

Ganglion Cysts

Surgical Indications and Considerations

Anatomical Considerations: A ganglion is a cyst filled with mucin. It has a smooth translucent wall that is associated closely with a joint or tendon sheath. They are usually connected by a stalk to an underlying joint capsule or ligament. They are found most commonly on the dorsum of the wrist, where they are associated with the scapholunate ligament. Ganglion cysts can also be found on the volar surface, however, less commonly. Here, they are associated with the scaphotrapezial joint. Because of their intimate relationship, the radial artery is very important to note when assessing volar ganglions.

Pathogenesis: The pathogenesis of ganglions is unknown or uncertain. The most widely held belief is that cysts form as a result of mucoid degeneration of collagen and connective tissues. This explanation implies that a ganglion represents a degenerative structure that houses the myxoid changes of connective tissue. A recent theory suggests that cysts form after a trauma or soft tissue irritation. As a result of trauma, modified synovial cells lining the synovial capsular interface are stimulated to produce mucin, specifically hyaluronic acid. Mucin dissects along the attached joint ligament and capsule to form capsular ducts. These function as valvelike structures producing lakes. The ducts and lakes of mucin coalesce to eventually form a cyst.

Epidemiology: Ganglion cysts are the most common soft tissue tumors of the hand and wrist. Seventy percent occur in individuals between the ages of 20 and 40. Women are affected 3 times as often as men. Their frequency is about equal in both the right and left hands. Occupation does not seem to play a role in increasing ganglion formation.

Diagnosis

- Most patients describe pain as dull, achy
- Motion limitation
- Paresthesias
- Weakness
- Spontaneous drainage
- Change in size
- Cyst rarely visualized on radiograph
- MRI studies
- Allen test-when ganglion in proximity to radial artery

Nonoperative versus Operative Management: Some therapies used initially may consist of splint immobilization and NSAIDs. In the past, closed rupture—a sharp blow with a heavy object—was used. But it is associated with a 22-66% recurrence rate, and patients do not find it to be an appropriate treatment. One study showed a report of wrist fracture with this method. The most common nonsurgical method of treatment used today involves needle aspiration followed by a steroid injection. Multiple punctures with a needle preceded by a local anesthetic are associated with a 13% cure rate. This rate increases to 40% if splinted for 3 weeks after one aspiration or

puncture. The cure rate again increases to 85% after 3 sessions. Surgery is indicated when the patient feels significant pain or when the cyst interferes with activity. Surgery is also suggested if the ganglion is causing nerve compression, since this can result in problems with movement and sensation of the hand.

Surgical Procedure: The most accepted technique for ganglion cysts is open surgical technique.

To remove a dorsal wrist ganglion, a small incision is made on the back of the wrist. The tendons that run across the back of the wrist and into the fingers are retracted out of the way. The surgeon follows the ganglion down to where it attaches to the wrist capsule. Once the surgeon locates this area, the entire ganglion, including its stalk, is excised. The joint capsule may or may not need to be sutured. Finally, the skin incision is sutured shut. The surgical procedure used to remove a volar wrist ganglion is essentially the same. However, the volar ganglion is located close to the radial artery. In some cases, the volar ganglion even wraps around the artery. This makes excision a bit more difficult. The surgeon must be careful to protect the artery, while performing the same procedure as for the dorsal wrist ganglion. Both of these procedures pose risks. Even after surgery, a ganglion may reoccur. However, this is uncommon. There is a risk of infection, as with any surgery, though, slight in this case. Excision can sometimes result in decreased motion, instability, and nerve or blood vessel damage, with greater risk of nerve/blood vessel damage associated with removal of volar ganglion.

Preoperative Rehabilitation

- Control pain and edema
- Education/Review of post-operative rehabilitation program

POSTOPERATIVE REHABILITATION

Phase I for Traditional Immobilization and Rehabilitation: 0-10 days

Goals: Protect surgical repair
Control edema and pain
Reduce effects of deconditioning

Intervention:

- Placement of bulky dressing or volar splint (by MD)
- Elevation and ice
- AROM into pain free ranges to restore wrist and finger mobility
- General conditioning exercise program

Phase II for Traditional Immobilization and Rehabilitation: 10-20 days

Goals: Continue to protect surgical repair post dressing/splint removal
Continue to control edema and pain
Progress AROM to increase mobility
Minimize deconditioning effects

Intervention:

- Elevation and ice
- Alpha-stimulation to reduce any residual pain
- AROM into pain free resistance
- Progress conditioning program

Phase III for *Traditional* Immobilization and Rehabilitation: 20 days-1 month

Goals: Progress AROM to normal function
 Promote excellent scar tissue healing
 Increase strength of hand and wrist
 Minimize deconditioning

Intervention:

- Joint traction—carpal mobilization
- Scar massage—to prevent adhesions
- Ultrasound—to advocate scar healing
- Full AROM exercises
- Strengthening exercises
- Progress conditioning program
- Work station modifications as needed

Phase IV for *Traditional* Immobilization and Rehabilitation: 1-2 months

Goals: Return to unrestricted function
 Necessary workstation modifications in place
 Patient independent in home exercise program

Phase I for *Early Motion* and Rehabilitation: 0-3 days

Goals: Prevent wound complications
 Control edema and pain
 AROM to restore movement
 Prevent deconditioning

Intervention:

- Protect surgical site
- AROM into pain free ranges
- Elevation and ice to control edema/pain
- Conditioning program to maintain muscular health

Phase II for *Early Motion* and Rehabilitation: 3-10 days

Goals: Removal of dressing-by MD (day 3)

- Promote wound healing
- AROM to patient tolerance
- Prevent deconditioning

Intervention:

- Ultrasound to promote wound healing
- AROM into pain free resistance
- Progressive conditioning program
- Instruct patient on exercises to do at home

Phase III for *Early Motion* and Rehabilitation: 10-20 days

Goals: Full ROM

- Good wound healing
- Normal strength of hand and wrist
- Patient independent in home exercises

Intervention:

- Strengthening exercises: silly putty, active flexion/extension, light weights, etc.
- Scar massage
- Continue ultrasound
- Observe patient on home exercise program-progress/modify as needed

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