

Original Research Article

Wrist ganglia – treatment by aspiration and methylprednisolone injection into the cavity with IV cannula needle- our experience in a rural teaching institution.Sharma, Man Mohan¹, Batra, Kasturi Mohan², Kakria, Hira Lal³, Chandra, Rajesh⁴¹Associate Professor, ²Assistant Professor, ³Professor & Head, ⁴Professor, Dept. of Orthopaedics, SGT Medical College, Hospital & Research Institute, Budhera, Gurgaon-122505, Haryana, India***Corresponding author**

Dr. Man Mohan Sharma

Email: manmohan500@gmail.com

Abstract: Ganglion is one of the commonly seen lesions in minor surgical practice. Treatment of wrist ganglia includes simple reassurance, watchful waiting, non-operative aspiration, injection, surgical excision and even sometimes advanced endoscopic excision. Recurrence is the common problem, irrespective of the treatment modality. The aim of the study was to assess the effectiveness of cyst aspiration and methyl prednisolone acetate injection using two IV cannula rather than using sharp pointed needle, a relatively new technique in the treatment of wrist ganglia. The method in this study evaluates the results of sixteen wrist ganglia patients presenting to our rural teaching institute who were treated by the two IV cannula techniques used for aspiration and methyl prednisolone injection into the cavity. The patient's age, sex, site of the cyst, any previous treatment taken, adjacency to the artery and the nerves and recurrence were recorded. The Results in The study involved 16 patients that received aspiration treatment for wrist ganglion cysts between January 2012 and August 2015. There were 10 (62.5%) female and 6 (37.5%) male patients with wrist ganglia with ages varying from 15 to 42 years and a median age of 20.64±5.4 years. We didn't detect any complication associated to methyl prednisolone injection. Recurrence was observed in three (18.75%) patients. In Conclusion the Inspired by the lower recurrence rate as compared to other aspiration therapy with sharp pointed needle and at the same time because it is simple, noninvasive, less time consuming, safe and cost effective method, we recommend this method as a better option before any surgical intervention.

Keywords: Aspiration, Corticosteroid injection, Wrist ganglia

INTRODUCTION

Although ganglion is one of the commonest but troublesome lesions met in minor surgical practice. There is little agreement as regarding their etiology and treatment. These are the benign soft tissue tumors which usually occurs around the wrist, consisting of mucin-filled cyst connected to a tendon, tendon sheath, or joint capsule [1]. They may also present as intra-osseous or intra tendinous [2]. Most ganglions are seen in females in their second, third or fourth decades of life [3].

Usually wrist ganglia cysts develop as a result of fluid leak out when placed within the surrounding sheath of the wrist tendons. It becomes a cystic structure that contains similar fluid with the normal fluid found within a joint or a tendon sheath. Most commonly wrist ganglia are seen in the dorsal aspect of the hand and less often in the volar aspect of the hand [4].

Spontaneous resolution is commonly seen with 50% of untreated patients when assessed at six years [5]. Average size ranges from 1 to 3 cm diameter but there are certain case reports which state larger sizes of ganglia. The patients usually remain asymptomatic however sometimes the pain may be present when the cyst applies pressure on neighboring tissues, especially on a nerve. Sometimes volarganglia may cause paresthesia arising from compression of ulnar or radial nerves or their branches. The lump is generally smooth, fairly tense and fixed. Sometimes patients present for consultation because they are worried about how the ganglion looks or worried about malignancy [5]. The diagnosis can be made clearly by history and physical examination but the treatment options have many options and each treatment option yields different success results [6].

The various treatment modalities of wrist ganglia varies from simple assurance to the patient without any intervention to simple aspiration of cyst, aspiration and injection with or without hyaluronidase and/or methylprednisolone, transfixation with a silk suture, rupturing cyst wall manually or puncturing by a percutaneous needle or by percutaneously incising with a tenotomy and radically excising the cyst either by open or endoscopic methods. The best results in terms of recurrence have been reported with surgical excision.

Single or double sharp pointed needles are used for aspiration of the ganglia cyst generally. Cyst fluid firstly is aspirated out which is followed by injection of steroid into cyst cavity. The recurrence rate of this technique is relatively high as between 59%-68% for dorsal ganglion (even with recurrence rate of 88% for volar ganglion) [7, 8].

In this study we assessed the results and effectiveness of cyst aspiration and methyl prednisolone acetate injection with double IV cannula rather than sharp pointed needle, as a relatively new technique in the treatment of wrist ganglia.

MATERIALS AND METHODS

A prospective study was conducted on patients presenting to the orthopedic out-patient department at the institute hospital for wrist ganglions (dorsal and volar) from January 2012 to August 2015. Full medical and surgical history was taken before starting the procedure along with proper hand examination. Patients were given detailed explanation of the adopted technique and proper consent was taken. This study comprised 16 patients with ganglia who were followed up for a minimum period of 9 months (range 9-24 months).

The aspiration procedure was performed in all cases by a single surgeon (MMS) and all the patients were followed up for a minimum period of 9 months.

Patients having infected ganglion, ganglion of other sites, ganglion less than 10 mm in size, previous treatment taken in any form, ganglion associated with arthritic disorder and patients with diabetes were excluded from the study.

Materials

One IV Cannulas of 20 Gauge (G), One IV Cannulas of 22 Gauge (G), 10 cc and 2 cc disposable syringes, Inj. Methylprednisolone (Inj. Depo-Medrol).

Aspiration technique

The procedure was done on out-patient day care basis under all aseptic conditions. The cystic cavity was picked by one of the IV cannula with size of 20 Gat the distal part for evacuation of the cavity. At the proximal part of the cyst the other 22 G IV cannula tip was pricked to inject methyl prednisolone into the cavity. The metal parts of two IV cannulas were withdrawn and only plastic parts stayed in the cystic cavity. Meanwhile evacuating the cavity by using 10 cc disposable syringes through IV cannula from the distal part, methyl prednisolone (Depo-Medrol®, 40 mg methyl prednisolone) was injected by using 2 cc disposable syringes via the IV cannula at the proximal part (Fig. 1). This process was maintained until all cystic fluid was aspirated out and white colored methyl prednisolone was seen coming out in the IV cannula that placed distally.

RESULTS

Patients mean follow up time was 1.7±0.5 years. There were 10 (62.5%) female and 6 (37.5%) male patients with wrist ganglia with ages varying from 15 to 42 years and a median age of 20.64±5.4 years. The dominant hand (right hand was dominant hand in all studied cases) was affected in 12 (75%) cases while in 4 (25%) non-dominant (left) hand was affected. All the cysts were smaller from 3.1 centimeter (cm) diameter. There was no complication related to methyl prednisolone acetate injection. Recurrences were noted in 3 (18.75%) patients (Table-I). The relapsed ganglion cysts were treated by surgical excision.

Table-1: Demographic and clinical data

Male / Female n (%)	6 (37.5%)/10(62.5%)
Age Mean±SD.	20.64±5.4 years
Mean follow-up time, mean±SD.	1.7±0.5 years
Side of wrist Dominant (Right)/Non-dominant (left) (n) (%)	12(75%)/4(25%)
Recurrence n(%)	3 (18.75%)



Fig.1: Pricked cystic cavity by two IV cannulas. Evacuation done by the distally placed IV cannula & methyl prednisolone injected by the proximal IV cannula.

DISCUSSION

There are many treatment modalities available for treating it, which in itself indicates that no single effective treatment modality is available without complications. So regarding the treatment of ganglion, a large number of methods have been reported in the literature, bursting of the ganglion manually thumping with a heavy book (traditionally “the Bible”) being the most ancient one [9]. It was noted that ganglia taking no treatment occasionally give history of spontaneous disappearance [10]. The methods in use include simply reassurance to the patient, simple aspiration, aspirations and injection of corticosteroid with or without hyaluronidase[10], injection of sclerosing agent [11], manual rupture, cyst wall puncture with a needle, trans-fixation with silk suture [12,13], radical surgical excision[9], arthroscopic excision[14], x-ray therapy[15]. Varying rates of success of these methods have been reported which shows considerable variations.

In the present study, favorable results were achieved by us with aspiration of cyst and injection of methyl prednisolone acetate treatment with not using sharp pointed but IV cannula needle in patients with wrist ganglia. In follow-up period of this relatively new aspiration technique with plastic IV cannula needle, there was observed no complication, low recurrence rate and reduced need for surgical intervention.

Patients who were treated with aspiration and injection of various medications showed cure rates of 57–64% while those treated with surgical excision showed good cure rates of 84–94% [10, 16]. Injection therapy reported the advantages in the form of relatively low recurrence rate (18%), no scar, simple out-patient

treatment which can readily be given by junior doctor, no risk to tendons or neighboring structures, joints, no worsening of the appearance even if injection fails to cure[16].

The recurrence rate of ganglions is quite high after surgery. In most reviews, the recurrence rate was around 40% [17]. Faithfull *et al.*; showed that in 28% of patients who had surgical intervention were unsatisfied due to persistent pain, limitation of function [18].

In a series of 347 patients Zachariae *et al.*; reported a recurrence rate of 34% who were operated upon even in a well established hand clinic [19]. A recurrence rate of 15% to 20% was reported by De Rosary *et al.*; [17] and Posch [20] in their series of surgically treated patients. Gundes *et al.*; found

The mean complication rate was 56% for volar ganglia and 12.5% for dorsal ganglia. They stated palmar cutaneous branch of the median nerve in two patients and the palmar superficial branch of the radial artery laceration in two patients [21]. McEvedy reported a 40% failure rate following ‘simple’ excision [16]. Other modes of therapy such as crushing, aspiration and injection also reported comparable recurrence rates [17]. In another study, injury to the median palmar cutaneous nerve in 10%, injury to the radial artery in 5% and wrist stiffness in 12.5% of the patients are declared [22]. In a similar study parallel results were obtained [23]. Gumus *et al.*; showed that the procedure of sclerotherapy damages the lining of the main ganglion and causes severe fibrosis around the cyst [24]. Furthermore thumb and index finger ischemia after aspiration and sclerosing agent injection in volar wrist ganglion has been reported. Palmar circulation did

not recover and the digits became gangrenous with clear demarcation. The patients left thumb the distal phalanx had to be amputated [25].

In the previous studies, recurrence rates for simple aspiration and aspiration plus steroid injection therapies are 59-68% and 40% respectively [7,8]. There was recurrence rate of 18.75% in the present study for the new technique of cyst aspiration and steroid injection with plastic IV cannula needle. This is comparable to another study [26]. This encouraging recurrence rate of this method is lesser than the one of other method in which sharp pointed needle is used. This low recurrence rate in our study is also comparable to with the recurrence rates of arthroscopic and surgical interventions.

Recently orthopedic surgeons are doing arthroscopic resections. They reported that there was no impairment of wrist motion, function and neurovascular complication [27]. Arthroscopic resection in recent studies has been shown to be an effective and safe method with minimum postoperative morbidity and better cosmetic results for dorsal ganglia. But they also stress that in case of volar ganglia open operation should be used as treatment of choice because arthroscopic resection is difficult technically [28]. Direct entrance is achieved by the use of IV cannulas into the cystic cavity. After spotting the cyst fluid coming by the IV cannula, sharp-pointed metal needle part is withdrawn and the remained plastic part is less harmful for artery and nerves close the cyst. Therefore fewer complications related to neighboring structures are met. Total aspiration of the fluid from the cyst until the white colored methyl prednisolone acetate was seen in the syringe and usage of cortisone are the reasons of our low recurrence rate.

CONCLUSION

In the present study we assessed the effectiveness of a relatively new method of aspiration and injection of methyl prednisolone acetate into the cyst cavity by using IV cannula needle instead of sharp pointed needle. Lower recurrence rate was observed in comparison to other aspiration therapy with sharp pointed needle. Inspired by the results we choose to use IV cannula needle for the aspiration from the cyst and injection of steroid in treatment of wrist ganglia before any surgical intervention. Because it is simple, noninvasive, less time consuming, safe and cost effective method.

REFERENCES:

1. Nahara ME, Bucchieri JS; Ganglion cysts and other tumour related conditions of the hand and wrist, *Hand Clin.* 2004; 20(3):249-60.
2. Thournburg LE; Ganglions of hand and wrist, *J AM Acad Orthop Surg.* 1999; 7(4):231-8.

3. Minotti P, Taras JS; Ganglion cysts of the wrist. *J American society for surgery of Hand*, 2002; 2:102-7.
4. Nelson CL, Sawmiller S, Phalen GS; Ganglions of the wrist and hand. *J Bone Joint Surg.* 1972; 54(7):1459-1464.
5. Burke FD, Melikyan EY, Bradley MJ, Dias JJ; Primary care referral protocol for wrist ganglia, *post grad Med J*, 2003; 79:329-331.
6. Noppachrt L, Vajara W; Randomized controlled trial between surgery and aspiration combined with methylprednisolone acetate injection plus wrist immobilization in the treatment of dorsal carpal ganglion. *J M Assoc Thai*, 2004; 87(12):1513.
7. Nield DV, Evans DM; Aspiration of ganglia. *J Hand Surg Br.* 1986; 11(2):264.
8. Richman JA, Gelberman RH, Engber WD, Salamon PB, Bean DJ; Ganglions of the wrist and digits. Results of treatment by aspiration and cyst wall puncture. *J Hand Surg. [Am]* 1987; 12(6):1041-1043.
9. Nelson CL, Sawmiller S, Phalen GS; Ganglion of the wrist and hand. *J Bone Joint Surg Am* 1972; 54:1459-64.
10. Clay NR, Clement DA; The treatment of wrist ganglia by radical excision. *J Hand Surg* 1988; 13-B: 187-191.
11. Paul AS, Sochart DH; Improving the results of ganglion aspiration by the use of hyaluronidase. *J Hand Surg* 1997; 22-B: 219-221.
12. Shapiro PS, Seitz WH; Non neoplastic tumours of the hand and upper extremity. *Hand Clinics* 1995; 11:133-60.
13. Angelides AC; Ganglios of the hand and wrist. In: Green DP, *Operative hand surgery*. 2ndEd. New York: Chirchill Livingstone, 1998:2281-99.
14. Sanders WE; The occult dorsal carpal ganglion. *J Hand Surg (Br)* 1985; 10:257-60.
15. Noppachrt L, Vajara W; Randomized controlled trial between surgery and aspiration combined with methylprednisolone acetate injection plus wrist immobilization in the treatment of dorsal carpal ganglion. *J M Assoc Thai*, 2004; 87(12):1513.
16. McEvedy BV; The simple ganglion: a review of the modes of treatment and an explanation of the frequent failures of surgery. *Lancet* 1954; 266: 135-136.
17. De Orsay RH, Mecray PM, Ferguson LK; Pathology and treatment of ganglion. *Am J Surg* 1937; 36:313-9.
18. Faithfull DK, Seeto BG; The simple wrist ganglion more than a minor surgical procedure? *Hand Surg.* 2000; 5(2):139-143.

19. Zachariae L, Vibe-Hansen H. Ganglia; Recurrence rate elucidated by a follow up of 347 operated cases. *Acta Chir Scand*, 1973; 139: 625-628.
20. Posch JL; Tumours of the hand. *J Bone Joint Surg* 1956; 38-A: 3: 517-540.
21. Gundes H, Cirpici Y, Sarlak A, Muezzinoglu S; Prognosis of wrist ganglion operations. *Acta Orthop Belg*. 2000;66(4):363-367.
22. Aydin A, Kabakas F, Erer M, Ozkan T, Tuncer S; Surgical treatment of volar wrist ganglia. *Acta Orthop Traumatol Turc*. 2003; 37(4):309-312.
23. Edwards SG, Johansen JA; Prospective outcomes and associations of wrist ganglion cysts resected arthroscopically. *J Hand Surg*. 2009; 34(3):395-400.
24. Gumus N; A new sclerotherapy technique for the wrist ganglion: transcutaneous electrocauterization. *Ann Plast Surg*. 2009; 63(1):42-44.
25. Jalul M, Humphrey AR; Radial artery injury caused by a sclerosant injected into a palmar wrist ganglion. *J Hand Surg*. 2009; 34(5):698-699.
26. Korkmaz M, Ozturk H, Senarslan DA, Erdogan Y; Aspiration and methylprednisolone injection to the cavity with IV cannula needle in the treatment of volar wrist ganglia: New technique. *Pakistan journal of medical sciences*, 2013; 29(1): 103.
27. Ho PC, Law BK, Hung LK; Arthroscopic volar wrist ganglionectomy. *Chir Main*. 2006; 25(S1):221-230.
28. Rocchi L, Canal A, Pelaez J, Fanfani F, Catalano F; Results and complications in dorsal and volar wrist Ganglia arthroscopic resection. *Hand Surg*. 2006; 11(1-2):21-26.