

Arthritis of the Base of the Thumb (CMC Joint Arthritis)

What is it?

Any condition that irritates or damages a joint is called arthritis. The bones of a normal joint are covered by cartilage which allows smooth and pain-free movement of the bones over one another. Damage to the cartilage allows the bones to rub against each other producing pain and increased wear and tear.

The joint at the base of the thumb consists of 3 bones (metacarpal—the first bone of the thumb at its base; the trapezium—a small carpal bone; and the scaphoid—a major wrist bone); these have a matched saddle-like shape. Any of the opposing bone surfaces may have arthritis. Because of its design, the basilar joint of the thumb allows for a wide range of movement—up, down, across the palm, and pinch to each finger, and is subjected to great forces. The major stabilizing ligament tends to stretch out producing abnormal motion, cartilage wear, and arthritis.

CMC arthritis is more common in women and tends to start after age 40. Past injuries may contribute as does osteoarthritis.

Symptoms

The first symptom is usually pain at the base of thumb with pinching or gripping. Early on, this pain is usually most noticeable on the palm side of the thumb. Weakness in pinch eventually occurs, followed by deformity and shrinkage of the web space between the thumb and index finger.

Staging by X Ray

- Stage I: A normal joint with only possible widening from synovitis (inflammation of the joint lining).
- Stage II: joint space narrowing with debris and bone spurs less than 2mm.
- Stage III: joint space narrowing with debris and bone spurs more than 2 mm in size.
- Stage IV: scaphotrapezium (trapezium—medium—and scaphoid—wrist side bone)
- Stage V: Stage IV involvement plus arthritis of a small adjacent joint (scaphotrapezoid joint)

Conservative Self-Treatment:

Modify your activities.

Avoid heavy pinch and grip activities

Use large easy-flow pens and increase the grip size on golf clubs, kitchen utensils, and tools.

Ice the area which is most swollen and tender for five to fifteen minutes at a time.

Take “over the counter” non-steroidal anti-inflammatory drugs (NSAIDs), such as aspirin or ibuprofen. Check with your pharmacist or primary care physician or nurse practitioner regarding possible side effects and drug interactions.

A splint or brace which supports the thumb may support/unload the joint and decrease both wear and tear AND pain. A hard splint is more effective than a soft splint and a custom made splint may be better tolerated and work better than an over the counter splint.

Conservative Medical Treatment:

A custom splint with the thumb end (IP) joint free will support and unload the stresses on the joint. The splint should be worn on a nearly full time basis until symptoms resolve.

Hand based splints are less restrictive and better tolerated. Forearm-based splints provide better immobilization.

NSAIDs will usually be recommended.

The splint and the NSAIDs used in combination will decrease joint synovitis and joint effusion (swelling).

If symptoms persist, an injection of cortisone into the joint usually produces transient relief. It will not cure the arthritis and is a temporizing measure.

Results of conservative care as reported in Medical literature include:

Swigert (1999):

Patients achieving sufficient symptom relief to allow continued daily activities with intermittent splint use:

Stage I and II disease: 76%

Stage III and IV: 54%

Berggren:

Hand use change and splinting helped 70% avoid surgery.

Surgery on the Joint

Surgery is indicated when conservative treatment fails to provide adequate symptom relief to allow participation in desired activities, i.e., when pain, deformity, and weakness sufficiently interfere with daily function. The decision for surgery rests with and depends on how much your thumb bothers you. The goals of surgery are to relieve pain and prevent progressive weakness and deformity.

Some people will have symptoms which remain mild, flare up from time to time, and are treatable with splints and anti-inflammatory medication. Others will have progressive arthritis, but “burn out”, i.e., continue with deformity and weakness, but have an appreciable spontaneous decrease in pain. Others will develop progression to a severe problem which prevents normal functioning due to pain, deformity, and weakness.

There are many different operations for this condition.

In early disease (Stage I) with only ligament laxity and no joint damage, reconstruction of the stabilizing beak ligament may be done.

Trapeziometacarpal TM Arthroscopy can be done with shrinkage of the capsule and ligaments. Short term follow up is promising, but “the absence of published reports of outcome justifies a modicum of restraint before adopting these alternatives.” Green

For stages II to V, there are many procedures available. The most commonly performed procedure is called the **LRTI** or **a Trapeziectomy with Tendon interposition and metacarpal stabilization:**

The trapezium (middle bone at the base of the thumb) is removed. The relationship between the adjacent base of the thumb and the index finger is maintained by using a tendon graft from a wrist flexor tendon (flexor carpi radialis) woven through the base of the thumb metacarpal. Sometimes the joint is pinned temporarily. The space between the remaining bones is maintained/cushioned by the rolled end of the same tendon.

Patients have been followed and studied for up to 9 years after LRTI. Pinch strength and grip strength continue to improve between 2 and 6 years. At 9.4 years after surgery, there was a 92.5% increase in grip and a 50% increase in pinch strength compared to preoperative levels. 95% of patients reported excellent pain relief. Shortening was 11 to 13% of immediate preop values.

An alternative but similar procedure is **a trapeziectomy with stabilization by a top of thumb tendon (Abductor pollicis longus or APL)**. Early results are similar to the LRTI, but no long term studies have been reported.

Removal of ½ of the Trapezium (middle bone of the joint) or **hemitrapeziectomy** has been done in the past for Stage I and III disease. However, “few surgeons today preferentially perform a hemitrapeziectomy . . . because of the technical ease and benefit of improved restoration of the breadth to the thumb-index web when complete trapeziectomy is performed . . . pantrapezial involvement contraindicates procedures such as TM arthrodesis (fusion) or emitrapeziectomy alone.” Green

Trapeziectomy with temporary distraction and pinning has gained recent popularity. Results at 2 years show no statistical difference between this and LRTU (see below). There was complete pain relief in 73% of patients at 6 months and 92% at 2 years. Grip strength improved by 47%, key pinch strength by 33% and tip pinch strength by 23%. Shortening was 51%. But long term follow up has not yet been reported, there is a potential for decrease in pinch strength with time, and we know that LRTI strength continues to improve for many years.

Trapeziectomy plus a spacer with a tendon “anchovy” scar ball makes no significant difference over excision alone. Weakness and shortening remain a long term problem.

Joint replacement with an implant has had a high loosening rate. There are new implant systems currently being evaluated but long term results will not be known for several years.

Fusion of the trapeziometacarpal joint (the 2 end bones of the joint) may also be done. The bones are cut and pinned until they heal together producing essentially one stable bone. There is a 12.8% incidence of delayed bone healing and a 7.6% incidence of no bone healing with the procedure. Movement of the thumb CMC joint is reduced—40% of patients could not move at all. Strength is slightly increased. This is usually recommended for young manual laborers and in paralyzed patients. Pain relief is excellent but mobility is limited and abnormal wear at the adjacent joint may produce future problems.

Sources:

Hand Surgery, authors: Berger, RA, Weiss APC: Lippincott, Williams and Wilkins, Philadelphia 2004

Green's Hand Surgery, authors: Green, Hotchkiss, Pederson, and Wolfe: Elsevier, Churchill, Livingstone, Philadelphia, 2005