



A Loop Suture Technique in Treatment of Wrist and Ankle Ganglion

KEYWORDS

ganglion wrist, ganglion ankle, loop suture, minimum invasive technique.

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ABSTRACT Background : Ganglion or ganglion cyst is common swelling of the wrist and ankle joint. Ninety percent of these ganglia are present around wrist joint while ten percent are present around ankle joint.

Material and method : The study was conducted on one hundred and fifty patients with diagnosis of ganglion wrist or ankle. One hundred and forty patients with ganglion wrist and ten patients with ankle ganglion were included in this study. These patients were treated by a minimum invasive technique of loop suture. A polypropylene suture 1-0 was used to place single loop suture into the ganglia. The mucinous contents were expelled by massage. The polypropylene suture was rotated in the loop formed. This loop was kept for seven to ten days and then removed.

Results : This leads to complete obliteration of the ganglia in all the patients. Infection occurred in six patients which was treated with antibiotics. Persistent pain was present in only one patient.

Recurrence was observed in two patients only within one year. The results of this loop suture technique are comparable to others who have placed two loop sutures and also to surgical excision of the ganglia.

Conclusion : This loop suture technique is a minimum invasive technique with 98% cure rate. It gives very good cosmetic results and avoids complications of surgery and anaesthesia.

Introduction

Ganglia are non-malignant or benign tumour like cystic lesions that occur in association with musculoskeletal structures around wrist and ankle joint¹. These ganglia are common in young women especially in and around the wrist. They are common in second and third decade of life². Trivial trauma as a causative factor for ganglion is narrated by at least 10% of the patients. But their pathogenesis remains unclear; they may represent sequelae of synovial herniation or coalescence of small degenerative cysts arising from the tendon sheath, joint capsule or bursae².

Histologically, ganglion has a thin connective tissue capsule, but no true synovial lining and contain mucinous material filled with gelatinous fluid rich in hyaluronic acid and other mucopolysaccharides³.

A clinical presentation of these patients is swelling and pain. They can occur in numerous locations. Sixty percent of all ganglion are present on dorsum of wrist while twenty percent are present on volar aspect of the wrist. 10% arise from flexor tendon sheaths or in association with distal interphalangeal joints. The rest of 10% are present around the ankle joint.

Several studies have shown that sonography is accurate in the diagnosis of ganglion⁴. They are described as simple or well defined cystic lesions. Others have described these as complex based on sonography. On sonography the vast majority are anechoic to hypoechoic and well defined. Many may demonstrate presence of locules as well as acoustic enhancement. Synovial cyst should be included in the differential diagnosis which may be distinguished on MR Imaging⁵.

With pressure treatment in form of wristband 53% of ganglion resolve spontaneously¹³. Surgical excision of ganglia

remains the gold standard for symptomatic ganglion⁷. Any invasive treatment should reliably warrant benefit outweighing the presenting complaints. Minimum invasive techniques like needle aspiration of cyst⁹, injection of hydrocortisone, triamcinilone and hyaluronidase have been used⁶. Minimum invasive technique using 2-0 silk suture has been used by Gang et al, obtaining 95% cure rate¹³. We have used 1-0 polypropylene suture in single loop passed through the ganglion cyst.

This study was carried out using this minimum invasive technique of loop suture as ambulatory surgery.

Materials and methods

The study was conducted at PGIMS Rohtak in department surgery on outpatient basis as ambulatory surgery. A total of 150 cases were included in the study. They attended the outpatient surgery department. Patients presenting with clinical diagnosis of ganglion wrist were investigated by haematological tests. The ganglion which were hard on palpation or were present on volar surface of wrist joint particularly on radial artery on median nerve were subjected to sonography. All wrist and ankle ganglion, whether simple or complex, were included in the study. Recurrent ganglion wrists after surgical excision were excluded from study. Small wrist ganglia of less than 9mm in size were also excluded from study.

Technique of loop suture

These patients were operated in outpatient department as day care. After cleaning the wrist or ankle with povidine iodine, subcutaneous infiltration is given with 2% Lignocaine. The wrist or ankle was flexed or extended to make the ganglion prominent. A monofilamentous polypropylene suture 1-0 is used to pass through the ganglion cyst cavity. A single loop is formed with a diameter of 5cm or more. The contents of ganglion which it contains, a jelly like ma-

terial is expressed out. A pressure bandage is applied over wrist or ankle joint. The patient is instructed to remove this bandage next day and expel the contents by gentle massage. The patient is advised to pull the thread to and fro. These movements should be made at least thrice daily. A wrist band can be worn by patient over the wrist the ganglion cyst as compression bandage. After seven to ten days when the ganglion cyst has flattened, the loop suture is removed. However the patient continues to wear the elastic bandage for another ten days. Broad spectrum antibiotic is given for five days continued further lest infection is apparent. The patient is followed at three months interval.

Results

Clinically of these one hundred and forty cases of wrist ganglion, 120 were females and twenty were males. Out of ten cases of ankle ganglion, 6 were females and 4 were males. Out of one hundred and fifty cases studied, 140 (93.3%) patients having wrist ganglion and 10 (6.7%) patients having ankle ganglion. In wrist ganglion, 98 (70%) were located on dorsal side of wrist, twenty eight (20%) were present on volar surface of wrist joint and 14 (10%) were arising from the tendinous sheath, eleven were arising from extensor tendon sheath and remaining four were arising from flexor tendon sheath. In ankle ganglion, all the 10 were present on lateral side.

Out of all ganglion, one hundred and twenty four were simple cystic, twenty four were complex cystic and six were hard in consistency. The size of simple ganglia varied from 10mm-25mm whereas complex ganglia varied 21mm-40mm. The size of ganglia which were hard varied from 10-20mm.

Sonographic study were done in twenty four patients only, fifteen of these were unilocular simple cyst, six of these showed multilocular septation and thick wall, the remaining three were thick wall and contained solid gel probably due to previous haemorrhage. Haematological investigations were normal in all the patients.

This technique of single loop suture using 1-0 polypropylene was performed in all the one hundred and fifty cases of ganglion wrist and ankle. On opening the pressure bandage and gentle massage, the ganglion swelling disappeared completely in one hundred and thirty two patients. In remaining eighteen patients, the swelling disappeared by fifth day on gentle massage. No antibiotics were given except in five patients in whom infection occurred. The loop suture was removed on day seven, leading to complete disappearance of ganglion.

Recurrence was observed in nine patients in three months follow up period. In these patients five were dorsal wrist ganglion, two were volar surface ganglion and two were ankle ganglion. The cosmetic results in all the patients were very good with no scarring even in patients in which infection occurred.

Discussion

The ganglia are most prevalent swelling around the wrist. Clinical diagnosis is used in diagnosis of ganglion wrist and ankle. The clinical diagnosis is quite accurate in most of patients with simple cystic ganglion. In case of complex cystic ganglion or the ganglion which have solid consistency clinically, sonography is used to differentiate lesions like synovial proliferation, giant cell tumour of tendon sheath and a collapsed ganglion⁴. It has been found that complex

cystic ganglia are larger in size than simple ganglion. In this study, complex cystic ganglia were present with in dorsal or volar wrist and had a larger diameter as compared to simple ganglion. In addition, most of tendon sheath ganglia are simple and had a smaller diameter in comparison to ganglia arising from wrist joint. This is because that wrist ganglion become more complex as they enlarge in less restricted wrist soft tissue as compared to extensor and flexor tendon sheath ganglion that are restricted by surrounding tendon sheath and more likely to remain small in size³. Similarly, ankle ganglion achieve a larger size and are complex.

Patient often report changes in ganglion size over time. It is important to note locule on sonography because minimum form of treatment like aspiration of cyst alone, or with injection of hyaluronidase or hydrocortisone may be unsuccessful in ganglion with multiple locules³. On ultrasonography, solid appearing ganglia are collapsed due to haemorrhage inside it and relative proportion of constituents of mucin like glucosamine, albumin, globulin and hyaluronic acid³.

With 53% of wrist ganglion particularly less than 10mm resolve spontaneously¹³. Although surgical excision of ganglion remains the gold standard of symptomatic ganglion treatment but recurrence rate is high⁷. Minimum invasive treatment consists of aspiration of ganglion alone⁹, aspiration and injection of hyaluronidase¹⁰, aspiration and injection of hydrocortisone⁶; all with equal incidence of recurrence.

The loop suture technique was first used by Gang and Maktlouf in 1998. They placed two loop sutures of 2-0 silk through the ganglion at right angle to each other achieving 95% cure rate¹³. This minimum invasive suture technique was used by others with good results avoiding complications of operation and anaesthesia^{12,14}.

We have treated the ganglion making single loop with 1-0 monofilamentous poly propylene suture. The jelly like Mucin is expelled by massage and leads to collapse of the cyst. The collapsed walls of the cyst get adherent to each other; leading to obliteration of ganglion cyst cavity. The loop suture is moved in to and fro manner which helps in expulsion of mucin and ultimately a thin capillary like channel remains. This fine channel gets obliterated after removal of loop suture. Pressure due to elastic wrist band helps in forming adhesions of the two walls of the cyst. The results of this single loop technique are equivocal with others. The positive outcome achieved with this technique and minimum complications like infection only; we propose that this single loop suture technique for wrist ganglion should be treatment of choice as ambulatory surgery.



Fig 1: Ankle ganglion



Fig 2: Loop suture in Ankle ganglion



Fig 4: Loop suture in wrist ganglion



Fig 3: Dorsal wrist ganglion

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