***Original Article***

# Surgical Management of De Quervain tenosynovitis


**Abstract**

**Introduction**

De Quervain tenosynovitis (De Quervain's Disease, DQD) is a common affection, renowned by its false benignity, wich can compromise the function of the hand especially in manual workers and be a source of non attendance at work. Surgical treatment represents a radical solution and deserves a bigger place in the management of this pathology.

The aim of this work was to study the epidemiological, clinical and therapeutic aspects of DQD with a literature review.

**Methods:**

This is a retrospective study of 50 surgically treated DQD cases in the department of plastic and hand surgery of University Hospital of Nabeul between 2011 and 2021.

The clinical criteria studied were: sharp pain on palpation of the radial border of the wrist and at the maneuvers of stretching the concerned muscles (The maneuver of Eichhoff, The maneuver of Finkelstein, The test of G. Brunelli, kapandji). The results were evaluated according to the Kapandji score.

**Results :**

It is a series of adults (average age= 45 years), manual workers, predominantly female (sex ratio= 0, 25). The dominant side is affected in 80% of cases.

Pain is the most common reason for consultation. The average duration of symptoms before surgery was less than 12 months in 64% of cases. Clinical signs were assessed by the finkelstein test which was positive in all cases.

All our patients were operated on after failure of medical treatment, 14% longitudinal and 86% transverse incision, a septum was found in 40 cases, and it was resected.

The termination of the abductor pollicis longus was split in 20 cases.

The post-operative complications were essentially aesthetic represented by 4 hypertrophic scars.

Resumption of work was done within the post-operative month. The results were evaluated according to the Kapandji score which was ≥ 9 in 84% of the cases. The Finkelstein test was negative in all cases and palpation in relation to the abductor pollicis longus tendon at the radial styloid did not cause any more pain.

All patients reported a marked improvement in their symptomatology and the majority of cases were satisfied with the aesthetic outcome.

**Conclusion:**

The De Quervain tenosynovitis reputed by its false benignity is a disabling pathology, source of absenteeism in manual workers. Surgery finds its indication, since it is the only method to permanently eliminate pain and quickly resume a normal professional and daily activity.



**Keywords :** De Quervain tenosynovitis, surgical release, Finkelstein maneuver, Kapandji score.

**Introduction**

De Quervain tenosynovitis is a fairly common, under diagnosed affection. It results from an inadequacy between the container - osteo-fibrous slide of the first dorsal compartment - and its contents, the tendons of the extensor pollicis brevis (EPB) and abductor pollicis longus (APL) [1].

The diagnosis is essentially clinical. The treatment is primarily medical. In case of failure, surgery finds its indication. Neglected or poorly managed, this pathology is a source of difficulties during daily activity and absenteeism among manual workers.

The aim of this work is to study the epidemiological, clinical, anatomopathological and therapeutic aspects of De Quervain tenosynovitis in comparison with the data of the literature and evaluating the different surgical techniques in the management of this affection.

**Materials and methods**

Fifty cases of DQD treated surgically were studied retrospectively in the department of plastic and hand surgery of University Hospital of Nabeul over the past 10 years.

The inclusion criteria were:

- constant pain at the palpation of the radial border of the wrist
- pain at maneuvers of stretching of the muscles concerned (The maneuver of Eichhoff, The maneuver of Finkelstein, The test of G. Brunelli, kapandji).
- daily activities compromised
- failure of well-conducted medical treatment (involving analgesics, NSAIDs, resting orthoses, corticosteroid infiltrations as well platelet-rich plasma) for a period longer than 3 months
- absence of other local affections suc as wrist arthrosis, trigger thumb, rhizarthrosis…

The exclusion criteria were :

- little to moderate, non constant pain
- negativity of the Finkelstein maneuver
- patients who refuse surgery
- symptoms explaned by another affection

We used a score that took into account pain, thumb mobility (Kapandji rating and thumb feedback), the aesthetic aspect of the scar, and patient satisfaction.

**Outcome**

The average age in our series was 45 years with extremes of 18 to 64 years. The female predominance was clear with a sex ratio of 0.25.

All of our patients were manual workers with a unilateral tenosynovitis on the dominant side in 80% of cases. Medical history of patients is illustrated in the following table :

| **Medical history** | **Number of patients** |
|---|---|
| Diabetes | 8 |
| Operated previously for carpal tunnel syndrome in same hand | 2 |
| Trigger thumb in same hand | 3 |
| Post partum period | 12 |

**Table 1 :** repartition of patients having a pathological medical history

Pain is the most common reason for consultation, present in 100% of cases. Other symptoms are illustrated in the following diagram (figure 1) .

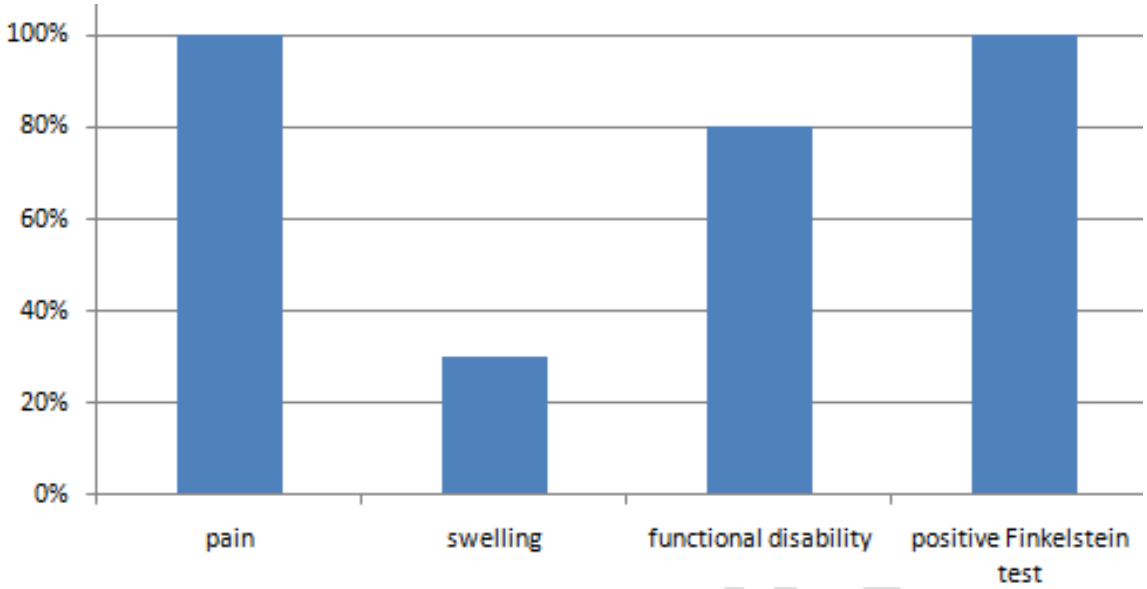


**Figure 1 :** proportion of symptoms objectfied in our population

The average duration of symptoms before the intervention was less than 12 months in 64% of cases with extremes of 3 months to 4 years.

The clinical signs were assessed by the Finkelstein test which was positive in all cases. All our patients were operated on after failure of medical treatment. 14% longitudinal and 86% transverse incision, a septum was found in 40 cases, and it was resected. The termination of the APL was split in 20 cases: 2 splits in 28% of cases, 3 in 6% of cases, 4 in 4% of cases and 5 in 2% of cases (Figure1).

The post-operative complications were mainly aesthetic represented by 4 hypertrophic scars and 2 cases of irritation of sensitive branch of the radial nerve. The resumption of work and normal physical activity was done in the post-operative month.

The results were evaluated according to the Kapandji score wich was ≥ 9 in 84% of cases.

Post operatively, the finkelstein test was negative in all cases and palpation of the affected tendons was no longer painful.

All patients reported a significant improvement in their symptomatology and the majority were satisfied with the aesthetic outcome.

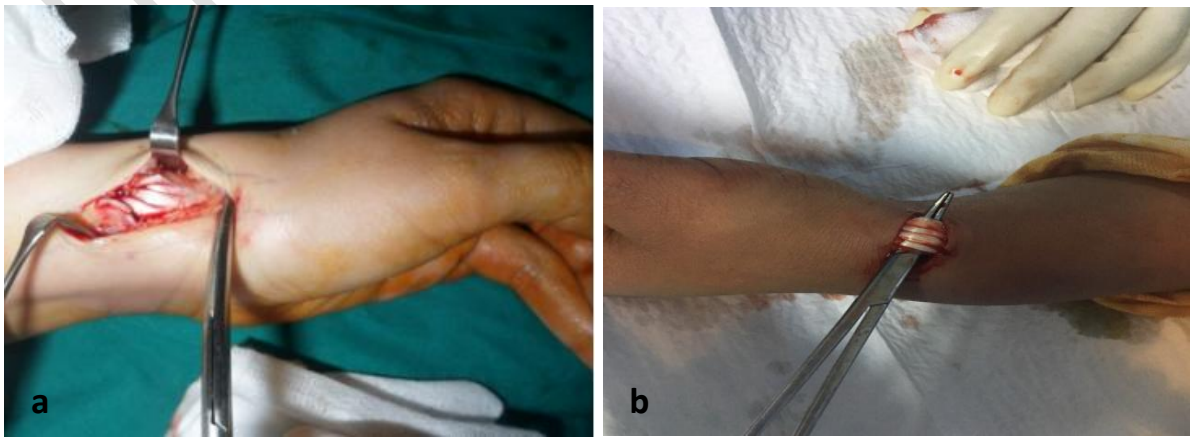

**Figure 2 : anatomic variations of APL tendon. a. 2 splits b. 4 splits**

**Discussion**

De Quervains Disease (DQD) is a stenosing tenosynovitis of the first dorsal compartment of the wrist. In 1895, Fritz De Quervain published a series of five patients operated for a tenosynovitis of the first dorsal compartment and since, this pathology bore its name: the De Quervain tenosynovitis [2,3,4]. It occurs mostly in women as demonstrated by several studies [6-10].

Consistent with the literature, the dominant side is affected in the majority of cases [6,8,9,11].

The diagnosis of DQD is based on interrogation where individuals often report a progressive onset of radial-sided pain of the wrist becoming permanent at a more advanced stage. Average time of progression of the disease is 6 months for most authors [12, 13].

Clinical examination of the wrist may reveal swelling at the level of radial styloid, decreased thumb extension , and cracking of tendons as they slip through the thickened sheath [14].

Rarely, a trigger sensation at the first dorsal compartment is observed in 1.3% of patients [15, 16], and can occur on both the APL and the EPB. Generally, it indicates an evolved form of DQD [17]. The blockage of the abduction of the thumb is exceptional [18].

The pain can be provoked by palpation of the concerned tendons at the level of radial styloid or during a stretching manoeuvre of the concerned muscles:

- *The Eichhoff Manoeuvre* [19] : The patient is asked to form a fist, the thumb flexed inside the fingers and the wrist is tilted ulnar. This test is nonspecific.

- *Finkelstein's Maneuver* [12]: The patient's thumb is held in the hand and ulnar deflection is produced.

- *The G. Brunelli test* [20]: active abduction of the thumb, with radial deviation of the carp.

- *the WHAT (Wrist Hyperflexion Abduction Thumb) test*: proposed by Goubau et al. [21], the patient is asked to bend his wrist while holding his thumb in abduction and extension; then a gradual resistance is produced on the thumb. According to a study by Berghs and al: this test is more reliable than the Finkelstein test [22].

X-rays allow us to evaluate the osteoarticular state and eliminate a differential diagnosis. In the typical form it is normal, however a small bony outgrowth of the radial styloide can be visualized on a tangential incidence or false profile of the radius.

S. Suresh [23] recommends to carry out X-rays especially in forms resistant to medical treatment in search of differential diagnosis. Chloros. [24] reports a case of an osteoma of the radial styloid presenting as DQD. Chein. [27] found cortical erosions, sclerosis or periosteal bone placement and concluded there were He a positive predictive valuebetween DQD and radial styloid anomaly occuring distally (which should not be confused with the spur at the epiphyseal remnant).

Ultrasound completes the clinical diagnosis. It is not mandatory, but it allows to analyze the two tendons APL and EPB, detect the presence of a septum separating them, show a thickening of the tendon sheath or rarely a small synovial collection [28]. It was realized in 3 cases of our study.

MRI is a little performed exploration, which has not been indicated in our series. When it is performed, it shows intra tendinous hypersignal T2, tendon thickening or peritendon effusion.

Several pathologies can be evoked in front of a pain at the level of the radial styloid. Clinical examination should eliminate: Intersection syndrome, Wartenberg radial neuritis or osteoarthritis of the wrist.

Surgery is performed under loco-regional anaesthesia in an outpatient setting.

There are several incision options for the first dorsal compartment :

- *The longitudinal incision:* Provides better exposure and lower rate of nerve damage [6,29, 30]. It also prevents palmar tendon subluxation due to a more dorsal release of the compartment sheath. However, Mellor and Ferris [31] reported that longitudinal incisions had a high rate of nerve damage and poor aesthetic outcomes. These findings are consistent with the results of our study where all unsightly scars result from a longitudinal incision.
- *The transverse incision:* it is transverse to the tendons with an incision of about 2cm at the level of the fold of radial inclination of the wrist. This method has better aesthetic outcomes [23,30, 32] but poses a higher risk of nerve damage.

Whatever incision is used, the sensitive branches of the radial nerve must be carefully protected to approach the first compartment. After opening the tendon sheath, the search for the intertendinous septum is systematic [33]. The latter must be excised [34]to prevent therapeutic failures due to incomplete decompression [34].

| Study | Population | Evolution | Incision | Results |
|---|---|---|---|---|
| **M.A. Altay [8] (2002-2008)** | 48 | | transverse | Excellent : 64%<br>good : 30%<br>poor : 6% |
| **M. Azeem [11] (2009-2011)** | 20 | 4 to 6 months | oblique | Excellent : 94%<br>Poor : 5% |
| **Y. Bouras [10] (2001-2007)** | 20 | 6 months | longitudinal | Excellent : 80%<br>Good : 20% |
| **Our study** | 50 | 3 months to 4 years | 43 transverse<br>7 longitudinal | Pain disappeared in all cases,<br>4 hypertropic scars |

**Table 2** : comparative table showing results of different incisions in literature

Reported surgical complications included irritation of the superficial branch of the radial nerve [28, 35, 36], dislocation of the APL, unfavourable enlargement and adhesion of the scar.

Nerve damage can be iatrogenic leading to a painful neurosis, or related to an irritation by the posterior part of the sheath. It ranges from 2% to 27% [7, 31, 37] and occured in 2 cases in our series. Abrisham et al. [6] compared the results of longitudinal and transverse incisions in 120 patients. They observed that nerve injury was only present in the transverse incision group. However, this can occur regardless of the type of incision.

These complications are avoided by protecting the sensitive branch of radial nerve and systematic resection of the posterior part of the first compartment [38]. The recommended incision is transverse but some surgeons use an axial one.

Kang and al [39,40] used endoscopic surgery to release the 1st dorsal compartment. They used Portals 1 cm distal and 3 cm proximal to the radial styloid, with a 2 mm transverse cutaneous incision to create an operating field. The authors report less nerve damage in the endoscopic release group than in open surgical release.

Another complication of this intervention may be palmar subluxation of the tendon. Although it is usually asymptomatic, it can sometimes become painful when the hand is used for manipulative activities [41-45].

Prevention of this complication can involve several techniques: the « Le Viet plasty », the distally pedicled flap of the dorsal retinaculum or the omega plasty using the pulley itself [34, 46].

Ramesh and Britton [42] used dorsal retinaculum to prevent subluxation. With this technique, part of the retinaculum is used to create a U-shaped flap to retain the EPB and APL tendons.

A. Kapandji [47] described a clever enlargement plasty: the first compartment is opened obliquely, then it makes two counter-incisions and during the suture, flaps slide, increasing this space.
The approach of Daniel Cloutier [49] was to make a transverse incision, Kapandji-like enlargement plasty, opening/resection of the septation and resection of the accessory abductor, in order to decompress further.
Wilson and al. [44] successfully used a distal radial fascia-fat flap of the forearm for the recurrent form of De Quervain. The flap was lifted and turned 180 degrees; then the vascularized fascial tube was used to wrap the tendons of APL and EPB.
These techniques are not performed systematically during the intervention. However, this retinaculum creates a plane between the tendons and the sensory branches of the overlying radial nerve, and retains a lubrification of the tendons.
When DQD is associated with Wartenberg neuritis, the surgical technique differs. The incision is longitudinal to the tendons and allows a better approach of the dorsal sensitive branch of the radial nerve which is neurolysed. The incision line should be shifted from the nerve axis to avoid painful adhesions. Surgical outcomes are similar.
Pain usually disappears after a few weeks. Excellent results were reported after surgery in 92% of cases in literature, which is perfectly consistent with our results [33, 37].
After surgery, the patient keeps a dressing for 15 days and receives analgesics. Mobilization of fingers and use of the hand the day after the operation are encouraged. The hand should be kept elevated to promote venous drainage.
As soon as the wound is healed, a regular local massage is indicated to reduce the pain, limit the adhesions and promote the return of the sliding planes in the operated area.

**Conclusion**

Medical treatment of DQD is indicated in the early stages and it should not exceed 3 months. Beyond this period and in the absence of improvement, surgery finds its place since it allows to eliminate permanently the pain and quickly resume a normal professional and daily activity.

**ETHICAL APPROVAL**

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

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