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To Compare Thread Technique Versus Aspiration Plus Steroid Injection Of Wrist Ganglion In Terms Of Frequency Of Recurrence

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Abstract

Objective: To compare the recurrence of wrist ganglion following thread technique versus aspiration plus steroid injection.

Methods: This was a Randomized controlled trial conducted in the Department of Surgery. HIT Hospital, Taxila from June 2020 to December 2020. Sixty patients were randomized into two equal groups A and B after clinical diagnosis of wrist ganglion. Informed written consent was obtained after informing all pros and cons of the procedure. The thread technique was done in group A while in group B methyl prednisolone acetate 40 mg/ml was injected after aspiration. The patients were followed 2 weeks, 6 weeks, 3 months, and 6 months. The clinical examination was done to see the possible recurrence.

Results: The mean age of the participants was 29.30 ± 6.0 years. The mean duration of ganglia was 19.33 ± 8.35 months. The location of ganglia was 37 (61.7%) dorsal and 23 (38.3%) volar. The male-to-female ratio was 22 (36.7%): 38 (63.3%). Collectively, the frequency of recurrence was 6 (10%), 10 (16.7%), 12 (20%) and 16 (26.7%) at 2 weeks, 6 weeks, 3 months, and 8 months respectively. There was no difference between groups A and B in terms of age, gender, location, and duration of disease (p values 0.401, 0.592, 0.791, 0.783 respectively). The frequency of recurrence was significantly different among groups at 6 months i.e. 12 (40.0%) in group A versus 4 (13.3%) in group B (p-value 0.020).

Conclusion: The thread technique of wrist ganglia is superior to steroid injection in terms of recurrence. The RCTs with a larger sample size and prolonged follow-up would provide more insight into this subject.

Keywords: Cyst, Ganglion, Thread technique, Swelling

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Introduction

Ganglia is the most common cause of referral for upper extremity soft tissue tumours. More than 50% of referrals belong to this category. Ganglions originated from joint capsules or tendon sheaths. The most common site is the wrist followed by the vicinity of interphalangeal joints. The dorsal ganglia mostly originate from the scapho-lunate interosseous ligament while the volar may arise from the radio-scaphoid joint or scapho-trapezial joint.[1, 2] The most common presentation is a painless lump in the abovementioned areas. The pain may arise when the ganglia exert pressure effects during movements. The diagnosis is clinical in most cases and additional laboratory or radiological investigations are often not helpful.[2, 3]

The treatment of ganglia is mainly sought out due to pain or cosmetic reasons. Management is tailored accordingly ranging from simple reassurance to surgical excision with in-between options of aspiration with and without steroid injection, hyaluronidase injection and thread or seton insertion. The surgical excision may be orthoscopic as well.[4, 5]

The aspiration and steroid injection may be cost-effective but is associated with skin pigmentation, atrophic changes, and increased chances of recurrence.[6] Surgical excision is associated with operative costs, infections and possible chances of nerve, tendon, or joint damage. The thread technique has been seen in some early research but to some extent has been ignored irrespective of the fact that it is cost effective and has comparable outcomes. The recurrence is common with all the current procedures.[7, 8] A study by Zangana, M. and K. Dizaye found that a recurrence of 4% was observed in the threading technique while 43% in aspiration plus steroid injection ($p < 0.001$).[9]

We conducted this study to determine the frequency of recurrence of wrist ganglia between the threading technique and aspiration plus steroid injection. Both these procedures are being practised as outpatient procedures in our setup. There is a paucity of local and international literature regarding this specific subject. The result of our study would provide us with better insight into this subject and will leave us with a better choice for treating wrist ganglia.

Materials And Methods

This randomized controlled trial was conducted at HIT Hospital Taxila from January 2020 to June 2020 for one year with a clinical diagnosis of wrist ganglion. This study was conducted by ethical standards and principles. Institutional Review Board (IRB) or Ethics Committee approval was obtained before the commencement of the research (Reference number: ERC/19/15(b). Informed consent was acquired from all participants involved in the study. The research was conducted with respect for participant privacy, confidentiality, and autonomy. The trial was registered on clinicaltrails.gov (NCT06790615). The sample size of 60 patients (30 in each group) was calculated by taking recurrence rates of 4% and 43% for threading technique and aspiration plus steroid injection respectively from a study.[9] The level of significance was 5% and the power of the test was 90%. The age range of 18 to 50 years from both gender groups with clinical and radiological diagnosis of wrist ganglion was included. Patients with a history of previous invasive treatments, compound ganglion, diabetes mellitus, bleeding diathesis, immunosuppression or rheumatoid arthritis were excluded from the study. The sampling technique was consecutive non-probability. Randomization of patients was done into two equal groups by computer-generated numbers. In group A, the aspiration of ganglion was done by an 18G needle attached to a 10 ml syringe. After full aspiration, methylprednisolone (40 mg/ml) was injected into the cavity. In group B, the silk suture size 1 was passed horizontally through the ganglion and tied over sterile gauze. The evacuation of mucinous contents was done manually, and patients were instructed to do manual massage three times daily for 7 days. The thread was removed after 2 weeks or when only serosanguinous discharge was observed at the entry points of the thread. Both procedures were done with full aseptic measures and under local anaesthesia of 1% lignocaine. The patients were followed in OPD after 2 weeks, 6 weeks, 3 months, and 6 months. The recurrence was noted down on specially designed proforma for study.

The data was analyzed by Statistical Package for Social Science (SPSS) version 25 registered for Microsoft Windows. The quantitative variables like age and duration of disease were expressed by mean and standard deviation. The qualitative variables like gender and recurrence at follow-up visits were expressed as frequency and proportions. Both groups A and B were compared among each other in terms of recurrence at 2 weeks, 6 weeks, 3 months, and 6 months by Chi-Square test. A p-value of <0.05 was considered statistically significant.

Results

We aimed at our target sample size of 60 patients (30 in each group). The total patients selected were 73 out of which 13 lost follow-up. The mean age of the participants was 29.30 ± 6.0 years. The mean duration of symptoms was 19.33 ± 8.35 months. The location of ganglia was 37 (61.7%) dorsal and 23 (38.3%) volar. The male-to-female ratio was 22 (36.7%): 38 (63.3%). Collectively, the frequency of recurrence was 6 (10%), 10 (16.7%), 12 (20%) and 16 (26.7%) at 2 weeks, 6 weeks, 3 months, and 8 months respectively.

Table 1: Age, gender, and duration among groups

Parameter	Group A (Steroid group) (n=30)	Group B (Thread group) (n=30)	P value
Age (years)	29.83 ± 6.21	28.37 ± 7.17	0.401
Gender (M/F)	10/20	12/18	0.592
Location (Dorsal/Volar)	19/11	18/12	0.791 Error! Bookmark not defined.
Duration of symptoms (months)	19.03 ± 8.10	19.63 ± 8.73	0.783 Error! Bookmark not defined.

There was no difference between groups A and B in terms of age, gender, location, and duration of disease (p values 0.401, 0.592, 0.791, 0.783 respectively, Table I). The frequency of recurrence changed over subsequent follow-up visits. The frequency of recurrence was significantly different among groups at 6 weeks and 6 months (p values 0.038 and 0.020, Table II). The recurrence was different at 2 weeks and 3 months but fell below the required level of significance (p values 0.085 and 0.053 respectively). There were no differences in gender and location groups in terms of recurrence at six months (p-values 0.936 and 0.603).

Table 2: Recurrence among groups

Frequency of recurrence	Group A (Steroid group) (n=30)	Group B (Thread group) (n=30)	P value
After 2 weeks	5 (16.7%)	1 (3.3%)	0.085
After 6 weeks	8 (26.7%)	2 (6.7%)	0.038
After 3 months	9 (30.0%)	3 (10.0%)	0.053
After 6 months	12 (40.0%)	4 (13.3%)	0.020

Discussion

Ganglion cysts are synovial cysts which are filled with mucinous contents. These are most common in the upper extremity. The diagnosis is mainly clinical with few clinical signs like the Tadpole sign. Occasionally radiological evaluation is required. The exact etiology is unknown but microtrauma leading to mucinous degeneration is considered responsible for it. The female gender is more prone to have ganglia as well as patients with wrist hyperlaxity. About 60-70% of the ganglion cysts are found in the dorsal wrist area.[10, 11] Dorsal ganglia are commonly located superficial to the scapholunate ligament while dorsal cysts are located between the radial artery and flexor carpi radialis.[12] The main reasons to seek medical attention are pain, tenderness, and cosmetic concerns. Both surgical and non-surgical options are available, but the pros and cons should be clearly explained to patients.[2, 13]

Simple reassurance is enough for some patients as 58% of ganglion cysts resolve spontaneously over time. The symptomatic treatment is enough for some patients. Aspiration alone of wrist ganglia has a high frequency of recurrence and injection of steroids after aspiration improved outcomes. The results in different studies are variable after steroid injection.[10, 14] The recurrence in my study was 40% after steroid injection. The difference may arise since in our study we used an 18G single needle to aspirate and inject while the above study used double 18G lines i.e. distal for aspiration and proximal for injection.

The surgical excision has been traditionally advocated due to increased patient satisfaction and decreased frequency of recurrence in short and long-term follow-ups as compared to aspiration alone or with steroid injection. Cluts, L. M. and J. R. Fowler had a recurrence of 3.8% after surgical excision in a short-term follow-up. The recurrence is associated with the surgeon's expertise and male gender.[8] A study with a long-term follow-up of 5 years showed that recurrence after surgical excision may reach up to 8%. The location of the ganglion has no impact on the recurrence. The surgical excision has some concerns over it due to the proximity of neurovascular elements in the excision of volar ganglia.[15] The surgery of dorsal ganglia is prone to develop unsightly scars that provide the opportunity for arthroscopic procedures to get in.[16]

A study by Zangana, M. and K. Dizaye compared the thread technique with traditional methods for the treatment of wrist ganglia. With a sample size of 785 patients with dorsal ganglia, three methods i.e. surgical excision, aspiration and steroid injection, and thread technique were compared among each other. At the end of six months, recurrence of 24%, 43% and 4% was noted in surgical excision, aspiration plus steroid injection and thread technique respectively.[9] A recent study by Chaudhary, S., et al. (2021) on thread technique demonstrated that after six months of follow-up, the recurrence rate was 9%. Most of the patients were satisfied and the procedure was almost painless without any significant complications. The technique was a bit modified in this study as the silk suture was passed over a sterile gauze to keep the entry and exit sites of silk relatively wide enough to permit the early flow of thick mucinous contents. The recurrence was observed in cases in which the evacuation of entire contents was not possible.[7] Another recent study found the recurrence after the threading technique as 3.8%.[4] The study by Saeed, B., et al. included a total sample of 204 patients, with a mean age of 29.26 ± 8.16 years. Dorsal wrist ganglions accounted for 160 cases (78.43%), whereas volar ganglions were identified in 44 cases (21.57%). The mean duration of symptoms was 10.07 ± 3.74 months. Recurrence rates showed no significant difference between the groups, with the threading group recording 7 recurrences (4.35%) and the surgical excision group 2 recurrences (4.65%) (p = 0.931).[17] The use of thread other than silk has been studied also which shows similar recurrence rates as compared to silk e.g., nylon showed a 6.6% recurrence rate.[18] A prospective study evaluated 30 patients with dorsal wrist ganglia larger than 5 mm treated at the General Surgery outpatient department of Government Hospital Sarwal, Jammu, India. The mean age of the patients was 44.29 ± 2.59 years, with the majority being female, and the primary reason for intervention was cosmesis. The study achieved a cure rate of 93.3%, with a recurrence rate of 6.7% (2 cases).[19]

My study targeted a sample size of 60 patients, with 30 in each group. A total of 73 patients were initially selected, but 13 were lost to follow-up. The mean age of participants was 29.30 ± 6.0 years, and the average symptom duration was 19.33 ± 8.35 months.

Ganglia were located dorsally in 61.7% of cases (37 patients) and vulgarly in 38.3% (23 patients), with a male-to-female ratio of 36.7% to 63.3%. Recurrence rates were 10% at 2 weeks, 16.7% at 6 weeks, 20% at 3 months, and 26.7% at 8 months. The recurrence rates differed significantly between groups at 6 weeks ($p = 0.038$) and 6 months ($p = 0.020$). While differences at 2 weeks and 3 months were noted, they were not statistically significant ($p = 0.085$ and 0.053, respectively). Gender and location showed no association with recurrence at six months ($p = 0.936$ and 0.603). Shakya et al. describe the "Triple Technique," a new outpatient procedure for treating dorsal wrist ganglions, which combines aspiration, steroid injection, and trans fixation with silk suture for 3 weeks. The study included 83 patients with a mean age of 31.7 ± 12.4 years with an overall success rate of 95.2%. The Triple Technique is an effective and safe method, with a recurrence rate of less than 5% at 2 years.[20]

Conclusion

The threading technique of wrist ganglia is superior to steroid injection in terms of recurrence rate in short-term follow-up. The RCTs with a larger sample size and prolonged follow-up would provide more insight into this subject.

References

1. Federer AE, Yoo M, Stephens AS, Nelson RE, Steadman JN, Tyser AR, et al. Minimizing Costs for Dorsal Wrist Ganglion Treatment: A Cost-Minimization Analysis. J Hand Surg Am. 2023;48(1):9-18 10.1016/j.jhsa.2022.09.002: http://doi.org/[10.1016/j.jhsa.2022.09.002
2. Gregush RE, Habusta SF. Ganglion Cyst. StatPearls. Treasure Island (FL): StatPearls Publishing
3. Copyright © 2021, StatPearls Publishing LLC.; 2025.
4. Craik JD, Walsh SP. Patient outcomes following wrist ganglion excision surgery. J Hand Surg Eur Vol. 2012;37(7):673-7 10.1177/1753193411434376: http://doi.org/[10.1177/1753193411434376
5. Kumar P, Giroti C, Dhobal A, Singh AR. Management of ganglion by double loop suture technique. Asian J Med Sci. 2023;14(2):188-91.
6. Koehl P, Rueth MJ, Sesselmann S, Necula R, Mada L, Schuh A. [Wrist ganglion]. MMW Fortschr Med. 2023;165(2):56-7 10.1007/s15006-022-2131-1: http://doi.org/[10.1007/s15006-022-2131-1
7. Hamlin K, Haddon A, Khan Y, Miller C, Lawrie D. Dorsal Wrist Ganglion: Pilot for Randomized Control Trial Comparing Aspiration Alone or Combined with Injection of Platelet-Rich Plasma. J Wrist Surg. 2023;12(1):18-22 10.1055/s-0042-1744367: http://doi.org/[10.1055/s-0042-1744367
8. Chaudhary S, Mandal S, Kumar V. Results of modified thread technique for the treatment of wrist ganglion. J Clin Orthop Trauma. 2021;13:57-62 10.1016/j.jcot.2020.08.018: http://doi.org/[10.1016/j.jcot.2020.08.018
9. Cluts LM, Fowler JR. Factors Impacting Recurrence Rate After Open Ganglion Cyst Excision. Hand (N Y). 2022;17(2):261-5 10.1177/1558944720921477: http://doi.org/[10.1177/1558944720921477
10. Zangana AM, Dizaye KF. A New Method in the Management of Wrist Ganglion (Silk Thread Passed through the Ganglion) in Comparison with Other Traditional Methods. World Family Medicine Journal/Middle East Journal of Family Medicine. 2016;14(1):15-20 10.5742/mewfm.2015.92791: http://doi.org/[10.5742/mewfm.2015.92791
11. Ahmad Shah A, Raina AH, Ganie MA, Kumar IA. Comparison of Aspiration Followed by Intra-Lesional Steroid Injection and Surgical Excision in Management of Dorsal Wrist Ganglion. World J Plast Surg. 2019;8(2):181-4 10.29252/wjps.8.2.181: http://doi.org/[10.29252/wjps.8.2.181
12. Bram JT, Falk DP, Chang B, Ty JM, Lin IC, Fazal FZ, et al. Clinical Presentation and Characteristics of Hand and Wrist Ganglion Cysts in Children. J Hand Surg Am. 2021;46(12):1122 e1- e9 10.1016/j.jhsa.2021.02.026: http://doi.org/[10.1016/j.jhsa.2021.02.026
13. Zhang A, Falkowski AL, Jacobson JA, Kim SM, Koh SH, Gaetke-Udager K. Sonography of Wrist Ganglion Cysts: Which Location Is Most Common? J Ultrasound Med. 2019;38(8):2155-60 10.1002/jum.14912: http://doi.org/[10.1002/jum.14912
14. Lyon C, Eldred SV, Desanto K. What is the best treatment for wrist ganglion cysts? J Fam Pract. 2020;69(1):E23-E4.
15. Horvath A, Zsidai B, Konaporshi S, Svantesson E, Hamrin Senorski E, Samuelsson K, et al. Treatment of Primary Dorsal Wrist Ganglion-A Systematic Review. J Wrist Surg. 2023;12(2):177-90 10.1055/s-0042-1753542: http://doi.org/[10.1055/s-0042-1753542
16. Kulinski S, Gutkowska O, Mizia S, Martynkiewicz J, Gosk J. Dorsal and volar wrist ganglions: The results of surgical treatment. Adv Clin Exp Med. 2019;28(1):95-102 10.17219/acem/81202: http://doi.org/[10.17219/acem/81202
17. Shanks C, Schaeffer T, Falk DP, Nunziato C, Hogarth DA, Bauer AS, et al. The Efficacy of Nonsurgical and Surgical Interventions in the Treatment of Pediatric Wrist Ganglion Cysts. J Hand Surg Am. 2022;47(4):341-7 10.1016/j.jhsa.2021.12.005: http://doi.org/[10.1016/j.jhsa.2021.12.005
18. Saeed B, Ullah JS, Aziz M, Shahid M, Siraj AS, Tariq SR. Comparison of Recurrence Rate of Wrist Ganglion Between Seton and Open Surgical Excision in Military Hospitals of Pakistan. Pak Armed Forces Med J 2023;73(1):50-3.
19. Thapa P, Lakhey RB. Successful Outcome of Transfixation Technique with Linen in Dorsal Wrist Ganglion: A Descriptive Cross-sectional Study. JNMA J Nepal Med Assoc. 2021;59(243):1150-4 10.31729/jnma.6574: http://doi.org/[10.31729/jnma.6574

20. Kour R, Sharma G, Kour G, Gupta K, Sharma R. Determine the results of treatment of dorsal wrist ganglia by using the transfixation technique: an observational study. JK Practitioner. 2021;26(3).
21. Shakya A, Garje V, Rathore A. The triple technique: A simple and effective outpatient procedure for the dorsal wrist ganglion. J Clin Orthop Trauma. 2021;23:101619 10.1016/j.jcot.2021.101619: http://doi.org/[10.1016/j.jcot.2021.101619

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