

## COMPARISON OF FREQUENCY OF RECURRENCE FOLLOWING ASPIRATION AND INJECTION OF STEROID VERSUS SURGICAL EXCISION IN THE TREATMENT OF WRIST GANGLION

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### ABSTRACT

**Objective:** To compare the frequency of recurrence following aspiration and injection of steroid versus surgical excision in the treatment of wrist ganglion.

**Study Design:** Randomized controlled trial.

**Place and Duration of Study:** General surgical department, Combined Military Hospital, Rawalpindi, Pakistan, from Jan 2010 to Dec 2010.

**Material and Methods:** Sixty patients of clinically diagnosed wrist ganglia were randomized into groups 'A' and 'B' with 30 patients in each group. After approval by the hospital ethical committee, patients in group 'A' were subjected to aspiration and injection of methyl-prednisolone acetate 40 mg/ml and those in group 'B' underwent surgical excision of the ganglion. Patients were explained the procedure they were subjected to and they were also counselled about the risk of recurrence after a particular procedure and after that informed written consent was obtained from them. Patients were followed up at intervals of 2 weeks, 6 weeks, 3 months and 6 months after the procedure to look for recurrence in both groups.

**Results:** On follow up at 6 months, 12 (40%) patients in group A while only 2 (6.66%) patients in group B had recurrence of the ganglion. No complications were noted. This difference was found to be statistically significant ( $p = 0.0023$ ).

**Conclusion:** Recurrence of wrist ganglion is considerably less in patients treated with surgical excision and should be preferred over aspiration and steroid injection.

**Keywords:** Injections, Recurrence, Tendons, Wrist ganglion.

### INTRODUCTION

Ganglia are the most common benign soft tissue tumors of the hand<sup>1-5</sup>. They comprise almost 50% to 70% of all referrals for upper extremity masses<sup>3</sup>. Ganglia are soft mucin filled cysts and are usually attached to underlying joint capsule or tendon sheath<sup>1</sup>. Common locations include the dorsal or volar aspect of the wrist and tissue adjacent to finger joints<sup>4</sup>. Amongst the dorsal ganglia, commonest site is scapho-lunate interosseous ligament whereas amongst the volar ganglia two third originate from radio-scaphoid joint and one third from scapho-trapezoidal joint. A few originate from distal interphalangeal joints. Most commonly patients present with a solitary painless lump on the dorsal or volar aspect of the wrist<sup>5</sup>. Patients may also present due to cosmetic

reasons, pain or they may be apprehensive due to swelling. Compound ganglions are less commonly encountered and can lead to carpal tunnel syndrome<sup>6</sup>. The diagnosis is primarily clinical. Wrist radiography is neither useful nor cost effective in evaluation of such patients except when there is suspicion of an underlying bone disease<sup>7</sup>.

Treatment options available are reassurance, aspiration alone or combined with corticosteroid or hyaluronidase injection, excision, seton insertion and arthroscopic resection<sup>8-11</sup>. Aspiration and injection of steroids has been advocated because of concerns regarding operative cost, risk of infection, nerve damage, joint stiffness, scar formation and recurrence following surgical excision and is the preferred mode of treatment in children<sup>2,12</sup>. Alternatively, surgical excision has been advocated because of the recognized complications including skin depigmentation, subcutaneous atrophy and recurrence following

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aspiration and corticosteroid injection. Both the procedures can be performed in the outpatient settings under local anesthesia<sup>2,13</sup>. We conducted this study to ascertain the frequency of recurrence of ganglion following either aspiration followed by steroid injection or surgical excision as both treatment modalities are being practiced in our setup.

### MATERIAL AND METHODS

It was a randomized controlled trial conducted at general surgical department of CMH Rawalpindi from Jan 2010 to Dec 2010. Patients with a clinical diagnosis of wrist ganglion, between ages 15 to 60 years and belonging to both genders were included in this study. Patients with recurrent ganglion after a past surgical procedure, compound ganglions, history of rheumatoid arthritis, diabetes mellitus, immunosuppression and bleeding diathesis, and those with local infection at the site of operation or with a suspicion of another diagnosis were excluded from the study. Hepatitis serology of the included patients was ensured before procedure and for those found

procedures aseptic measures were ensured. In group B the procedure was accomplished under local anesthesia (1% lignocaine with adrenaline according to body weight). Excision was performed by surgeon and removal of capsule and the stalk of the ganglion was ensured including 1 to 2 mm margin of tendon sheath or joint capsule depending upon the origin of the ganglion. No preoperative or postoperative antibiotics were administered to any patient except to those who developed any signs of post procedural infection. Patients in both groups were given tablet diclofenac sodium 50mg twice daily for three days for pain relief and were assessed at intervals of 2 weeks, 6 weeks, 3 months and 6 months post procedure for recurrence. Patients who developed recurrence were again offered treatment during their follow up but the choice of treatment was left to the patients this time.

Data was recorded in a predesigned proforma and was analyzed on SPSS software version 16.0. Mean and standard deviation were calculated for the quantitative variable (age)

**Table-1: Results of both groups at different durations.**

Follow up at 02 weeks				
	Recurrence	No Recurrence	Chi Square Value	p-value with Yates Correction
Group A	02 (6.66%)	28 (93.33)	2.069	0.0384
Group B	0	30		
Follow up at 06 weeks				
Group A	06 (20%)	24 (80%)	6.667	0.098
Group B	0	30		
Follow up at 03 months				
Group A	09 (30%)	21 (70%)	7.680	0.0056
Group B	01 (3.33%)	29 (96.66%)		
Follow up at 06 months				
Group A	12 (40%)	18 (60%)	9.317	0.0023
Group B	02 (6.66%)	28 (93.33%)		

positive and who underwent excision, two separate surgical sets were designated to minimize the transmission of hepatitis.

Sixty patients were randomized by random number sampling method into groups A and B. Those in group A underwent aspiration and injection of steroid while those in group B had surgical excision under local anesthesia. In both

while frequency and percentage was assessed for the categorical variables (gender, site of ganglion and recurrence of ganglion at 2 weeks, 6 weeks, 3 months and 6 months). Chi square test was used to compare recurrence of ganglion in groups A and B at 2 weeks, 6 weeks, 3 months and 6 months. A *p* value of < 0.05 was considered as significant.

## RESULTS

A total of 60 patients with wrist ganglions were included in the study having an average age of  $36.5 \pm 12.2$  years with a minimum age of 16 and a maximum age of 60 years. There were 65% males and 35% females with a male to female ratio of 1.85:1. The frequency of dorsal wrist ganglions was 85% and of volar wrist ganglions was 15%.

The comparison of frequency of recurrence between groups A and B at 2 weeks, 6 weeks, 3 months and 6 months is shown in table 1. The frequency of recurrence was more in group A as compared to group B at 6 months and this difference was statistically significant with a *p* value of 0.0023. Overall in both groups 14 patients developed recurrence and frequency of recurrence was observed more in volar ganglia as compared to dorsal ganglia i.e 8 and 6 respectively.

## DISCUSSION

This study provided us a chance to compare the two most common procedures used for the treatment of wrist ganglion in our setup i.e. surgical excision and aspiration of the cyst contents followed by injection of steroids. In our study, treatment by surgical excision was found to be statistically superior to aspiration and steroid injection.

Study conducted at Glenfield Hospital, UK showed a recurrence rate of 58% and 39% following aspiration and excision, respectively<sup>8</sup>. Another study conducted at King Chulalongkorn Memorial Hospital, Bangkok showed that success by excision was 81.8% and by aspiration combined with methyl-prednisolone acetate injection was 38.46%<sup>14</sup>. The results of surgical excision were comparable with studies conducted by Limpaphayom and Wilairatana<sup>14</sup>, Clay and Element<sup>15</sup> and Varley et al<sup>18</sup> who had a reported success rate of 97% and 73-99% respectively in their studies. For aspiration our success rate was 60% at 6 months which was comparable to the study by Humail et al<sup>19</sup> and Holm and Pandey<sup>20</sup>. The success rate was better in a study conducted by Richman et al<sup>17</sup> who concluded that 3 weeks wrist immobilization following aspiration could improve the outcome. Wrist immobilization for

3 weeks was not done in our study. Also, the number of attempts in aspiration of the cyst might affect the result. It was found that

**Table-2: Comparison of two groups in terms of age, gender and type of ganglion.**

	Groups	
	A	B
Age	16-60 years	16-60 years
Gender		
Male	21	18
Female	09	12
Type of ganglion		
Dorsal	24	27
Volar	06	03

repeated aspiration for three times could improve the outcome<sup>21,22</sup>. Repeated aspirations were also not done in our study.

The result of aspiration and steroid injection are comparable to the results obtained by Holm and Pandey<sup>20</sup> and Limpaphayom and Wilairatana<sup>14</sup> who used methyl-prednisolone acetate. The results obtained in our study are also comparable to the study by Khan and Hayat<sup>23</sup> in which triamcinolone acetonide was used. The results by aspiration and steroid injection are much lower when hydrocortisone was used as reported by Derbyshire<sup>16</sup>.

The follow up period of our study was 6 months which is a suitable time period to determine recurrence rate; Janson and colleagues<sup>24</sup> had reported 60% of their recurrences in 6 month's time period.

Aspiration and steroid injection is an easy to perform procedure which is cost effective, carries less post operative pain and is repeatable but has a high recurrence rate. Surgical excision is also performed as an outdoor procedure under local anesthesia but carries with it the risk of nerve injury, scar formation, wound infection and the time off work for the patient is more (average of 19.7 days<sup>15</sup>) as compared to aspiration method, it is also more time and resource consuming but has a low recurrence rate. Surgeons should explain the pros and cons of each treatment modality to the patients to facilitate them in selecting the treatment option. Acceptance by the patient might be relatively high for the aspiration

method due to cosmetic reasons as the scarring after surgery and the invasive nature of the excision seems to be the barrier for recommending surgical excision to every patient.

## CONCLUSION

Surgical excision is associated with a lesser rate of recurrence as compared to aspiration and injection of steroid. We recommend offering patients with wrist ganglions surgical excision in addition to other treatment modalities.

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