

Outcome of Aspiration Alone and Aspiration with Instillation of Steroid in Ganglion Cyst of Wrist- A Comparative Study

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Abstract:

Background: Ganglion cysts are common soft tissue swellings of hand and wrist. Main concerns patients have are the cosmetic appearance and the fear of future malignancy. Various modalities of treatment are available but known to have high rate of recurrence. Here we study mainly the recurrence rate after aspiration alone and aspiration with instillation of steroid, to compare these minimally invasive procedures that can help to treat and give symptomatic relief from this commonly occurring problem.

Methodology: A Prospective, Comparative study was carried out with purposive sampling to include all patient of Ganglion cyst of wrist. After detail counseling, Patient desired among Aspiration only and Aspiration with instillation of Steroid randomly. All cases were followed up on 3rd, 6th and 12th month. Recurrence data were collected and all data were arranged and analyzed.

Result: Total 113 patients were included in our study, Male female ratio was 1:1.3, Mean age was 31.3 years. 74(65.5%)

Introduction:

Ganglion cyst is one of the most common soft tissue swelling in hand and wrist, commonly seen on the dorsum of the wrist in 70% cases, followed by 20% on volar side and tendon sheath of fingers. Ganglion cysts are asymptomatic except swelling. Most patients are concern about the cosmetic appearance and malignant potentiality of the swelling¹. Wrist ganglia cysts usually

develop as the consequence of fluid leak out within the sheath that surrounds the wrist tendons and becomes a cystic structure containing identical fluid with the normal fluid of a joint or a tendon sheath. Wrist ganglia are most commonly found in the dorsal aspect of the hand and less often in the volar aspect².

patient had ganglion on right wrist and 39 (34.5%) patient had it on left wrist. Dorsal ganglion was 89 (78.8%) and Volar ganglion was 24 (21.2%). In this study 58 (51.3%) patient underwent Aspiration alone, among them total 22 (37.9%) had recurrence. 12 (20.7%) had recurrence of the ganglion within 3 months, followed by 6(10.3%) within 6 month and 4 (6.9%) within 12 month. Aspiration with instillation of steroid was done in 55 (48.7%) patients. Recurrence within 1 year was found in total 16 (29.1%) cases. 4 (7.3%) had recurrence within 3 month and 6 (10.9%) cases each had recurred within 6 and 12 month respectively. Dorsal and Volar ganglion had similar recurrence rate i.e 33% irrespective of type of procedure.

Conclusion: We may conclude that Aspiration with instillation of steroid had better outcome than Aspiration alone but both have significant recurrence rate.

Keywords: Cyst, Ganglion, Aspiration, Wrist.

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Treatment options of the ganglia are 1) Conservative therapy i.e following up only with reassurance and counseling, which is convenient for small sized, asymptomatic lumps. 2) Aspiration with or without instillation of steroid, and 3) Surgical excision. Aspiration is usually performed by single or double sharp pointed syringe or cannula needle. Initially, cyst fluid is aspirated and then steroid is instilled into the cyst cavity. The recurrence rate of this technique is relatively high as between 59%- 68% for dorsal ganglion (even with recurrence rate of 88% for volar ganglion)^{3,4}.

The purpose of the study was to compare the effectiveness and outcome of single occasion cyst aspiration alone and aspiration with instillation of steroid,

which are very easy and well tolerated office based procedure with no or very low rate of complication but having a higher rate of recurrence.

Materials and method:

A Prospective, Hospital based comparative study was planned and carried out from July 2018 to June 2020, (Total 24 month), in Combined Military Hospital (CMH) Momenshahi, Mymensingh, a secondary care level 2 peripheral Armed forces hospital situated in a divisional district. Ethical clearance was obtained from appropriate body. Purposive sampling was done to include all patient of Ganglion cyst of wrist. Patients with wrist ganglions at least 1 cm in size, without history of trauma or previous treatment and having willingness to participate in the follow-up were included in the study. Diagnosis of ganglion was based on history and clinical examination. In some patients radiography or ultra-sonogram was done to rule out other lesions. Patients were counseled and informed consent was taken prior to procedure.

Patient chose his or her desired procedure among Aspiration only and Aspiration with instillation of Steroid after all known merits and demerits of both procedures have been explained to them. Thus study population was divided into two groups. Group- A underwent

aspiration of cyst only and Group- B underwent aspiration with instillation of steroid, as per their choice of treatment modality. Triamcinolone Acetonide (40mg/ml) preparation was used in cases of instillation of steroid. For aspiration 16G/18G cannula was used to gain access in the cyst cavity, confirmed by flow of clear jelly like cyst fluid, under topical anesthetics whereas instillation was done using an additional syringe, through the same cannula keeping it in site. All this procedure was done by single surgeon in the above mentioned center as a day case procedure in minor Operation theater setup. All cases had single intervention only. No repetition of aspiration or instillation was done. Elastic bandage was applied in all patients and recommended for 3 weeks. All cases were followed up on 3rd, 6th and 12th month, by direct OPD visit or on telephone conversation. Only recurrence data were collected and all data were arranged and analyzed using IBM SPSS 25 statistical software. No other complications such as skin hypopigmentation, pain or bleeding data were taken into cognizance for this study purpose. Patients who missed the follow-up or could not be communicated were excluded from the study.

Result:

Table-I

Demographic and clinical distribution of cases (n- 113)

Variable	Frequency	Percentage	P-value
Sex			
Female	65	57.5%	0.132
Male	48	42.5%	(One-sample binominal test)
Side			
Right wrist	74	65.5%	0.001
Left wrist	39	34.5%	(One-sample binominal test)
Site of ganglion cyst			
Dorsal	89	78.8%	0.000
Volar	24	21.2%	(One-sample binominal test)
Age	31.3 + 10.87		0.098*
Range	08 - 60		(one-sample
		Kolmogorov-	simirnov test)
			*Lilliefors corrected

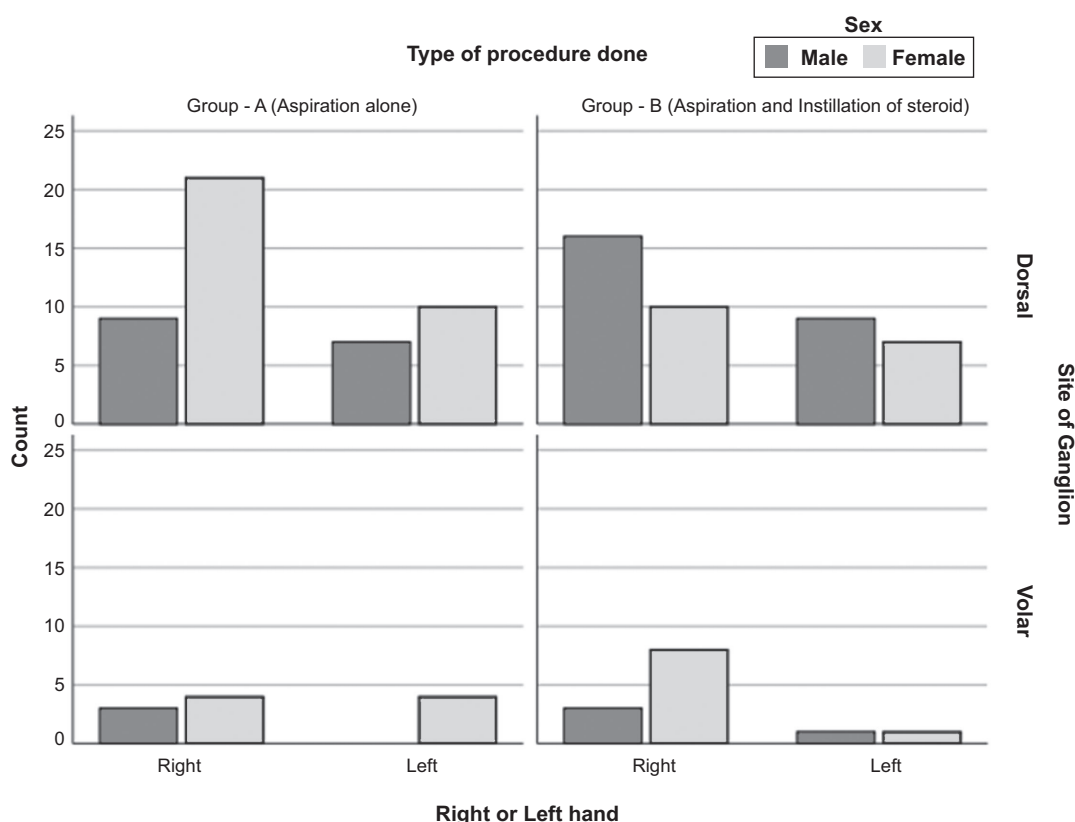


Fig-1: Comparison of cases among groups according to variables

In group-A (Aspiration alone), (n= 58), mean age was 30.12 years, ranging from 08 years to 58 years. Among this cases, 67.2% were female, 81% having dorsal ganglion cyst and 63.8% have the cyst on their right hand.

Whereas in Group- B, (Aspiration and instillation of steroid), (n= 55), mean age of study population was 32.58 years, ranging from 12 years to 60 years. Among cases, 52.7% are male, 76.4% have dorsal ganglion cyst and 67.3% have it on their right hand.

Table-II

Distribution and association of Type of procedure with Recurrence (n=113)							
Type of procedure	Frequency	Percentage	Recurrence				No recurrence
			Within 3 month	Within 6 month	Within 12 month	Total recurrence	
Group-A (Aspiration alone)	58	51.3%	12 20.7%	6 10.3%	4 6.9%	22 37.9%	36 62.1%
Group-B (Aspiration with Instillation of steroid)	55	48.7%	4 7.3%	6 10.9%	6 10.9%	16 29.1%	39 70.9%
Total	113	100%	16 14.2%	12 10.6%	10 8.8%	38 33.6%	75 66.4%

P-value 0.217. No significant association
 Chi-square test: Pearson Chi-square value 4.443, ,
 Effect size Phi and Cramer’s V 0.198, with Degree of freedom 3.

Table-III*Distribution and association of Site of Ganglion with Recurrence (n=113)*

Site of Ganglion	Frequency	Percentage	Recurrence				No recurrence
			Within 03 month	Within 06 month	Within 12 month	Total recurrence	
Dorsal ganglion	89	78.8%	12 13.5%	10 11.2%	8 9.0%	30 33.7%	59 66.3%
Volar ganglion	24	21.2%	4 16.7%	2 8.3%	2 8.3%	8 33.3%	16 66.7%
Total	113	100%	16 14.2%	12 10.6%	10 8.8%	38 33.6%	75 66.4%

P-value 0.960. No significant association

Chi-square test: Likelihood ratio 0.299 (Assumption violated)

Effect size Phi and Cramer's V: 0.051, with Degree of freedom 3.

Discussion:

Total 113 patients were included in our study, and were divided in two groups according to procedure done. In group-A (Aspiration alone), there was 58 cases and in Group- B, (Aspiration and instillation of steroid), 55 cases were included. In this study of 113 cases, 65 (57.5%) female and 48 (42.5%) male was included (Table 1), having Mean age 31.3 years, Median 31 and Standard Deviation 10.87. minimum age was 8 years and max age 60 years. 74(65.5%) patient had ganglion on right wrist and 39 (34.5%) patient had it on left wrist. None was found with Bilateral or multiple ganglions. Dorsal ganglion was 89 (78.8%) and Volar ganglion was 24 (21.2%). Figure 1, distribute the cases among groups according to the site, side and sex. In group-A (Aspiration alone), (n= 58), 67.2% were female, 81% having dorsal ganglion cyst and 63.8% have the cyst on their right hand. In Group- B, (Aspiration and instillation of steroid), (n= 55), 52.7% are male, 76.4% have dorsal ganglion cyst and 67.3% have it on their right hand.

Angelides AC⁵ found 60-70% ganglions are dorsal wrist ganglia whereas, Greendyke SD⁶ described 13- 20% are Volar wrist ganglion. In a study, Thommasen HV⁷ stated that Ganglia are more common in women than in men. They are typically seen in between the third and the sixth decades of life. Findings of our study are also similar to the available published data.

In this study 58 (51.3%) patient underwent Aspiration alone (Table 2), among them total 22 (37.9%) had

recurrence of ganglion. 12 (20.7%) had recurrence of the ganglion within 3 months, followed by 6(10.3%) within 6 month and 4 (6.9%) within 12 month. Early recurrence was noted among this group of aspiration alone. In their study Nield DV³ and Richman JA⁴ found recurrence rate of aspiration alone is 59% and 64% respectively. Zubowicz VN⁸ showed aspiration only can solve up to 85% of wrist ganglions but his study design was based on repeated, (up to 3) aspirations only, and they also published repeated aspiration reduces the success rate too. Esteban et al⁹ followed up for 27 months and found 35% recurrence rate. Varley GW¹⁰ followed cases up to 48 months and found 68% recurrence. Stephen et al¹¹ found 69% failure rate after following up 12 months. Our study findings are near similar to some of the available published data, but we cannot confirm the high early recurrence rate as none have studied duration of recurrence separately. But from variations of recurrence rate we can predict that, with duration of follow up the recurrence rate varies significantly.

Aspiration with instillation of steroid was done in 55 (48.7%) (Table 2) patients. Recurrence within 1 year time was found in total 16 (29.1%) cases. 4 (7.3%) had recurrence within 3 month and 6 (10.9%) cases each had recurred within 6 and 12 month respectively. Wright et al¹² found 83% failure rate after aspiration with steroid instillation whereas Breidahl and Adler¹³ followed up 12 month and found recurrence rate 60%. Paul AS¹⁴

reported 43% recurrence after 2 year of follow up. Murat K¹⁵ used Methyl prednisolone for instillation with double cannula puncture technique, similar to our study technique and reported 15.8% recurrence rate after 2 year of follow up. Human et al¹⁶ reported, recurrence rate 43% in aspiration and steroid instillation and 24% in formal opensurgical excision of dorsal wrist ganglions. Varley GW¹⁰ had mean follow up of 46 months and reported 67% failure rate. Technique of cyst aspiration and steroid instillation and follow up period causes variation of findings in published studies. Under such condition our study findings may be considered satisfactory. Statistically no significant association could be established among the recurrence rate according to follow up period with aspiration and aspiration with steroid, p value was 0.217 and small effect size (0.198).

Warren Gude and Vincent Morelli¹⁷ in their review article commented after detail workup on the available publications that, Potential causes of this variability include the fact that many studies are small and may introduce statistical error. Follow-up in many studies, are often incomplete, at times, no better than 70–80%, and of variable length. As per the natural history of the ganglion, spontaneous regression is seen in up to half of patients, which has a significant role in analysis of result with prolong follow-up time¹⁷. Studies with an extended period of follow-up may incorrectly include cysts that naturally resolved as an indication of a successful intervention. On the other hand, follow-up that is too brief may not provide adequate time for recurrence. In case of our study, the study population was mostly those, entitled in a military hospital such as soldiers and their families. They are relatively healthy and cautious about their medical issues. Most of the patients are having good compliances and follows the instructions properly. These factors may contribute in findings of our study.

In this study, both Dorsal and Volar ganglion had similar recurrence rate i.e 33% (Table 3) irrespective of type of procedure done i.e. Aspiration alone and Aspiration with Steroid instillation. No significant association was found statistically on cross tab analysis, with P-value 0.960, Chi-square test Likelihood ratio 0.299, with very small effect size 0.051. In their study Richman JA⁴ found recurrence rate of volar ganglion after aspiration with single needle technique is 57% and 69% for dorsal ganglion. Murat K¹⁵ found 15.8% recurrence of volar

ganglion by double cannula puncture technique in their study. Holm PCA¹⁸ reported 40% recurrence rate in their study. These studies have variable data and very few published data has separately evaluated recurrence of volar and dorsal ganglion. We may conclude that there is no significant association of recurrence with site of ganglion after aspiration, though space for large scale study is always there.

Warren Gude and Vincent Morelli¹⁷ also reviewed the mechanism of action, how the steroid, if instilled in a ganglion cyst, reduces the rate of recurrence. Their conclusion of such quarry is idiopathic mechanism. Though previously ganglion cyst was thought to be a result of inflammation, later it was established that these cyst are not associated with inflammatory theory of origin¹⁷. Thornburg¹⁹ in his study showed the result of steroid instillation is equivocal to aspiration alone and it does not support the inflammatory theory of cyst formation.

In our study, only recurrence rate was evaluated. No other complications, such as pain, haemorrhage, inadvertent injury to surrounding structures during procedure, systemic manifestations of steroid instillation and hypopigmentation of overlying skin was not evaluated. Such limitations can be explained as this procedure is mostly safe and adequate pre-operative and intra-operative cautious technique and dose adjustment makes it a safe, easy and well tolerated procedure. The study was designed to compare the most important issue, which is the recurrence rate not the complications.

Conclusion:

We have evaluated the easily applicable and well tolerated method of treating the commonly occurring wrist ganglion within our available resources to establish a satisfactory method and found that Aspiration with instillation of steroid is with better result than Aspiration alone, though recurrence rate is higher in both method, but steroid instillation can delay the recurrence and have better compliance. Recurrence has no variation according to site of the ganglions.

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We have none or nothing to acknowledge.

Conflict of interest:

We have no conflict of interest to declare

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