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Management of ganglion by double loop suture technique

Pavneesh Kumar[1], Chetan Giroti[2], Aviral Dhobal[3], Anoop Raj Singh[4]

[1,2,3]Assistant Professor, Department of Orthopaedics, Government Doon Medical College, Dehradun, Uttarakhand, [4]Associate Professor, Department of Orthopaedics, Shaikh-Ul-Hind Maulana Mahmood Hasan Medical College, Saharanpur, Uttar Pradesh, India

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ABSTRACT

Background: Ganglion is a common cystic swelling around wrist presenting in outdoor department, clinical examination is sufficient for making diagnosis of simple cyst, cosmesis and pain are main presenting complain. Treatment includes aspiration with or without injections but has high recurrence rate, surgical excision has low recurrence rate but being invasive there are numerous complications and should be warrant depending on patient complain. Minimal invasive loop suture technique has low recurrence and minimal complication. **Aims and Objectives:** The aim of the study was to manage the ganglion by double loop suture technique. **Materials and Methods:** One hundred and four patients with volar and dorsal wrist ganglion fulfilling inclusion and exclusion criteria received treatment by minimal invasive loop suture technique, 6-month follow-up was done for reviewing any recurrence of cyst. **Results:** From these 104 patients, 76 were females and 28 were males, with a median age of 22 years. Ninety-four (90.4%) patients presented with dorsal wrist ganglion and 10 (9.6%) patients had volar wrist ganglion. The size of simple ganglia varied from 10 mm to 32 mm Cosmesis was the most common presenting complaint in 84 patients (80.7%) followed by pain (19.3%). Recurrence of swelling was observed in four patients (3.8%). Complications were encountered in two cases in the form of superficial infection at the site of entry point of threads. **Conclusion:** Radical surgical excision is gold standard but warranted by patient complains as there are numerous complications. Double loop suture technique is an ambulatory surgical procedure and has very promising results with low recurrence rate and complications.

Key words: Double loop; Ganglion; Aspiration; Recurrence; Minimal invasive

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INTRODUCTION

One of the most frequent benign soft-tissue tumors of the wrist and hand that presents to the outside department is the ganglion.[1] Most frequently, it is seen close to the joint capsule or the fibrous tendon sheath. The patient's primary complaints are swelling, sporadic pain, and cosmetic concerns. They may be the results of synovial herniation or the coalescence of tiny degenerative cysts that originate from the tendon sheath, joint capsule, or bursae.[2] Their pathophysiology is yet unknown. The mainstay of treatment is surgical excision or aspiration. With bracelet pressure therapy, 53% of ganglions dissolve on their own.[3] The gold standard for treating symptomatic ganglions is still surgical removal of ganglia.[4] However, any intrusive procedure must consistently guarantee that the benefits outweigh the presenting complaints. Less invasive procedures include cyst aspiration with a needle.[5] Hydrocortisone, triamcinolone, and hyaluronidase[6] injections have all been utilized as minimally invasive methods, although they all have a high recurrence rate.

Treatment of ganglion cysts still presents a challenge in terms of minimally invasive techniques with low recurrence and complications. Gang and Maktilouf,[3] achieved a 95% cure rate using a minimally invasive loop suture approach using 2–0 silk suture. We put a double loop of 1–0 silk suture through the ganglion cyst.

Address for Correspondence:
Dr. Anoop Raj Singh, Associate Professor, Department of Orthopaedics, Shaikh-Ul-Hind Maulana Mahmood Hasan Medical College, Saharanpur, Uttar Pradesh, India. **Mobile:** +91-8948736796. **E-mail:** hunkanoop@gmail.com

In this study, ambulatory surgery using the minimally invasive double loop suture technique was used.

Aims and objectives

To manage the ganglion by double loop suture technique.

MATERIALS AND METHODS

Between January 2019 and November 2019, patients who complained of a cystic swelling over their wrist at our institute's outdoor orthopedics department were the subject of a prospective study. The study was pre-approved by the Institutional Ethics Committee for the final permission. Clinical examination was used to make the diagnosis; sonography was recommended to rule out other swellings in cysts with solid consistency and in the proximity of the radial artery. One hundred and four patients with dorsal or volar ganglion cysts over the wrist that are larger than 5 mm and have never had any previous intervention are included in the study. Patients with ganglion cysts other than those in the wrist that are <5 mm in size, close to the radial artery, infectious, linked to an arthritic condition, and those who have already had therapy in any manner were excluded from the study. In surgical method, after performing a sensitivity test, the cystic area was injected with 2% xylocaine while the part was coated with 5% betadine and covered with a cut sheet. Cyst aspiration was carried out using a 16G needle (Figure 1a). and the appearance of jelly-like fluid from a cyst corroborated this (Figure 1b). Then, using the same needle to pierce out from the opposite location of the cyst, a silk no. 1 suture thread was threaded through the cyst, and the right position was verified by the presence of a glistening look. A loose knot was tied in the form of a loop and left behind (Figure 2a). Similarly, to prevent any skin puckering, a second thread was passed perpendicular to the first (Figure 2b). A compression bandage was placed on top of the aseptic dressing. Patient was given instructions to gently massage the dressing over the cyst and was then given 3 days of analgesics and antibiotics to take home. No restriction of movement was advised.

First follow-up was after 3 days for dressing change and then patient was asked for second follow-up after 3 weeks for suture removal (Figure 3), clinical examination done in and subsequent follow-ups at 3 and 6 month for any recurrence of swelling. In individuals who experienced a cyst recurrence within 6 months, recurrence was considered.

RESULTS

Seventy-six of the 104 wrist ganglion cases involved females, whereas 28 involved males have a median age of 22 years with ages ranging from 10 to 46. Ninety-four (90.4%) of the patients in these cases had dorsal wrist ganglions and

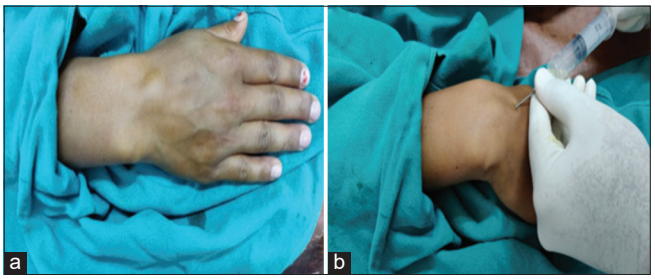

Figure 1: (a and b) Dorsal wrist ganglion cyst and surgical technique of aspiration of ganglion cyst

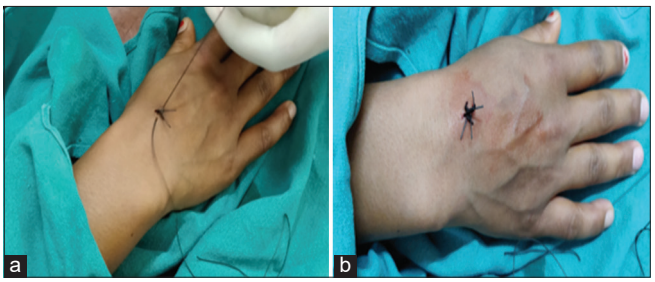

Figure 2: (a and b) Surgical technique of double loop suture for ganglion cyst

10 (9.6%) had volar wrist ganglions. Simple ganglia ranged in size from 10 mm to 32 mm. Two measurements were made perpendicular to one another for each ganglion using a Vernier caliper with a minimum calibration of 1 mm, and the mean of the two readings was calculated. Regardless of sex, ganglion position, or dominance, cosmesis was the most frequent presenting complaint in 84 patients (80.7%), followed by pain in 20 individuals (19.3%).

One hundred patients had their pain and cosmesis fully eliminated, yielding a success rate of 96.2%. Within a 6-month follow-up period, four individuals (3.8%) experienced a recurrence of edema. Three dorsal wrist ganglions and one volar surface ganglion were present in these patients. At the 10-day follow-up, two instances experienced complications in the form of a superficial infection at the thread entry location, which was treated with antibiotics.

Even in patients who had infections, the cosmetic outcomes were always excellent and left no scars. All surgeries were carried out by a single surgeon and patients were all monitored for at least 6 months after the treatment.

DISCUSSION

Ganglion cysts are a common benign cystic swelling that is seen in hospitals' outpatient clinics. A clinical evaluation that includes dimensions ranging from 1 to 3 cm^8 and consistency that is firm to rubbery is adequate to make the diagnosis. When a ganglion has a solid consistency, sonography is used

Figure 3: (a-c) Second follow-up after 3 weeks for removal of suture

to distinguish it from lesions such synovial proliferation, giant cell tumors of the tendon sheath, and collapsed ganglions. The most frequent justification for hospital visits is cosmetic worry about the cysts, which just calls for reassurance. 53% of wrist ganglions, especially those that are smaller than 10mm, spontaneously resolve.[3] In the past, a hefty object like a dictionary or the Bible was used to deliver a powerful hit to the cyst. Anti-inflammatory medications, supportive splinting, compression bandaging, and suction, with or without injection, can all be used to treat patients with mild symptoms in the beginning.[9-12]

Aspiration followed by steroid injection temporarily relieves symptoms in about 80% of patients with dorsal wrist ganglion cysts, although recurrence is frequent.[4] The results of conservative treatment for volar wrist ganglion are not encouraging. After aspiration and injection, there is a significant rate of ganglion cyst recurrence, 20 of 24 (83%) and 100% in patients who need multiple injections.[13] With an 87% of success rate following steroid injection therapy, the prognosis for ganglion cysts is favorable, indicating the development of ganglion cysts as a result of persistent inflammatory response.[7] In a study revealing problems including skin depigmentation and subcutaneous fat atrophy in patients who had undergone aspiration with or without steroid, Varley et al., concluded that the injection of steroid has no additional benefits.[14]

The gold standard treatment for ganglion cysts is still surgical excision; however, this is frequently more invasive given the symptoms of the patient.[15] Post-operative recurrence rates were initially up to 40% due to insufficient surgical dissection, but after adopting a radical surgical technique that includes *en bloc* excision of the cyst, its pedicle, and the capsule of the surrounding joint, recurrence rates have improved.[16] Recurrence rates for the volar wrist ganglia and dorsal wrist ganglia were 7% and 1–5%, respectively, in a research by Angelides and Thornburg.[17] Despite having fantastic surgical results, there are several side effects include infection, neuroma, scar, and keloid. In a Rizzo research, 25% of patients reported wrist stiffness, for which 8 weeks of physiotherapy were advised.[18] Post-operative wrist instability is sometimes observed and attributed to the ganglion's pre-existing etiology rather than to open ganglionectomy and scapholunate instability.[19-22] When removing a volar ganglion cyst surgically, neurovascular structures including the radial artery and branches of the median nerve are particularly vulnerable to damage.[17,23,24] Therefore, the decision to do surgical excision should be based on the severity of the patient's symptoms. Gang and Maktlouf employed the loop suture technique for the 1st time in 1998. They achieved a 95% of cure rate by inserting two loop sutures of 2–0 silk perpendicular to one another through the ganglion.[3] Others have successfully avoided surgical and anesthesia-related problems using this minimally invasive technique.[25,26]

We used 1–0 silk suture to treat the double loop-forming ganglion. Massage causes the jelly-like mucin to be ejected, which causes the cyst to collapse and cause its walls to attach to one another, obliterating the cavity of the ganglion cyst. Cystic fluid drains from the body through a tiny capillary-like channel created by the loop suture. After the loop suture is removed, this tiny channel is destroyed. The pressure from the elastic wrist band aids in the formation of adhesions between the cyst's two walls. The outcomes of this double loop method are debatable in comparison to others. Due to the successful results obtained with this technique and the few problems, such as infection, we suggest that this double loop suture technique for wrist ganglion should be the preferred ambulatory surgery option.

Limitations of the study

The present study has some limitations. The duration was short. This method was not compared with other methods.

CONCLUSION

The diagnosis of ganglion cysts around the wrist is a common issue in the outside patient section. Since the majority of these patients have cosmetic concerns, reassurance is sufficient for these individuals. Patients with symptoms and a big ganglion may need treatment such as splintage, NSAIDS, aspiration with or without steroid or sclerosing agent injection; however, these operations have a high recurrence rate. Although a radical surgical excision is the gold standard, there are several complications that make it necessary. The ambulatory double

loop suture technique has highly positive outcomes with a minimal recurrence rate and problems.

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Authors' Contributions:
PK- Concept and design of the study and manuscript preparation; **CG-** Reviewed the literature and manuscript preparation; **AD**- Reviewed the literature and manuscript preparation; **ARS**- Concept, design of the study, interpretation, preparation of manuscript, and revision of the manuscript. All authors read and approved the final manuscript..

Work attributed to:
SMMH Medical College, Saharanpur - 247 002, Uttar Pradesh, India.

Orcid ID:
Dr. Pavneesh Kumar - https://orcid.org/0000-0002-7576-2611
Dr. Chetan Giroti - https://orcid.org/0000-0002-1185-1607
Dr. Aviral Dhobal - https://orcid.org/0000-0002-5701-7781
Dr. Anoop Raj Singh - https://orcid.org/0000-0003-4595-1646

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