

De Quervain's Disease

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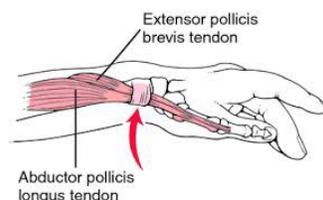
Introduction

De Quervain's disease, described by Fritz de Quervain, a Swiss surgeon, is defined as proliferative stenosing tenosynovitis of the first extensor compartment of the wrist resulting in radial sided wrist pain. This is particularly noticeable while forming a fist, grasping or gripping movement of the wrist and use of the thumb.

As with most tendinopathies, affected individuals are usually between 40-60 years of age with a female to male ratio of 3:1. Heavy labor is not necessarily linked to the disease [1].

Anatomy

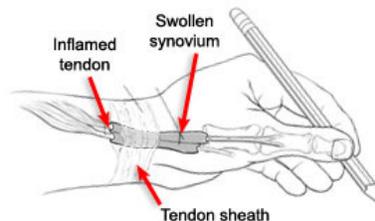
There are 6 extensor compartments at the level of the wrist. The first compartment, the site of tendinopathy in de Quervain's disease, contains the abductor pollicis longus (APL) and extensor pollicis brevis (EPB) tendons. Both tendons are enclosed in a fibro-osseous tunnel 1 cm proximal to the radial styloid process. The tunnel provides gliding of the APL and EPB tendons and prevents them from slippage and bow-stringing. The APL originates from the dorsum of the middle third of the radius and the dorso-lateral aspect of proximal third of the ulna. The APL has a variable anatomy: there can be an accessory APL tendon (AAPL), multiple tendon slips [2] and the insertion can vary with a superficial part over the base of the 1st metacarpal and deep part over the trapezium. The EPB originates more distally from the ulna, interosseous membrane and dorsal radius and inserts over the dorsal base of the proximal phalanx of the thumb. Anatomically the incidence of sub-compartments of EPB is approximately 30% [3]. The incidence of finding a sub-compartment while performing release of the first extensor compartment is much higher. This has an implication in the pathogenesis of the disease and also the main cause of failed surgery in de Quervain's disease. Presence of a sub-compartment can be reliably diagnosed by the EPB entrapment test pre-operatively (see below). Rarely, EPB can be absent [3] or fused with the extensor pollicis longus (EPL).



Pathophysiology:

Several theories have been postulated to explain the cause of de Quervain's tenosynovitis, which include: repetitive micro trauma, increased frictional forces, anatomic abnormality, mechanical compression and increased volume states as seen in pregnancy. It is also known as 'lactating mother' disease. 'Washer women' disease was another name given to this condition as it was more common in females who used to wash clothes frequently.

The basic pathophysiology is the presence of swollen and thickened extensor retinaculum covering the first dorsal compartment which subsequently results in painful resisted movements of the APL and EPB tendons. This causes pain and a resultant decrease in the range of motion of the thumb and wrist joints.



Signs and Symptoms:

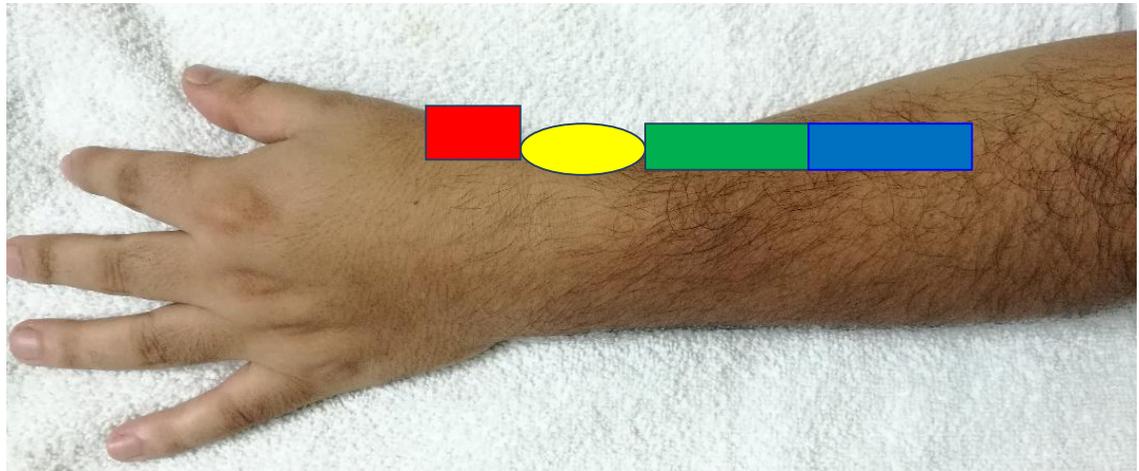
Patients typically complain of pain during daytime while working which is felt over the radial styloid area. There is painful movement of the thumb and the wrist joint especially on ulnar deviation. Thickening and crepitus near the radial styloid can be felt in a minority of patients.

Differential Diagnosis:

De Quervain's tenosynovitis is mainly differentiated from other conditions by site of the pain and tenderness.

1. Osteoarthritis of the first carpometacarpal joint: Pain is located distal to the radial styloid.
2. Intersection syndrome: It is the tenosynovitis of the second dorsal compartment. Pain will be located about 2 inches proximal to the radial styloid.

3. Wartenberg syndrome: Compression of the superficial branch of the radial nerve. Tenderness is felt in the middle third of the forearm along the radial border.



Site of pain in various conditions:

Red: arthritis of the first carpometacarpal joint

Yellow: De Quervain's tenosynovitis

Green: Intersection syndrome

Blue: Wartenberg syndrome

Do we need an X-ray?

X-rays are usually normal but it is advised to do an x-ray to rule out other causes of radial sided wrist pain. In long standing cases there maybe bony ridging over the radial styloid area.

What investigation is needed (USG / MRI)?

USG is done when the diagnosis is unclear. It may show the presence of tenosynovitis or thickening of the compartment. USG also helps to differentiate between indications for non-operative management (proliferating type) or operative management (stenosing type, partial tendon rupture.). In addition to this, USG aids in identifying the anatomical variations in the tendons. The role of MRI however is minimal.

Clinical tests

The diagnosis of DeQuervain's tenosynovitis is purely clinical and one has to be very thorough with certain clinical tests to establish an accurate diagnosis.

1. Finkelstein test: This test has been misquoted and the wrong description has gone into many Orthopedic textbooks. The original Finkelstein test is done by supporting the forearm with one hand and pulling the thumb down

to the ulnar side causing ulnar deviation at the wrist while the thumb is flexed (Figure below)



Finkelstein Test

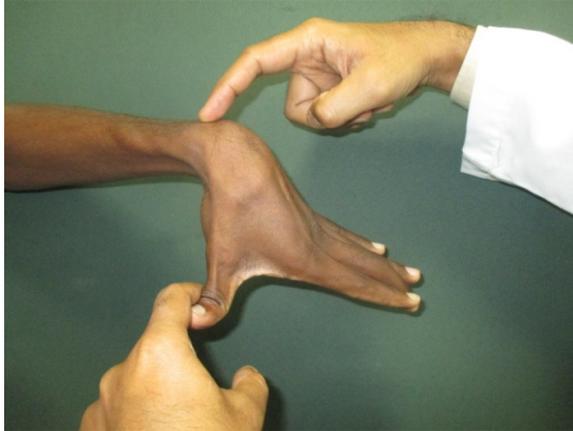
2. Keeping the thumb flexed into the palm and performing acute ulnar deviation is also diagnostic, albeit painful (Figure below) This is called the Eichoff maneuver. This maneuver was originally done to describe the type of pain which happens in De Quervain's disease but has wrongly replaced Finklestein's test in some text books.



Eichoff maneuver

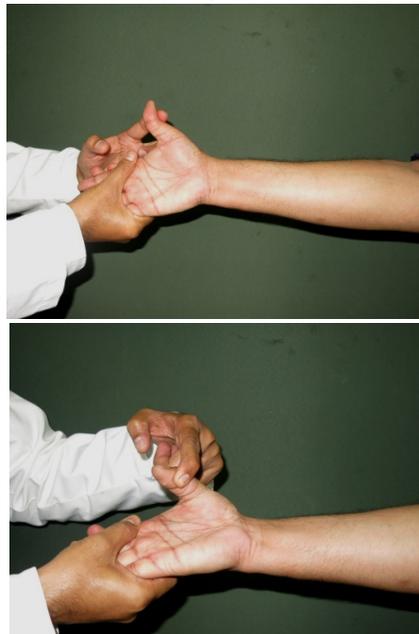
3. WHAT test: Described by Goubau et al [4]. Wrist Hyperflexion and Abduction of Thumb test. He revealed that this test has more sensitivity (0.99) and improved specificity (0.29) and with a better positive predictive value (0.95) and an improved negative predictive value (0.67). This test

gives less pain and might be tolerated better because the patient is in control of the maneuver. It is performed by acutely hyperflexing the wrist and then asking the patient to do thumb abduction against resistance (Figure). Patient will typically complain of pain over the radial styloid. As patient is controlling the maneuver, they tend to stop in presence of pain, making this a more comfortable test with the same accuracy as other tests.



WHAT test.

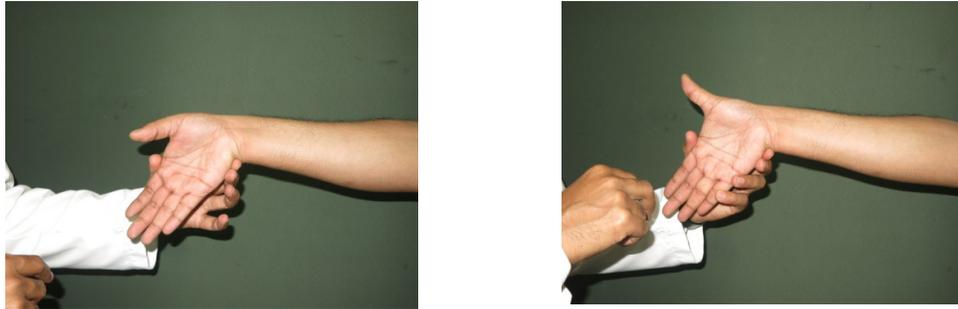
4. EPB entrapment test: This test is helpful to detect the presence of a separate EPB compartment [5]. Ask the patient to do thumb abduction and extension both against resistance. If thumb extension is more painful than abduction it indicates the presence of a separate compartment for EPB.



EPB Entrapment Test.

5. Another clinical test which is less painful, has recently been described by Taylor and Froimson [6]. The test is done with the wrist in ulnar deviation

and deemed positive when the thumb is kept abducted while a negative test occurs when the thumb adducts with the ulnar deviated wrist. This is also known as the 'Tethered thumb sign' (figure below)



Management

Non-operative treatment

Conservative treatment includes splint for the wrist and thumb which is to be worn for at least 6 hours a day to limit movement and reduce pain. Oral NSAIDs (non steroidal anti inflammatory drugs) should be taken regularly for not more than 2 weeks to reduce the inflammation. Other physical therapies including heat and cold therapy, helps in reducing inflammation and pain. Modification of daily leisure and occupational activities greatly helps.

How effective are steroids?

Local steroid injections are a proven effective modality to relieve the symptoms by reducing inflammation over the wrist [7]. The meta- analysis study by Rowland et al, cited improvements of up to 93% of patients seen over a period ranging from 1 month till 17 months. Adverse effects of steroid injections at the level of the wrist are local skin atrophy, depigmentation and capillary brittleness and rarely, rupture of the tendons. Recent studies however, show good potential of PRP injections (platelet-rich plasma)[8] over conventional steroid injections. The injection is given over the peri-tendinous area (NOT into the tendon) within the sheath and best done under ultrasound guidance.



When we should consider surgery?

Surgery is indicated for patients who do not respond to conservative treatment for a duration of at least 6 weeks. Patients with high functional demand or severe functional limitations can be considered as early candidates for surgery. The other relative indication is the presence of the EPB tendon sub-compartment characterized by a positive EPB entrapment test. As described earlier, a stenosing type diagnosed with USG is also an indication for surgical release.

The operative procedure is relatively straightforward and two types of surgical incisions have been described in the literature. A longitudinal incision gives better exposure whereas a transverse incision (1 cm proximal to the wrist crease) gives better cosmesis. We use a longitudinal incision in the presence of florid tenosynovitis and a transverse incision when the tenosynovitis is less. After the skin incision, care is taken to prevent injury to the dorsal sensory branch of the superficial radial nerve as it courses over the area. This nerve is at risk for a complete transection during a transverse incision, while a longitudinal incision may lead to scar tissue affecting the nerve in its entire length. The extensor sheath is released completely over the dorsal aspect, whilst the volar aspect of the sheath is preserved to prevent subluxation of the released APL and EPB tendons. Post operatively, a thumb spica or splint is prescribed to aid in wound healing as well as for pain control. The splint and sutures are removed after 10 to 14 days and patient is allowed normal activities as tolerated.

Complications

As described earlier, steroid injections are known to cause local dermatological reactions such as cutaneous and subcutaneous atrophy and areas of skin hypopigmentation and should therefore not be used more than 2 or 3 times. Patients should be counselled regarding this possible complication prior to injection and surgery.

A frequent complication seen after operative treatment is incomplete decompression. Therefore, it is important to ensure that the tendon sheath is opened over its entire length and that all tendons are released. A duplicate APL tendon can be mistaken for an EPB tendon, which can be trapped in a separate tendon sheath / thick fibrous septum within the first extensor compartment. One should ensure that the release is complete. EPB release is confirmed by pulling the tendon out of the compartment and confirming that it is producing MCP extension.



Pulling of EPB tendon and checking for MCP extension- End point of surgical release.

Other complications following surgery include a painful neuroma of the dorsal superficial radial nerve (which can be more disturbing to the patient as compared to the initial De Quervain's disease itself), recurrence, scar tenderness or hypertrophy, complex regional pain syndrome and continued pain as a result of incorrect diagnosis.

References

1. Stahl et al. Work related etiology of De Quervain's tenosynovitis: a case-control study with prospectively collected data. BMC Musculoskelet Disord. 2015 May 28;16:126.
2. Akan M et al. Multiple tendons of the abductor pollicis longus muscle. Hand Surg. 2002 Dec;7(2):289-91.
3. Jackson, W T et al..Anatomical variations in the first extensor compartment of the wrist. A clinical and anatomical study. Journal of Bone & Joint Surgery Am: July 1986, 68(6):923-26
4. Goubau et al. The wrist hyperflexion and abduction of the thumb (WHAT) test: a more specific and sensitive test to diagnose de Quervain tenosynovitis than the Eichhoff's Test. J Hand Surg Eur. 2014, 39: 286-92.

5. RD Alexander et al. The extensor pollicis brevis entrapment test in the treatment of de Quervain's disease. *The Journal of Hand Surgery*. Sept 2002;27 (5); 813-816
6. ED Taylor, Al Froimson. Tethered Thumb Sign: A Unique Observation in the Physical Examination of de Quervain Tenosynovitis. *The Journal of Hand Surgery*. June 2013; 38(6): 1258
7. Rowland et al. The Effectiveness of Corticosteroid Injection for De Quervain's Stenosing Tenosynovitis (DQST): A Systematic Review and Meta-Analysis. *Open Orthop J*. 2015 Sep 30;9:437-44.
8. MF Sikkandar, SM Sha. Treating De Querveins Tenosynovitis Using The PRP Technique : A Case Series. *Journal of Educations and Social Sciences*. Oct 2017; 8 (in preceding)