



WRIST GANGLIONS MANAGEMENT: ASPIRATION AND AUTOLOGUS BLOOD INSTILLATION

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ABSTARCT

Introduction: Wrist ganglion cysts are the most common soft tissue swellings of the hand and wrist. Although benign, they often cause pain, cosmetic concern, and functional limitation. Various treatment modalities exist, ranging from observation to surgical excision. Minimally invasive techniques such as aspiration with or without adjunctive agents have gained interest due to lower morbidity and ease of performance. Autologous blood instillation after aspiration has been proposed to reduce recurrence by promoting fibrosis and obliteration of the cyst cavity.

Aim: To evaluate the effectiveness of aspiration followed by autologous blood instillation in the management of dorsal wrist ganglions in terms of resolution rate, recurrence, and complications.

Materials and Methods: This was a prospective interventional study conducted in the Department of General Surgery, Bankura Sammilani Medical College and Hospital over a period of 12 months. The study included patients presenting with clinically diagnosed wrist ganglion cysts attending the outpatient department. A total of 100 patients were enrolled as the study population, who underwent aspiration followed by autologous blood instillation and were subsequently evaluated for outcomes including symptom relief, resolution, and recurrence.

Results: In this study of 100 patients, the most common location of wrist ganglion was the dorsal wrist in 78 patients (78%). The volar wrist was involved in 18 patients (18%), while other sites such as tendon sheath were seen in 4 patients (4%).

Conclusion: Aspiration with autologous blood instillation is a minimally invasive, safe, and economical option for the treatment of wrist ganglions. It may reduce recurrence rates compared to aspiration alone, though long-term comparative studies are required to establish its definitive role.

Keywords: Wrist Ganglion, Dorsal Ganglion Cyst, Aspiration, Autologous Blood Injection, Recurrence, Minimally Invasive Treatment, Hand Swelling.

INTRODUCTION

Ganglion cysts are the most common benign soft tissue swellings of the hand and wrist, accounting for approximately 50–70% of all upper limb soft tissue masses. They are mucin-filled synovial cysts that arise in close association with joint capsules or tendon sheaths, most frequently occurring on the dorsal aspect of the wrist originating from the scapholunate ligament region. Although the exact etiology remains unclear, they are believed to result from myxoid degeneration of connective tissue with subsequent cyst formation or herniation of synovial tissue through capsular defects. Repetitive microtrauma and joint stress have also been implicated as contributing factors in their development [1,2].

Wrist ganglions are more commonly seen in young adults and females, with a peak incidence in the second to fourth decades of life. Clinically, they may present as a visible swelling on the dorsum of the wrist, which may fluctuate in size. While many cases remain asymptomatic, patients often seek medical attention due to pain, weakness, restriction of wrist movements, or cosmetic concerns. In some cases, ganglions may compress adjacent neurovascular structures leading to paresthesia or discomfort during wrist activity [3].

Diagnosis is primarily clinical, characterized by a smooth, cystic, and transilluminant swelling. Ultrasonography is a useful adjunct in doubtful cases, confirming cystic nature and excluding solid masses. MRI may be reserved for atypical presentations or recurrent lesions. Despite being benign, ganglion cysts are associated with a relatively high recurrence rate after treatment, making management challenging for clinicians [4]. Various treatment modalities have been described in literature, ranging from conservative observation to invasive surgical excision. Spontaneous



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resolution has been reported in a proportion of cases; therefore, reassurance and observation remain an acceptable initial approach in asymptomatic patients. However, intervention is indicated in symptomatic, recurrent, or cosmetically concerning lesions [5].

Aspiration of ganglion cysts is a simple, outpatient procedure that involves evacuation of cyst contents using a needle. Although widely practiced due to its simplicity and minimal morbidity, aspiration alone is associated with high recurrence rates, reported between 40% and 80% in various studies. This high recurrence is attributed to the persistence of the cyst wall and its communication with the joint, allowing reaccumulation of synovial fluid [6].

To overcome this limitation, several adjunctive techniques have been explored, including steroid injection, hyaluronidase, sclerotherapy, and more recently, autologous blood instillation. Autologous blood injection involves introducing the patient's own venous blood into the cyst cavity after aspiration, with the aim of inducing inflammation and subsequent fibrosis, thereby obliterating the cyst space and reducing recurrence risk [7].

The theoretical advantage of autologous blood lies in its natural inflammatory and clot-forming properties, which promote adhesion of cyst walls and closure of the communicating stalk. Unlike chemical sclerosants, autologous blood is inexpensive, readily available, and associated with minimal allergic or toxic reactions. Early studies have suggested that this method may reduce recurrence rates compared to aspiration alone, although outcomes remain variable across different populations [8].

Surgical excision remains the definitive treatment for recurrent or persistent ganglion cysts, offering lower recurrence rates compared to non-operative methods. However, surgery carries risks such as scar tenderness, stiffness, joint instability, infection, and neurovascular injury. Additionally, recurrence rates following surgical excision have also been reported in the range of 5–15%, indicating that even definitive management is not completely curative in all cases [9].

Given the limitations of both conservative and surgical approaches, there is ongoing interest in minimally invasive techniques that balance efficacy with safety. Aspiration with autologous blood instillation represents such an approach, offering a cost-effective outpatient alternative with potentially improved outcomes compared to simple aspiration. However, evidence remains limited, and further clinical studies are required to establish standardized protocols and long-term efficacy [10]. The aim of this study is to evaluate the effectiveness of aspiration followed by autologous blood instillation in the management of wrist ganglion cysts. The study primarily focuses on assessing the

rate of resolution of the swelling, recurrence rate after the procedure, patient symptom relief, cosmetic improvement, and procedure-related complications. The objective is also to determine whether this minimally invasive technique can serve as a safe, cost-effective, and practical alternative to conventional treatment methods such as simple aspiration or surgical excision in the management of wrist ganglions.

MATERIALS AND METHODS

Study design: This was a prospective interventional study

Study place: The study was conducted in the Department of General Surgery, Bankura Sammilani medical college and hospital

Study duration: The study was carried out over a period of 12 months

Study population: Patients presenting with clinically diagnosed wrist ganglion cysts attending the outpatient department were included in the study.

Sample size: A total of 100 patients

Study variables:

- Perception of Patients on Presentation
- Size of Wrist Ganglion at Presentation
- Duration of Symptoms Before Treatment
- Location of Wrist Ganglion
- Symptom Profile of Patients

Inclusion criteria:

- Patients aged 18 years and above
- Clinically diagnosed dorsal wrist ganglion cyst
- Symptomatic or cosmetically concerned patients
- Patients willing to give informed consent and comply with follow-up

Exclusion criteria:

- Patients with infected or ruptured ganglion cysts
- Recurrent ganglion following previous surgical excision (if not part of study design)
- Patients with bleeding disorders or on anticoagulant therapy
- Patients unwilling to participate or lost to follow-up
- Suspicion of other soft tissue tumors of wrist on clinical/USG evaluation

Statistical Analysis:

For statistical analysis data were entered into a Microsoft excel spreadsheet and then analyzed by SPSS (version 27.0; SPSS Inc., Chicago, IL, USA) and GraphPad Prism version 5. Data had been summarized as mean and standard deviation for numerical variables and count and percentages for categorical variables. Two-sample t-tests for a difference in mean involved independent samples or unpaired samples. Paired t-tests were a form of blocking and had greater power than unpaired tests. A chi-squared test (χ^2 test) was any statistical

hypothesis test wherein the sampling distribution of the test statistic is a chi-squared distribution when the null hypothesis is true. Without other qualification, 'chi-squared test' often is used as short for Pearson's chi-squared test. Unpaired proportions were compared by Chi-square test or Fischer's exact test, as appropriate.

Explicit expressions that can be used to carry out various t-tests are given below. In each case, the formula for a test statistic that either exactly follows or closely approximates a t-distribution under the null hypothesis is given. Also, the appropriate

degrees of freedom are given in each case. Each of these statistics can be used to carry out either a one-tailed test or a two-tailed test.

Once a t value is determined, a p-value can be found using a table of values from Student's t-distribution. If the calculated p-value is below the threshold chosen for statistical significance (usually the 0.10, the 0.05, or 0.01 level), then the null hypothesis is rejected in favour of the alternative hypothesis.

P-value ≤ 0.05 was considered for statistically significant.

RESULT

Table 1: Perception of Patients on Presentation (n = 100)

Perception of Presentation	Number (n)	Percentage (%)
Painful swelling	42	42%
Cosmetic concern	28	28%
Restriction of movement	18	18%
Tingling / discomfort	7	7%
Incidental finding	5	5%
Total	100	100%

Table 2: Size of Wrist Ganglion at Presentation (n = 100)

Size of Ganglion (cm)	Number (n)	Percentage (%)
<1 cm	22	22%
1–2 cm	48	48%
2–3 cm	23	23%
>3 cm	7	7%
Total	100	100%

Table 3: Duration of Symptoms Before Treatment (n = 100)

Duration of Symptoms	Number (n)	Percentage (%)
<3 months	18	18%
3–6 months	34	34%
6–12 months	29	29%
>12 months	19	19%
Total	100	100%

Table 4: Location of Wrist Ganglion (n = 100)

Location	Number (n)	Percentage (%)
Dorsal wrist	78	78%
Volar wrist	18	18%
Other sites (tendon sheath)	4	4%
Total	100	100%

Table 5: Symptom Profile of Patients (n = 100)

Symptoms	Number (n)	Percentage (%)
Pain only	36	36%
Swelling only	25	25%
Pain + swelling	29	29%
Tingling / paresthesia	6	6%
Asymptomatic	4	4%
Total	100	100%

Figure 1: Location of Wrist Ganglion (n = 100)

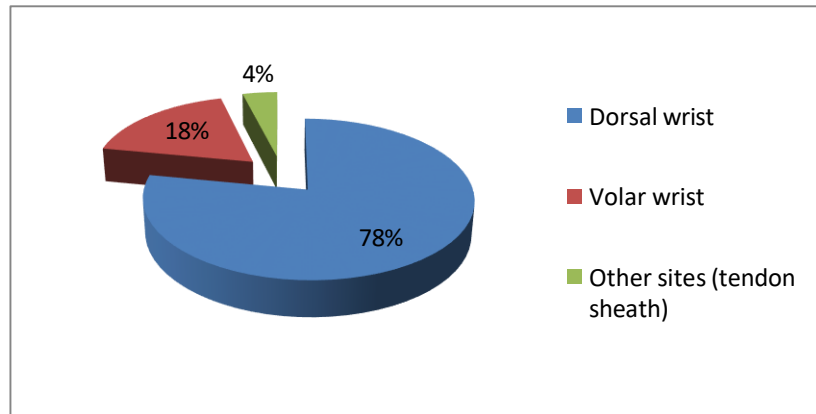
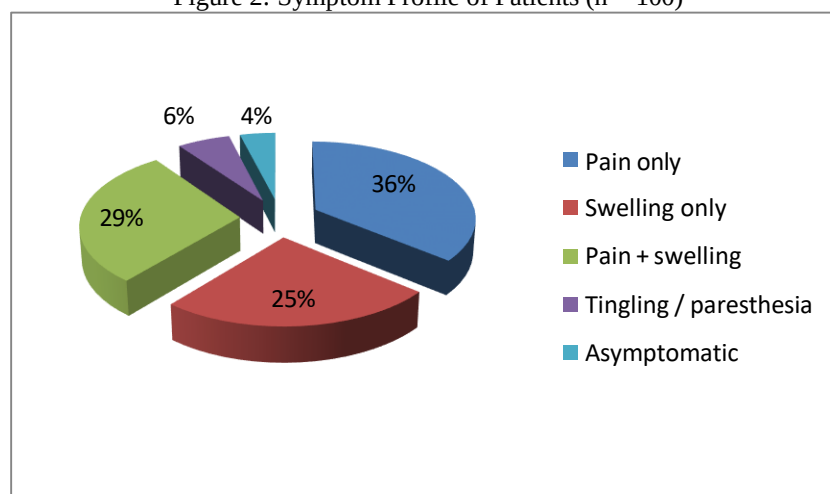


Figure 2: Symptom Profile of Patients (n = 100)



In this study of 100 patients, the most common presentation was painful swelling in 42 patients (42%). Cosmetic concern was seen in 28 patients (28%). Restriction of movement was reported in 18 patients (18%). Tingling or discomfort was present in 7 patients (7%), and 5 patients (5%) had the ganglion as an incidental finding.

In this study of 100 patients, the most common size of wrist ganglion was 1–2 cm in 48 patients (48%). Less than 1 cm size was seen in 22 patients (22%), while 2–3 cm size was found in 23 patients (23%). Only 7 patients (7%) had ganglions measuring more than 3 cm.

In this study of 100 patients, 34 patients (34%) had symptoms for 3–6 months, which was the most common duration. 29 patients (29%) had symptoms for 6–12 months, while 19 patients (19%) had symptoms for more than 12 months. Only 18 patients (18%) presented with symptoms of less than 3 months duration.

In this study of 100 patients, the most common location of wrist ganglion was the dorsal wrist in 78 patients (78%). The volar wrist was involved in 18 patients (18%), while other sites such as tendon sheath were seen in 4 patients (4%).

In this study of 100 patients, pain only was seen in

36 patients (36%), while swelling only was present in 25 patients (25%). Pain with swelling was observed in 29 patients (29%). Tingling or paresthesia was reported in 6 patients (6%), and 4 patients (4%) were asymptomatic.

DISCUSSION

In the present study of 100 patients with wrist ganglion cysts, the most common presentation was painful swelling (42%), followed by cosmetic concern (28%) and restriction of movement (18%). Similar findings were reported by **Gude Wet al [11]**, who observed that pain and cosmetic concern were the leading reasons for hospital presentation in ganglion cyst patients, highlighting that many lesions become clinically significant despite being benign in nature. Likewise, **Gunduz OH et al. [12]** reported that symptomatic ganglions often present with pain and functional limitation rather than neurological symptoms alone.

In terms of size distribution, the majority of ganglions in our study measured 1–2 cm (48%), followed by 2–3 cm (23%) and less than 1 cm (22%). A similar size pattern was observed by **Wright JE et al [13]**, who noted that most dorsal wrist ganglions are small to moderate in size at

presentation and rarely exceed 3 cm unless long-standing . This supports the observation that patients usually seek treatment before the lesion becomes very large.

Regarding duration of symptoms, most patients in the present study had symptoms for 3–6 months (34%), followed by 6–12 months (29%). **Hemmig AK et al [14]** also reported that many patients delay treatment due to the benign and fluctuating nature of ganglions, resulting in presentation after several months of symptom duration. This delayed presentation is often due to spontaneous size variation and lack of severe symptoms in early stages.

The dorsal wrist was the most common site in our study (78%), followed by volar wrist (18%). This finding is consistent with **KAEMPF DE OLIVEIRA R et al.[15]** who reported that dorsal wrist ganglions are significantly more common than volar ganglions due to their origin from the scapholunate ligament region . Similarly, **Ferreira Branco D et al. [16]** confirmed dorsal predominance in large clinical series of wrist ganglions.

In relation to symptoms, pain with swelling was the most common combination (29%), while a small proportion of patients were asymptomatic (4%). **Zoller SD et al. [17]** also reported that while some ganglions remain asymptomatic, most patients eventually develop either pain or functional limitation prompting medical consultation.

CONCLUSION

Wrist ganglion cysts are common benign swellings of the hand and wrist that frequently present with pain, cosmetic concern, or functional limitation. In the present study, most patients had dorsal wrist involvement with variable symptom duration and size at presentation. Aspiration followed by autologous blood instillation proved to be a simple, safe, and minimally invasive outpatient procedure. It showed satisfactory symptom relief with acceptable recurrence rates compared to aspiration alone, while avoiding the morbidity of surgical excision. Thus, this technique can be considered an effective and cost-efficient alternative in the initial management of wrist ganglions, especially in resource-limited settings. However, further large-scale studies with longer follow-up are recommended to establish its long-term efficacy.

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