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## Arthroscopic excision of occult volar and dorsal wrist ganglion: Case report

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### Abstract

Ganglion cysts are the most common soft tissue lesions of hand and wrist, most commonly located over dorsal aspect of wrist originating from scapholunate inter-osseous ligament. Definitive management is open surgical excision. Arthroscopic resection is an effective treatment modality for symptomatic occult dorsal and volar wrist ganglion with good functional and cosmetic results. The patient in our case presented with left wrist pain and generalized swelling for 1 month duration with decreased range of movements of wrist joint which was diagnosed as septated ganglion cysts along the dorsal and volar aspects of scapholunate ligament. They were excised arthroscopically and there was complete functional recovery within 6 months. Arthroscopic excision of occult wrist ganglion is a novel technique and is gaining rapid popularity because of minimal perioperative morbidity, earlier functional recovery and faster return to work.

**Keywords:** Arthroscopy, wrist ganglion, excision

### Introduction

Ganglion cysts are the most common soft tissue lesions of the hand and wrist, commonly located over Dorsal aspect of wrist originating from scapholunate inter-osseous ligament<sup>1</sup>. It develops due to Degeneration of connective tissue of synovium or tendon. It may be asymptomatic or may present with pain and limitation of activity.

Definitive management is open surgical excision with recurrence rate of about 5%. Aspiration of Ganglion should be condemned as recurrence rate is as high as 40%. Surgical excision is indicated when the ganglion causes pain or affects range of motion and can be performed open or arthroscopically. Rates of recurrence with arthroscopic dorsal ganglionectomy are comparable with those of open excision.

Wrist arthroscopy has several advantages like easier visualization and palpation of the ganglion during surgical removal allowing for more accurate confirmation of complete removal, easier conversion to open surgery if arthroscopic removal fails, faster rehabilitation and return of motion and stitchless closure allowing for reduced scarring and improved cosmesis. Arthroscopic excision of dorsal wrist ganglion is a novel technique and is gaining rapid popularity because of minimal perioperative morbidity, earlier recovery and faster return to work and a more cosmetically acceptable.

### Case History

A 24 years female presented with pain and generalized swelling of the left wrist since 1 month. She gives a past history of falling on an out stretched hand 12 years back and had a ligamental tear which was managed conservatively with immobilization and analgesics.

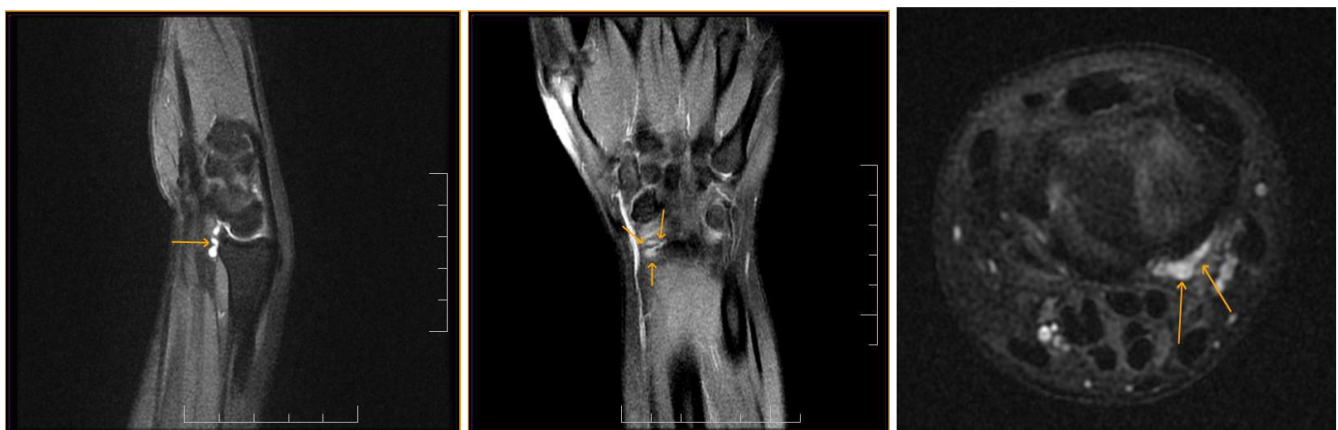
On examination she had generalized moderate swelling with tenderness over scapholunate junction. Movements of the wrist were painful and restricted.



**Fig 1:** Preoperative patient pictures showing swelling and restricted motion of left wrist

X- Ray did not show any evidence of bony injury. MRI was suggestive of partial tear of volar and dorsal components of

scapholunate ligament with small septated ganglion cysts along volar and dorsal aspects.



**Fig 2, 3, 4:** MRI images showing occult dorsal and volar wrist ganglion

Upon thorough clinical examination patient underwent relevant investigations. The preoperative complaints of pain and wrist range of motion were recorded. Wrist arthroscopy was performed after consent. Under general anesthesia, with the patient lying supine on the operating table. The upper limb

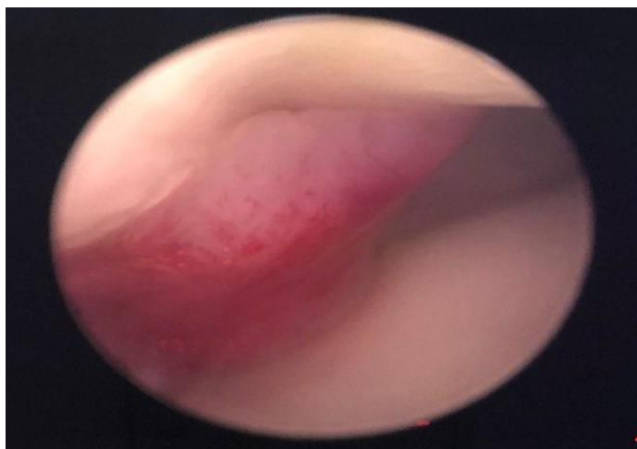
was positioned on a hand table with a mid-arm pneumatic tourniquet applied. Four kilograms of weight was suspended from the index and middle fingers using finger traps for joint distraction (Figure5).



**Fig 5:** Patient positioning

Skin marking of distal radius articular margin, Lister's tubercle, ulnar styloid process, tendon of the extensor pollicis longus, extensor digitorum communis and extensor carpi ulnaris was done. The 3, 4 portal was made first and a diagnostic arthroscopy of the radiocarpal joint was done. Presence of synovitis of the wrist joint and an occult volar and dorsal ganglion cyst was noted. The dorsal capsule in the

region of the scapho-lunate interosseous ligament was visualized. Ganglion was identified (Figure 6). Motorized shaver blade was introduced from the 3, 4 portal to debride the dorsal capsule in the region of the ganglion stalk. Thorough joint debridement with excision of ganglion cyst on the volar and dorsal side was done. Additionally posterior inter-osseous neurectomy was done.



**Fig 6:** Arthroscopic picture of the ganglion

The portals were closed and compressive dressing was done. The patient was discharged after 3 days and encouraged to start wrist range of motion. The sutures were removed on the tenth post-operative day. Patient was followed up once a week for the first four weeks followed by once a month for six months. The duration the patient took to return to a painless wrist with full range of motion was noted. Patient satisfaction

with respect to cosmesis and function was noted.

### Results

Postoperative period was uneventful and patient was followed up for a period of 6 months. Patient showed complete relief of pain with movements of wrist joint being normal at 2 weeks after surgery and during entire period of follow up.



**Fig 7:** Post-operative clinical picture after suture removal



**Fig 8:** Post – operative clinical pictures showing normal range of movements



## Discussion

Dorsal wrist ganglion is the most common type of ganglion arising from the hand. The etio-pathogenesis of ganglia remains controversial although theories like mucoid degeneration of collagen tissue, repetitive micro trauma, occupational, intra-articular pathology and scapho-lunate instability have been described [2, 4, 5].

Patients with dorsal wrist ganglia usually complain of dull aching pain which may be due to the ganglion location and its close relation to the posterior interosseous nerve. Some patients complain of pain during wrist movement especially extension. Patients frequently present due to cosmetic concern.

In this case patient had wrist pain and cosmetic concern (diffuse swelling). Patient had pre-operative restricted wrist range of motion. The symptoms improved to a painless wrist with complete range of movement in 2 weeks postoperatively. The origin of dorsal ganglia is at the dorsum of the scapho-lunate interosseous ligament. The transition area between the interosseous ligament and dorsal capsule may serve as a tortuous duct that acts as a one way valve allowing fluid to enter the cyst from the joint [2].

The success of any procedure would be directly related to its ability to identify and excise the ganglia. Spontaneous ganglia resolution has been reported between 28% and 58% [4, 6]. Success rate of non-operative management like rupturing with a Bible, mallet or doctors thumb is approximately 50% [7]. Aspiration, with or without steroid, has a success rate of 35% to 50% [8, 9].

Open surgical excision of the ganglion cyst has lowered the recurrence rate to 10% to 40% [2, 3]. The key to open surgical excision is identification of the stalk and its removal from the base of the scapho-lunate interosseous ligament along with the surrounding capsule.

In open surgical excision, the scar of surgery may be associated with poor cosmesis and also numbness distally and around the scar due to iatrogenic injury to the dorsal sensory nerve branches. Wrist stiffness is frequently associated following open surgical excision. This may be due to prolong immobilization, closure of the dorsal capsule, excessive handling of the extensor tendons and damage to the extensor retinaculum. Damage to the scapho-lunate interosseous ligament while excising the stalk may cause iatrogenic scapho-lunate instability [10].

Arthroscopic resection of dorsal wrist ganglion has several advantages. Most importantly it gives direct access to the dorsal aspect of the scapho-lunate ligament which is the most common site of the pathology. Precise identification and excision of the stalk under magnification from within the joint by debriding an area of 5 to 10mm<sup>2</sup> of the dorsal capsule ensures complete removal and hence a very low recurrence rate. Being a minimally invasive procedure, the arthroscopic method permits immediate wrist movement to be started and hence allows for a more rapid return of wrist range of motion and faster return to daily activities and profession.

The arthroscopic method allows for protection of the scapho-lunate interosseous ligament as it is directly visualized under well magnified condition and bright illumination and hence reduces the chances of injury to this ligament. The portal is 3mm in size and hence has a very good cosmetic appeal. Following arthroscopic resection, patient was satisfied with respect to the cosmetic results.

Arthroscopic ganglion resection allows simultaneous evaluation and management of other intra-articular

pathologies. Upto 42% cases with dorsal wrist ganglia have been reported to have intra-articular pathologies. [11] In our case patient synovitis of the wrist joint was noted. Thorough joint debridement with excision of ganglion cyst and posterior inter-osseous neurectomy was done.

Hence, arthroscopic resection is an effective treatment modality for symptomatic dorsal wrist ganglia with good functional and cosmetic result. It has relatively lower recurrence rate, lesser post-operative morbidities, and better cosmetic result and provides an opportunity to identify and manage intra-articular pathologies.

## Patient Declaration Statement

“The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.”

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