

A New Sclerotherapy Technique for the Wrist Ganglion

Transcutaneous Electrocauterization

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Abstract: Ganglion, a cystic benign mass, most common soft tissue tumor of the hand, usually occurs in hand, wrist, and foot. In this study, we discuss a new sclerotherapy technique through which 17 patients with wrist ganglion were treated by using short bursts of high-frequency low voltage electrodesiccation delivered through a fine electrode that was inserted into the sac. Their ages varied from 28 to 52 with an average of 32.7 years. Two patients had volar wrist and 15 others had dorsal ganglia. In all patients, an ultrasound imaging was done for the discrimination of the other hand tumors.

Under aseptic conditions, first ganglion was aspirated by using a large needle, which was commonly used for peripheric venous catheterization, and 0.5 mL of 1% xylocaine was injected into the cystic cavity, then electrocauterization was done. In the postoperative follow-up ranging from 6 to 29 months, 1 recurrence developed 3 months after the intervention, requiring the same procedure to overcome it. No complication occurred and all complaints of the patients resolved with this approach. The present technique is simple, safe, effective, and inexpensive for ganglion sclerotherapy, resulting in hopeful outcomes to become as an acceptable alternative to the open surgery.

Key Words: ganglion, sclerotherapy, electrocautery, aspiration, wrist

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Ganglion is a cystic benign tumor of the hand, usually at the wrist, and rarely at the other regions of the hand, knee, and foot. It is known as one of the most common soft tissue tumors of the hand, wrist, and foot. Although a ganglion is close to joints or tendinous sheaths, sometimes it occurs in carpal bones as an occult cyst.¹ Because most ganglia are asymptomatic, no treatments are required. If swelling, pain, and restriction of the joint motion, which are the most occurring symptoms of the ganglia develop, either surgical or conservative treatment is necessary. In almost all cases, clinical findings are enough to describe a ganglion; however, some imaging methods such as ultrasound, magnetic resonance imaging, and direct radiography that may be chosen for the visualization of the radiographic findings of an intraosseous cyst are available for the diagnosis.^{1,2}

So far, many methods involving either surgical or conservative approaches have been reported for the treatment of ganglions. The treatment modalities may be divided into 4 groups such as observation, aspiration, sclerotherapy, and surgical excision.³ Major disadvantage of all conservative approaches corresponding to the surgical excision is high rate of recurrence, but the present study offers a new technique for ganglion sclerotherapy as a conservative solution in which transcutaneous aspiration and electrocauterization of cyst sac is performed, resulting in successful outcomes and

seeming to be an effective, simple, safe, reliable, and inexpensive alternative to the other treatment modalities.

MATERIALS AND METHODS

This study included 17 patients, 6 men and 11 women with wrist ganglia, whose ages varied from 28 to 52 with an average of 32.7 years. Two patients had volar hand ganglia and 15 others had dorsal hand ganglia (Fig. 1). There were no inclusion criteria and selection of cases for the study, so all patients suffering from a ganglion were admitted into the study, but none of them had any ganglia recurrence, all the ganglia were untreated.

An ultrasound imaging was made for the discrimination of the other hand tumors. All interventions under aseptic conditions were performed by the same surgeon, with local anesthesia in an operating room. The ganglion was aspirated by using a large needle covered by a catheter that is commonly used for peripheric venous catheterization, and then 0.5 mL of 1% xylocaine was injected into the aspirated cavity. Later, the needle was removed but catheter left in place for a passage of a fine electrode. A few minutes later, a fine electrode was inserted into the cyst through the catheter, and electrocoagulation with short bursts of high frequency and low voltage delivered from a standard, commonly using a type of unipolar electrocautery was given once for 2 seconds duration with 35 Joule power, resulting in a burn in the cyst sac. The catheter with electrode was then removed and a pressure garment was worn for a week. Also, aspirated cyst fluid was examined cytologically.

In this technique, the largest portion of the ganglion is cauterized, so the electrode is not inserted deep to the base of the neck of the ganglion; this provides a safe cauterization that is limited only to the cyst sac. Deep movements of the electrode through the neck of the ganglion may cause extrusion of the electrode from the ganglion wall, leading to injury of adjacent structures during electrocauterization; the electrode is not threaded down to the base of the neck of the ganglion in cases of ganglia with a long neck running transversely across the wrist, usually to the scapholunate ligament.

RESULTS

Transient swelling and pain occurring in 8 cases subsided with analgesics in 3 days. Any problem involving wrist functions did not develop in the follow-up period varying from 6 to 29 months, with an average of 17 months (Fig. 2). Neither early nor late complication was encountered during the follow-up period. In 1 case with dorsal wrist ganglion, 3 months after the intervention incomplete recurrence developed, resulting in 5.8% of recurrence rate; therefore, the same procedure was repeated and no other recurrence appeared. The patients' complaints related to the ganglion such as swelling, pain, and restriction of the joint motion resolved after the intervention.

DISCUSSION

Although ganglion cysts are the most common benign tumors of the wrist, presenting as mass formation close to joints or tendinous sheaths, their pathogenesis remains controversial. Many methods have been described for the treatment of ganglions, in which

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FIGURE 1. View of the dorsal wrist ganglion.



FIGURE 2. Appearance of the same wrist 29 months after the sclerotherapy with cautery.

surgical excision seems to be the most-effective one with low recurrence rate. Observation, aspiration, multiple puncture, a resting plaster, cross-fixation of the ganglion with a heavy suture, or closed rupture by external pressure and sclerotherapy are the well-known and most frequently using other treatment modalities.³⁻⁷ Surgical excision is usually considered as an aggressive treatment in patients with substantial pain or persistent numbness interfering with activities of daily life, when the ganglion is resistant to conservative treatment.^{3,4} Major disadvantage of all conservative approaches is high rate of recurrence corresponding to the surgical excision. Five-year follow-up of palmar ganglions has demonstrated that spontaneous regression is possible up to 35% to 40%. Moreover, in some studies significant differences have not been observed in the recurrence rates between excision of a palmar wrist ganglion and aspiration or other conservative approaches. For these reasons, conservative approaches remain attractive for surgeons and patients.² Therefore, all researches relating to the conservative techniques aim to find a new approach to providing lower or at least similar recurrence rate corresponding to the surgery's rate, and offering safe, easy, effective, and inexpensive treatment modality without any complication and morbidity such as an incision scar.

Theoretically, sclerotherapy procedure in a ganglion damages the lining of the ganglion sac and microcysts, and induces severe fibrosis into the cyst, so that this may prevent the retention of mucoid degenerative liquid and reduce the rate of ganglion recurrence.^{3,4} For sclerotherapy of a ganglion, aspiration of mucoid fluid, and then injection of a sclerosing agents into the cyst, such as methylprednisolone acetate, hypertonic saline, phenol, and hyaluronidase, is performed.⁵⁻⁸ When dealing with the results of sclerotherapy, the recurrence and complication rates have been reported better than those of the aspiration techniques only, even if in some series, complication and recurrence were not observed. In a study conducted by Dogo, including 29 patients with ganglion of the wrist, there was only one recurrence after treatment with hypertonic saline as a sclerosant agent.⁷ Ho et al also showed that ultrasound-guided aspiration after hyaluronidase instillation provided a useful alternative to surgery with a high success rate.⁸

Although some successful results have been reported about the experience of ganglion sclerotherapy using different sclerosants, sclerotherapy and the other conservative approaches have now been accepted to have high recurrence rate and to be ineffective in the treatment. Also after the wide experience of the ganglion sclerotherapy, some drawbacks existed about the spreading of the sclerosant agents in the joint. If the sclerosant passes into the joint, severe damage to the joint may result; hence, the wide use of the sclerotherapy declined after the publication of these reports.⁹

Park et al conducted a study including 10 patients to overcome this challenge, providing a controlled sclerotherapy with phenol through a skin incision over the ganglion. Phenol with a fine cotton tip applicator was directly applied to the lining and the base of the ganglion cyst, resulting in cauterization of the inside lining of the ganglion cyst. Successful outcomes were obtained without any recurrence and major complication.³ However, it leaves an incision scar of approximately 10-mm length and skin pigmentation caused by chemical burn after the phenol application.

Present technique provides successful ganglion sclerosis with electrocautery without any skin incision and does not leave any skin scar or pigmentation, but care must be taken to avoid skin burn due to electrocautery. A very low recurrence rate was observed in only one patient (5.8%), leading to a consideration which was an acceptable rate corresponding to the reported rates of the surgical excision in the literature which vary from 0% to 56% in different studies.¹⁰⁻¹³ Recurrence should be related to either multilocular or multiple cyst formation; or ineffective cauterization causing from incomplete burning of the cyst cavity due to the movement of the needle from cavity center to the periphery of the cyst. When dealing with this limited experience, a multicystic ganglion observing on the preoperative ultrasound may be considered not to be suitable for this technique, and recurrence seems likely to be higher in these cases. In some ganglia which are close to the radial nerve, this technique should not be used, as the cauterization may damage the nerve.

Ganglion sclerosis using cautery may be thought to overcome some serious results and related drawbacks of the previously used techniques for sclerotherapy. This procedure damages the lining of the main ganglion and, causes severe fibrosis around the cyst sac, preventing the retention of mucoid degenerative liquid and reducing the rate of the recurrence. It seems that the intervention is capable of producing effective and stable fibrosis into the ganglion without skin incision, skin pigmentation, and any damage to the joint, providing an acceptable recurrence rate when compared with the surgery and other conservative approaches.

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