Sonographically guided percutaneous treatment of ganglion cysts

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Authors: S. Delgado Saiz¹, J. L. Del Cura Rodríguez¹, R. Zabala Landa¹, M. D. D. Hernández-Argüello², M. A. Schuller Arteaga¹, D. Grande Icaran¹; ¹Bilbao/ES, ²Pamplona/ES
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Aims and objectives

Ganglion cysts are the commonest soft tissue mass arising from the wrist and hand.

They are most commonly encountered in young women.

On US they have an anechoic appearance with posterior acoustic enhancement and may be multiloculated. Up to 70% arise dorsally, from the region of the scapholunate ligament.

A ganglion lacks a true synovial lining and is filled with viscous yellowish fluid. Although they may be asymptomatic and often resolve spontaneously, sometimes they cause pain.

Indications for treatment of ganglia include pain, functional impairment, nerve compression or aesthetic reasons. Traditional treatment has been surgical removal of the ganglia.

As ganglion cyst usually lies in a superficial location, percutaneous US-guided aspiration and treatment offers a very interesting and less aggressive alternative to the surgical treatment. The advantage of US-guided aspiration is that the presence of a ganglion can first be confirmed and the needle can be positioned accurately, minimizing the risk of soft tissue damage and haemorrhage. In fact, simple puncture and aspiration are advocated as the first step by many clinicians.

There have been no randomized controlled studies showing that corticosteroid injection into the ganglion improves the outcome over simple aspiration, but its use is widely accepted. Some clinicians reserve corticosteroid injection for larger lesions. Ethanol sclerosis has been also widely used for sclerosis of cystic lesion, so, this substance appears as an alternative to the treatment of ganglia.

The purpose of our study is to evaluate the efficacy of sonographically guided percutaneous treatment of ganglion cysts using corticosteroid or ethanol injection as part of the treatment. (Fig 2)
**Images for this section:**

![Imagery related to percutaneous treatment US-guided of ganglion cyst](image-url)

**Fig. 1:** Percutaneous treatment US-guided of ganglion cyst

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Methods and materials

Patient Selection:

An intention-to-treat retrospective analysis of all consecutive ganglion cyst percutaneous treatment performed between September 2012 and September 2016 in Basurto University Hospital. The patients are referred to us by the Orthopedic Department after a suspicion has been raised or after a diagnosis of ganglion cyst by US or MRI. Procedures performed are recorded in the database of our Hospital Information System.

The evolution of the patients was followed in the Information System of our Public Health System. In the cases in which the evolution could not be ascertained a phone call was carried out to ask the patients about the evolution. Clinical efficacy of the treatment, recurrences and demographic data were recorded.

Procedure details

We treat ganglion cysts by aspiration under ultrasound guidance. Percutaneous treatment was performed under real-time US guidance, using a 10-12 MHz linear probe. After an initial US evaluation to identify the lesion and to plan the procedure, 1% lidocaine was injected in the path. The US probe was placed over the target and the needle was advanced with US guidance to the lesion, aspirating the fluid thereafter.

As the fluid within ganglia is often very viscous or gelatinous, a large-bore needle is recommended for aspiration. We use a 14G needle.

The needle may need to be moved into different positions within the ganglion to aspirate the whole fluid. Sometimes, the amount of aspirated fluid is scarce.

After the aspiration, a substance is injected to prevent recurrence. The patients have been randomly treated with corticosteroid or ethanol injection, depending on the preferences of the radiologist performing the procedure and also depending on the hour in which the procedure was performed, as the whole ethanol injection procedure needs more than an hour to be completed. No statistic differences were observed between both groups of patients with different treatments (table 1).

In the patients treated with corticosteroid, 40 mg of Triamcinolone Acetonide was injected. In the patients treated with alcohol, an amount of absolute ethanol equivalent to 1/3 of the volume of fluid aspirated from the ganglia was injected and posteriorly, after 60 min, aspirated. Patients with recurrence were percutaneous treated again using a different substance.
All the procedures were performed by radiologist with more than 10 years of experience in this kind of treatments. The procedures were performed using different platforms: ATL 5000, IU-22 and Epiq (Philips, Eindhoven, Nederland) (Fig 1)

**Statistical analysis:**

The efficacy of the treatment was defined by the radiological and clinical resolution and absence of clinical recurrence. Improvement was defined by a complete or near-complete disappearance of the symptoms. Recurrence was defined by the relapse of the ganglion after a period of improvement. Chi-square test and Kaplan-Meier analysis was carried out. A p-value < 0.05 was considered significant. (Table 1)
### Table 1: Table 1

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Fig. 1: Percutaneous treatment US-guided of ganglion cyst

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Results

Ninety-five consecutive patients (57 females and 38 male) were treated. The mean age was 46.6 (SD 16.4). The median follow up time was 34.5 month (range 2-86.25). The most frequent area treated was wrist (63.5%).

The median ganglion cyst size was 1.5 cm (range 0.3-4 cm).

Technical success was seen in all the patients.

Recurrence during the follow-up was observed in 18.5% of patients treated with steroids and in 46.7% of patients treated with alcohol. Differences between both treatments were significant (p<0.02). The median time until recurrence was 33 month (range 1-61).

Surgery was finally required only in 6 of 96 patients (6.25%). No complications were observed.

There were no statistically significant differences in recurrence regarding to the age and sex of the patients and the size of the ganglion. (Fig 2) (Fig 3)

LIMITATIONS

This study has some limitations, primarily the fact that there is no comparison with another possible treatment of ganglion cyst, like surgery. The selection of the treatments was not blinded, but a matter of preference of the performer radiologist, although the assignation of treatment appears as not biased in table 1.

It has also been a retrospective analysis with only four years of analysis, although the cases were consecutive.

Nevertheless, we believe our results provide supporting evidence of the efficacy of percutaneous treatment, demonstrating an excellent alternative at surgery.
Fig. 2: Survival

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<table>
<thead>
<tr>
<th>Sclerosing agent</th>
<th>Time to recurrence (weeks)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Steroids</td>
<td>1426.946</td>
</tr>
<tr>
<td>Ethanol</td>
<td>774.000</td>
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<tr>
<td>Global</td>
<td>1352.373</td>
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</tbody>
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Fig. 3: Survival

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Conclusion

In this study, the efficacy of percutaneous treatment US-guided with aspiration and steroids or alcohol instillation was evaluated. According to results obtained from our database, the success of percutaneous treatment is very high.

Additionally, according with the recurrences, the injection of steroids is more effective than alcohol to avoid recurrences.

There is no risk of complications for the patient. This treatment provide a good alternative to surgery as a first-line treatment.
References


