing all potential compression sites. Post-operative rehabilitation focuses on pain control, restoring range of motion, and gradual strengthening^[11].

Prognosis

Most patients respond well to conservative management, especially when diagnosed early. Surgical outcomes are generally favorable, though recovery may be prolonged.

Conclusion

Radial Tunnel Syndrome is an underdiagnosed cause of lateral forearm pain. Accurate clinical assessment and early initiation of rehabilitation can prevent chronic disability. A multimodal rehabilitation approach focusing on pain relief, nerve mobility, and muscle conditioning is essential for optimal recovery.

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