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ORIGINAL ARTICLE

Outcome of Corticosteroid Injection in De Quervain's Tenosynovitis

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ABSTRACT

Background: De Quervain's tenosynovitis is a painful and swollen stenosing tenosynovitis of the first dorsal compartment of the wrist. After analysing the patient's medical history and doing a physical examination, a diagnosis is made. Finkelstein's test is almost always positive.

Objective: The goal of this study was to investigate the effectiveness of local corticosteroid injections in the treatment of de Quervain's tenosynovitis.

Material & Methods: The study enrolled fifty patients with De Querven's Tenosynovitis. NSAIDs were provided orally and topically to all patients for an average of six weeks with no obvious improvement. Using a visual analogue scale, it was determined how much soreness would be felt in the first dorsal compartment and how much pain would be felt during the Finkelstein test. The edoema was removed by injecting a mixture of 1 mL (10 mg) triamcinolone-acetonide and 1 mL of 1% lidocain hydrochloride into the affected wrist's first dorsal compartment. They were subsequently examined every two weeks for twenty-four weeks. After a local triamcinolone acetonide injection, pain and discomfort on the radial side of the wrist were alleviated, and a negative Finkelstein test was done.

Results: The mean age among the patients was 36.6 years with 12.4 SD. The maximum age was 60 years and the minimum age was 25 years old. The duration of symptoms in 4-8 weeks was observed, the mean value was 6 weeks with 1.4 as SD the minimum duration recorded was 4 weeks with 8 weeks as maximum duration. At the start of the week of appearance of symptoms the pain score was 6.44 with 1.6 as SD. The minimum pain score was 4 and maximum pain score was 8. Pain score at 4 weeks was 0.66 with 1.6 as SD. As per the independent t-test the p value was less than 0.05 so the test was significant statistically.

Conclusion: One or two local steroid injections in the first dorsal compartment can give considerable pain and inflammation alleviation in people with de Quervain's tenosynovitis.

INTRODUCTION

De Quervain's tenosynovitis is a stenosing tenosynovitis of the first dorsal compartment of the wrist caused by poor gliding of the abductor and extensor pollicis tendons. It affects the wrist's first dorsal compartment. The tendons of the first dorsal compartment of the wrist are most likely to be affected by a thickening of the ligamentous structures that protect them. The disorder is commonly referred to as stenosing tenosynovitis, but the microscopic morphology is consistent with degeneration. The cause of the disorder is unknown. The two kinds of degeneration are myxoid degeneration and fibrocartilagenous degeneration. In addition, mucopolysaccharide accumulation is observed. [3] Approximately 0.5 percent of males and 1.3 percent of women are thought to be affected by the condition in the Pakistan, according to current estimates.[4]

The condition can be identified quickly and readily based on the patient's medical history and physical exam. Occasionally, the patient reports pain in the radial styloid region, which is confirmed by clinical examination, which also reveals local tenderness and edema in some situations. Finkelstein's test is positive in the vast majority of cases. [5] It is necessary to do the Finkelstein test by instructing the patient to clench their fist with their thumb inside it and deviate their hand to the ulnar side. When a patient has De Quervain's illness, he or she will have pain in the affected area. [6] There is no consensus on the best way to treat this disease. [7] It has been noted that treatments such as rest massage, cold and heat treatments, diathermy, splints, and anti-irritants are useless in the treatment of this sickness. [8] Nonsurgical treatment options include local corticosteroid injections, bracing, physical therapy, and a thumb spica cast, which are all quite effective. Resistant cases of the first dorsal compartment of the wrist are treated with surgery to alleviate the compartment. [9] In 91 percent of patients, surgery (splitting or excising a strip of the tendon's covering layer) has been shown to be curative; nevertheless, it has been associated with higher costs and surgical complications in other situations. [10] The purpose of this study is to determine whether or not local corticosteroid injections for de Quervain's tenosynovitis are effective.

De Quervain's tenosynovitis is quite common, however there has been little investigation into the efficacy of nonoperative treatment in large study groups despite the high frequency of the condition.

[3] When combined with corticosteroid injection, Mardani-Kivi et al[8] discovered that the combination of thumb spica splinting/casting and corticosteroid injection produced superior results than injection alone in a

randomised prospective study. Additionally, a case report of refractory de Quervain's tenosynovitis that was treated with platelet-rich plasma has been made public. [9] Moreover, in a randomised double-blind study, researchers discovered that concurrent therapy with nimesulide, a nonsteroidal anti-inflammatory medicine, did not result in a superior outcome when compared to triamcinolone injection alone. [4] Noninvasive treatments such as steroid injection should be investigated more thoroughly to determine whether they provide the greatest benefit. This is due to the invasive nature of surgical treatment, as well as the longer recovery time and potential problems associated with it. We feel that corticosteroid injections could be a successful treatment for de Quervain's tenosynovitis in some cases. The purpose of our study was to determine the efficacy of one or two corticosteroid injections and to determine whether certain demographic or comorbidity variables could predict treatment success or failure in certain patients.

MATERIAL AND METHODS

The study was done between January 2019 and December 2020 at a Teaching Hospital and a private practise, with results expected in December 2020. The project would enroll a total of 55 patients (55 hands). Five patients were not followed up, but 50 patients' data were accessible for investigation. Previously, all patients had been treated for their ailment with oral and topical NSAIDs for an average of six weeks (range, four to eight weeks) with no improvement, leaving them dissatisfied with their treatment. The area surrounding the radial styloid (first dorsal compartment of the wrist) was tender on physical examination, and the Finkelstein test was positive in all of the patients. The visual analogue scale (VAS 0-10) was used to determine the level of pain, with 0 representing no discomfort, 1–3 representing mild pain, 4–6 representing moderate pain, and 7–10 representing severe pain. Under the age of 18, with symptoms consistent with rheumatoid arthritis, gout, diabetes mellitus, or pregnancy, and with a history of trauma or steroid injection in the region, participants were included.

When reviewing a patient's chart, the following information was gathered: age, gender, race, ethnic origin, BMI (if available), injected limb side, injection dates of service, type of corticosteroid injected, content of follow-up clinical note (if present), surgery date of service (if applicable), and presence of comorbidities (carpal tunnel syndrome, diabetes, rheumatoid arthritis, Dupuytren's disease, and hypothyroidism. Patients who did not supply accurate information were eliminated, and the process was repeated until a sufficient number of patients was obtained. Apart from that, there were no restrictions.

We utilised logistic regression models to predict treatment success probabilities and associated 95% confidence intervals, as well as to examine the significance of univariate relationships between patient variables and treatment failure. Gender, age at first injection, race, ethnic origin, BMI, injection site, and comorbidities such as diabetes, hypothyroidism, Dupuytren's disease, and carpal tunnel syndrome are all considered. Due to the fact that some participants had measurements taken on both hands, the findings cannot be regarded as totally independent.

Injection technique: One millilitre (10 mg) triamcinolone acetonide and one millilitre (1%) lidocain hydrochloride hydrochloride were combined in a 5 millilitre (5 cc) syringe using 24 or 26 gauge needles. Prior to the injection, the presence of soreness at the injection site was determined. The needle was placed into the first extensor compartment of the wrist, parallel to the abductor polices longus and extensor polices bravis tendons. After removing the needle, the wrist was wrapped. The synovial sheath was stretched as a result of the volumetric effect. Patients were permitted to take paracetamol tablets as needed to alleviate discomfort. Following the injection, each patient was examined two weeks later for early clinical response and then monitored biweekly for the next 24 weeks. Treatment success was determined by the intensity of pain and tenderness on the radial side of the wrist, as well as a negative Finkelstein test. The key outcome markers in this trial were pain alleviation and a negative Finkelstein test result. In this study, secondary outcome indicators were the existence of chronic discomfort and tenderness, skin depigmentation, and a positive Finkelstein test.

RESULTS

SPSS version 25.0 was used to analyse the data, and a one-sample t-test was used (Table 2). There were 15 (30%) men and 35 (70%) women out of a total of 50 patients. The participants ranged in age from 25 to 60 years old. (The average age is 36.6 years.) The right hand was affected in 34 (68%) of the patients, whereas the left hand was damaged in 16 (32%) of the patients. In 32 (64 percent) of the patients, the dominant hand was afflicted. The average time from the beginning of symptoms to study enrolment was 6 weeks (range 4 weeks to 8 weeks). The degree of discomfort on a 10cm VAS was measured at the start of the trial. Twenty-three patients had a VAS score of 8, fifteen had a score of 6, and twelve had a score of 4. Fifteen patients were given a second injection two weeks after the first because they had not responded to the first. After a single injection, 35 patients (70 percent) were symptom-free. After the injections, the patients were called every two weeks. At four weeks, 42 (84%) of 50 patients had no symptoms and were entirely satisfied with their treatment with no VAS (Table 1).

The other eight patients experienced discomfort in the first dorsal compartment of the wrist and a positive Finklestein test (severity of pain, VAN 6 in 3 and VAN 3 in 5 patients). All of the patients were symptom-free and pleased with the results after six weeks. After 24 weeks of follow-up, we detected no recurrence in this group of patients. Although steroid side effects were found in 18/50 (36%) of participants, they were only temporary. Thirteen patients (26%) felt temporary soreness at the injection site, which went away in four to ten days. Three individuals had a localised area of depigmentation, while two others had subcutaneous fat atrophy. In about 20 weeks, these modifications were reversed. There were no nerve injuries, tendon ruptures, or infections.

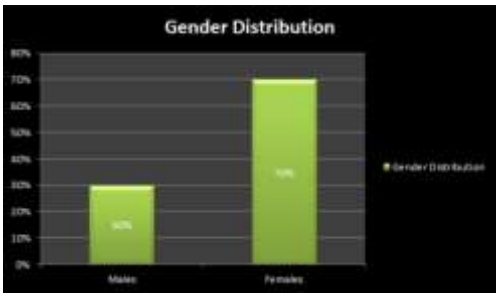

Figure 1: Description of gender distribution, showing more percentage of females than males.

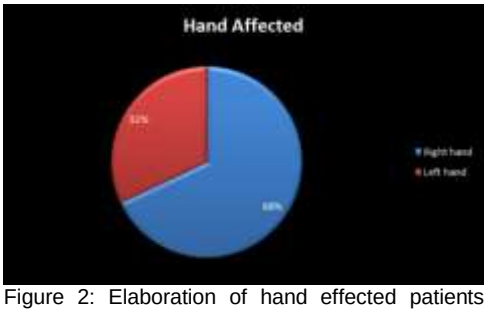

Figure 2: Elaboration of hand effected patients showing more percentage of right hand than left hand.

Table 1: The mean age among the patients was 36.6 years with 12.4 SD. The maximum age was 60 years and the minimum age was 25 years old. The duration of symptoms in 4-8 weeks was observed, the mean value was 6 weeks with 1.4 as SD the minimum duration recorded was 4 weeks with 8 weeks as maximum duration. At the start of the week of appearance of symptoms the pain score was 6.44 with 1.6 as SD. The minimum pain score was 4 and maximum pain score was 8. Pain score at 4 weeks was 0.66 with 1.6 as SD.

Age(years)	Mean	Standard Deviation	Minimum	Maximum
	36.6	12.4	25	60
Duration of symptoms (4-8 weeks)	6	1.4	4	8
Pain Score at start	6.44	1.6	4	8
Pain score at 4 weeks	0.66	1.6	0	6
Pain Score at 6 weeks	0.00	0.00	0	0
Adverse reactions	0.5	0.78	0	3

Table 2: As per the independent t-test the p value was less than 0.05 so the test was significant statistically.

	Independent t test					
	t	Df	P value	Mean Difference	95% of the confidence interval of the difference	
					Lower	Upper
Age	20.64	49	<0.001	36.60	33.08	40.12
Duration of symptoms (4-8 weeks)	29.78	49	<0.001	6.20	5.6	6.5
Pain Score at start	27.62	49	<0.001	6.40	5.7	7.0
Pain score at 4 weeks	2.65	49	<0.001	0.66	0.18	1.12
Adverse Reactions	4.51	49	<0.001	0.55	0.29	0.71

DISCUSSION

According to the data, 70% of patients in our study were female, with an average age of 36.6 years. SA Mehdinasab and SA Alemohammad[7] did a study in which they discovered that 86.3 percent of patients were female and had a mean age of 32.6 years. Prior to coming to us, all of our patients had attempted unsuccessfully other forms of treatment (such as rest and oral NSAIDs). Localized steroids administered topically are now considered standard therapy for DeQurvain's condition. Numerous studies have demonstrated that local steroid injections have a high success rate in the treatment of a number of illnesses. After analysing seven peer-reviewed articles, Richie and Eriner concluded that local steroid injection is successful in 83 percent of patients. Treatment with injection plus splint resulted in a 61% cure rate, while treatment with splint resulted in a 14% cure rate, and treatment with rest or nonsteroid anti-inflammatory medicines resulted in a 0% cure rate. It was discovered to be the most effective and beneficial therapy option available at the time for this ailment. They injected 327 wrists and then studied them for 9.6 months, during which no tendon rupture was seen. According to Avciet al., they had a 100 percent success rate. Takuya Sawaizumi reported a 94 percent success rate with local injections of Triamcinolone for individuals with De Quervain's illness in a 2007 study. Although the vast majority of patients were completely satisfied, 26% experienced relapse and 32% encountered complications during the research period. [13] All patients in this trial indicated satisfaction after a 24-week follow-up period, and there was no sign of recurrence. According to McDermott JD et al, a journal of the American Chiropractic Association, 36 of 37 wrists evaluated in 36 patients (97 percent) reported recurrent complaints after a 6-week follow-up (2012). On average, one wrist out of every fourteen had a recurrence. During the investigation, no issues were discovered. [14]

However, this investigation revealed distinct issues in 36% of the cases analysed. This could be because the study used a 24-week follow-up period rather than the 6-week follow-up period used in the study of McDermott and collegues[14]. C. Peters-Veluthamaningal et al.[15] compared a single steroid injection with splinting with a thumb spica on 18 pregnant or nursing women. There were two groups of nine patients each, with nine patients in each group. Within one week of treatment, patients in the steroid group reported total pain alleviation, whereas none of the patients in the spica group reported such improvement. During the investigation, no issues were discovered. [15] Our study found that 70% of patients were symptom-free two weeks

after the intervention, 84% were symptom-free four weeks later, and 100% were symptom-free six weeks later. At the 24-week milestone, there had been no recurrences. As a result, the effects of triamcinolone can last up to six weeks following administration.

Triamcinolone has been described as a lyophobic steroid having a slower rate of tissue absorption than other steroids and a longer duration spent in the sheath than other steroids. This medication's anti-inflammatory effects are anticipated to last between two and four weeks. [16] In our study, 18/50 (or 36% of subjects) experienced adverse events. Within 10 days, thirteen of the thirteen patients had recovered from the brief soreness at the injection site. The remaining five patients, who had skin depigmentation (3 patients) and subcutaneous fat atrophy (2 patients), had their abnormalities repaired during the next 20 weeks. Steroid injections may cause unpleasant side effects such as pain at the injection site and hypopigmentation of the skin. These are temporary side effects. Prior to commencing therapy with this medicine, it is crucial that patients are aware of these side effects. [17,18] Our study has a drawback in that it only includes a brief follow-up time. After six months of follow-up, there was no sign of recurrence. Additional research on this subject, in our judgement, will be required in the future.

Peters et al[15] conducted a double-blind prospective experiment to examine the effects of steroid injection into the abductor pollicislongus and extensor pollicis brevis tendon sheaths. Although the trial enrolled only 19 patients, the researchers discovered that injecting both tendon compartments may provide the greatest benefit, with injection accuracy likely playing a crucial role in treatment success. [15] In other instances of tenosynovitis, injections have been reported to be beneficial even when the medication is not confined within the sheath; thus, it is unknown if the drug must be contained within the compartment in this circumstance. [12]Avci et al previously demonstrated that the ultrasound guided group experienced a higher reduction in pain than the standard injection group at follow-up, as judged by the visual analogue scale (VAS). This demonstrates that injecting de Quervain's tenosynovitis into this exact anatomical region is a successful treatment, as made possible by technical advances. Additionally, Rettig et al[6] compared bespoke orthotics, naproxen 500 mg, and corticosteroid injections with 4-mg betamethasone in 300 patients (319 limbs) with de Quervain's tenosynovitis. They classified patients according to the severity of their diseases. According to their findings, the authors evaluated the scenario and classified it as minimum, mild, or moderate to severe. 249 patients in the moderate to severe category received injections, with 53 receiving two and 17 receiving three. [6] Eighty-six percent of patients reported complete alleviation, while seven percent reported improvement and four percent reported no change. [6]

Numerous variables were unavailable, including BMI, hand dominance, and medical comorbidities. We employed a range of injection drugs and dosages, and it is possible that we were ignorant of any changes in effectiveness. On the other hand, alternative preparations have demonstrated promising effects. [10] Some patients chose to utilise an orthosis, while others did not, based on personal preferences or expert suggestions. Additionally, symptom resolution is entirely subjective, and we rely on the patient's claim of symptom decrease to judge whether or not the patient has received symptom relief. We do not have a set time limit for determining the success of an operation; however, patients are often asked to return in 6 to 8 weeks, or sooner if necessary, for a follow-up consultation. A tiny proportion of patients may relapse after discharge, and we would not be able to learn about these cases unless the patients were readmitted to the institution.

Additionally, despite the quantity of research outlining risk factors for de Quervain's tenosynovitis, there is a dearth of data assessing demographic characteristics as predictors of treatment outcome. Goldfarb et al[17] discovered that being over 40 years old, being black, and being female all increase the likelihood of having de Quervain's tenosynovitis (de Quervain's tendonitis). Obese patients are more likely to fail than non-obese patients, because obesity is connected with physiological and anatomical traits that make them less receptive to treatment or predispose them to a more severe condition. One possible explanation for the increased failure rate in individuals with BMI 30 is difficulty getting the drug into the first extensor compartment as a result of the patient's increased subcutaneous adipose tissue.

Our findings indicate that corticosteroid injections are a viable therapeutic therapy option for de Quervain's tenosynovitis, with a 70% short-term success rate following only two or fewer injections in the knee joint. As with all retrospective research, this review has limitations. Our data are only as trustworthy as the documentation provided within the medical record. Additionally, the 55 patients were selected at random, with a preference for those who had recently received services, which may have resulted in selection bias. Further research is necessary to extensively examine other possible predictors of therapy efficacy, as well as whether symptoms recur at a later time point.[18]

CONCLUSION

We observe that a single or two local steroid injections into the first dorsal compartment of patients with de Quervain's tenosynovitis result in quick improvement.

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