



# Hematoma Distraction

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**Surgery for thumb carpometacarpal arthritis is indicated after nonoperative interventions fail to provide relief. Trapeziectomy with temporary K-wire distraction is a simple technique that provides equivalent outcomes to ligament reconstruction techniques.**  
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## Background

Thumb carpometacarpal (CMC) joint osteoarthritis is common and usually presents as basilar thumb pain that is exacerbated by pinching and gripping activities. When nonoperative modalities, such as splinting, activity modification, and anti-inflammatory medications, fail to provide relief, surgery is often recommended. One of the first descriptions of surgical treatments was a simple trapeziectomy without any stabilization by Gervis<sup>1</sup> in 1948. While this provided pain relief, patients had significant postoperative instability and weakness, as described by Murley<sup>2</sup> in 1960 and Iyer<sup>3</sup> in 1981. They also saw significant subsidence of the metacarpal and this was thought to be the cause of these postoperative findings. In the same journal issue as Gervis's original work, Muller proposed arthrodesis of the CMC joint,<sup>4</sup> but this fell out of favor due to the loss of motion. Subsequently many methods have been tried and studied, including various joint implants, tendon interposition, foreign material interposition, ligament reconstruction, tendon suspension, suture suspension, and combinations of these techniques. This paper will focus on trapeziectomy with K-wire distraction of the first metacarpal for the treatment of thumb CMC arthritis. This technique allows a hematoma to develop in the site of the trapezium, which later is replaced with dense scar that resists metacarpal subsidence after the K-wire is removed. Surgeons who utilize this technique appreciate the efficiency, lack of donor site

morbidity, and excellent clinical outcomes associated with the technique.

## Technique

Trapeziectomy and hematoma distraction arthroplasty for thumb CMC arthritis can be performed for patients with degenerative, inflammatory, or posttraumatic arthritis that has failed nonoperative treatment. Regional block has been our preferred method of anesthesia, but wide-awake local anesthesia with no tourniquet has been described as well.<sup>5</sup> A dorsal radial incision is made over the thumb CMC joint. The subcutaneous dissection is done bluntly using spreading of tenotomy scissors down to the joint capsule, with care taken to avoid injuring branches of the radial sensory nerve. The first dorsal compartment is released and a retractor is placed between the extensor pollicis brevis and abductor pollicis longus tendons. The radial artery is dissected from the capsule and retracted out of the way. Small branches extending distally and deep are ubiquitously present, and we use cautery to transect these to allow for mobilization of the main artery.

Next, the base of the thumb metacarpal is used to identify the CMC joint and the trapezium. With the radial sensory nerve branches and radial artery retracted out of the way, a linear capsulotomy is made from the base of the metacarpal to the scapho-trapezium joint. The capsule is raised as flaps radially and ulnarly off of the trapezium using a scalpel or bovie electrocautery. With the subluxation of the thumb that these patients often have, distraction of the thumb is often helpful in identifying the trapezium that can be hidden from view. Visualization of the saddle joint of the CMC should be used to confirm that the dissection is in the correct location. Fluoroscopy can also be used to confirm the anatomy prior to trapeziectomy.

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Once the trapezium has been identified, a scalpel is used to free the attachments to the surrounding bones superficially. The bone can be removed in any number of ways. The classic description includes removing it piecemeal using an osteotome (directed along the course of the flexor carpi radialis so as to avoid transecting it), rongeur and an elevator (we prefer a freer elevator for this). A finger is used to confirm that there are no remaining pieces that need to be resected. Removing it piecemeal has been theorized to create more inflammation and scar that can prevent subluxation,<sup>6</sup> although this has never directly been investigated. One can also perform an efficient trapeziectomy using a threaded Steinmann pin as a joystick to remove the bone in one piece with a combination of scalpel, scissors, and an elevator.

Once the trapezium has been resected, the metacarpal will want to subside toward the scaphoid (Fig. 1). The thumb is then distracted and placed in a position of approximately 30° palmar abduction and slight opposition (Fig. 2). One 1.6 mm (0.062 in) K-wire is inserted percutaneously from the base of the thumb metacarpal into the base of the index metacarpal, trapezoid, or scaphoid (Fig. 3). Care is taken to avoid injuring the radial sensory nerve branches (Fig. 4). The base of the thumb metacarpal should be at or distal to the base of the index middle finger (Fig. 5). A second pin can be used to provide additional stability if needed. Fluoroscopy can be used to confirm position if it can not be confirmed by direct visualization (Figs. 6 and 7). The pin is bent and cut above the skin to allow for removal in the office. The capsule is then reapproximated. We prefer to use a 4-0 absorbable, monofilament suture in a purse-string fashion, with care taken to avoid injuring the radial artery during closure. The skin is closed with the surgeon's choice of suture. A forearm-based thumb spica plaster splint is created with the interphalangeal joint free.



**Figure 2** The space for the scar to form is restored with distraction of the thumb.

On postoperative day 10, after sutures are removed if needed, a forearm-based thumb spica cast is placed with IP joint free. The cast and K-wire are removed 4 weeks after this (approximately 5.5 weeks postoperatively). The patient is then allowed to wean off of a neoprene thumb spica as tolerated. Patients are brought back for evaluation 2 weeks later and are referred to hand therapy if they cannot abduct the thumb out



**Figure 1** After trapeziectomy, the metacarpal head subsides toward the scaphoid.



**Figure 3** The thumb is distracted, abducted, and opposed for K-wire placement beginning at the thumb metacarpal base. The FCR tendon is visible in the base of the wound.

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