

# De Quervain's Disease: Comparison between Two Methods of Intra-sheath Methylprednisolone Acetate Injection

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## ABSTRACT

**Introduction:** De Quervain's disease is a tenosynovitis of first dorsal compartment tendons around radial styloid process. It is very common condition seen and treated during routine orthopaedic OPD practice. Study was done to compare between two methods of intra-sheath Methylprednisolone acetate Injection in de Quervain's disease.

**Material and Methods:** 30 De Quervain's disease patients were treated with an intra-sheath injection of Methylprednisolone acetate (MA) from May 2014 to Dec 2015. A mixture of 1 ml (40 mg) of MA and 1 ml of 1% lidocaine hydrochloride was used for injection. The first 15 patients (Group-1), received injection by 26 gauge needle inserted vertically at the site just above the indurated tendon sheath into the first dorsal compartment of wrist. Remaining 15 patients (Group-2) were injected by a 110° bent needle (26G), introduced into the tendon sheath longitudinally between the EPB and APL tendon. All were followed up for about 6 months. A questionnaire was given to them regarding their treatment outcome, satisfaction rate and any recurrence. Complications and total number of injections for full relief were also noted. The results were categorised into four categories: excellent, Good, Fair and Poor. All these variables has been compared between two injecting methods.

**Results:** The efficacy rate was 93%. The treatment results of longitudinal injection method was better than those of vertical injection method. Recurrence was observed in seven hands (23%), and complications in 11 hands (37%); however, over 93% of patients were satisfied with the injection.

**Conclusion:** Longitudinally injecting method of injecting steroid increases the precision to be intra-sheath and also minimises the chances of leakage of drug into surrounding tissue. By showing upto 100% of efficacy rate, the longitudinal injection method is an effective option to treat De Quervain's disease.

**Keywords:** De Quervain's Disease, Intra-Sheath Steroid, Methylprednisolone Acetate

## INTRODUCTION

The De Quervain's disease<sup>1</sup> is primarily treated non-surgically by restricting the activity of thumb, splints and intra sheath steroid injection. If non-surgical management fails, surgical release of first dorsal compartment tendons are done.<sup>2,3</sup> Most of the time activity restriction, splints and pain medication are not enough to relieve the symptoms. And also due to work pressure the patients want early relieve of their symptoms. Surgical release is a promising option for early return of activity but it creates some doubts and fear to the patients. Various articles have already shown the role of Methylprednisolone acetate (MA) injection in snapping fingers.<sup>4-6</sup> There are some recent reports on the efficacy of intra sheath triamcinolone acetonide (AC) injection into the tendon sheath. Some studies showed that it is comparable to surgical release in terms of relieve of symptoms and early return to activity.<sup>7</sup>

Methylprednisolone acetate (MA) is an intermediate acting white

or practically white, odourless, crystalline powder. It is soluble in dioxane, sparingly soluble in acetone, alcohol, chloroform, and methanol, and slightly soluble in ether. It is practically insoluble in water. Its aqueous suspension when given Locally, acts for long duration with less systemic side effects. The technique for instilling the injection exactly into the tendon sheath also have an impact on how much the patient is relieved. We have compared two techniques for intra sheath injection of MA and report on its clinic al outcomes and various complications.

## MATERIAL AND METHODS

30 patients with de Quervain's disease were treated with an intra-sheath injection of MA from May 2014 to Dec 2015 in a tertiary care hospital (RMCH). Those who have unilateral disease were included in the study. All patients have been given the survey questions (Table-1) and asked to answer them in a face to face interview. There were 12 men and 18 women in this series, with a mean age of 33 years (range 25 years to 46 years). There were 16 Right hands (dominant hand) and 14 Left hands. Patients who have bilateral disease were not included in this study. The mean duration from the onset of pain to the first examination was 13 weeks (range 1 week to 41 weeks), and the mean duration of follow-up examination was 6 months (range 4 months to 12 months). All patients were Finkelstein test positive. They had sharply localised tenderness in the first dorsal compartment of the wrist. All complained pain and difficulty in using their hands in daily life. Following patients were excluded from the study:

1. Patients who had diagnosed diseases like rheumatoid arthritis, gout, chronic renal failure or diabetes mellitus.
2. Patients who are pregnant.
3. Patients who had taken intra-sheath steroid injection in the past for treatment of their de Quervain's disease

All injections were given by the same doctor in all of the patients, using the same protocol. A mixture of 1 ml (40 mg) of MA and 1 ml of 1% lidocaine hydrochloride was used for injection. In principle, maximum of three injections were given with an interval of 2 weeks between injections, and treatment was completed when patient relieved of the symptoms.

For performing intra-sheath injection, at first the region of maximum tenderness and indurations was confirmed by palpation. In the first 15 patients (Group-1), a 26 gauge needle was inserted vertically at the site just above the indurated tendon sheath into the first dorsal compartment of wrist till the bone is reached. And then the needle was pulled slightly back to reach the point where the syringe could be pushed without

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resistance. However for the remaining 15 patients (Group-2) we palpated and verified the extensor pollicis brevis (EPB) tendon and Abductor pollicis longus (APL) tendon just anterior to the anatomical snuff box and immediately below the radial styloid process. After this we bend the 26 gauge needle at an angle of 110° and injected the mixture by entering into the sheath longitudinally between the EPB and APL tendon. When there is sufficient filling in the tendon sheath both distally and proximally and injection was no longer possible to push in, then the needle was pulled out. In principle all injection should be into the tendon sheath but there may be some leakage into the subcutaneous tissue. The treatment results were categorized into four categories:

1. Excellent: No pain or disruption of daily life.
2. Good: Occasional pain but no disruption of daily life.
3. Fair: Reduced pain but there is disruption of daily life.
4. Poor: Continued or worsening pain and disruption of daily life.

Differences between the two injecting methods were surveyed in terms of the number of injections, recurrence of tenosynovitis, occurrence of complications, and variations in the outcome of the treatment. Additionally, according to the questionnaire, other two items listed in Table-1 were surveyed. All follow-up examinations were done by the senior author.

### STATISTICAL ANALYSIS

Microsoft office 2007 was used for the statistical analysis. Descriptive statistics like mean and percentages were used for data analysis.

### RESULTS

All the patients were examined personally by the senior author. All results were compared between two groups according to the variables given in Table-2. The category wise treatment results of the MA injection at the final follow up were excellent in 21 hands (70%), good in 7 hands (23%), and fair in two hands (7%); no hands showed a poor result. The efficacy rate, which combines the excellent and good results

taken together, was 93% means 28 hands. For differences in the injection method, Group-1 was excellent in nine hands (60%), good in four hands (27%), and fair in two hands (13%). For Group-2 patients, it was excellent in 12 hands (80%), and good in three hands (20%). The longitudinal injection method was better than the vertical injection method, with an efficacy rate of 100%.

The number of injections was 1 for 21 hands (70%), 2 for seven hands (23%), and 3 for two hands(7%) with a mean of 1.4. For 70% of subjects, treatment was completed after one injection. For differences in the injection method, the number of vertical injection method was 1 for 10 hands (67%), 2 for four hands (27%), and 3 for one hand (6%), and the longitudinal injection method was 1 for 11 hands (73%), 2 for three hands (20%), and 3 for one hand (7%). There were fewer longitudinal injections than vertical one.

The recurrence of tenosynovitis was seen in seven hands (23%), of which 4 hands(27%) were in the vertical injection method group and three hands (20%) were in the longitudinal injection method group; however, this recurrence was relieved by repeating the injection of MA. Regarding the treatment choice in the case of recurrence, 24 patients (80%) in both the groups answered that they would choose the intra-sheath steroid injection, with 10 patients (67%) in the vertical method group and 14 patients (93%) in the longitudinal method group. Four patients (13%), all from vertical injection group, answered that they would choose surgery.

### Complications

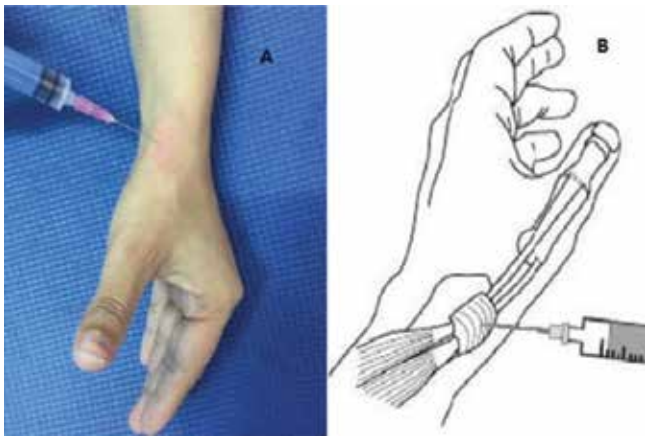
Temporary pain aggravation was seen in six patients for the first 2 days after the injection; however, it had disappeared in all these hands by the time of subsequent examination 2 weeks later. De-pigmentation around the needle-insertion site was observed in three hands, and atrophy of subcutaneous fat tissue at the same site was observed in two; however, all these symptoms had disappeared spontaneously within 6 months. There is no injury to the superficial radial nerve, no tendon rupture and no evidence of infection after injection was observed.

1. What is your condition?	<ul style="list-style-type: none"> <li>• There is neither pain nor disorder in ordinary daily life.</li> <li>• There is occasional pain but no disorder in ordinary daily life.</li> <li>• Pain was reduced but there is disorder in ordinary daily life.</li> <li>• Pain and disorder in ordinary daily life are continuing or getting worse.</li> </ul>
2. Are you satisfied?	<ul style="list-style-type: none"> <li>• I am glad to have chosen intrs sheath injection.</li> <li>• I should have chosen an operation for early return to ordinary daily life.</li> </ul>
3. If tenosynovitis recurred again?	<ul style="list-style-type: none"> <li>• I will choose an intrs sheath injection.</li> <li>• I will choose an operation for early return to ordinary life.</li> </ul>

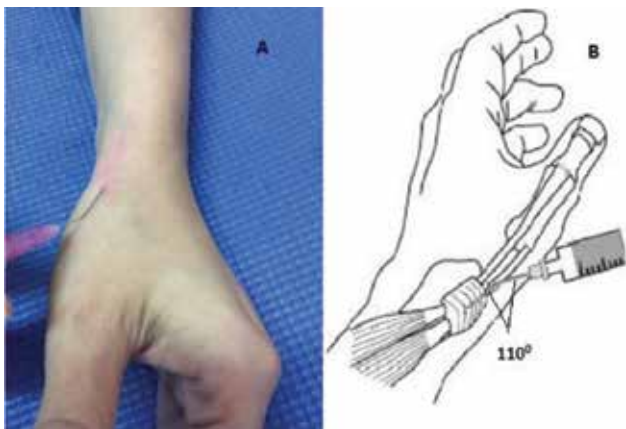
**Table-1:** Questionnaire

Treatment results (category wise)	Number of Injections			Recurrence of tenosynovitis			Satisfaction Rate			Treatment of choice in recurrence		
	Overall (%)	Gr-1 (%)	Gr-2 (%)	Overall (%)	Gr-1 (%)	Gr-2 (%)	Overall (%)	Gr-1 (%)	Gr-2 (%)	Overall (%)	Gr-1 (%)	Gr-2 (%)
Excellent	(70) 21	(60) 9	(80) 12	(23) 7	(27) 4	(20) 3	(93) 28	(87) 13	(100) 15	(80) 24	(67) 10	(93) 14
Good	(23) 7	(27) 4	(20) 3									
Fair	(7) 2	(13) 2	-									
Poor		-	-									
Efficacy (Exc. +Good)	(93) 28	(87) 3	(100) 15							(13) 4	(27) 4	-

**Table-2:** Result variables.



**Figure-1** Injection methods. For the first 15 hands the mixture was injected at one point directly above the indurated tendon sheath in the first dorsal compartment of the wrist. A: The clinical pic. B: diagrammatic representation



**Figure-2:** Injection methods. In the remaining 15 hands, the mixture was injected longitudinally into the common sheath between extensor pollicis brevis tendon and abductor pollicis longus tendon with a 1100 bent needle. A: The clinical pic. B: Diagrammatic Representation of the same.

## DISCUSSION

Since 1895 when de Quervain<sup>1</sup> reported pain along the radial styloid process due to impaired tendon gliding in the first dorsal compartment of the wrist, there have been many papers published regarding its clinical features and management. Nonsurgical treatment using intra-sheath steroid injections has been reviewed by many.<sup>8-13</sup> We studied intra-sheath injections of MA for patients with de Quervain's disease, and the efficacy rate was 93% in our study. Richie and Eriner<sup>10</sup>, who reviewed seven papers regarding the treatment outcomes in de Quervain's disease and concluded that the efficacy rate of injecting the steroid alone was 83%. Recently Takuya et al.<sup>7</sup> reported efficacy rate of intra-sheath injection upto 89%. Although the evaluation method in our study was more or less same, but we compared different techniques of injection and reported a much better outcome (93%) than previously reported.

MA is an intermediate acting steroid and it remains in the tendon sheath for a longer duration of time. The anti-inflammatory effects of MA may persist from 2 weeks to about 1 month after injection. That's why MA is considered an effective steroid in treating chronic inflammation. In our study we have fully informed the patients for its possible complications like transient increase in pain, depigmentation of skin and subcutaneous fat

atrophy which may persist for sometime after injection.<sup>14-16</sup> Froimson<sup>2</sup> showed that surgery is readily chosen for treatment of de Quervain's disease with the view that it reduces the treatment period and prevent recurrence despite good outcomes with intra-sheath injection. Sometimes surgical treatment has been chosen for tenosynovitis without careful consideration, and without emphasis over nonsurgical treatment.<sup>8</sup> In our series the average number of injections was 1.4, requiring 12 days, for one treatment period. This period is not so long and is comparable to that from the day of surgery to the removal of stitches. In our study about 93% of patients were satisfied by opting intra-sheath injection. Tenosynovitis recurrence was seen in 23% of patients, which is not insignificant; but with regard to the treatment of choice in the event of recurrence, 80% of patients answered to choose again for intra-sheath injection. We have reported complications in 11 hands (37%), but they are not serious and all resolved spontaneously, suggesting that intra-sheath steroid is a viable option in most of the cases.<sup>17</sup>

## CONCLUSION

Accurate injection of needle into tendon sheath is very important to have the full effect. By vertically injecting the mixture into the tendon sheath we first reach upto the bone and then pulled back slightly to feel for the loss of resistance. During this process the chances for leaking of mixture into surrounding tissue is high. By longitudinally injecting method we go along the two tendons of APL and EPB directly into the tendon sheath and presumed to be more precise. Our results were also encouraging by showing upto 100% of efficacy rate. Thus we conclude that intra-sheath injection of MA by longitudinal injection method is a promising option to treat De Quervain's disease.

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