

Original Article

Local Corticosteroid Injection Versus Open Surgical Release in De Quervain Tenosynovitis: A Prospective Non-Randomized Comparative Study

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Disclaimer: This study has not been published or submitted elsewhere for publication.**AI Disclosure:** During the preparation of this manuscript, we used Claude (Claude Sonnet 4.6) for grammatical correction and language editing of the manuscript text. This tool was used exclusively to improve the linguistic clarity and correct grammatical errors in the written text. It was not used for data collection, statistical analysis, interpretation of results, literature search, or generation of any scientific or clinical content. All intellectual content, clinical reasoning, data analysis, and conclusions are the exclusive work of the named authors. The authors have thoroughly reviewed and taken full responsibility for the accuracy and integrity of the manuscript.**Data Availability Statement:** Data are available from the corresponding author upon reasonable request for reproducing the results of this analysis. The data are not publicly deposited because institutional policies do not allow it and because there is no explicit consent from the participants to make the data publicly available.**Institutional Review Board****Approval**

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Abstract

Objective: De Quervain tenosynovitis is a frequent cause of radial-sided wrist pain in clinical practice and is a stenosing tendinopathy involving the first dorsal extensor compartment of the wrist. Corticosteroid injection and surgical release are widely used for its treatment; however, there is a lack of comparative evidence on the effectiveness of these treatments in a real clinical setting.

Methodology: In this prospective, non-randomised, single-centre comparative study (ClinicalTrials.gov: NCT07683429), 100 patients with clinically diagnosed De Quervain tenosynovitis who failed to respond to initial conservative treatment were enrolled. Forty-nine patients were allocated to corticosteroid injection (CSI), and 51 to open surgical release (OSR) treatment, based on the investigators' clinical judgment and patient choice. The Visual Analogue Scale (VAS, 0-10) was used to measure pain severity at baseline, 1 month, and 6 months after the intervention. Independent samples t-tests were used to compare the differences between groups, and a linear mixed-effects model was used to model pain trajectories over time. The normality of continuous variables was checked before parametric analysis using the Shapiro-Wilk test. A trained assessor blinded to the treatment allocation performed the VAS assessments at follow-up.

Results: Most of the cohort (72%) were women, and the mean age was 36.7 ± 8.0 years. There were no significant differences in age or sex between the two groups; however, the VAS scores were slightly higher in the surgical group (8.71 ± 1.06) than in the CSI group (8.27 ± 0.97 ; $p = 0.033$) at baseline. The surgical release group had significantly lower pain scores at 1 month (1.49 ± 0.78) than the CSI group (3.22 ± 1.07 ; $p < 0.001$). This difference persisted and widened at six months (surgical: 0.59 ± 0.57 versus CSI: 2.88 ± 1.18 ; $p < 0.001$). There was a significant group $\times$ time interaction ($p < 0.001$) for the linear mixed-effects modelling for pain scores over follow-up, indicating that the surgical release group had greater and more lasting reductions in pain. No significant complications were observed in either group.

Conclusion: Corticosteroid injection and open surgical release are effective treatments for De Quervain tenosynovitis. Surgical release was more effective and long-lasting in relieving pain, particularly in cases of chronic or intractable pain. However, corticosteroid injection remains a minimally invasive first-line treatment. Treatment decisions should be based on the severity of symptoms, patient preference, and available resources.

Keywords: De Quervain tenosynovitis; corticosteroid injection; surgical release; visual analog scale; prospective non-randomized comparative study.

Introduction

Tenosynovitis of the tendon sheaths of the abductor pollicis longus and extensor pollicis brevis, known as De Quervain tenosynovitis (DQT), was first described by the Swiss surgeon Fritz de Quervain in 1895. It is more common in people whose work or home activities require repeated actions of the thumb, such as using the ulnar wrist deviation, which is more common among women doing housework and caregiving activities. At its most basic, DQT is an inflammatory process that causes the tendons of the abductor pollicis longus (APL) and extensor pollicis brevis (EPB) to become inflamed in the first

dorsal extensor compartment of the wrist under the extensor retinaculum in the area of the fibro-osseous tunnel.^{1,2} The exact pathophysiological mechanism remains unclear, but most agree that the process involves progressive thickening of the tendon sheath and overlying retinaculum, causing their mechanical impingement and pain, while there are degenerative changes within the tendon substance itself.^{3,4}

There are both conservative and operative strategies for managing DQT. First-line treatment involves activity modification, thumb spica splinting, non-steroidal anti-inflammatory drugs (NSAIDs), and local corticosteroid injection (CSI).⁵ While surgical decompression and CSI are well established, the literature on the comparison of the long-term outcomes is inconsistent, with some studies showing similar results and others favouring one treatment modality over the other.⁶ The relative benefits of each treatment were clinically significant. Both corticosteroid injection and surgical release are minimally invasive outpatient procedures with good short-term success in many patients; however, surgical release (which carries the inherent risks associated with an operative procedure) is a more permanent anatomic decompression with high long-term success rates. The fact that one modality is more likely to provide long-term pain relief and in what clinical situations is of direct relevance to practitioners treating this condition.

This study aimed to prospectively compare pain outcomes between corticosteroid injection and open surgical release in a group of patients with clinically diagnosed DQT who were unresponsive to conservative treatment to guide treatment decisions based on evidence.

Methodology

This prospective non-randomised comparative study was performed in a single tertiary care centre to evaluate pain relief in patients with De Quervain tenosynovitis treated with either CSI or open surgical release. There was no formal randomisation, but treatment assignment was made in collaboration between the treating physician and the patient based on clinical judgement regarding the severity of symptoms, patient preference, and individual clinical history. The study was approved by the Institutional Review Board (IRB number: 1302) and was conducted in compliance with the Declaration of Helsinki. This study was retrospectively registered in ClinicalTrials.gov (NCT07683429). Patients were followed up for 6 months. Patients were recruited, and data were collected from March 2023 to April 2025. All participants provided informed consent before enrolment. Patients were consecutively recruited from the Rawalpindi Teaching Hospital, Rawalpindi outpatient department. The treating clinician of eligible patients who had failed to improve after conservative treatment for at least 4 weeks approached them to participate during their clinic visit when they presented with symptoms of DQT. To reduce possible bias, predetermined inclusion and exclusion criteria were used, and an objective assessment of outcomes was performed. However, because the subjects were not randomly assigned, selection bias cannot be ruled out.

A formal a priori sample size calculation was not performed before enrolment. A total of 100 patients was determined by feasibility, based on the volume of eligible patients presenting to the institution during the study period, consistent with sample sizes reported in comparable non-randomised studies of De Quervain's tenosynovitis. The observed between-group effect sizes are reported transparently to facilitate sample size planning for future confirmatory research in this field.

Patients were included if they had a clinical diagnosis of DQT, were aged 18–70 years, were male or female, and experienced pain that affected their activities of daily living. Patients were excluded if they had concurrent inflammatory arthropathy (e.g., RA or gout), a history of previous wrist injury, previous surgical or injection treatment for DQT, or any coexisting upper limb pathology (rotator cuff, epicondylitis, carpal tunnel syndrome).

Corticosteroid Injection: The CSI group of eligible patients received 1 mL of triamcinolone acetonide (40 mg/mL) and 1 mL of 1% lidocaine directly into the first dorsal extensor compartment under strict aseptic conditions. Ultrasound was not used.

Surgical Release: In the surgical group, patients underwent open decompression of the first dorsal compartment under local or regional anaesthesia. This included a longitudinal incision extending over the radial styloid, careful dissection and release of the fibro-osseous sheath overlying the APL and EPB tendons, and non-absorbable suturing of the wound.

The two groups were treated identically postoperatively: a thumb spica splint for two weeks and no load-bearing activities using the thumb and hand for four to six weeks.

The main outcome was pain intensity, measured using the visual analogue scale (VAS, scored 0 to 10). This was recorded three times: at baseline (before treatment), one month later, and six months after the intervention. Measurement bias was minimised by having VAS assessments at follow-up performed by a trained assessor blinded to treatment allocation. The VAS is valid and reliable for measuring pain in musculoskeletal conditions, with a minimum clinically important difference (MCID) of approximately 1.5 points. It has been widely used for the study

of hand and wrist conditions, such as De Quervain tenosynovitis, and has high test–retest reliability and sensitivity to clinical change. The secondary variables assessed at baseline were patient age and sex to describe the study sample and assess potential confounding factors. All adverse events were recorded clinically during the follow-up period.

Demographic information and VAS scores were obtained at baseline. Participants were followed up either with a pre-arranged clinic visit or by a structured telephone interview at 1 and 6 months by trained research staff. All data were recorded in a safe and secure electronic database with systematic quality checks for completeness and accuracy.

All data were entered into a secure electronic database immediately after each patient encounter. Before the analysis, two independent researchers checked the dataset for completeness and accuracy. We confirmed the completeness of the data at both follow-up time points. Complete outcome data were available for all 100 enrolled patients at one-month and six-month follow-up, and no imputation procedures were required. We identified outliers by visually inspecting boxplots and addressed them individually in consultation with the study team.

Baseline characteristics were presented separately for each treatment group. All data are presented as mean $\pm$ standard deviation (SD) for continuous variables and frequency and percentage for sex (categorical). Independent samples t-tests and chi-square tests were used to identify differences between groups at baseline for continuous and categorical variables, respectively.

Pain trajectories across the three time points were examined using a linear mixed-effects model, which appropriately accounted for the within-subject correlation inherent in repeated measures data. Fixed effects for the treatment group (CSI versus surgical release), time point (baseline, 1 month, 6 months), and group $\times$ time were included in the model. The random intercept was chosen for each participant, and an unstructured covariance matrix was specified to model the residual covariance structure. Restricted maximum likelihood (REML) was used to estimate the parameters. Residual diagnostic plots were used to assess the model fit. The interaction term (group $\times$ time) was the main inferential target. Estimated marginal means with 95% confidence intervals (CIs) were reported, and pairwise post hoc multiple testing corrections were performed using Bonferroni correction. Cohen's d was used to quantify the effect sizes for pairwise between-group differences.

Mixed model analysis was used for exploratory subgroup analyses by sex and age (<50 years or ≥ 50 years), where cell size allowed. Independent t-tests were also performed to compare the pain reduction from baseline to each follow-up point between groups.

The significance level for all hypothesis tests was $\alpha = 0.05$, and they were two-sided. Multiple comparison correction was performed using the Bonferroni method. All analyses were performed using complete case analysis. All primary analyses were performed on continuous outcome measures that remained on the original scale. The VAS was ordinally scaled, but was analysed as a continuous variable, as is the convention in musculoskeletal clinical research, and was found to be normally distributed after Shapiro-Wilk testing. IBM SPSS Statistics version 28.0 was used for all the analyses. Reporting followed the TREND guidelines for non-randomised evaluations (a completed TREND checklist is attached as an additional file).

Results

Participant Characteristics

One hundred and twelve patients were evaluated for eligibility. Of the 12, 7 did not meet the inclusion criteria (4 with concurrent inflammatory arthropathy, 3 receiving prior treatment for DQT), and 5 refused to participate. A total of 49 patients were allocated to the corticosteroid injection (CSI) group and 51 to the open surgical release group. All 100 enrolled patients were followed up at 1 and 6 months and were included in the final analysis. The cohort population was mostly female (72%). The average age of the total sample was 36.72 years (standard deviation (SD) = 8.043 years, range 21–55 years), and the average baseline pain intensity using the Visual Analogue Scale (VAS) was 8.49 (SD = 1.040, range 7–10).

The two groups were compared for baseline comparability before the analysis. There were no significant differences in sex distribution ($\chi^2(1) = 0.016$, $p = 0.901$) or mean age ($t(98) = -1.280$, $p = 0.204$) between the two groups; therefore, they were well matched on these demographic factors. A small but statistically significant difference in baseline pain was noted, with the surgical release group reporting modestly higher VAS scores (mean = 8.71, SD = 1.064) than the CSI group (mean = 8.27, SD = 0.974; $t(98) = -2.157$, $p = 0.033$; mean difference = -0.441 , 95% CI [-0.846 , -0.035]). The imbalance in these variables was accounted for in the primary mixed-effects analysis. Table 1 lists the basic demographic and clinical data of the patients.

Table 1: Baseline demographic and clinical characteristics by treatment group

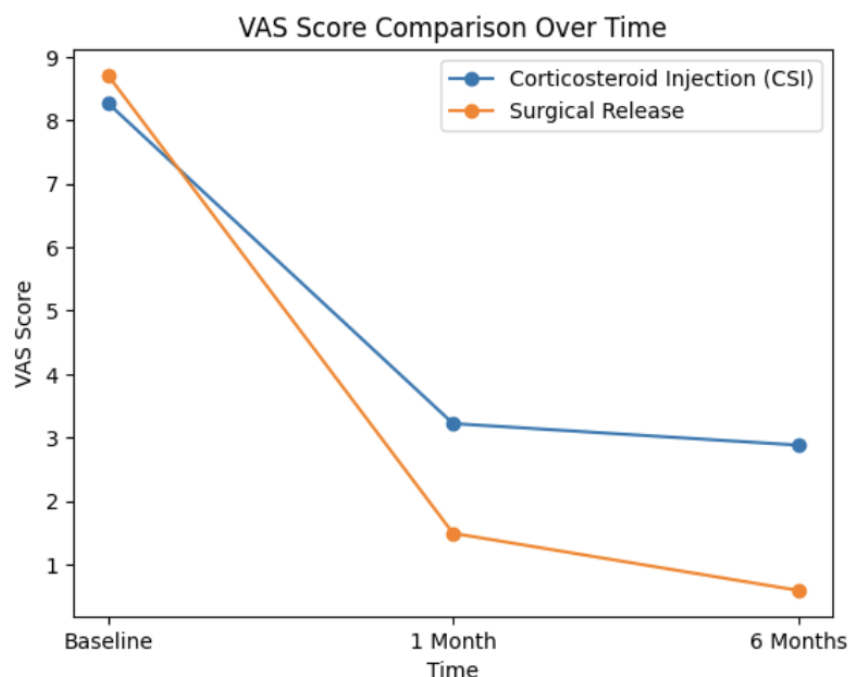
Characteristic	CSI (n = 49)	Surgical Release (n = 51)	p-value
Age, years (mean $\pm$ SD)	35.67 $\pm$ 7.838	37.73 $\pm$ 8.186	0.204
Gender, n (%)			0.901
- Male	14 (28.6%)	14 (27.5%)	
- Female	35 (71.4%)	37 (72.5%)	
Baseline VAS pain (mean $\pm$ SD)	8.27 $\pm$ 0.974	8.71 $\pm$ 1.064	0.033

Pain Outcomes Over Time

At each follow-up time point, unadjusted between-group comparisons showed significant and large differences in pain scores in favour of the surgical release. At one month, patients in the surgical group reported markedly lower pain (mean = 1.49, SD = 0.784) than those in the CSI group (mean = 3.22, SD = 1.066; $t(98) = 9.294$, $p < 0.001$; mean difference = 1.734, 95% CI [1.364, 2.105]). By six months, this divergence had widened further, with the surgical group demonstrating near-complete pain resolution (mean = 0.59, SD = 0.572) compared with persistent residual pain in the CSI group (mean = 2.88, SD = 1.184; $t(98) = 12.389$, $p < 0.001$; mean difference = 2.289, 95% CI [1.923, 2.656]). The results are presented in Table 2 and plotted in Figure 1.

Table 2: Unadjusted VAS pain scores by treatment group and time point

Time Point	CSI (mean $\pm$ SD)	Surgical Release (mean $\pm$ SD)	p-value
Baseline	8.27 $\pm$ 0.974	8.71 $\pm$ 1.064	0.033
1-Month Follow-up	3.22 $\pm$ 1.066	1.49 $\pm$ 0.784	<0.001
6-Month Follow-up	2.88 $\pm$ 1.184	0.59 $\pm$ 0.572	<0.001

**Figure 1: Comparison of VAS Scores Over Time Between Corticosteroid Injection and Surgical Release Groups**

The visual analogue scale (VAS) scores at baseline, 1 month, and 6 months are shown for both treatment groups. Surgical release demonstrated a quicker pain reduction than corticosteroid injection.

A linear mixed-effects model was fitted, including an intercept per patient and group, time, and group $\times$ time, owing to the repeated measures structure of the data and the baseline pain imbalance between groups. The two treatment groups had significantly different pain trajectories across follow-up (group $\times$ time interaction was highly significant, $F(2, 98) = 49.815$, $p < 0.001$).

Table 3 shows the estimated marginal means derived from the model. The difference in pain scores between the surgical release and CSI groups was modest (8.706 vs. 8.265, respectively) at baseline. However, by one month, pain in the surgical group was significantly lower (1.490 versus 3.224 for CSI), and this difference was strengthened at six months (0.588 versus 2.878 for CSI). The 95% confidence intervals at each follow-up time point did not overlap between groups, supporting the statistical evidence of the superiority of surgical release over the study period.

Table 3: Estimated marginal means from the linear mixed model. Time points correspond to baseline (1), 1-month follow-up (2), and 6-month follow-up (3). SE = standard error; CI = confidence interval

Group	Time Point	Mean	SE	95% CI
CSI	Baseline	8.265	0.146	7.976-8.555
	1 Month	3.224	0.133	2.960-3.489
	6 Months	2.878	0.132	2.616-3.139
Surgical Release	Baseline	8.706	0.143	8.422-8.990
	1 Month	1.490	0.131	1.231-1.749
	6 Months	0.588	0.129	0.332-0.845

The following exploratory subgroup analyses were performed to determine whether treatment effects varied between males and females or young patients (under 50 years) and adults (at or over 50 years of age). No statistically significant interactions were found between the treatment group and either of the subgroup variables. The results for the women followed the same trend as the men, with the surgical release group again showing greater pain reduction at 1 and 6 months than the CSI group. Likewise, there was no difference in the response between the age groups. The results of these subgroups are preliminary and should not be interpreted as definitive or conclusive; they are only hypothesis-generating.

Discussion

The clinical interest in the comparative management of De Quervain tenosynovitis has increased, and both corticosteroid injection and surgical release have become entrenched within treatment algorithms. This duality has been represented in the existing literature. In a systematic review and meta-analysis, Cevik et al.⁷ reported a relative risk of 1.61 for treatment success with corticosteroid injection compared with immobilisation alone, supporting its use as a first-line treatment. Bhat et al.⁶ directly compared the two main modalities of CSI and found that ultrasound-guided CSI and surgical release broadly achieved similar six-month pain outcomes and function, indicating that CSI accuracy may be a key predictor of nonoperative success. However, surgery is still considered the last-resort therapy when other treatments fail, as it provides consistent and long-term symptom relief. To this end, Batra et al.⁸ reported that up to 80% of patients resolved their symptoms after two corticosteroid injections, making injection therapy a clinically sound and minimally invasive first-line approach. The body of literature supports the idea of a personalised treatment plan, with CSI being the first line of treatment and surgery being used for those who do not respond well to CSI⁹.

For the present study, patients with clinically confirmed DQT who were unresponsive to conservative treatment were allocated to one of two treatment groups based on clinician judgment and patient preference: CSI (49 patients) and open surgical release (51 patients). The CSI protocol involved a single injection of triamcinolone acetonide (40 mg/mL, 1 mL) and 1% lidocaine (1 mL) without ultrasound guidance, performed under aseptic conditions in the first dorsal compartment. The surgery included a horizontal incision 1–2 cm proximal to the radial styloid, decompression of the APL and EPB tendons, and wound closure with nonabsorbable sutures. The two groups followed the same postoperative rehabilitation, which included 2 weeks of thumb spica splint and 4–6 weeks of wrist-loading restriction.

The fact that most of our cohort was female (72%) is consistent with the known epidemiology of DQT. Raza et al.¹⁰ confirmed a higher incidence of the condition among women, and Stahl et al.¹¹ similarly reported a female proportion of 81% in their series of 189 patients. Shahzad et al.¹² reported comparable findings, collectively reinforcing the well-documented female predisposition to this condition in diverse clinical settings.

The mean patient age was 36.72 years (SD = 8.043 years, range 21–55 years), which is comparable to previously published data. In their systematic review, Wai-si et al.¹³ found a mean age of 34 years, whereas Omoke and Nnadozie¹⁴ reported a mean age of 38.9 ± 11.27 years in 41 patients. There is a similar age distribution in these geographically spread studies, indicating a consistent age profile for patients with DQT.

Regarding clinical outcomes, there was significant and persistent pain relief following surgery, with VAS scores dropping from 8.71 ± 1.064 at baseline to 1.49 ± 0.784 at 1 month, and further to 0.59 ± 0.572 at 6 months. This is similar to the value reported by Bhat et al.⁶ of VAS improvement from 6.8 to 1.0 at 6 months after the surgical release. The CSI group, on the other hand, showed relatively less improvements, with a VAS reduction from 8.27 ± 0.974 at baseline to 3.22 ± 1.066 at one month and 2.88 ± 1.184 at six months. The limited effectiveness found in the CSI group was likely due to the lack of ultrasound guidance compared to Bhat et al.⁶ who reported similarly good results with ultrasound-guided injection (VAS 6.7 to 1.0); successful injection is known to depend on good intracompartmental injection.

Alam et al.¹⁵ maintained that both approaches are effective in treating DQT, suggesting that a one-size-fits-all treatment plan is not the best approach; treatment choice should be based on the clinical picture, patient expectations, and individual circumstances of the patient. Our findings are further supported by Ismail et al.¹⁶, who found that surgery is more effective than corticosteroid injection in patients with recalcitrant DQT. The durability of surgical results was emphasised by Garçon et al.¹⁷ who found that 85% of patients were fully functional at a mean follow-up of 9.5 years and that the overall satisfaction rate was 97.5% in 89 operated patients. Near-complete symptom resolution was also reported after surgical decompression with a good complication rate by Morshed et al.¹⁸ albeit with a relatively short follow-up duration.

Safety concerns were not observed in either group during the study period. A small number of patients among the CSI recipients reported transient discomfort at the injection site and localised skin changes which healed spontaneously. A small number of patients in the surgical group had minor postoperative complications, such as superficial irritation of the wound and slow healing, which were treated conservatively. There were no cases of tendon rupture, deep infection, or neurovascular injury reported in either arm of the study.

The findings of this study confirm open surgical release as a definitive and effective treatment for DQT, particularly in patients experiencing chronic or marked symptoms, even with injection therapy. In the interim, they remind us that corticosteroid injection is a useful, low-risk first-line option that is effective in reducing pain in many patients. The benefit of ultrasound-guided injection that has been noted in the literature compared to landmark-based injection, used in the current study, suggests that this technique may be a modifiable variable that is worthy of further prospective investigation.

First, the study was not randomised and thus may have been subject to selection bias because clinicians made the treatment decisions, and the patient's preferences were considered when choosing a treatment. Second, this study was conducted at a single centre, thus reducing its generalisability. Third, functional outcome measures (DASH or PRWE) were not used, which limited the assessment to pain. In addition, the follow-up period after treatment (6 months) may not be representative of long-term recurrence or late effects. Finally, a formal a priori sample size calculation was not conducted, and the sample size was defined based on feasibility, which could impact the robustness of the results. Furthermore, because this was a prospective non-randomised comparative study and did not use random allocation, the trial was not prospectively registered. The trial was retrospectively registered in ClinicalTrials.gov (NCT07683429) after participant recruitment commenced. Delayed registration is acknowledged as a limitation and reflects local institutional practice at the time rather than any modification of study outcomes or protocol. Moreover, the lack of ultrasound guidance due to limited resources during the injection procedure could have affected the accuracy of the injection; therefore, this factor should be considered in future studies that will follow a standardised procedure for injecting steroids.

Conclusions

In our study, both surgical release and corticosteroid injection were shown to be effective methods for treating De Quervain tenosynovitis. Surgical release resulted in better and lasting pain reduction, especially in patients who did not respond to corticosteroid injection. Corticosteroid injection, however, is a valuable, minimally invasive, first-line approach which provides significant relief in most patients. Treatment of this condition continues to be individualised based on clinical severity, patient preference, and available resources, and treatment outcomes are best optimised by using this approach.

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Contributions:

SA OI - Conception, Design

SA OI AR TA AA - Acquisition, Analysis, Interpretation

SA OI AR TA AA - Drafting

SA OI AR - Critical Review

All authors approved the final version to be published & agreed to be accountable for all aspects of the work.

References

1. De Quervain F. On a form of chronic tendovaginitis by Dr. Fritz de Quervain in la Chaux-de-Fonds. 1895. American journal of orthopedics (Belle Mead, NJ). 1997 Sep 1;26(9):641-4.
2. Anandha Geethan KS, Athiban Siva Subin DA, Ramkumar Reddy K. A comparative study of open surgery versus steroid injection in the management of De Quervain tenosynovitis. Int J Contemp Med Res. 2022;9(6):F1-F6.
3. Huisstede BM, Coert JH, Fridén J, Hoogvliet P, European HANDGUIDE Group. Consensus on a multidisciplinary treatment guideline for de Quervain disease: results from the European HANDGUIDE study. Phys Ther. 2014 Aug 1;94(8):1095-110. <https://doi.org/10.2522/ptj.20130069>
4. Skef S, Ie K, Sauereisen S, et al. Treatments for de Quervain Tenosynovitis. Am Fam Physician 2018;97:Online.
5. Ashraf MO, Devadoss VG. Systematic review and meta-analysis on steroid injection therapy for De Quervain tenosynovitis in adults. Eur J Orthop Surg Traumatol. 2014 Feb;24(2):149-57. <https://doi.org/10.1007/s00590-012-1164-z>
6. Bhat AK, Vyas R, Acharya AM, Rajagopal KV. De Quervain tenosynovitis: a non-randomized two-armed study comparing ultrasound-guided steroid injection with surgical release. Musculoskeletal surgery. 2023 Mar;107(1):105-14. <https://doi.org/10.1007/s12306-022-00735-0>
7. Cevik J, Keating N, Hornby A, Salehi O, Seth I, Rozen WM. Corticosteroid injection versus immobilisation for the treatment of De Quervain tenosynovitis: A systematic review and meta-analysis. Hand Surg Rehabil. 2024 Jun 1;43(3):101694. <https://doi.org/10.1016/j.hansur.2024.101694>
8. Batra A, Elbaz M, Batra J. Role and efficacy of corticosteroid (40 mg methyl prednisolone acetate) injection for non-surgical treatment of de-quervains tenosynovitis, and incidence of complications of the procedure in 55 limbs: A retrospective study. International Journal of Orthopaedics. 2023;9(3):423-6. <https://doi.org/10.22271/ortho.2023.v9.i3f.3453>
9. Keidan T, Saleh S, Svorai Band S, Gannot G, Oron A. DE QUERVAIN TENOSYNOVITIS-CLINICAL PRESENTATION AND TREATMENT. Harefuah. 2022 Nov 1;161(11):706-8.
10. Raza W, Bakar A, Awan S, Qadir RI. Outcome of steroid injections in patients with de-Quervain's tenosynovitis. J Med Sci. 2020 Jul 29;28(2):162-6.
11. Stahl S, Vida D, Meisner C, Stahl AS, Schaller HE, Held M. Work related etiology of De Quervain tenosynovitis: a case-control study with prospectively collected data. BMC Musculoskelet Disord. 2015 May 28;16(1):126. <https://doi.org/10.1186/s12891-015-0579-1>
12. Shahzad K, Khan RD, Iqbal S, Zahid FM, Israr M, Aslam B. Comparison of intralesional corticosteroid injection with and without thumb Spica cast for de-Quervain tenosynovitis. The Professional Medical Journal. 2021 Oct 31;28(11):1682-6. <https://doi.org/10.29309/TPMJ/2021.28.11.4732>
13. Wai-si TE, Joanne Y, Yu LK, Lun YK, Christian F, Pui NS. De Quervain Tenosynovitis: A Systematic and Citation Network Analysis Review. Biomed J Sci Tech Res. 2020;24(5):18674-84. <https://doi.org/10.26717/BJSTR.2020.24.004125>
14. Omoke NI, Nnadozie UU. Clinical outcome of nonoperative treatment of De Quervain disease with local corticosteroid injection in Nigerian setting. Nigerian Journal of Surgery. 2019;25(2):146-52. https://doi.org/10.4103/njs.NJS_10_19
15. Alam KQE, Sahu N, Muhammed JC, Bakode H, Kohli GBS. Comparative efficacy of release surgery versus steroid injection in the management of De Quervain tenosynovitis: a randomized controlled trial. Int J Pharm Clin Res. 2024;16(12):58-62.
16. Ismail D, Paresh D, Mohit D, Sudhanshu D, Swapnil D. Comparative study between surgical release and local steroid injection in treatment of De Quervain disease. Int J Orthop Sci. 2023;9(3A):1-4. <https://doi.org/10.22271/ortho.2023.v9.i3a.3404>
17. Garçon JJ, Charruau B, Marteau E, Laulan J, Bacle G. Results of surgical treatment of De Quervain tenosynovitis: 80 cases with a mean follow-up of 9.5 years. Orthop Traumatol Surg Res. 2018 Oct 1;104(6):893-6. <https://doi.org/10.1016/j.otsr.2018.04.022>

18. Morshed T, Ferdous MZ, Atiquzzaman MD, Sarkar D, Sen AK. Outcome of surgical resection of De Quervain stenosing tenosynovitis. Clin Pract. 2020;17:1482-5. [https://doi.org/10.37532/2044-9038.2020.17\(3\).419](https://doi.org/10.37532/2044-9038.2020.17(3).419).