

# Phenol Cauterization for Ganglions of the Hand, Wrist, and Foot: A Preliminary Report

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Many methods have been reported for the treatment of ganglions. The authors present their modified technique for ganglion sclerotherapy. Their modification enables them to perform sclerotherapy safely and consistently, and they have treated 10 patients in this manner. The method is described and the cases are illustrated.

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Ganglion cysts are common, benign, soft-tissue tumors of the hand and wrist. There are various treatments available including observation, aspiration, sclerotherapy, and surgical excision.<sup>1-5</sup> Because these cysts sometimes disappear spontaneously, nonoperative treatment is usually advocated in most instances. However, recurrence is the most common complication of the treatment of ganglions. If substantial pain or persistent numbness caused by a ganglion interferes with activities of daily life, and the ganglion is resistant to conservative treatment, aggressive treatment should be considered.

Ordinary sclerotherapy involves aspiration followed by injection of one of many sclerosants into the cyst cavity.<sup>6,7</sup> However, there is a risk of the sclerosant passing into a joint or tendon sheath. We modified conventional sclerotherapy by combining it with a small incision. Instead of injecting a sclerosant, a small incision is made and phenol is applied to the lining and the base of the ganglion cyst. This modification has the

obvious advantage of enabling sclerotherapy to be performed safely.

## Patients and Methods

### Patients

We have treated 10 patients (9 women and 1 man) using our modified technique. The age at the time of surgery ranged from 18 to 50 years. The average follow-up period was 12 months (range, 6-19 months). Six of the ganglion cysts were in the dorsal wrist, two were in the volar carpal region, one was in the dorsum of the foot, and one was in the proximal interphalangeal joint. Satisfactory results were obtained in all patients. No major complications have occurred; minor complications include skin pigmentation caused by chemical burn.

### Methods

This procedure can be performed with local anesthesia without the use of a tourniquet. A small transverse incision (approximately 10 mm) is made over the ganglion cyst. The cyst is dissected from the surrounding tissue as much as possible. Dissection does not need to expose the stalk and capsular attachment. The ganglion cyst is then opened and the viscous mucin fluid is removed. The capsule of the cyst is pulled out from the incision. A fine cotton-tip applicator is immersed in phenol (more than 88%), and the excess is wiped with gauze. The inside lining of the ganglion cyst is cauterized with phenol. Particular care must be taken to cauterize the region of the capsular attachment sufficiently. Care must be taken not to damage the skin with phenol. The phenol-immersed applicators should be changed periodically, and phenol should be applied several times. The total time of phenol application is



*Fig 1. (A) Preoperative view of the dorsal wrist. (B) The ganglion cyst is opened and the capsule of the cyst is pulled out from the incision. (C) Inside, the ganglion cyst is cauterized with phenol. (D) Immediate postoperative view. (E) Appearance 9 months after the operation.*

approximately 3 minutes. After phenol cauterization, anhydrous ethanol is applied to inactivate the phenol, and saline is also applied to wash out the residual phenol.<sup>8</sup> Most of the phenol-cauterized capsule is excised to reduce the quantity of phenol-induced necrotic tissue, and the wound is then closed. A small piece of gauze moistened with ointment is placed over the wound, and the dressing is held in place with tape. The average time to perform this procedure is approximately 15 minutes. Plaster or a splint is not used. All sutures are removed within 1 week after the operation.

## Patient Reports

### Patient 1

A 35-year-old male dentist had a dorsal wrist ganglion (Fig 1). He had already undergone aspiration and triamcinolone injection several times. The ganglion often caused pain during his work. He underwent an operation using our method, and the results at 9 months after the operation were satisfactory. There were no signs of recurrence, and the operative scar was inconspicuous except for slight pigmentation around the suture line.

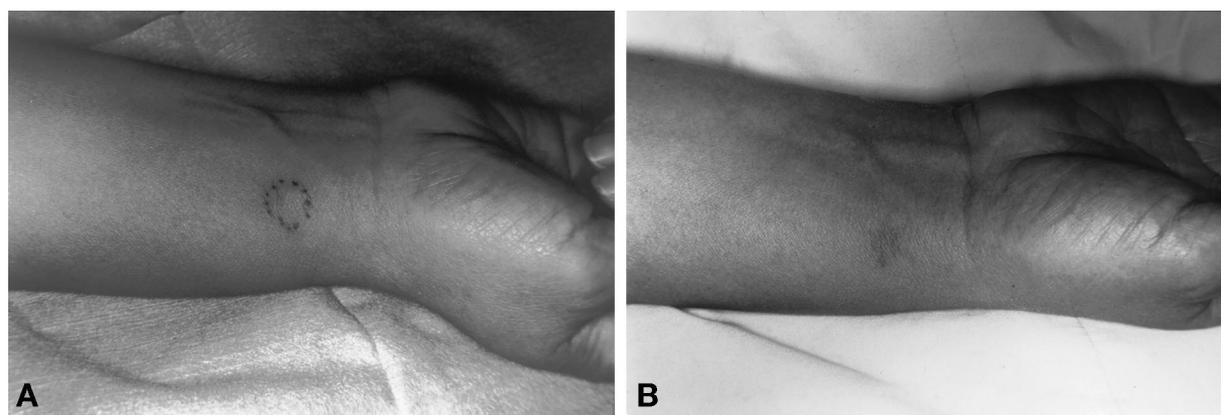


Fig 2. (A) Preoperative view of the volar wrist. (B) Appearance 6 months after the operation.

### Patient 2

A 50-year-old woman presented with a volar carpal ganglion (Fig 2). This patient was a laborer and she complained of pain and numbness in her hand. The preoperative view is shown in Figure 2A. The 6-month postoperative view is shown in Figure 2B. There are no signs of recurrence and the patient has been able to work without any problems.

### Discussion

Ganglions have been treated by both operative and nonoperative techniques. The indications for treatment include pain, numbness, weakness, and disfigurement. Because the rate of spontaneous resolution is high, surgical intervention is only considered when a ganglion causes symptoms and is resistant to conservative treatment.<sup>1,5</sup> Excision of the ganglion, its capsular attachment, and a small cuff of underlying ligament have recently been advocated for successful surgery. The results of macroscopic and microscopic studies suggest that the high recurrence rate of ganglions is the result of insufficient excision or the result of microcysts in the surrounding capsular tissue and ligament.<sup>2,9,10</sup> Excision of a small cuff of normal capsule along the stalk has been shown to reduce the recurrence rate. This lower recurrence rate may be the result of the removal of a valve mechanism or microcysts in the surrounding capsular tissue.<sup>11</sup> There have been a number of recent reports advocating the excision of all attachments to the ligament and surrounding tissue. However, in patients in whom the ganglion arises from the scapholunate ligament or the artic-

ular capsule, wide excision may affect articular kinematics and joint stability adversely.<sup>5</sup>

Our procedure is a modification of conventional sclerotherapy. In 1962, MacEvedy<sup>6</sup> reported a high success rate in sclerotherapy and recommended aspiration and injection of a sclerosant as the first method of treatment. After the report by MacEvedy,<sup>6</sup> various agents such as iodine, phenol, and 5% morrhuate have been used as sclerosants. However, these have all been shown to be ineffective. Mackie and colleagues<sup>7</sup> reported that sclerotherapy was either ineffective (with recurrence rates as high as 60%) or dangerous. Andren and Eiken<sup>12</sup> showed that mucinous fluid can pass from the wrist joint to the ganglion, but not vice versa. They postulated the presence of a one-way valve mechanism. If the one-way valve mechanism fails and the sclerosant passes into the joint, severe damage to the joint may result. Wide use of sclerotherapy has stopped after the publication of these reports, and sclerotherapy is not currently recommended for the treatment of a ganglion.

With our modified method, phenol is applied within a very short time without injection and is washed out completely. Our procedure is thought to resolve the serious shortcoming of the previously used technique for sclerotherapy. Our procedure damages the lining of the main ganglion and the microcysts, and induces severe fibrosis around the one-way valve mechanism. This fibrosis may prevent the retention of mucoid degenerative liquid and reduce the rate of ganglion recurrence. Because the capsular tissue and ligament are not excised using our method, articular kinematics and joint

stability are not disturbed. Furthermore, our technique can be performed under local anesthesia without the use of a tourniquet. This technique can be performed easily in an outpatient clinic. Our technique is simple and has many advantages. The only disadvantage is a small incisional scar.

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