

## Comparison of Recurrence of Wrist Ganglion Following Aspiration and Injection of Steroid Versus Surgical Excision

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### ABSTRACT

**Objective:** To compare the frequency of recurrence after surgical excision versus aspiration and injection of Steroids of wrist ganglion

**Study Design:** Comparative cross-sectional study.

**Place and Duration of Study:** Department of General Surgery at Combined Military Hospital, Kohat Pakistan, from Sep 2018 to Aug 2019.

**Methodology:** Seventy patients reported to the Outpatient Department, Combined Military Hospital, Kohat Pakistan, with complaints of ganglion and wanted treatment. Patients were randomly allocated into two Study Groups 1 and 2, by lottery method. Group-1 was treated by aspiration of the cyst contents followed by Steroid injection, while Group-2 was by excision of the ganglion surgically under a local anaesthetic agent. The patient was followed up after three months to look for recurrence in both groups.

**Results:** The frequency of recurrence was 34.29% in Group-1 and 5.71% in Group-2, (*p*-value was less than 0.001).

**Conclusion:** Surgical excision results in lesser recurrence when compared with simple aspiration and Steroid injection for ganglion of the wrist.

**Keywords:** Aspiration, Recurrence, Steroid injection, Surgical excision, Wrist ganglion

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### INTRODUCTION

Ganglions are the most common tumours occurring in the hand and wrist.<sup>1</sup> 50 to 70% of all referrals for upper extremity masses compromise the wrist ganglion. Ganglia are mucine-filled soft cysts usually attached to the underlying tendon sheath or joint capsule.<sup>2</sup> There has yet to be a consensus regarding the preferred treatment of wrist ganglia. Different treatment modalities available are reassurance, only aspiration or aspiration of fluid combined with Corticosteroid or hyaluronidase injection, excision, insertion of seton in the shape of prolene one and arthroscopic resection. The most commonly practised treatment options are the aspiration of the cyst. Contents followed by Steroid injections and surgical excision.<sup>3,4</sup>

Steroids injection after aspiration has been advocated because of rising operative costs, infection risk, nerve damage, joint stiffness after joint splinting, scar formation and reoccurrence of ganglion after surgical excision. It is the preferred method of treatment in the younger age group. Alternatively, surgical excision has been advocated due to complications,

including skin pigmentation, nerve injury, subcutaneous atrophy and recurrence following Corticosteroids injections.<sup>5</sup> The most accepted surgical treatment for ganglion cysts involves the removal of the masses using an open surgical technique.<sup>6,7</sup> However, arthroscopic resection of dorsal ganglions has become increasingly popular. The use of the arthroscope affords the surgeons the added benefit of carrying out a complete evaluation of the joint.<sup>8,9</sup>

Few local studies are available to compare the recurrence rate after treatment with aspiration and injection of Steroids versus excision surgically. However, the excision of ganglion surgery seems difficult to accept the patients owing to complications like scar formation and post-operative infection. Therefore, this study was planned to compare the recurrence rate of these treatment modalities and to treat the wrist ganglion more precisely based on this study. Moreover, patients with ganglion can convince of the preferred method of treatment based on the evidence at hand.

### METHODOLOGY

This comparative cross-sectional study was conducted at the Department of General Surgery, Combined Military Hospital, Kohat Pakistan, from September 2018 to August 2019. After approval from

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the Hospital Ethical Committee, (vide ERC certificate no.E-2005/A/26). A sample size (n) of 70 patients has been selected for this study. The WHO calculator was used to calculate the sample size, with a level of significance of 5%, power of test 80%, anticipated population proportion (P1)=30%,<sup>10</sup> anticipated population proportion (P2)=3.3%.<sup>10</sup> A sample size of 70 was calculated (35 patients in each group randomly divided in Groups 1 or 2). Non-probability consecutive sampling was employed.

**Inclusion Criteria:** Patients aged 15 to 60 years, of either genders presenting in the Out-Patients Department with the diagnosis of wrist ganglion and requiring treatment for the wrist ganglion were included in the study.

**Exclusion Criteria:** The patients with recurrent ganglions after a past surgical procedure, a history of rheumatoid arthritis, diabetes mellitus, immunosuppression and bleeding diathesis, patients with Local infection at the site of operation and with compound ganglions were excluded from the study.

Total of 70 patients from the surgical out-patient Department (OPD) at CMH, Kohat, fulfilling the inclusion and exclusion criteria, were included in the study. Informed written consent was taken from all patients. Patients were randomly allocated into 2 Groups, 1 and 2, by lottery method. Group-1 was treated by aspiration of the cyst contents followed by Steroid injection, while Group-2 was by excision of the ganglion surgically using local anesthetic. Patients were not administered any antibiotic after the treatment except those who developed signs of infection. The same suture material and Steroid injection were used in all the patients, and surgeons treated all the patients with the same competency level. The patient was followed up after three months to look for recurrence in both groups.

Statistical Package for Social Sciences (SPSS) version 23.0 was used for the data analysis. Mean and standard deviation for the quantitative variables were calculated. In addition, frequency and percentage were presented for the categorical variables. Chi-square test was applied to find out the association. The *p*-value of  $\leq .05$  was considered statistically significant.

### RESULTS

A total of 70 cases (35 in each Group) were enrolled to compare the frequency of recurrence after the excision of the ganglion surgically versus aspiration and Steroid injection. The mean in Study Group-1

was  $34.91 \pm 8.62$  years and  $34.94 \pm 8.63$  years in Group-1. Comparison of recurrence after surgical excision versus aspiration and Steroid injection of the ganglion of the wrist showed that 12(34.29%) patients in Group-1 and 2(5.71%) patients in Group-2 had recurrence, (*p*-value $<0.0010$ ) (Table-I).

**Table-I: Comparison of Recurrence after Surgical Excision versus Aspiration and Steroid Injection of Ganglion of Wrist (n=70)**

Recurrence	Group-1 (n=35)	Group-2 (n=35)	<i>p</i> -value
	n(%)	n(%)	
Yes	12(34.29%)	2(5.71%)	<0.001
No	23(65.71%)	33(94.29%)	

Site of ganglion showed that 26(74.29%) patients in Group-1 and 29(82.96%) in Group-2 had right side involved whereas 9(25.71%) patients in Group-1 and 6(17.14%) in Group-2 had left side involvement. The Chi-Square test was applied to evaluate the association of different variables. There was a significant association with age, gender, side and duration of wrist ganglion in Groups 1 and 2 (Table-II)

**Table-II: Association of Age, Gender, Side and Duration in Groups 1 And 2 (n=70)**

Factors	Reoccurrence		<i>p</i> -value
	Yes	No	
<b>Age 15-40 years</b>			
Group 1	7	18	0.02
Group 2	1	22	
<b>Age 41-60 years</b>			
Group 1	5	5	0.02
Group 2	1	11	
<b>Gender Male</b>			
Group 1	7	10	0.01
Group 2	1	15	
<b>Gender Female</b>			
Group 1	5	13	0.06
Group 2	1	18	
<b>Side(Right)</b>			
Group 1	8	16	0.003
Group 2	1	28	
<b>Side(Left)</b>			
Group 1	4	5	0.26
Group 2	1	5	
<b>Duration (1-6 months)</b>			
Group 1	7	14	0.05
Group 2	0	19	
<b>Duration (&gt;6 months)</b>			
Group 1	5	9	0.04
Group 2	1	15	

### DISCUSSION

Ganglions are tumour-like swellings in the wrist and hand, which are very well known. Usually, they arise in the tendon sheath from the pedicle or joint

capsule. On the dorsal side of the wrist, there are around 60 to 70% ganglions found. In females, wrist ganglia usually occur in the 2nd to the fourth decade of life. Patients prefer medical treatment because they want to avoid the fear of surgery and pain.<sup>11,12</sup>

In our study, comparison of recurrence after excision surgically versus aspiration and Steroid injection ganglion of the wrist showed that 34.29% patients in Group-1 and 5.71% in Group-2 had no recurrence.

A previous study reveals that 36% of the cases avoided surgery due to cosmetic effects and 26% for pain, 28% for malignancy and 8% of the cases due to abnormal function.<sup>13</sup> However, this study compared the recurrence rate in patients undergoing aspiration and Steroid injections versus the excision of ganglion surgically.

Recurrence was determined in 12% in Group-1 and 58% in Group-2, (p-value was 0.001). These findings were similar to the findings of a previous study, where the rate of recurrence was 58% in those patients treated with aspiration, while in those patients who underwent surgical excision, the recurrence rate was 39%.<sup>14</sup>

The success rate in surgical excision was 81.8% in another study and only 38.46% in aspiration and Steroid injection. In other trials, the recurrence rate for dorsal ganglia removed surgically was less than 5% of the cases and 7% in the volar wrist ganglion.<sup>15,16</sup> While the patients undergoing up to three times aspiration showed only a 15% recurrence rate, according to another study.<sup>17</sup> According that study, with each succeeding aspiration, more failure was recorded, and other authors also confirmed this fact, who revealed no benefit of repeat aspiration.<sup>18,19</sup>

A study conducted in USA,<sup>14</sup> showed that aspiration and Steroid injection in young females is more reasonable than the excision of wrist ganglion surgically, which leads to a larger scar mark, so aspiration and Steroid injection may be given to those focused on cosmetic effects. We implicate the above hypothesis that as the recurrence rate with surgical excision is lower, it is meant for those whose priority is avoiding recurrence and successfully removing ganglions. Recent advances focus on the arthroscopic management of ganglion, which caters to good cosmesis and lower recurrence rates.

### CONCLUSION

We concluded that the wrist ganglion recurrence after surgical excision is less common when compared to aspiration and injection of Steroids at three months.

**Conflict of Interest:** None.

### Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

SNS & AP: Conception, study design, drafting the manuscript, approval of the final version to be published.

TB & MST: Data acquisition, data analysis, data interpretation, critical review, approval of the final version to be published.

UA & FK: Critical review, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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