A new method in the management of wrist ganglion (Silk thread passed through the ganglion); in comparison with other traditional methods

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Abstract

Objectives: To compare a new method of ganglion management, efficacy of resolution, frequency of complications and recurrence of managing dorsal wrist ganglions with aspiration followed by intra-cystic injection of Methylprednisolone and surgical excision and our new procedure Silk thread passed through the ganglion.

Study Design : A prospective descriptive study.

Place and Duration of Study: This is a prospective study conducted at the Department of Surgery Erbil Teaching Hospital-Erbil, Kurdistan Region of Iraq from April 2005 to June 2014.

Patients and Methods: A total of 785 patients were included in this study,120 cases were excluded from the study because they were lost to follow-up. All patients were thoroughly examined to exclude the other causes of wrist swelling. The patients were divided into three groups A, B &C according to their choice of treatment. Group A were treated by surgical excision, Group B were treated by aspiration followed by steroid injection and group C by Silk thread passed through the ganglion. Baseline Data were recorded preoperatively and postoperative data were obtained at the intervals of 2 weeks, 6 weeks, 3 months, and 6 months. At the end of 6 months the data form was completed and results analyzed.

Results: Patient's satisfaction was higher in Group C after Silk thread passed through the ganglion followed by surgical excision even if the ganglions recurred. The recurrence rate was 4 % in Silk thread passed and 24% surgical excision group and 43% in aspiration with steroid injection in group B.

Conclusion: In this study Silk thread passed through the ganglion had better results compared to surgical excision and to aspiration and injection of Methylprednisolone.

Key words: Dorsal, Wrist Ganglion, Silk thread passed through the ganglion, surgical excision, aspiration, Methylprednisolone injection.

Introduction

Ganglia are the most common benign soft tissue tumors of the hand. They represent 50% to 70% of all soft tissue tumors of the hand, and in some series, the percentage is even higher (1).

These soft murine-filled cysts are usually attached to the adjacent underlying joint capsule or tendon sheath (2).

The cyst expands in size and the fluid cannot flow freely back into the synovial cavity. Dorsal wrist represents 70% of all ganglion and volar writ ganglion up to 20 %.(3)

Dorsal ganglion cyst originates from the scapholunate joint, often with direct attachment to the scapholunate interosseous ligament (ISLIL) (4).

The ganglions usually appear spontaneously without any particular cause; pain associated is dull aching pain and severity is not related to the size of ganglions. The diagnosis of the ordinary wrist ganglion should rarely be in doubt when the mass is in typical site and has the usual size, shape and consistency, though other serious entities may simulate wrist ganglion (5).

Different treatment modalities for wrist ganglions have been described in literature ranging from observation reassurance, digital pressure rupture with mallet, aspiration with or without different agents, subcutaneous tenetomy dissection and cross fixation with heavy sutures to orthoscopic resection and surgical excision (6).

Surgical excision of wrist ganglia has been reported to have the best success rates in terms of recurrence; for example Angelides and Wallace in1976 reported a 99% success rate (7). However, the treatment is relatively expensive and can only be offered reliably in a specialist hand center. The complications associated with the treatment by surgical excision are recurrence, infection, wound healing, neuromas, joint stiffness and decreased grip strength. Aspiration and injection of steroid has higher recurrence rate, but other complications are much lower than that of surgical excision (8).

This prospective study was conducted to find out whether aspiration and injection of ganglion with Methylprednisolone was effective as surgical excision and Silk thread passed in a cross manner.

Patients and Methods

Seven hundred and eighty five patients were included from the outpatient department of surgery Erbil Teaching Hospital, Erbil, Kurdistan Region of Iraq from April 2005 to June 2014. All patients were thoroughly examined by the attending physician to exclude the other causes of dorsal wrist swelling. All 785 patients were informed about the three treatment modalities and they were divided into three groups A, B and C according to their options. Group A comprised 163 patients treated by surgical excision and 155 formed Group B and were dealt with by aspiration and Methylprednisolone: 20-40 mg injections and 464 formed Group C dealt with Silk thread passed in a cross manner (Figure 1).

There was no sex or age limit. Those patients who were operated on or aspirated in the past were excluded from this study. Blood test including blood CP, ESR, RA factor and X-Rays wrist joint AP and Lateral view were performed in all cases.

In Group A surgical excision was performed under General Anaesthesia. Pneumatic tourniquet was applied in most cases. The incision used respected the skin creases and was long enough to give satisfactory exposure of the skin lesion. Attempt was made to exercise a generous capsular margin about its base and joint capsule was left open and cauterized. One shot of I.V 3rd generation Cephalosporin was given at time of induction followed by 3 doses of oral antibiotics postoperatively. Prior to wound closure tourniquet was released, hemostasis secured and the wound was closed with prolene. Patients were called for follow up on the 2nd week, 6th week, and 3,6 month; findings were documented. The patients in Group B and C were in OPD in supine position with wrist flexed on a towel. The area was prepared and draped.

Syringe (10ml) with 18 gauge needle was inserted in the center of the ganglion; gelatinous content was aspirated and demonstrated to the patient. Syringe was removed leaving needle in place. 1.5ml local anesthetic injection Xylocaine and 40 mg of methylprednisolone was injected. In group C, no.1 silk on cutting needle was inserted in the ganglion horizontally from side to side; a ring of silk created gelatinous content was evacuated by gentle digital pressure on the ganglion xylocaine lubricant was applied on the silk ring and the patient advised to rotate the silk ring and apply gentle digital pressure on the ganglion 3 times\day for 7 days .

Patients were asked to follow up at the OPD and 2 weeks, 6 weeks, and 6 months findings were documented and results were analyzed.

Technique of new in cross manner:
Under aseptic measures, a silk No.1 on a curved needle passed through the ganglion (Figure 1) and aspiration of the jelly like transparent material was performed by applying pressure on the ganglion with the thumb jelly material comes out at both sides of the needle puncture and silk fixed as a Ring. After complete evacuation a crepe bandaging was applied over the wrist (Figures 1, 2, 3, 4) On the second day after procedure the first dressing was removed and patients start to rotate the silk in both directions with applying local digital pressure and antibiotic ointment. Silk was removed on the 12th day. In this procedure no anesthesia was used during the procedure all patients were followed up every month for an initial 3 months and at 6 months interval for one year.

Figure 1: dorsal wrist ganglion classical site

Figure 2: Insertion of needle through the ganglion after application of topical anesthesia under aseptic condition

Figure 3: Farther advancement in the process of needle insertion creating a ring in the silk

Figure 4: The procedure has been completed

Results

Table 1: Resolution of pain at different intervals

Intervals	Group A n=123	Group B n=115	Group C n=427	P value
2nd week	(62) 50 %	(63) 55 %	(342) 80%	P<00.1
6th week	(76) 62 %	(77) 67 %	(362) 85%	P<00.1
3rd month	(85) 69 %	(83) 73 %	(375) 88%	P<00.1
6th month	(87) 71 %	(91) 79 %	(405) 95%	P<00.1
12 months	(102) 83 %	(100) 87 %	(418) 98%	P<00.1

Table 2: Wrist stiffness in both groups at different intervals

	Group A n=123	Group B n=115	Group c n=427	P value
3rd month	(45) 37 %	(33) 33 %	30 07%	P<00.1
6th month	(33) 27 %	(46) 40 %	21 05%	P<00.1
1 Year	(16) 13 %	(61) 53 %	8 02%	P<00.1

During the study period from April 2005 to June 2014,785 patients with dorsal wrist ganglion were included in this study 532 patients were female and 253 were male. Patient's age ranged from 18-38 years, mean age was 25 years. In this study 120 patients were lost during follow up leaving 665 patients.

One hundred and twenty three patients in group A , 115 patients in group B and 427 in group C were available for follow up at 6 month. Complete resolution of pain in group A, B & group C at different follow up intervals are shown in Table 1.

Stiffness of wrist was observed in all 3 groups which improved at different intervals in group A. In group B stiffness increased in late follow up probably because of more recurrence and completely improved in the first month shown in Table 2. At the end of six month recurrence rate was 24% (29 patients) in group A as compared to group B where 43 % (49 patients) presented with recurrence while recurrence rate in group C was 4%(17) . There were four cases of superficial infection in group A which responded to antibiotics and dressing. There was one case of change in skin color in group B, and 8 cases with superficial infection in group C.

Discussion

A ganglion in a musculoskeletal system is spherical accumulation of fluid produced from an adjacent joint capsule or tendon sheath. It's not a neoplasm because it is a cellular, and it's not a cyst because the collection of clear viscous fluid is contained in the cavity, which is not lined by epithelium(1). Dorsal wrist ganglion is the most common non-tumorous swelling of the wrist (2, 5, 6).

This prospective clinical trial compared the treatment of ganglion by either aspiration and steroid injection or surgical excision and Silk thread passed through the ganglion. Different treatment methods for wrist ganglion are reassurance, rupture, and aspiration with or without different agents, surgical excision and arthroscopic resection (7, 9). Explanation of the benign nature of ganglion and natural history that it may fluctuate in size over time can relieve the fear of malignancy (10). Results of different treatment methods reported literature are variable. There is general impression that Silk thread passed in through the ganglion offers excellent result comparing with open excision and aspiration with or without different agents, probably on the basis of Angelides and Wallace's (2006) study reporting 1 % recurrence rating (11) Clay and Clement (2008) have also shown low recurrence rate of 3 % (12), while other studies reported higher recurrence rate (7, 13).

Regarding open excision, McEvedy (1999) reported 40 % recurrence rate (14), Jacobs and Govaers (2006) reported 28 % and Dias et al (2007) 39 % recurrence rate (3, 15). We had a recurrence rate of 24 % in our study. The variability in results to some extent seems to be surgeons dependent. Recurrence rate after aspiration and injection of different agents are higher and least with Silk thread passed through the ganglion. Gerhard et al reported 85 % recurrence rate after hyaluronidase injection aspiration. McEvedy (1999) reported 80 % recurrence rate after sclerosant (14). Derbyshire (1966) reported 60-85% recurrence rate after aspiration and injection of steroid

(16). We have low recurrence of 43 % after aspiration and injection of methylprednisolone compared to other studies. Arthroscopic resection of ganglion of wrist originally described by Osterman and Raphael (1995) is technically difficult and demanding (17). Different series of arthroscopic resection wrist ganglion have shown promising results. We did not have any significant complication.

Reviewing the literature and with our results it seems Silk thread passed through the ganglion has better results in comparison with other methods of treatment and is an acceptable option in our setup.

Conclusion

In this study we have concluded that recurrence rate, postoperative joint stiffness and pain resolution was least in a new method technique comparing with other classical surgical and non-surgical groups. Further studies with more patients are needed to elucidate the clinical impact of Silk thread passed in cross manner in the management of wrist ganglion.

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