Minireview Article

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 and seductive solution and deserves a bigger place in the management of this pathology.
The aim of this work was to study the epidemiological, clinical, anatomopathological and therapeutic aspects of DQD and to evaluate the different surgical techniques in the management of DQD with a literature review.

Methods:
This is a retrospective study of 50 surgically treated DQD cases.
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 :
This is a retrospective study on 50 wrists operated for De Quervain tenosynovitis in the department of plastic and hand surgery of University Hospital of Nabeul between 2011 and 2021.
It is a series of adults (average age= 45), 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, present in all the cases.
The average duration of development 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 abductor pollicis longus was split in 20 cases: 2 strips in 28% of cases, 3 strips in 6% of cases, 4 stripss in 4% of cases and 5 strips in 2% of cases.
The post-operative complications were essentially aesthetic represented by 4 hypertrophic scars. The resumption of work and normal physical activity were 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 tendons 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 to permanently eliminate pain and quickly resume a normal professional and daily activity.

Introduction

De Quervain tenosynovitis is a fairly common affection but often under diagnosed. This pathology of idiopathic origin 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).
It is manifested by pain at the radial border of the lower end of the radius.
Its diagnosis is essentially clinical. The treatment is primarily medical involving analgesics, NSAIDs, resting orthoses, corticosteroid infiltrations as well as PRP (platelet-rich plasma). Surgery finds its indication in case of failure of medical treatment. Neglected or poorly managed, this pathology is a source of difficulties during daily activity and absenteeism among manual workers.
We conducted a retrospective study of 50 patients operated in the department of plastic and hand surgery of University Hospital of Nabeul over the past 10 years. 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 clinical criteria studied were:

- pain at the palpation of the radial border of the wrist
- maneuvers of stretching of the muscles concerned (The maneuver of Eichhoff, The maneuver of Finkelstein, The test of G. Brunelli, kapandji).

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 patients. Pain is the most common reason for consultation, present in 100% of cases. 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.
The post-operative complications were mainly aesthetic represented by 4 hypertrophic scars. 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.

Discussion

De Quervains Disease (DQD) is a stenosing tenosynovitis of the first dorsal compartment of the wrist. It was first described in the anatomy textbook in 1892 by Paul Jules Tillaux [1], a French surgeon and anatomist, and then by Henry Gray in 1893. 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].

DQD is a common pathology that affects women mostly in the fourth decade, especially manual workers. Its incidence is 2,8 cases per 1000 person per year for females and 0,6 cases per 1000 person per year for males [5].

It is indeed a female pathology, as demonstrated by the series of Abrisham and Scheller which is composed of 80% women, Altay 86%, Hyun Joo Lee 90%, Bouras 70% and 80% in our series [6-10]. The average age is 45 for Abrisham and our series, 47 for Scheller and Altay, 51 for Hyun Joo Lee and 49 for Bouras.

Consistent with the literature, the dominant side is affected in the majority of cases: Abrisham 60%, Azeem 100% female, Altay 74%, Hyun Joo Lee and Bouras 78% [6,8,9,11].

The diagnosis of DQD is based on interrogation where individuals often report a progressive onset of pain or tenderness at the level of the radial styloid at the beginning becoming permanent at a more advanced stage. The average time of progression of the disease is 6 months for most authors [12, 13].

Clinical examination of the wrist may reveal swelling or nodular formation at the level of radial styloid, decreased extension and range of motion at the trapezo-metacarpal joint, and cracking of tendons as they slip through the thickened sheath [14].

Very 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 muscles concerned:

- *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 et al: this test is more reliable than the Finkelstein test [22].

X-rays allow us to evaluate the osteoarticular state and to 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 another etiology of wrist pain. It analyzed clinical data for 114 patients over a four-year period (2003 to 2007). Wrist x-rays were performed in 39 cases, of which 14 were abnormal.

Chloros. [24] reports a case of an osteoma of the radial styloid presenting as DQD. Many authors [25, 26] have analysed skeletal changes in DQD. Osteoporosis was noted and local inflammatory hyperemia was considered the causal factor.

Chein. [27] has retrospectively analyzed the skeletal changes of the radial styloid and found cortical erosions, sclerosis or periosteal bone placement that could lead to the diagnosis. He found a positive predictive value if there was a radial styloid anomaly.
The Leao series showed 6 cases out of 22 with periosteal reaction [25,26].
Radial styloid abnormalities in DQD occur distally [27] and should not be confused with the spur at the epiphyseal remnant.
Ultrasound is a non-invasive exploartion of the tendons in the first dorsal compartment of the wrist and completes the clinical diagnosis. It is not mandatory, but once performed 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.
The MRI is a little performed exploration, which has not been indicated in our series. When it is performed, it shows a hypersignal T2 intra tendinous, 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 incision 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 to prevent therapeutic failures due to incomplete decompression [34].
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.
The damage to the radial nerve can be iatrogenic leading to a painful neurosis, or related to an irritation by the posterior part of the sheath. Surgical lesions of the superficial radial nerve range from 2% to 27% [7, 31, 37]. It represents 4% of surgical complications in our series.
Abrisham et al. [6] compared the results of longitudinal and transverse incisions in 120 patients. They observed that the nerve injury was only present in the transverse incision group. However, nerve damage can occur regardless of the type of incision.
Suresh and Zaki [23] proposed a feel-pinch-pull method to protect the sensitive branch of the radial nerve at the radial border of the wrist. They recommended manual protection of the sensitive branch of the radial nerve and by palpating and pulling the ventral nerves with the subcutaneous tissue. However, this manoeuvre is controversial because it changes anatomy and brings other sensory branches of the radial nerve closer to the operating area.

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

Recently, Kang et 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.

In another retrospective study, 24 DQD treated with endoscopic release had less pain and disability than 26 DQD treated with classical approach at an average of 20 months after surgery [40].

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].

The 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.

J.Bakhach and al applied the principle of Omega «Ω» magnification plasty on the radiostyloidal pulley. This technique involves removing the anterior pulley attachment from the anterior peak of the radial styloid. This unipolar release causes an expansion of the volume of the pulley by a phenomenon of unrolling. By increasing the internal volume and eliminating the conflict with the APL and EPB tendons, this plasty completely respects the integrity of the pulley, its biomechanical properties and the physiological relationships of the tendon slide [34].

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.

Rassi and collab suggest two incomplete parallel retinaculum incisions [48].

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.

Littler and al. [45] also described another technique in which the septum dividing the first extender compartment and the EPB is removed from the compartment, and the retinacular sheath is relegated in a loose manner to the APL tendon to prevent tendon subluxation.

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 adhesions that cause pain. The 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].

In a study conducted by Zarin and Ahmad from 2001 to 2002 [50], patients with DQD who did not respond to conservative treatment were operated on and followed up for a minimum period of 3 months with excellent surgical outcomes.

Wetterkamp. [51] examined 72 cases of DQD in comparison to literature data and reported 82% complete recovery after surgical release.

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 essential. 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

The medical treatment 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 alone allows to eliminate permanently the pain and quickly resume a normal professional and daily activity.
Our findings encourage us to raise awareness among our colleagues, occupational physicians, physical physicians and rheumatologists about the value of early and adequate management of this pathology.

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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