

Ulnar Nerve and Median Nerve Neuropathy in the Cyclist

See also Ulnar neuropathy

See also Median nerve compression

See also Peripheral neuropathy

Background

1. General info

- Overuse injuries occur in cyclists who regularly ride, especially those involved in competition
- Ensuring that bike fit is correct is major factor in preventing overuse syndromes

2. Definitions

- Ulnar neuropathy
 - Compression of ulnar nerve at wrist "handlebar palsy"
- Median neuropathy
 - Compression of median nerve in carpal tunnel

Pathophysiology

1. Pathology of dz

- Ulnar neuropathy
 - Compression of ulnar nerve at Guyon's canal in wrist
 - Motor/sensory symptoms or both
- Median neuropathy
 - Compression of median nerve at carpal tunnel from
 - Direct pressure on handlebars and/or stretch of median nerve d/t hand and wrist extension
 - Paresthesias and/or motor function deficit

2. Incidence/ prevalence

- Actual incidence unknown
- Study of 25 cyclists
 - 23 cyclists reported subjective motor and/or sensory symptoms after extended cycling tour

3. Risk factors

- Mountain bikers have more symptoms than road bikers
- Forward position on bike causing extra wt distribution on hands
 - Predisposing fit issues
 - Handlebars too low
 - Saddle too far forward
 - Saddle tilted down
 - Handlebar stem too long
- Extended time cycling
- Rough terrain producing trauma and/or vibration

4. Morbidity/ mortality

- Long term morbidity can be reduced and prevented in most cases by
 - Early recognition and prevention of further compression

Diagnostics

1. History

- Ulnar neuropathy (at hand and wrist)
 - Sensory symptoms in fifth digit and medial half of fourth digit
 - Paresthesias
 - Hypoesthesia
 - Hyperesthesia
 - Aching or lancinating pain in medial and proximal forearm
 - Clumsiness or weakness of hand
 - Motor symptoms
 - Loss of thumb adduction strength
 - Abduction/adduction of digits
- Median neuropathy
 - Sensory symptoms of thumb, index, middle, and ring fingers
 - Paresthesias
 - Hypoesthesia
 - Hyperesthesia
 - Pain may radiate proximally into forearm, upper arm, shoulder
 - Complaints of
 - Clumsiness
 - Weakness
 - Inability to open jars or twist off lids
 - Weakness of pincer strength

2. Physical exam

- Ulnar nerve
 - Motor function
 - Interosseous functional testing
 - Finger abduction and adduction strength
 - Adductor pollicis testing
 - Thumb abduction
 - Froment sign: ask pt to pinch piece of paper between thumb and index finger tips
 - Adductor pollicis weakness presents w/flexion of thumb IP joint
 - Sensory function
 - In ulnar nerve distribution (palmar and dorsal surfaces of 5th digit and medial half of fourth digit); test
 - Soft, sharp, and two-point discrimination
 - Assess distal 5th digit to minimize overlap w/median nerve
 - Hypothenar wasting-late effect
 - Palpation and compression at Guyon's canal may reproduce symptoms
 - Palpate for bony or soft tissue abnormalities
- Median nerve
 - Motor function
 - Asses thumb opposition strength
 - Sensory function
 - In median nerve distribution (thumb, index, middle, and lateral ½ ring finger); test
 - Soft, sharp, and two-point discrimination

- Phalen test
 - Tinel test
 - Compression and palpation at carpal tunnel may reproduce symptoms
 - Palpate for bony or soft tissue abnormalities
3. Diagnostic testing
- EMG/NCS studies can confirm dx
 - Helps differentiate compressive neuropathy in wrist/hand from more proximal or central process

Differential Diagnosis

1. Cervical radiculopathy
2. Acute brachial neuritis
3. Anginal pain
 - Especially if left sided or in ulnar distribution
4. Proximal nerve entrapment
 - Ulnar nerve: forearm, cubital tunnel, arcade of struthers
 - Median nerve: forearm or proximal arm
5. Ulnar artery aneurysm or thrombosis

Therapeutics

1. Must relieve pressure on nerve
 - Well-padded gloves
 - Avoid riding routes w/high vibration
 - Decr riding time
 - Extra handlebar tape to incr handlebar thickness and cushioning
 - Raise handlebar stem
 - Verify that saddle is not too far forward
 - Verify that saddle nose is not tilted down
 - Road-type handlebars
 - Use alternative hand positions
 - Change hand position freq during rides
 - Avoid hand positions that place pressure or stretch on offended nerve
 - Flat-bar handlebar (mountain bikes) must decr compression
 - Discontinue riding
 - Change handlebar type
 - Install one of the newer handlebar grips w/an "anatomic" design
 - Consider recumbent bicycle-seated or supine position decr pressure on nerve
2. Consider
 - Splinting
 - NSAIDs
 - Oral steroids
 - Steroid injections
 - Surgery in recalcitrant cases

Follow-Up

1. Return to office
 - Long-term disability can occur
 - Follow-up recommended to assure resolution of pts symptoms
 - Use self-report of symptom improvement or worsening

- Examine for evidence of muscular atrophy
 - Perform sensory testing
 - Assess hand motor function at each visit
 - May need more aggressive tx with:
 - Progressive symptoms
 - Progressive PE deterioration
 - Non-improvement
 - Intrinsic hand muscle atrophy
2. Refer to specialist
- Persistent or worsening symptoms not responding to 4-6 wks of
 - Activity modification
 - Splinting
 - NSAIDs
 - Injections
 - Refer to surgeon experienced in nerve release for ulnar and median compressive neuropathies
 - Intrinsic muscle atrophy
 - Prompt referral to surgeon
 - Pts with 2° intrinsic muscle atrophy may not regain full strength and function

Prevention/Screening

1. Padded cycling gloves
2. Proper bicycle fit
3. Freq changes in hand position while riding

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Evidence-Based Inquiry

1. Does surgery improve outcomes in patients w/carpal tunnel syndrome?
2. What is the best diagnostic approach to paresthesias of the hand?

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