Conservative Management of De Quervain's disease and its Outcome before Surgery

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ABSTRACT

Introduction: *De Quervain's disease is a mechanical stenosing tenosynovitis due to inadequacy volume between Abductor Pollicis Longus (APL), Extensor Pollicis Brevis (EPB) and their tunnel. Treatments methods include immobilization, NSAIDs, steroid injections and operation. For the first time Fritz De Quervain described treatment of this disease. Since then, various ways of treatment have been reported.* ***Objective:*** *The purpose of this study was to make proper clinical diagnosis of De Quervain's disease providing conservative treatment to the cases and to observe their outcomes.* ***Methods:*** *This was a clinical trial conducted in the department of Orthopedics, North Bengal Medical College Hospital, Sirajganj for a period of two years enrolling thirty cases of De Quervain's disease.* ***Results:*** *Of the 30 studied patients, 25 (83.3%) were female, and 5 (16.7%) were male and aged between 25 to 74 years. The disease more commonly affected subjects between 31 to 50 years of age (66.7%). All the subjects were treated by conservative management (by Triamcinolone acetonide). Majority (94%) had complete relief of symptoms obtained after 18 months of treatment.* ***Conclusion:*** *According to the study findings, it could be recommended that conservative management along with Triamcinolone acetonide injection might be the first choice before resorting to surgery.*

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INTRODUCTION

In 1885 Fritz De Quervain, a Swiss surgeon, first described De Quervain's tenosynovitis.[1,2,3] De Quervain's disease is described as painful stenosing tenosynovitis of the first dorsal compartment of the hand.[4,5] It is usually caused by overuse or an increase in repetitive activity, resulting in shear microtrauma from repetitive

gliding of the first dorsal compartment tendons (abductor pollicis longus or APL,and extensor pollicis brevis or EPB) beneath the sheath of the first compartment over the styloid process of the radius leading to thickening of the extensor retinaculum of the wrist (and not related to inflammation as was once thought).[3,4,6,7] Predisposing movements include forceful grasping with ulnar deviation or repetitive use of the thumb. Patients usually present complaining of radial wrist pain with thumb movements and tenderness over the first dorsal compartment.[3,4,5] Diagnosis is usually concluded by a positive Finkelstein's test (which causes a reproduction of pain at the radial styloid), as well as the presence of a tender nodule over the radial styloid.[3,4,5,8] The incidence of De Quervain's is not known in primary care, but the prevalence has been reported in the general population in the UK as 0.5% in men and 1.3% in women.[9] De Quervain's has also been shown to usually present in the fifth and sixth decades of life, as well as being more common in pregnant and lactating women.[5]

An increased incidence of this disorder has been found in recent years, and although this may be due to more frequent recognition of De Quervain's disease, it may also be attributed to the type of repetitive occupational trauma performed today, involving continued strain in the use of the hand. It seems that repeated irritation of the sheath and the tendons by forceful back-and-forth motions of the tendons during repeatedly performed operations, particularly dorsiflexion of the wrist and abduction of the thumb, are prone to produce this disease state. As the fibrous sheath becomes more edematous, it encroaches upon its tendons, with further aggravation of the condition. Friction may be increased as the smooth osseous space of the canal is changed by trauma. The role of occupational irritation as an etiological factor is further borne out by the fact that many cases occur when there is a change in occupation or resumption of a former job after a lay-off. This type of indirect trauma seems to be involved in the etiology to a greater degree than does direct trauma.[3,5,8] However, the superficial position of tendons makes them more easily susceptible to external and direct trauma. The disease is noted to be more common in persons who do manual work, particularly those who pinch the thumb while moving the wrist, e.g. housewives, knitters, typists, nurses, switchboard operators, pianists and golfer. It is approximately 10 times more common in females than in males, possibly, because of the greater excursion of the right first carpometacarpal joint in females and it more often involves the right than the left hand, probably owing to the predominance of right-handed people. The age occurrence is anywhere from 25 to 60 years, averaging 46 years. It is frequently unilateral, but occasionally bilateral cases are seen. The role of aberrant tendons in the etiology of this condition is still speculative. Some authors argue that because aberrant tendons occupy more space in the compartment, the factor of frictional trauma is increased. This is refuted by the fact that in cadaver material the incidence of aberrant tendons is approximately the same as in surgical material in persons with typical symptoms.[8] Laiou E noted that in 28% of his cases, trauma to the wrist was reported; however, in only two cases, there was direct trauma and in seven cases indirect trauma. In our series of patients, there were only two who reported any direct trauma in the region involved. In discussing the aetiology, Laiou E noted the relationship to trauma and friction and suggested that this might be a "collagen disorder", as it is often associated with rheumatoid disease.[9,11]

De Quervain's disease is characterized by pain over radial styloid process, onset is gradual but it

may begin acutely following a blow or sudden strain, gripping or lifting, or after a hard day's work involving the use of the wrist and hand.[10] Three criteria were held as essential before such a diagnosis was made. These were: (1) Tenderness on palpating the tendons of abductor pollicis longus and extensor pollicis brevis as they lie along the lower outer border of the radial styloid. (2) Pain, radiating up the forearm and down the thumb, on active abduction and extension of the thumb and aggravated by the resisted movement. Passive movements were invariably painless. (3) Pain on flexing the thumb into the palm and closing the remaining fingers around it.[1] This is further aggravated by forced ulnar deviation of the hand at the wrist (Finkelstein's test). Finkelstein's test was first described in 1930 and has recently been described as being performed in four stages: first with the application of gravity assisted gentle active ulnar deviation at the wrist, then the patient actively deviates the wrist in an ulnar direction, then further passive ulnar deviation by the examiner, and in the final stage, the examiner passively flexes the thumb into the palm.[6,8] The reliability, validity, specificity and sensitivity of this test has not been reported, but authors have claimed that the staged method of testing may be more accurate with higher sensitivity and specificity.[5,6,8] It has also been suggested that a patient must have pain four days out of seven.[9] All cases in the present series conformed to these criteria. This study was carried out to describe the treatment of De Quervain's disease either conservative or surgical management.

METHODS

The clinical trial conducted in the department of Orthopedics, North Bengal Medical College Hospital, Sirajganj for a period of two years enrolling 30 cases of De Quervain's disease. Duration of symptoms varied from five weeks to nine months. On examination, the classical signs, as described by De Quervain were observed. Informed consent was obtained from all the patients selected as subjects in this study. We have tried three types of treatment, two conservative and one surgical. These were: (1) Immobilization of the affected wrist by wrist brace with NSAIDs (Naproxen & Ibuprofen), (2) Injection Triamcinolone acetonide (TC) and (3) Unroofing the tendons by excision of the thickened tendon sheath. The treatment results were categorized into four groups: no pain or disruption of daily life was classified as excellent; occasional pain but no disruption of daily life as good; reduced pain but disruption of daily life as fair; and continued or worsening pain and disruption of daily life as poor. Differences between the two groups in terms of the number of injections, the recurrence of tenosynovitis, the occurrence of complications, and differences in the outcome of the treatment depending on differences in the injecting method were surveyed. All injections were performed by using the same technique. A mixture of 1 ml (10 mg) of TC and 1ml of 1% lidocaine hydrochloride was used for injection. In principle, injections were given a maximum of three times, with an interval of 2 weeks between injections, and treatment was terminated when effects were observed. Prior to intra-sheath injection, regions with tenderness and indurations were confirmed by palpation, and a 26 or 27-gauge needle was inserted vertically through the skin from the site immediately above the region up to the bone. Since resistance is so high, in this position, that the syringe cannot be pushed, the needle was pulled back to reach the point where the syringe could be pushed under resistance, we injected the mixture, stretching the synovial sheath by a volume effect. Sufficient filling in the tendon sheath distally and proximally was confirmed by palpation, and the needle was pulled out when injection was no longer possible. In principle, intra-sheath injection was used, but it should be noted that slight leakage into subcutaneous tissues could have occurred.

RESULTS

Of the 30 study subjects 25 (83.3%) were female, 5 (16.7%) were male and ages were between 25 to 74 years; more commonly occured in 31 to 50 years of age (66.7%) (Table I). More commonly found in housewives and there were no significant changes in treatment due to multiple duration of symptoms (Table II and Table III). When reviewed at two weeks 25 of the 30 patients were completely symptom-free. The remaining five had residual symptoms but all admitted of great improvement. One patient complained of mild aching after prolonged use of the hand but did not consider her symptoms severe enough to warrant a further injection. The fourth patient, a woman of 74, complained of weakness of grip but had no pain. On examination no weakness could be seen. Twenty-nine patients were seen 12 weeks after injection. Some 27 (90%) remained free of symptoms and signs apart from the thickening that was present in 8 (26.7%) patients. The patient who had complained of mild aching continued to do so, but again did not think her symptoms were severe enough to warrant a further injection. The symptoms of the patient complaining of weak grip were also unchanged but no local or systemic cause was found. She remained free of pain. Twenty-eight (94%) patients were seen after 18 months. One patient was reviewed and stated that she had remained symptom-free, and the patient who had complained of mild aching had become symptom-free.

The patient who complained of weakness of grip continued to do so. One patient who had been symptom-free at 12 weeks had a recurrence some three months before review. A further injection was given. Thus after 18 months, 27 of the 30 (90%) patients were symptom free and one, the 74-year-old woman, had no pain but professed weakness, which in no way incapacitated her. Twenty eight (94%) incidence of complete relief of symptoms was obtained after 18 months.

Table I: Age and gender distribution of study subjects

Age (in years)	Gender		Total (%)
	Male	Female	
<30	0(0%)	6(24%)	6(20%)
31 to 50	3(60%)	17(68%)	20(66.7%)
51 to 70	2(40%)	1(4%)	3(10%)
>70	0(0%)	1(4%)	1(3.3%)
Total	**5 (16.7%)**	**25 (83.3%)**	**30 (100%)**

Table II: Occupation of the study subjects

Occupation	Number (n)	Percentage (%)
Housewife	11	36.7
Religious teacher	04	36.7
Machine operator	04	13.3
Sales girl	02	6.7
Physician	02	6.7
Nurse	02	6.7
Checker	01	3.3
Typist	01	3.3
Painter	01	3.3
Plumber	01	3.3
Stitcher	01	3.3

Table III: Duration of symptoms prior to treatment

Duration in months	Number (n)	Percentage (%)
Less than six months	15	50
Seven to twelve months	14	46.7
Above thirteen months	01	3.3
Total	**30**	**100**

DISCUSSION

De Quervain's disease is a painful and often disabling condition which is readily amenable to treatment. It has frequently been stated that immediate surgery should be carried out on the grounds that the operation is quick and simple. This is undoubtedly so, but an even simpler treatment which carries a 96% success rate is preferable to surgery. Woods,[13] in a series of 36 cases, claimed 83% as symptom free, compared with 93%in this series.

Recently, nonsurgical treatment using intra-sheath steroid injections has been reviewed.[12,14,18] We performed intra-sheath injections of Triamcinolone acetonide (TC) for patients with De Quervain's disease, and the efficacy rate was 94% in this study. Richie and Eriner,[15] who reviewed seven current reputable papers and surveyed the treatment outcomes concluded that the efficacy rate of injecting the steroid alone was 83%. Although the evaluation method in this study was different from that in their reports, our outcomes were much better than those previous reported. As Froimson[19] observed, surgery is readily chosen to treat De Quervain's disease with the view of reducing the treatment period and preventing recurrence despite good outcomes with intra-sheath injection. Surgical treatment has been chosen for tenosynovitis without careful consideration, and nonsurgical treatment has not been emphasized.[14]

The exact aetiology of De Quervain's disease is not known, though the onset is often but not invariably associated with unaccustomed use of the hand. It is, however, acknowledged to be an inflammatory condition.[20] Corticosteroids are known to be among the most potent anti inflammatory agents, so that logically hydrocortisone should be the initial treatment of choice. The recent use of hydrocortisone in other soft-tissue lesions prompted this survey of its use in De Quervain's disease. The results of this small series are encouraging and seem to merit further trial of the method. It appears that hydrocortisone has a place in the treatment of this troublesome condition and may be used as an alternative to surgery in many cases. With supplies of hydrocortisone becoming more plentiful, this simple method of treatment may become more widespread, thereby making it unnecessary for most patients to undergo operation. The action of TC in the body remains to be clarified. Since TC is a lyophobic steroid and has two insoluble methyl groups in the constitutional formula, the absorption of TC by tissues is slower than that of other steroids and it remains in the tendon sheath for a long time, so the anti-inflammatory effects of TC are considered to persist from 2 weeks to about 1 month after injection.[21] TC is, therefore, considered more effective in treating chronic inflammation, such as De Quervain's disease, than other steroids. However, before starting the treatment, patients should be fully informed of a transient increase in pain and side effects of TC on the skin and subcutaneous tissue, which may persist for a time after injection.

In those cases in this series in which treatment has succeeded, full function has been restored

and all pain relieved almost immediately after the injection, although in one or two, there was a, time interval of several days before full relief was experienced. It is difficult to retain patients for long periods of observation when complete relief of symptoms has ensued. Nevertheless, although relief for one hundred days has been regarded as a cure for the purpose of this series, it is known that several patients have had no relapse for periods approaching six months. It will also prove valuable in patients not wishing to undergo surgery and has the great advantage of leaving no scar. If further experience substantiates, in these findings, it would appear to be the treatment of choice in De Quervain's disease and in tenosynovitis occurring at other sites. Probably, the previous reported poor results with this treatment were due to faulty technique. Correct technique, which is possible with minimal practice, is all important. As shown in this series, correctly administered triamcinolone acetonide provides comparable if not better results to those of surgery.[11] It is suggested that cases of De Quervain's disease should first be treated by conservative management along with local steroid injection after two or three times with a interval of two weeks, and that those who relapse within a short period be referred for operation in the usual way.

CONCLUSION

The study findings suggested that diagnosis should be made by proper physical examination keeping in mind the possibility of overlooking. It could be recommended that conservative management by Triamcinolone acetonide injection might be the first choice before resorting to surgery. Further study with a much larger sample from different institutions suggested to confirm the outcome of the disease.

Conflicts of Interest: None

REFERENCES

1. De Quervain F. Ueber eine Form von chronischer Tendovaginitis [Article in German]. Corresp Blatt Schweizer Aezte. 1895; 25: 389-394.
2. Huang TH, Feng CK, Gung YW, Tsai MW, Chen CS, Liu CL. Optimization design of thumb spica splint using finite element method. Med Bio Eng Comput. 2006; 44(12): 1105–1111.
3. Peters-Veluthamaninal C, Winters JC, Groenier KH, Mayboom-de Jong B. Randomized controlled trial of local corticosteroid injections for de Quervain's tenosynovitis in general practice. BMC Musculoskel Disorders. 2009; 10: 131.
4. Retig AC. Athletic injuries of the wrist and hand. Part II: overuse injuries of the wrist and traumatic injuries to the hand. Am J Sports Med. 200; 32(1): 262–273.
5. Avci S, Yilmaz C, Sayli U. Comparison of nonsurgical treatment measures for De Quervain's disease of pregnancy and lactation. J Hand Surg. 2002; 27A(2): 322–324.
6. Dawson C, Mudgal CS. Staged description of the Finkelstein test. J Hand Surg. 2010; 35A (9): 1513–1515.
7. Anne M Gilroy, Brain R Macpherson, Lawrence M Ross. Atlas Of anatomy, South Asian edition. Delhi. Stuttgart. New York. Rio: Thieme Medical and Scientific Publishers' Pvt Ltd. 2014; p.102.
8. Malanga GA, Nadler S. Musculoskeletal physical examination: an evidence-based approach. Philadelphia, PA: Elsevier Mosby. 2006; 171–173.
9. Crawford JO, Laiou E. Conservative treatment of work related upper limb disorders-a review. Occup Med. 2007; 57(1): 4–17.
10. Bunnell S. Surgery of the hand, 3rd ed. Philadelphia: J B Lippincott Company. 1956; p.774.

11. Young husband OZ, Block JD. De Quervain's disease: Tenovaginitis at the Radial Styloid Process. Cannad Med Ass J. 1963; 89: 508-512.
12. Harvey FJ, Harvey PM, Horsley MW. De Quervain's disease: surgical or nonsurgical treatment. J Hand Surg. 1990; 15: 83–87.
13. Woods TH. Conservative treatments of DE Quervain's disease. Br J Surg. 1964; 51: 358–359.
14. Ahuja NK, Chung KC, de Quervain F.: Stenosing tendovaginitis at the radial styloid process. J Hand Surg Am. 2004; 29: 1164-1170.
15. Richie CA 3rd, Eriner WW Jr. Corticosteroid injection for treatment of De Quervain's tenosynovitis: a pooled quantitative literature evaluation. J Am Board Fam Pract. 2003; 16: 102–106.
16. Weiss AC, Akeiman E, Tabatabai M. Treatment of de Quervain's disease. J Hand Surg. 1994; 19: 595–598.
17. Witt J, Pess G, Gelberman RH. Treatment of de Quervain tenosynovitis: a prospective study of the results of injection of steroids and immobilization in splint. J Bone Joint Surg Am, 1991; 73: 219–222.
18. Zingas C, Failla JM, Holsbeek MV. Injection accuracy of clinical relief of De Quervain's tendinitis. J Hand Surg. 1998; 23: 89–96.
19. Froimson A. Tenosynovitis and tennis elbow. In: Green DP, Operative hand surgery, 3rd ed. New York: Churchill Livingstone. 1993; p.1989–2006.
20. Lmphier TA, Crooker C, Crooker JL. De Quervain's disease. Ind Med Surg. 1965; 34: 847-856.
21. Quinnel RC. Conservative management of trigger finger. Practitioner. 1980; 224: 187–190.