

## Aspiration Alone, Aspiration Plus Steroid Injection and Aspiration Plus Ethanol Injection for Treatment of Dorsal Wrist Ganglions: A Comparative Study among Three Methods

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### Abstract

**Background:** There are varieties of treatment modalities to treat dorsal wrist ganglion cysts. But none of these has been the standard. So, we designed this study to compare among different treatment modalities. **Objective:** To compare the effects of aspiration alone, aspiration plus methylprednisone injection and aspiration plus ethanol injection into the dorsal wrist ganglions. **Materials and Methods:** This prospective study was performed in Dhaka Medical College Hospital, Dhaka from March 2010 to May 2011. Sixty six patients with dorsal wrist ganglions were treated in three groups — aspiration alone in 24 patients (Group A), aspiration plus methylprednisolone injection into the cyst in 20 patients (Group B) and aspiration plus ethanol injection, then reaspiration of the ethanol from the cyst after 3–5 minutes, in 22 patients (Group C). Elastic compression bandage was applied in all patients and recommended for 3 weeks. Follow-up was done at 1, 3, 6 and 12 months and conclusive assessment was done during final visit. **Results:** The success rate in Group A was seen in 9 patients (37.5%), in Group B in 11 (55%) and in Group C in 14 (63.5%) patients. The most frequent side-effect was pain during ethanol injection which was relieved by reaspiration of cyst. **Conclusion:** Injection of ethanol into the dorsal wrist ganglion was associated with higher success rate compared to aspiration and methylprednisolone injection. Further studies with larger sample size should be performed to assess the effect of ethanol injection in this disease.

**Key words:** Wrist ganglion; Aspiration; Methylprednisolone; Ethanol injection

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### Introduction

Ganglions are the most common tumor-like conditions in the hand and wrist. These usually arise from a pedicle in tendon sheath or joint capsule and are located over scapholunate ligament. About 60–70% ganglion cysts are found on dorsal aspect of the wrist. Ganglions are more prevalent in women, and generally seen from the second decades through fourth decades of life. Patients usually seek medical treatment because of the mass, pain, weakness, or fear of a malignancy.<sup>1,2</sup> Westbrook et al<sup>3</sup> conducted a study on 50 patients with ganglion cysts and found the following reasons for treatment: 36% for cosmetic appearance, 28% for malignancy, 26% for pain, and 8% for abnormal function.

There are varieties of modalities for treatment of ganglion cysts. These are observation, aspiration, intralesional steroid injection, sclerotherapy, arthroscopic resection, or surgical excision, but no one of these has been the standard or best treatment.<sup>4</sup> Aspiration may provide long term relief and has been reported to be effective in 20–30% of the patients.<sup>2</sup> Sclerotherapy involves aspiration of the cyst followed by injection of a sclerosant solution into the cyst cavity.<sup>5</sup> Surgical excision is best reserved for patients with persistent symptomatic ganglions.<sup>2</sup>

At present aspiration is the mainstay of nonoperative management and most studies demonstrate a success

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rate of 30–50%. To improve the results of treatment some authors advocated aspiration combined with steroid injection into the cyst cavity.<sup>6,7</sup> Sclerotherapy as injection of a sclerosant agent into the popliteal cyst has been described but the success rate with this technique has been variable.<sup>8</sup>

Regarding the effect of aspiration or steroid injection for treatment of ganglion cysts there are numerous studies in the literature. We found a number of studies for sclerotherapy in treatment of lesions such as hernias, varicose or cysts. In most of the these studies, percutaneous ethanol injection has been used for treatment of thyroid, renal, or hepatic cysts and researchers concluded that it was a safe, effective and minimally invasive procedure and alternative method for surgery. But no one described the effect of ethanol in wrist ganglions. In a few reports sclerosant solutions including phenol, sodium hypertonic, iodine, morrhuate sodium 5%, and OK-432 have been used for ganglions but with variable results.<sup>9,10</sup>

We decided to conduct this study to compare the effectiveness of the two traditional methods with a newer modality treatment for dorsal wrist ganglions.

**Materials and Methods**

This prospective descriptive study was carried out at Dhaka Medical College Hospital, Dhaka during March 2010 to May 2011. Sixty six patients with dorsal wrist ganglions were included in the study. Diagnosis of ganglion was based on history and clinical examination. In some patients radiography or sonography was done to rule out other lesions.

Patients aged ≥15 years with dorsal wrist ganglions at least 1 cm in size, without history of trauma or previous treatment and having willingness to participate in the follow-up were included in the study. All patients were explained about the lesion and treatment plan and consent was taken.

All study subjects were divided into three groups according to their treatment options.

Group A (n=24): Patients treated in supine position with wrist flexed, aspiration of the cyst

and evacuation of the gelatinous fluid with needle no. 14 or 16 and multiple puncture of the cyst wall.

Group B (n=20): Patients treated by aspiration, then, with the same needle in place, injection of 40 mg methylprednisolone acetate into the cyst.

Group C (n=22): Patients treated with aspiration followed by injection of one cc 76% alcohol (ethanol), then reaspiration and evacuation of the ethanol after 3–5 minutes.

Elastic bandage was applied in all patients and recommended for 3 weeks. Patients were followed-up at one, three, six and twelve months after treatment. Success was defined as disappearance of the cyst at final visit. In case of recurrence, treatment was defined as failure. Statistical data were analyzed using the software GraphPad Prism version 6.01.

**Results**

The mean age of the study subjects was 29.2 ± 9.89 years (15–53 years). There were 51 (77.3%) female and 15 (22.7%) male. The mean duration of cysts before treatment was 6.17 ± 3.5 months (2 to 18 months). The cysts were found in 42 patients on the right wrists and 24 on the left wrists. Table I shows the frequency of sex and side of involvement in three groups. With respect of sex and side of the lesion no significant difference was seen among three groups. Pain was experienced by all patients during ethanol injection and it was relieved after evacuation of ethanol. Results of success and recurrence rate are shown in Table II. No local infection or wrist stiffness was observed.

Table I: Distribution of patients according to sex and side of involvement

Groups	Sex	Frequency	Percentage	Side	Frequency	Percentage
Group A (n=24)	Female	20	83.3	Right	15	62.5
	Male	4	16.7	Left	9	37.5
Group B (n=20)	Female	15	75	Right	12	60
	Male	5	25	Left	8	40
Group C (n=22)	Female	16	72.7	Right	15	8.2
	Male	6	27.3	Left	7	31.8

For gender: Chi-square value 0.8196, p value 0.6638; For side: Chi-square value 0.3241, p value 0.8504

Table II: Success and recurrence rates in patients

Groups	Success Number (%)	Recurrence Number (%)
Group A (n=24)	9 (37.5%)	15 (62.5%)
Group B (n=20)	11 (55%)	9 (45%)
Group C (n=22)	14 (63.6%)	8 (36.4%)

## Discussion

Ganglions have been treated by varieties of nonoperative or operative methods. Because of benign course and spontaneous resolution in up to 50% of these patients, nonsurgical modes of treatment including simple observation, finger pressure, aspiration, injection of steroid, hyaluronidase, or sclerosing solution are usually advised initially for this lesion.<sup>2,11</sup> Among nonoperative techniques, aspiration with or without intralesional steroid injection has been widely used. Recurrence is the most common complication of treatment of ganglions. Paramhans et al<sup>12</sup> compared two methods of aspiration followed by triamcinolone injection and surgical excision for treatment of wrist ganglions. They found a recurrence rate of 8.4% and 21.5% respectively and concluded that intracystic steroid injection into the cyst was a safe mode of treatment. Human et al<sup>13</sup> reported that the recurrence rate was 43% in aspiration and steroid injection and 24% in surgical excision for treatment of dorsal wrist ganglions. On the other hand, Limpaphayom et al<sup>14</sup> in their study on 24 patients with wrist ganglions found that the success rate by aspiration combined with methylprednisolone acetate injection and wrist splint was 38.4%, and by excision was 81.8%. Hajer et al<sup>15</sup> conducted a study on 38 wrist ganglions and found that aspiration was a better choice than hyaluronidase injection or surgery.

Centeno et al<sup>5</sup> found that sclerotherapy was effective in popliteal cysts. Ho et al<sup>16</sup> concluded that sclerotherapy may be an alternative to surgery in the treatment of ganglions. Linetsky<sup>17</sup> described that sclerotherapy may be applicable to treat many symptomatic cysts of the musculoskeletal system. Some authors postulated that the injected sclerosant solutions may pass into the joint and result in joint inflammatory damage.<sup>18</sup> In our study we applied ethanol within a short time into the cyst and then evacuated it after 3–5 minutes. We thought our procedure was effective to resolve the side effects of sclerotherapy, as reported previously, and we did not find any sign of joint irritation and stiffness or limitation in motion of the wrist with this technique.

A sensation of temporary burning pain was experienced by the patients during injection which resolved after reaspiration of ethanol from the cyst.

The sclerosing action of the alcohol may be due to the fact that when ethanol remains in contact for a few minutes with inner wall of the ganglion, the epithelial cells become fixed and nonviable. This would help to make fibrosis of the cyst capsule and disappearance of ganglion.<sup>19</sup> To the best of our knowledge, it is the first study to assess the effect of ethanol injection into the ganglions of the wrist. In this study, aspiration followed by ethanol injection was associated with more success rate compared to aspiration alone or aspiration plus methylprednisolone. However, more studies with larger sample size should be conducted to assess the effect of ethanol sclerotherapy in the treatment of dorsal wrist ganglions.

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