International Journal of Orthopaedics Sciences

E-ISSN: 2395-1958
P-ISSN: 2706-6630
IJOS 2023; 9(3): 40-45

https://www.orthopaper.com
Received: 14-04-2023
Accepted: 18-05-2023

Dr. Ismail
Krishna Institute of Medical Sciences, Karad, Maharashtra, India

Dr. Paresh
Krishna Institute of Medical Sciences, Karad, Maharashtra, India

Dr. Mohit
Krishna Institute of Medical Sciences, Karad, Maharashtra, India

Dr. Sudhanshu
Krishna Institute of Medical Sciences, Karad, Maharashtra, India

Dr. Swapnil
Krishna Institute of Medical Sciences, Karad, Maharashtra, India

Corresponding Author:
Dr. Ismail
Krishna Institute of Medical Sciences, Karad, Maharashtra, India

Comparative study between surgical release and local steroid injection in treatment of De Quervain disease

Dr. Ismail, Dr. Paresh, Dr. Mohit, Dr. Sudhanshu and Dr. Swapnil

DOI: https://doi.org/10.22271/ortho.2023.v9.i3a.3404

Abstract
Background: De Quervain disease is a condition that is known to be the reason for lateral side wrist pain. it is more frequently happens with people that do heavy manual jobs like housewives, and butchers. Despite there being controversy in the management of De Quervain's tenosynovitis, but conservative management, includes corticosteroid injections combined with a lidocaine into the first dorsal compartment and surgical release of the first dorsal compartment. Through an oblique incision are considered a beneficial treatment.
Objective: The aim of this study is to compare between the effectiveness of local corticosteroid injection and open surgical release in the treatment of De Quervain disease in terms of symptomatic relief, patient satisfaction and complications,
Patients and Methods: The study is a prospective study carried out at Krishna Institute of medical sciences from April 2021 to October 2022. A total number of patients were Fifty patients with De Quervain disease, were grouped randomly into two groups; the first group consisted of twenty-Five patients who were treated with local corticosteroid injection, and the second group consisted of twenty-Five patients who were managed by surgical decompression. The recurrence rate and satisfaction after intervention were investigated in both groups using the 10-point visual analog scale (VAS).
Results: in this study, there were Forty females and Ten males with a female-to-male ratio (4). Group 1 consisted of Twenty-Five patients treated with local injection of the first dorsal compartment. 15 out of the twenty patients treated with this method were very satisfied, 5 were satisfied, 4 dissatisfied and 1 was very dissatisfied. Group 2 consisted of Twenty-Five patients treated by surgical Release. 20 out of the Twenty Five were very satisfied with the outcome. 3 were satisfied with the outcome and 2 were dissatisfied.
Conclusion: Surgical release comes with better outcomes with cases having De Quervain tenosynovitis that fails to respond to local injection.

Keywords: Surgical release, local corticosteroid injection, De Quervain's disease.

Introduction
In 1892, Tiilaux, in time Traite {233} d'Anatoinie Topographique, referred to an inflammation localized in the time groove of the tendons of the abductor pollicis longus and the extensor pollicis brevis characterized by a small tumor and intense pain when the patient moved his thumb. He felt that this condition resulted from fatigue and improved after a few days' rest. Tillaux referred to it as tenosynovitis crepitante or d'ai [1, 2]. In 1895, Fritz de Quervain published five cases of the new entity, which he called fibrosis stenosierende Tendovaginitis.

In a new publication in May 1912, de Quervain reported another eight cases; all of them cured by surgical treatment and offered opinions on the etiology and pathogenesis of the syndrome. [1] In 1930, Finkelstein reviewed the literature and reported twenty-four additional cases. He felt that chronic trauma should be considered the principal cause of the syndrome. From his work, the author derived the well-known Finkelstein sign, which is considered pathognomonic of the disease. In reality, Finkelstein transcribed the test described by Eichoff in 1927 [1]. Stenosing tenosynovitis of the first dorsal compartment is caused by attritional forces secondary to friction; the attritional forces produce swelling and thickening of the extensor retinaculum covering the first dorsal compartment. The functional impairment is secondary to resisted gliding of the APL and the EPB within the narrowed fibro-osseous canal, resulting in pain and decreased motion [3].

Several theories exist regarding the cause of de Quervain's disease. Possible etiologies include trauma, increased frictional forces, anatomic abnormality, biomechanical compression, repetitive microtrauma, inflammatory disease, and increased volume states, such as occurring during pregnancy. [3, 4]. Variations include septation of the first dorsal compartment and the presence of multiple slips of the APL and, occasionally, of the EPB tendon. Bahm *et al*. found the division of the first dorsal compartment by an additional septum in 60% of patients with symptomatic de Quervain disease; the APL consisted of multiple tendons in 76%. These anatomic variations may have an effect on the underlying pathophysiology of de Quervain tenosynovitis. Katsumi *et al*. [4].

Nonsurgical treatment should be the first course of action for de Quervain disease. The patient presenting with mild to moderate pain that does not limit activities of daily living should be treated with rest, splinting, non-steroidal anti-inflammatory drugs (NSAIDs),a nd or corticosteroid injection of the first dorsal compartment [5]. Splinting is an effective method for resting the APL and EPB tendons by immobilizing the thumb and wrist in a single position and reducing or preventing the friction that may exacerbate swelling and pain. Custom or prefabricated splints should be forearm-based; one such splint is a radial thumb spica extension that holds the wrist in neutral and the thumb in 30° of flexion and 30° of abduction. Although symptoms may improve with splinting, on removal of the splint, symptoms quickly return in some patients when the inciting activity is resumed [6]. Non-steroidal anti-inflammatory drugs determining the efficacy of NSAIDs is difficult because they are often combined with other treatment modalities in most series examining their use for de Quervain's tenosynovitis. Jirarattanaphochai *et al*. found no benefit to adding nimesulide, a selective cyclooxygenase- 2 iinhibitors to corticosteroid injection in a randomized, double-blinded prospective study [6]. Corticosteroid injection for de Quervain disease consists of 1mL of corticosteroid with 0.5 to 1 mL of a local anesthetic. Success has been reported with a variety of corticosteroids (eg, betamethasone, triamcinolone, dexamethasone, methylprednisolone) combined with any of several local anesthetics (eg, bupivacaine, lidocaine) [5].

Operative treatment of De Quervain syndrome-release of the first dorsal compartment by incision of the extensor retinaculum at the ulnar border of the first dorsal compartment and exploration of the first dorsal compartment for the presence of a septum-is carried out as an outpatient procedure [7].

Patients and Methods

The study is a prospective Clinical trial study carried out in the Department of Orthopedics at Krishna Institute of Medical Sciences from April 2021 to October 2022. A total of Fifty patients were diagnosed for having De Quervain disease, thirty four patients were females (88%) while ten were males (20%).

The patients were diagnosed through medical history and positive Finkelstein test results performed during physical examination. The Finkelstein test was performed to show the pain that occurs by the ulnar deviation of the wrist, while the thumb is being locked in the palm, which is one of the diagnostic criteria of the disease [10, 11]. An X-ray was obtained for each patient to differentiate arthritis of the thumb, metacarpophalangeal joints, and scaphoid-trapezium-trapezoid (STT) joints; arthrosis of radiocarpal and intercarpal joints; and fracture of the scaphoid.

We exclude Patients who cannot comply for a 3 months follow-up period and patients with connective tissue disease.

The Fifty patients were grouped randomly into two groups; group 1 consisting of twenty-five patients who were treated with local corticosteroid injection and Group 2 consisting of twenty-five patients who were treated by surgical decompression.

In Group 1 consisted of twenty (80%) females and 5(20%) males, patients of this group had a local injection of 2 ml of methylprednisolone 40 mg in combination with 1 ml of lidocaine 2% injected into the first dorsal compartment. the Injection procedure the wrist is positioned in slight ulnar deviation. Sterilization of injection site. The borders of the first dorsal compartment are straddled with the examiner's opposite thumb and index finger. A needle is introduced into the tendon sheath at the level of the styloid, parallel to the tendons. The injectable medication should flow smoothly and easily, with both visual and palpable inflation of the compartment. Patients were checked immediately after injection to identify the immediate adverse reaction to the injected material, after six weeks of injection, at two and three months intervals from the time of injection. The patient is considered to be improved when there is relief of pain and tenderness, in at least 2 out of the 3 diagnostic test and have no recurrence.

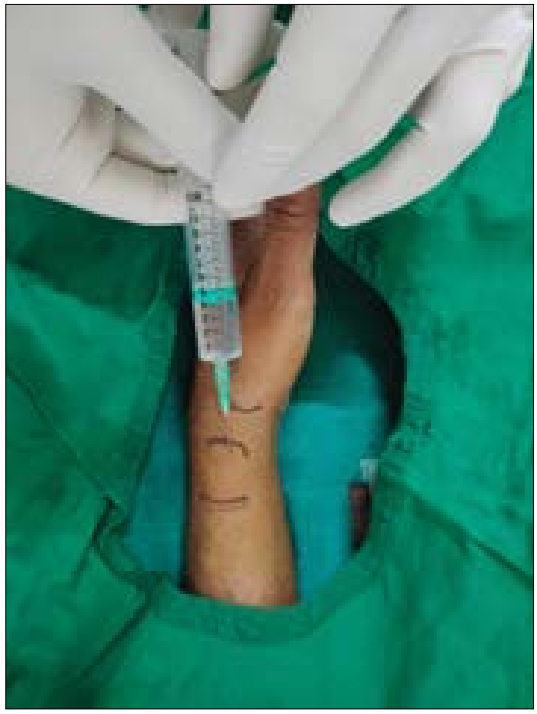


Fig 1: Local steroid injection

While in Group 2 consisted of 25 patients, 20(80%) were females and 5(20%) were males; this group was treated by surgery. The patient is given a supraclavicular block. exsanguination is done with an Esmarch tourniquet then an upper arm pneumatic tourniquet is used (inflated to 70 mm Hg above systolic blood pressure). a skin incision is made that is directed from dorsal to volar in a transverse-to-oblique direction, parallel with the skin creases over the area of tenderness in the first dorsal compartment over the center of the radial styloid starting from a point two and a half cm proximal and volar to the center of the radial styloid and ending two and a half cm dorsal and distal to it (Figure 1 A, B, C).

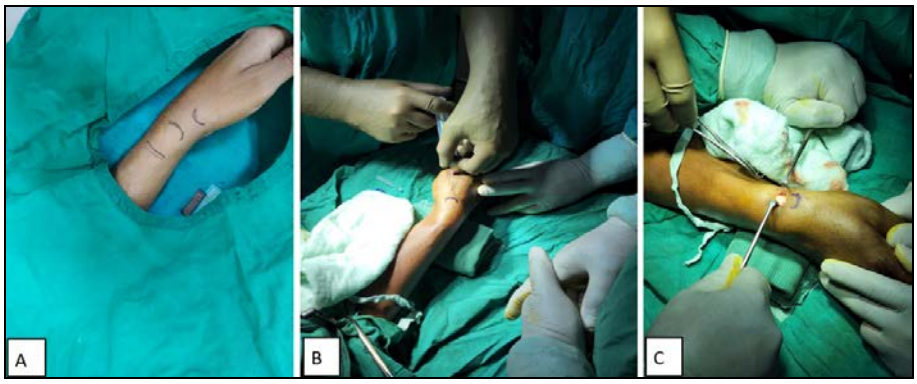


Fig 2: (A) planning the incision (B) skin preparation and draping (C) skin incision [8].

Carry sharp dissection just through the dermis and not into the subcutaneous fat, avoiding the branches of the superficial radial nerve. After retracting the skin edges, use blunt dissection in the subcutaneous fat. Find and protect the sensory branches of the superficial radial nerve, usually located deep in the superficial veins (Figure 2).

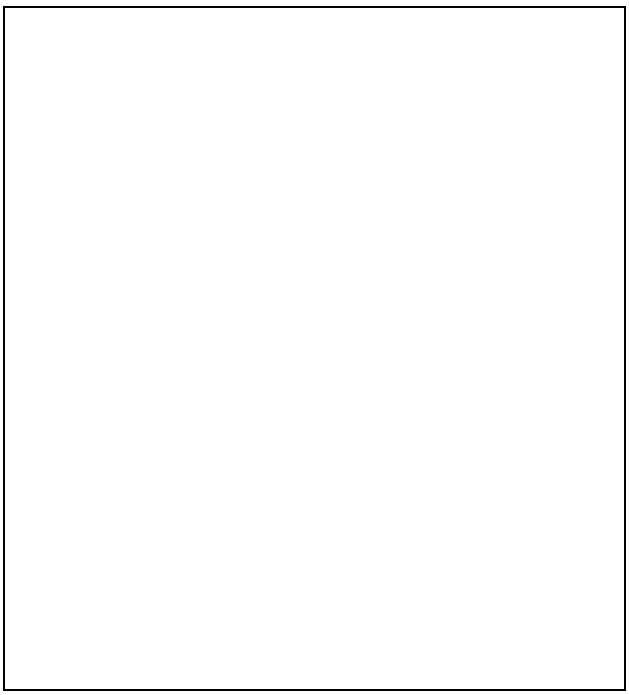
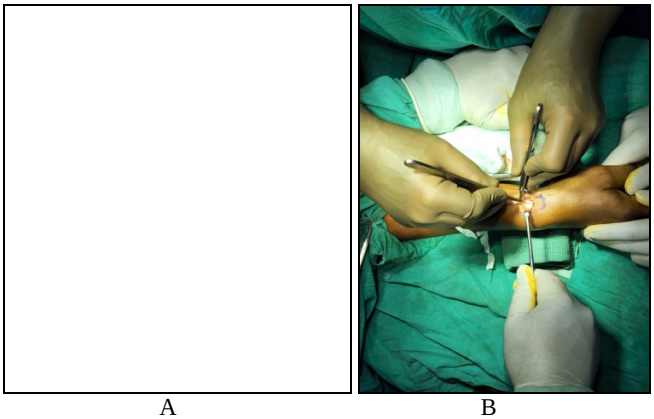


Fig 3: superficial radial nerve [7].

The thumb is passively ranged while the extensor retinaculum is inspected through the open wound. This allows the first dorsal compartment and its junction with the second dorsal compartment to be clearly ascertained. This also allows the extent of the retinaculum (from distal to proximal) to be determined and the possibility of incomplete release to be eliminated. Identify the tendons proximal to the stenosing dorsal ligament and sheath, and open the first dorsal compartment on its dorso-ulnar side (Figure 3 A and B).



A B

Fig 4: (A) proximal part of the canal entered (B) dorso-ulnar release of the first dorsal compartment [8].

With the thumb abducted and the wrist flexed, lift the abductor pollicis longus and the extensor pollicis brevis tendons from their groove. If they cannot be easily freed, look for additional "aberrant" tendons and separate compartments. The tourniquet is then deflated and the skin incision is closed, and apply a small pressure dressing (Figure 4).

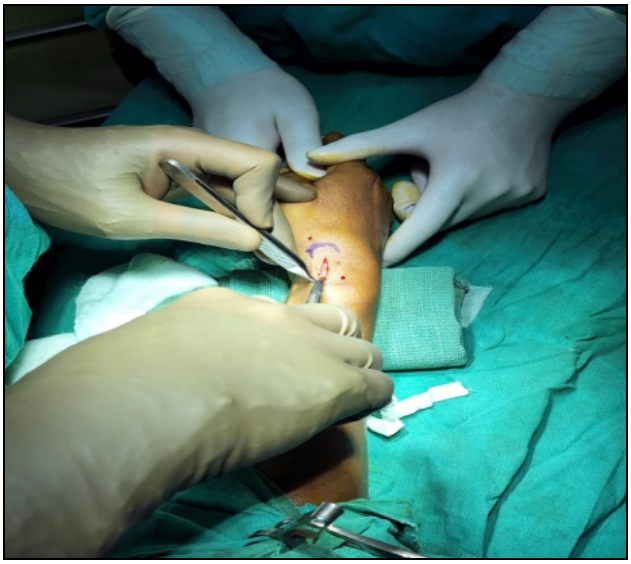
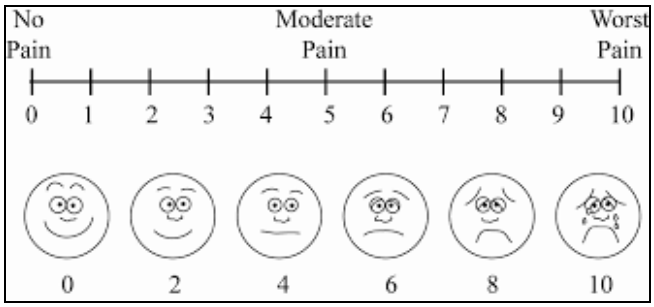


Fig 5: wound closure [8].

Prophylactic antibiotics were used in the form of cefotaxime 1 gram intravenously at the time of skin incision and another gram intravenously 6 hours post-operatively. The estimated time of the procedure is about twenty minutes. After treatment, active exercise of the thumb and hand is immediately encouraged and is increased as tolerated. The limb is placed in an arm sling for one week to prevent edema of the operative site.

The recurrence rate and satisfaction after intervention were investigated in both groups using the 10-point visual analog scale (VAS). The overall satisfaction rates were evaluated based on a 10-point scale score: 1-3, very dissatisfied; 4-5, dissatisfied; 6-7, satisfied; ≥ 8, very satisfied.



Results

In this study, there were forty (80%) females and 10(20%) males with a female-to-male ratio (4), (Table 1).

Table 1: Male-to-female distribution in the whole sample.

Sex	No.	Percentage
Male	10	20%
Female	40	80%
Total	50	100%

In group 1 there were 20 (80%) females and 5 (20%) males (table 2) while in group 2 there were 20 (80%) females and 5(20%) males (table 3).

Table 2: Male-to female-distribution in Group 1

Sex	No.	Percentage
Male	5	20%
Female	20	80%
Total	25	100%

Table 3: Male-to-female distribution in Group 2

Sex	No.	Percentage
Male	5	20%
Female	20	80%
Total	25	100%

45 (90%) of the patients were right-handed while 5(10%) were left-handed. Of the 50 patients, 40 patients had the disease on the same side of the dominant hand while only 10 had the condition on the side opposite to the dominant hand. 32 (71.11%) of the 45 right-handed patients had affection for the right (dominant) hand, while only 13 patients (28.88%) of them had affection for the left (nondominant) hand. While of the 5 left-handed patients only 3 (60%) patients had affectionforf the opposite nondominant hand and 2(40%) had affection of the same left dominant hand (table 4).

Table 4: Number and percentage of right and left-handed patients with respect to the affected side in relation to the dominant side.

	Right-handed patient	Left-handed patients	Affected dominant side	Affected non-dominant side
Number	45	5	34	16
Percent	90%	10%	68%	32%

Group 1 consisted of 25 patients treated with local injection of the first dorsal compartment. 15 out of the 25 patients treated with this method were very satisfied, 5 were satisfied,4 dissatisfied and 1 was very dissatisfied.

Of these 25 patients, 20 were females and 5 were males out of the thirty-four patients 5 did not respond to treatment and this non-response was defined by the failure of resolution of symptoms and at least two out of the three diagnostic criteria (table 5, chart 1).

Table 5: Response to Local injection

Result of Injection	No. of Patients	Percentage
Very satisfied	15	60%
Satisfied	5	
Dissatisfied	4	
Very dissatisfied	1	

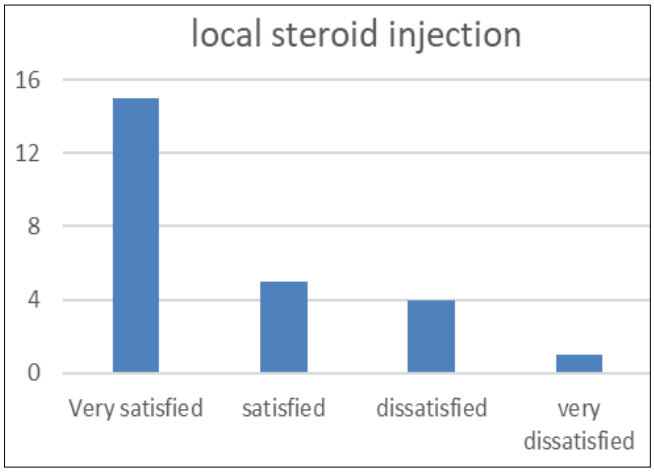


Chart 1: Response to local corticosteroid injection

18(72%) of the 25 patients developed complications (either immediate or late) Immediate complications twelve (52.17%) patients developed complications: 10(40%) patients had pain at the injection site. Four (16%) patients developed temporary radial nerve paresthesia. For late complications, four (16%) patients had hypopigmentation of the skin (figure 4) (Table 6).

Table 6: Immediate and late complications of local steroid injection.

Immediate Complication No. of patients Percentage		
Pain at the injection site	10	40%
Temporary radial nerve paraesthesia	4	16%
Total (Immediate)	14	56%
Late Complication No. of Patients Percentage		
Skin Hypopigmentation	4	16%
Total (Late)	4	16%
Total (Immediate & Late)	18	72%

Group 2

This group consisted of 25 patients treated by surgical Release. 20 (80%) out of the 25 were very satisfied with the outcome. 3 were satisfied with the outcome and 2 were dissatisfied, 20 of those patients were females, and only 5 male. 2 (8.00%) out of 25 patients who failed to respond to surgical decompression was one male patient. The failure of response was defined by the development of a painful scar in one male and persistence of symptoms in the other female (table 7).

Table 7: Response to surgery

Result of Surgery	**No. of patients**	**Percentage**
Very satisfied	20	80%
Satisfied	3	
Dissatisfied	2	
Very dissatisfied	0	

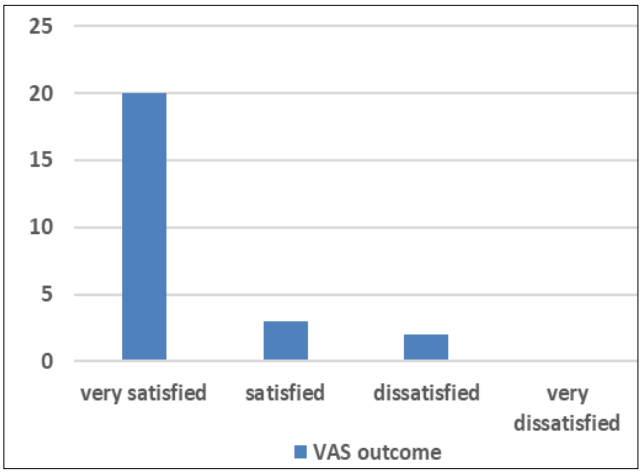


Chart 2: Vas's outcome

Complications of surgery

Three (14.28%) patients developed complications, and 1 (4.00%) of them developed surgical site scar. The other 2 (8%) of the 3 patients developed superficial wound infections those were managed with oral antibiotics and local dressing Table 8.

Table 8: Complications of surgery

Complication	**No. of patients**	**Percentage**
Painful scar	1	%
Superficial wound infection	2	8%
Total	3	12%

Discussion

In the study, we used surgical release of the first dorsal compartment and local injection of steroids. To compare the results of these two procedures. A total of 50 patients were having stenosing tenosynovitis at the radial styloid, with the following sex distribution, thirty 40 females (80%) and 10 males (20%). 25 patients received local injections of steroid (group 1), we used methylprednisolone 40 mg (2 ml) (combined with lidocaine 2% 1 ml). 25 patients had the surgical release of the first dorsal compartment, which was done under local anaesthesia in the operating room. In our study 34(68%) patients had the disease in the dominant hand and 16 (32%) had affection of the non-dominant hand which was similar to the results of Lane *et al.* [11]. That was 68% of patients developed the symptoms in the dominant hand which might be due to the high percentage of right-handed (and dominant) patients included in the study. concerning group 1 (treated with local injection), 15 patients (60%) had full relief of symptoms and were very satisfied, these patients were returned to normal activity this result seems to be comparable with the results of Anderson *et al.* [12]. study in which there was an improvement percentage of 81%. Results in our study might be slightly less might be attributed to the difference in the accuracy of injection and compartments separation. 5 were satisfied, 4 were dissatisfied and 1 was very dissatisfied as they suffered from the persistence of symptoms and signs, and this can be explained either by the inappropriate site of the injection or the presence of anatomical variation. Complications of local injection occurred as follows in group 1 Immediate complications, 14(56%) patients have had immediate complications 10 patients (40%) suffered from pain at the injection site; the result seems to be close to Anderson *et al.* [11] in which 35% of patients had pain at the injection site [12]. 4 patients (16%) had transient radial nerve paresthesia this is usually doesn't last for more than a month from time of injection. This result is higher than those found by Anderson *et al.* [12] in which there was only 4% of patients who developed temporary radial nerve paresthesias, this might be due to the extrusion of the injected material and pressure on the sensory branch of the radial nerve. In late complications, four (16%) cases had skin hypopigmentation at the injection site; this is lower than the results of Anderson *et al*. in which the percentage of this complication was 35%. concerning group 2 (treated surgically), 20 (80%) out of the 25 patients were very satisfied; these results seem to be close to Finkelstein *et al.* (3) and Kent *et al.* [13]. whose results were 95%, and 93% respectively. These patients had full satisfaction with the results of surgery and they returned to their daily activities. While two patients (9.52%) had failure to respond to surgical release as one developed painful surgical site scar and the other had a superficial wound infection. The complication rate of our study was (12%) in 3 patients this is comparable with the results of Kent *et al.* [13] (9%).

Conclusions

De Quervain disease is one of the common painful wrist conditions occurs more commonly in females. Local steroid injection is one of the treatment modalities with a success rate of (60%) with mild complications, whereas surgery gives a success rate of (80%) when indicated.

Surgical release is safe and can be done in a day clinic,

Although steroid injection is a treatment option for De Quervain's tenosynovitis, open surgery seems to be a more useful method with relatively low recurrence and

complication rates.

Recommendations

We recommend using local steroid injection for early cases of De Quervain disease and recommend surgical decompression for more chronic resistant cases that fail to respond to conservative treatment.

References

1. Luiz Leao. De Quervain Disease: A clinical and anatomical study. J bone joint surg. 1958;40-A:1063-70.
2. Solomon L, Warwick D, Nayagam S. Apley's system of Orthopedics and fractures. Tenth ed. London: Arnold; c2018. p. 777-778
3. Finkelstein H. Stenosing tendovaginitis at the radial styloid process. J Bone Joint Surg-A. 1930;12:509-540.
4. Kutsumi K, Amadio CP, Zhao C, Mark E. Gliding resistance of the extensor pollicis brevis tendon and abductor pollicis longus tendon within the first dorsal compartment in fixed wrist positions. J hand surg 2004;23(2):243-248.
5. Ilyas AM, Ast M, Schaffer AA, Thoder J. De Quervain tenosynovitis of the wrist. JAAOS - Journal of the American Academy of Orthopaedic Surgeons. 2007 Dec 1;15(12):757-64.
6. Ilyas AM. Nonsurgical Treatment for De Quervain's Tenosynovitis. J Hand Surg. 2009;34A(5):928-929.
7. Mathes SJ, Hentz VR. Mathes plastic surgery, the hand, and upper limb, 2nd edition, Elsevier, Philadelphia. 2006;7:1.
8. Terry Canale S. Campbell's operative orthopedics. Fourteen ed. Philadelphia: Mosby Company; c2021. p. 3850-3853.
9. Harvey FJ, Harvey PM, Horsley MW. De Quervain's disease: surgical or nonsurgical treatment. The Journal of hand surgery. 1990 Jan 1;15(1):83-7.
10. Witt J, Pess G, Gelberman RH. Treatment of de Quervain tenosynovitis. A prospective study of the results of injection of steroids and immobilization in a splint. JBJS. 1991 Feb 1;73(2):219-22.
11. Lane LB, Boretz RS, Stuchin SA. Treatment of de Quervain's disease: Role of conservative management. Journal of Hand Surgery [British]. 2001;26:258-260.
12. Anderson BC, Manthey R, Brouns MC. Treatment of De Quervain's tenosynovitis with corticosteroids: A Prospective Study of the Response to Local Injection, Arthritis, and Rheumatism. 1991;34:793-8.
13. Ta KT, Eidelman D, Thomson JG. Patient Satisfaction and Outcomes of Surgery for de Quervain's Tenosynovitis J HandSurg-A. 1999;24A:1071-1077.

How to Cite This Article

Ismail, Paresh, Mohit, Sudhanshu, Swapnil. Comparative study between surgical release and local steroid injection in treatment of De Quervain disease. International Journal of Orthopaedics Sciences. 2023;9(3):40-45.