

**RESEARCH PAPER**

# Recurrence of Ganglion Cysts Following Re-excision

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**Abstract**

**Background:** The recurrence of ganglion cysts after surgical excision has a reported rate of 4% to 40%. Recurrence rate after revision surgical excision is unknown. The purpose of this study was to define the incidence of recurrent ganglion cysts in patients who underwent a secondary excision procedure.

**Methods:** With Institutional Review Board approval, we retrospectively identified by CPT code and reviewed charts of patients who had recurrent ganglion cyst excision performed over a five-year period (2010 – 2014). Recurrence was defined as reappearance of a cyst in the same area as it was previously. Demographic information including recurrences and revision surgeries was collected in addition to outcome variables such as patient satisfaction, pain levels, and functional limitations.

**Results:** Out of the 42 revision cases identified 20 patients were reached. Mean time to recurrence of the cyst after the first ganglion cyst excision was 2.5 years (range: 1 month - 12 years). After the second ganglion cyst excision, three patients (15%) had a recurrence, each occurring within one year (mean: 11 months; range: 9-12). One of the three patients underwent a third successful ganglion cyst excision. The other two patients declined surgical intervention to date. Patients without a second recurrence (n=17) reported an average pain score of 0.1 (range: 0-2) on a scale of 1-10. Three (18%) reported some difficulty with day-to-day activities due to their scar. Seven (41%) patients reported at least transient numbness or tingling. Mean satisfaction was 9.8 on a scale of 1-10, and 100% reported that they would undergo another ganglion cyst excision should they ever have another recurrence.

**Conclusion:** Patients should be advised about the risk of recurrence after re-excision of ganglion cysts, which was noted to be 15% in our cohort. This rate of recurrence is similar to that of primarily excised cysts.

**Level of evidence:** III

**Keywords:** Ganglion cyst, Recurrence, Surgical excision, Wrist surgery

**Introduction**

Ganglion cysts are the most common masses afflicting the hand and wrist. Although these masses are benign, they can cause pain, weakness, and loss of function due to irritation of the branches of the posterior interosseous nerve, tendon, or capsular tissues (1). Ganglion cysts usually overlie joints or tendons and are typically located on the dorsal side of the wrist. To date, the exact pathogenesis of ganglion cysts remains unknown. However, several theories exist,

including synovial herniation, mucoid degeneration of periarticular structures, and/or a result of stressing the joint capsule and ligaments which stimulates the production of hyaluronic acid (2). Ganglion cysts have the potential to resolve spontaneously, and given the limited morbidity associated with these lesions, nonsurgical interventions, such as observation or needle aspiration, represent the primary treatment approaches (3,4).

Surgery is often reserved for patients with persistent

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or recurrent symptoms who have failed conservative therapy. Surgical removal can be performed using an open or endoscopic approach (5-8). During the procedure, removal of both the cyst and its stalk is necessary. If this is not done properly, postoperative recurrence may be more likely. There are several additional risk factors for recurrence after dorsal wrist ganglion excision, including presence on the dominant hand or wrist, female gender, and age of 24 years or younger (1,7). Rates of ganglion cyst recurrence following surgery have been reported to be in the range of 4% - 40% (9). However, following a second surgical excision, there are no published data on the incidence of another recurrence and the symptoms associated with it.

The present study can impact surgical decision-making and further define the surgical risks and benefits of revision ganglion cyst excision, as well as guide patient expectations.

### Materials and Methods

In this retrospective study, which was approved by the Institutional Review Board at our institution, our patient cohort was identified by searching electronic medical records data for Current Procedural Terminology (CPT) code 25112, which pertains to revision ganglion cyst excision. Specifically, this query encompassed all CPT codes over a five-year period (2010 - 2014). Recurrence of the ganglion cyst was defined as reappearance of a cyst in the same area as prior. The study adhered to the Strengthening the Reporting of Observational studies in Epidemiology (STROBE) guidelines. Of the 42 patients identified using this CPT code, 20 patients were reached by phone or email. These patients were asked to complete a questionnaire, which included demographic information, duration between primary and revision surgeries, surgical technique for each procedure (open vs. arthroscopic), and specifics regarding any third recurrences and/or second revision surgeries. Additionally, outcome data pertaining to patient satisfaction, pain levels, and functional limitations was collected.

### Results

Of all 42 patients identified with a ganglion cyst recurrence and subsequent revision surgery, 20 patients (48%) completed the questionnaire via phone call or email. The study cohort consisted of 12 women (60%) and 8 men (40%), with an average age of 46.2 years (range: 15 - 76; standard deviation: 17.8) [Table 1]. Distribution of ganglion cyst laterality was similar between the right (55% of cases) and left (45% of cases) hand/wrist. The dominant side was affected 55% of the time, and volar ganglion cysts were more common (60% of cases) than dorsal ganglion cysts (40% of cases). The primary surgical excision was performed using an open technique in 18 cases. Two ganglion cysts were excised using an arthroscopic technique.

Time to recurrence of the cyst after primary surgical excision ranged from one month to 12 years with an average of 2.5 years [Table 2]. The duration between the primary and revision surgeries ranged from two months to 14.6 years, with an average of 4.2 years

**Table 1. Patient Demographics and Clinical Characteristics**

	N	%
<b>Gender</b>		
Female	12	60
Male	8	40
<b>Age</b>		
<18	1	5
18-29	2	10
30-44	7	40
45-59	4	20
≥60	5	25
<b>Dominant hand</b>		
Left	0	0
Right	20	100
<b>Laterality of ganglion cyst</b>		
Left	9	45
Right	11	55
<b>Location of ganglion cyst</b>		
Volar	12	60
Dorsal	8	40

between procedures. All 20 revision surgeries were performed using an open technique. After the second ganglion cyst excision, three patients (15%) had a third recurrence. Demographic data from these three patients is available in [Table 3]. Each of these patients had a volar ganglion cyst, and all three recurred within one year of the revision procedure (mean: 11 months; range: 9 - 12 months). Only one of these three patients opted for a third ganglion cyst excision due to pain (pain level 3 on a scale from 1-10) and transient paresthesias which limited day-to-day activities. One patient did not seek additional treatment because they experienced no pain or functional limitations. The other patient cited the previous two recurrences as reasoning not to seek additional treatment, despite the ganglion cyst interfering with day-to-day activities.

Of the patients without a second recurrence (n=17), only one reported pain of 2 out of 10 attributed to scarring. Three patients (18%) reported some difficulty with day-to-day activities due to scarring. Seven patients (41%) reported transient numbness or tingling of the hand or wrist. On average, these patients reported a satisfaction level of 9.8 on a scale of 1-10 with their treatment. Of these 17 patients, 100% not that they would undergo another ganglion cyst excision should they ever have another recurrence.

### Discussion

Patients with a ganglion cyst recurrence more often presented with a lesion on the volar side of the wrist. Symptoms and limitations may be less well-tolerated on the volar side of the hand and wrist as compared to the

Table 2. Outcomes Data			
		After 1st surgery (N=20)	After 2nd surgery (N=3)*
Procedure technique, N (%)	Open	18 (90)	1 (100)
	Endoscopic	2 (10)	0
Time to recurrence, months	<12	10 (50)	1
	12-60	6 (30)	2
	>60	4 (20)	0
	Mean	30.3	11.0

Table 3. Demographics of Patients with Multiple Recurrences									
Patient	Age	Gender	PMH	Ganglion Cyst Location	1st Surgery	1st Recurrence	2nd Surgery	2nd Recurrence	3rd Surgery
1	46	M	GERD	Right Volar Wrist	Open	13 months	Open	12 months	Declined
2	35	F	Anemia Hypothyroidism GERD	Left Volar Wrist	Open	9 months	Open	9 months	Open
3	55	M	Seizure disorder GERD	Left Volar Wrist	Open	12 months	Open	12 months	Declined

dorsal side. Volar cysts are technically more difficult to surgically manage because there is a risk of damage to the radial artery and the stalk of the cyst may be more difficult to identify.

In three out of 20 patients (15%) there was a second recurrence of the ganglion cyst. Patients should be informed about the risk of recurrence after re-excision of ganglion cysts. The rate of ganglion cyst recurrence observed in this study is similar to the recurrence of primarily excised cysts (9). All patients reported that they would undergo another ganglion cyst excision if, hypothetically, the cyst were to recur. However, in the three patients who had a true third recurrence, only one had perused a second revision surgery to date.

This is the first report in the literature that gives insight into the incidence and outcomes of a second recurrence of ganglion cysts in the hand and wrist. Even so, there are limitations to this study. Only 48% of the patients identified responded via phone or email to the questionnaire. We are not certain in why our response ratio is so low. Geographic and demographic factors may play a role in this. Due to the small sample size we cannot provide conclusive recommendations based on the results.

Ganglion cysts have a high incidence, and additional research on the subject is warranted. Although these lesions are benign, most patients desire resolution of the cyst by means of aspiration or resection. Further research should be performed with a larger population sample to offer conclusive recommendations regarding secondary recurrence of ganglion cysts after re-excision.

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