

UNIT NO. 4

ORTHOPAEDIC PROBLEMS OF THE UPPER LIMB IN THE PRIMARY CARE SETTING

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ABSTRACT

The common orthopaedic problems of the upper limb seen at the outpatient setting are trigger finger, De Quervain's tenosynovitis, carpal tunnel syndrome, tennis elbow, golfer's elbow, and frozen shoulder. Pain and limitation of movement are the main symptoms. Treatment is initially conservative but surgical treatment will be needed if such treatment fails.

INTRODUCTION

In this paper, the key features in pathology, diagnosis and treatment of the following conditions are described:

- κ Trigger Finger
- κ De Quervain's Tenosynovitis
- κ Carpal Tunnel Syndrome
- κ Tennis elbow
- κ Golfer's elbow
- κ Frozen Shoulder

A. TRIGGER FINGER

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Overview

Trigger finger is an inflammatory process of the flexor tendon sheath that most commonly affects the thumb, ring and long fingers and is associated with repetitive trauma. Patients older than 40 years and those with history of diabetes and rheumatoid arthritis are most commonly affected.

Pathophysiology

A normal tendon glides under a restraining pulley. When a nodule develops in the tendon, it passes under the pulley as the finger flexes but becomes “stuck” on the palmar side of the pulley as the finger extends. The finger is then “locked” in flexion.

Clinical Symptoms

Patients' usual symptoms are as follows:

- κ Pain and catching (triggering) when they flex & extend their finger
- κ Occasionally the finger “locks” and may unlock as the day progresses
- κ They usually complain that the pain is at the proximal interphalangeal joint rather than the metacarpophalangeal joint
- κ Some patients have a painful nodule in the distal palm
- κ Some patients report swelling and stiffness in the morning
- κ Some patients may progress to develop flexion contracture of the proximal interphalangeal joint.

Clinical tests

There may be a tender nodule in the palm at the level of the distal palmar crease overlying the metacarpophalangeal joint (MCPJ). With flexion and extension of the fingers there will be a characteristic locking and unlocking of the fingers (i.e. triggering). This manoeuvre is often painful.

Treatment

Initial treatment is conservative but surgical treatment will be needed if this fails.

Conservative

Initial treatment can involve splinting the metacarpophalangeal joint in extension for 10-14 days with a short course of NSAIDs. Further hydrocortisone and lignocaine injection (H&L) may be administered. Latter has a success rate of 70-80%.

The technique of H&L injection involves introducing the needle into the flexor tendon over the metacarpal head (surface marking is the proximal digital crease) after sterile skin preparation. The needle is withdrawn slowly while light pressure is applied and a give is felt as the needle emerges from the tendon substance and fluid may be palpated in the tendon sheath distally.

Surgical

Surgical release of trigger digits is an effective treatment option. Complications, though rare are as follows:

- κ Injury to digital nerve and vessels
- κ Scar tenderness or contractures
- κ Sectioning of the adjacent A1 pulley resulting in bowstringing of the tendon with loss of motion.

REFERENCES

1. Snider RK. Essentials of Musculoskeletal Care. AAOS, 2nd Edition.
2. Green's Operative Hand Surgery. 4th Edition. Churchill Livingstone, 1999.
3. American Society for Surgery of the Hand: Examination and Diagnosis. 3rd Edition. Churchill Livingstone, New York, 1990.

B. DE QUERVAIN'S TENOSYNOVITIS

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Overview

De Quervain's tenosynovitis belongs to a condition characterised by stenosing tenovaginitis, i.e. inflammation of the tendon sheath. The abductor pollicis longus and extensor pollicis brevis tendons may become inflamed beneath the retinacular pulley at the radial styloid region. Fritz de Quervain first described this condition in 1895.

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Clinical features

Lifting activity in which the thumb is adducted and flexed while the hand is ulnarly deviated usually provokes symptoms.

Finkelstein test, a provocative test for de Quervain's tenosynovitis will be positive. This is performed as follows:

1. The patient's thumb is enclosed in the palm
2. The wrist is then abruptly ulnar deviated by the physician
3. In a positive test pain is produced on the radial border of the wrist.

Treatment

Conservative

The initial treatment option would be immobilization with a forearm-based thumb spica splint which prevents both wrist deviation and thumb carpometacarpal and metacarpophalangeal joint motion, while allowing interphalangeal joint motion.

The second treatment option would be hydrocortisone and lignocaine injection. After sterile skin preparation, the needle is introduced into the tendon sheath of the first dorsal compartment. It is withdrawn slowly while gently depressing the plunger until a give is felt. This would indicate that the needle is outside the tendons and within the sheath. Fullness will then be palpable in the sheath proximally and distally. A portion of the fluid should be re-directed ulnarly in an attempt to infiltrate the extensor pollicis brevis sheath, which sometime could be separate.

Surgical

Surgical release of the overlying retinaculum is an effective treatment option for patients whose symptoms have not improved after H&L. Because most patients with symptomatic disease have more than one abductor pollicis slip, it is essential that the extensor pollicis brevis tendon is identified and decompressed. In some instances, the first extensor compartment is divided into 2 separate tendon sheath by a septum. In such cases, each component of the sheath must be opened to allow unconstrained tendon gliding.

The following complications may occur:

1. Painful and disabling neuroma of the sensory branch of the radial nerve
2. Hypertrophic scars
3. Subluxation of the tendons due to extensive excision of the extensor retinaculum

REFERENCES

1. Snider RK. Essentials of Musculoskeletal Care. AAOS, 2nd Edition.
2. Green's Operative Hand Surgery. 4th Edition. Churchill Livingston, 1999.
3. American Society for Surgery of the Hand: Examination and Diagnosis. 3rd Edition. Churchill Livingston, New York, 1990.

C. CARPAL TUNNEL SYNDROME

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Overview

Compression of the median nerve within the carpal tunnel is the most common upper extremity compressive neuropathy. The carpal tunnel is the space along the palmar aspect of the wrist anatomically bounded by the scaphoid tubercle and the trapezium radially, the hook of the hamate and the pisiform ulnarly, and the transverse carpal ligament on the palmar side.

Clinical features

Though this condition is often idiopathic, it has been associated with the following conditions:

- κ Pregnancy
- κ Amyloidosis
- κ Flexor tenosynovitis
- κ Overuse phenomenon
- κ Acute or chronic inflammatory disorders
- κ Traumatic disorders of the wrist
- κ Tumours within the carpal tunnel

The differential diagnosis that should be considered is as follows:

- κ Compression of the median nerve more proximally
- κ Compression of the cervical roots
- κ Diabetic neuropathy – but diabetic patients also can develop concomitant symptoms of carpal tunnel syndrome

Patients with carpal tunnel syndrome have the following symptoms and signs:

Symptoms

- κ Numbness in the thumb, index and middle finger. Sometimes they complain of the entire hand feeling numb.
- κ Patients are usually awakened from sleep after a number of hours. Following active movement of fingers, symptoms improve and they are able to return to sleep
- κ They may complain of finger stiffness in the morning
- κ Numbness may be precipitated by activities in which the wrist is held in a flexed position for a sustained period of time, e.g. holding a cup, telephone receiver.

Signs

- κ Patients will have weakness of the abductor pollicis brevis muscle with objective assessment. There may be also visible atrophy of the thenar muscles
- κ Tinel's sign – This is elicited by percussing the skin overlying the median nerve just proximal to the carpal tunnel. When it is positive patients will complain of an electric sensation radiating into the thumb, index or ring finger
- κ Phalen's manoeuvre – With wrist flexion, onset of symptoms within 60 seconds is considered to be a positive test. This test is considered to be more diagnostic than Tinel's sign
- κ Two-point discrimination test – Two-point discrimination is often diminished in patients with carpal tunnel syndrome.

Investigations

Further evaluation of the carpal tunnel syndrome should include

the following tests:

- κ Radiograph of the wrist, including a carpal tunnel view
- κ Electrodiagnostic studies – Nerve conduction studies should be done to localize the nerve compression and to evaluate residual neural and motor integrity. A motor distal latency greater than 3.5 milliseconds is the best indicator of carpal tunnel syndrome.

Treatment

Initial treatment is conservative and surgical treatment is considered then this fails.

Conservative measures

Initial treatment options include prescription of a wrist splint to keep the wrist in a neutral position in the night. Activity modification is also an important measure e.g. adjustment of keyboard height to limit symptom provocation.

Injection of lignocaine and steroid mixture into the carpal tunnel will decrease the inflammatory response around the flexor tendons.

Surgical treatment

Patients unresponsive to conservative measures will benefit from surgical division of the transverse carpal ligament. This can be performed by either the direct open or through an endoscopic approach.

REFERENCES

1. Snider RK. Essentials of Musculoskeletal Care. AAOS, 2nd Edition.
2. Green's Operative Hand Surgery. 4th Edition. Churchill Livingstone, 1999.
3. American Society for Surgery of the Hand: Examination and Diagnosis. 3rd Edition. Churchill Livingstone, New York, 1990.

D. TENNIS ELBOW (Syn lateral epicondylitis)

– Dr KC Chong, Dr CO Low

Overview

Tennis Elbow or Lateral Epicondylitis is a condition characterised by pain and tenderness of the lateral aspect of the elbow. This can result from strain, overuse or direct trauma. This is a common affliction of the adult population.

Pathology

- κ Inflammation of the common extensor origin of the elbow, mainly tendinitis around the insertion of the ECRB (extensor carpi radialis brevis) muscle
- κ Other postulations:
- κ Entrapment of branches of radial nerve
- κ Intra-articular derangement of the annular ligament
- κ Redundant synovial fold

Diagnosis

Symptoms

- κ Pain at lateral epicondyle while lifting objects with palm facing down

- κ Pain while playing racket sports, throwing motion, wringing motion

Signs

- κ Localized tenderness in the region of the lateral epicondyle
- κ Decrease grip strength
- κ Pain with wrist extension against resistance

X-ray

The following may be present

- κ Calcific deposits
- κ Bone fragments
- κ Lateral exostosis

Differential Diagnosis

- κ Radial tunnel syndrome
 - o Posterior interosseous nerve is compressed under fibrous arch of the supinator muscle
 - o Tenderness over supinator (just distal to radial head)
 - o Pain reproduced by resisted forearm pronation, and resisted middle finger extension with wrist supported
 - o LA injection at arcade will relieve symptoms

Treatment

- κ Rest
- κ Ice
- κ NSAIDs
- κ Splint
- κ H&L injections
- κ Lifestyle adjustment
- κ Surgery if no improvement occurs

E. GOLFER'S ELBOW (Syn medial epicondylitis)

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Overview

Golfer's Elbow or Medial Epicondylitis is a condition characterised by pain and tenderness of the medial aspect of the elbow. This can result from strain, overuse or direct trauma.

Pathology

Microtears of tendons of origin of the flexor pronator muscle group, usually pronator teres and flexor carpi radialis (FCR).

Diagnosis

Symptoms

- κ Pain over medial epicondyle with throwing activities, golf

Signs

- κ Pain on resisted pronation or wrist flexion

Treatment

- κ Avoidance of aggravating activities
- κ Rest
- κ NSAIDs
- κ H&L injections

- κ Flexor and pronator strengthening exercises
- κ Surgery

REFERENCES

1. Chapman's Orthopaedic Surgery. 3rd Edition. Lippincott Williams & Wilkins
2. Orthopaedic Knowledge Update 7

F. FROZEN SHOULDER (Syn adhesive capsulitis)

– Dr KC Chong, Dr CO Low

Overview

This condition affects more women than men. Usual onset begins between ages 40 and 65. It affects approximately 10% to 20% of diabetics.

Aetiology

Adhesive capsulitis (frozen shoulder) results from thickening and contraction of the capsule. The final end result of reduction in capsular volume causes the symptoms of loss of range of motion and pain.

Pathology

The postulated pathology are:

- κ Vascular synovitis
- κ Intraarticular adhesions
- κ Capsular fibrosis

Diagnosis

- κ *Symptoms*
 - ο Shoulder pain with progressive loss of motion
 - ο 3 phases (each about 6 months):
 1. freezing – painful, with decrease in ROM
 2. frozen – mainly problem of decrease ROM
 3. thawing – gradual return of motion
- κ *Signs*
 - ο Decrease ROM, with limitation of both passive and active range of shoulder motion
 - ο Painful shoulder

Classification

1. Primary
 - ο idiopathic
2. Secondary
 - A. Systemic
 - ο Diabetes mellitus – frozen shoulder may be the 1st presentation for DM
 - ο Hypothyroidism
 - ο Hyperthyroidism
 - ο Hypoadrenalism
 - B. Extrinsic
 - ο Cardiopulmonary disease
 - ο Cervical disk
 - ο Cardiovascular accident

- ο Humerus fractures
- ο Parkinson's

C. Intrinsic

- ο Rotator cuff tendinitis
- ο Rotator cuff tears
- ο Biceps tendinitis
- ο Calcific tendinitis
- ο Acromioclavicular arthritis

Investigations

- κ Diagnosis is primarily clinical
- κ X-rays, ultrasound studies, and MRI to exclude other shoulder pathologies (e.g. fractures, rotator cuff tears)
- κ Arthrogram can demonstrate reduced capsular volume

Treatment

Treatment of frozen shoulder is primarily non-surgical

Conservative

- κ Anti-inflammatory medications
- κ Physical therapy - to improve motion range
- κ Intra-articular steroid injection

Surgical

- κ Manipulation under anaesthesia
- κ Capsular release (open and arthroscopic)

Outcome

- κ Up to 50% may have chronic stiffness of shoulder

REFERENCES

1. Chapman's Orthopaedic Surgery. 3rd Edition. Lippincott Williams & Wilkins

LEARNING POINTS

- ο Initial treatment of trigger finger involves splinting the metacarpophalangeal joint in extension for 10-14 days with a short course of NSAIDs. Hydrocortisone and lignocaine injection (H&L) may be administered. Latter has a success rate of 70-80%
- ο The initial treatment of de Quervain's disease would be immobilization with a forearm-based thumb spica splint which prevents both wrist deviation and thumb carpometacarpal and metacarpophalangeal joint motion, while allowing interphalangeal joint motion. The second treatment option would be hydrocortisone and lignocaine injection. Surgical release of the overlying retinaculum is an effective treatment option for patients whose symptoms have not improved after H&L
- ο The initial treatment options of carpal tunnel syndrome include prescription of a wrist splint to keep the wrist in a neutral position in the night, injection of lignocaine and steroid mixture into the carpal tunnel, and surgical division of the transverse carpal ligament if these fail
- ο Treatment of tennis elbow and golfer's elbow both consist of avoidance of aggravating activities, rest, NSAIDs, H&L injections, Flexor and pronator strengthening exercises, and surgery as the final resort
- ο Initial treatment of the frozen shoulder include anti-inflammatory medications, Physical therapy - to improve motion range, and intra-articular steroid injection, manipulation under anaesthesia, and capsular release (open and arthroscopic). Up to 50% may have chronic stiffness of shoulder.