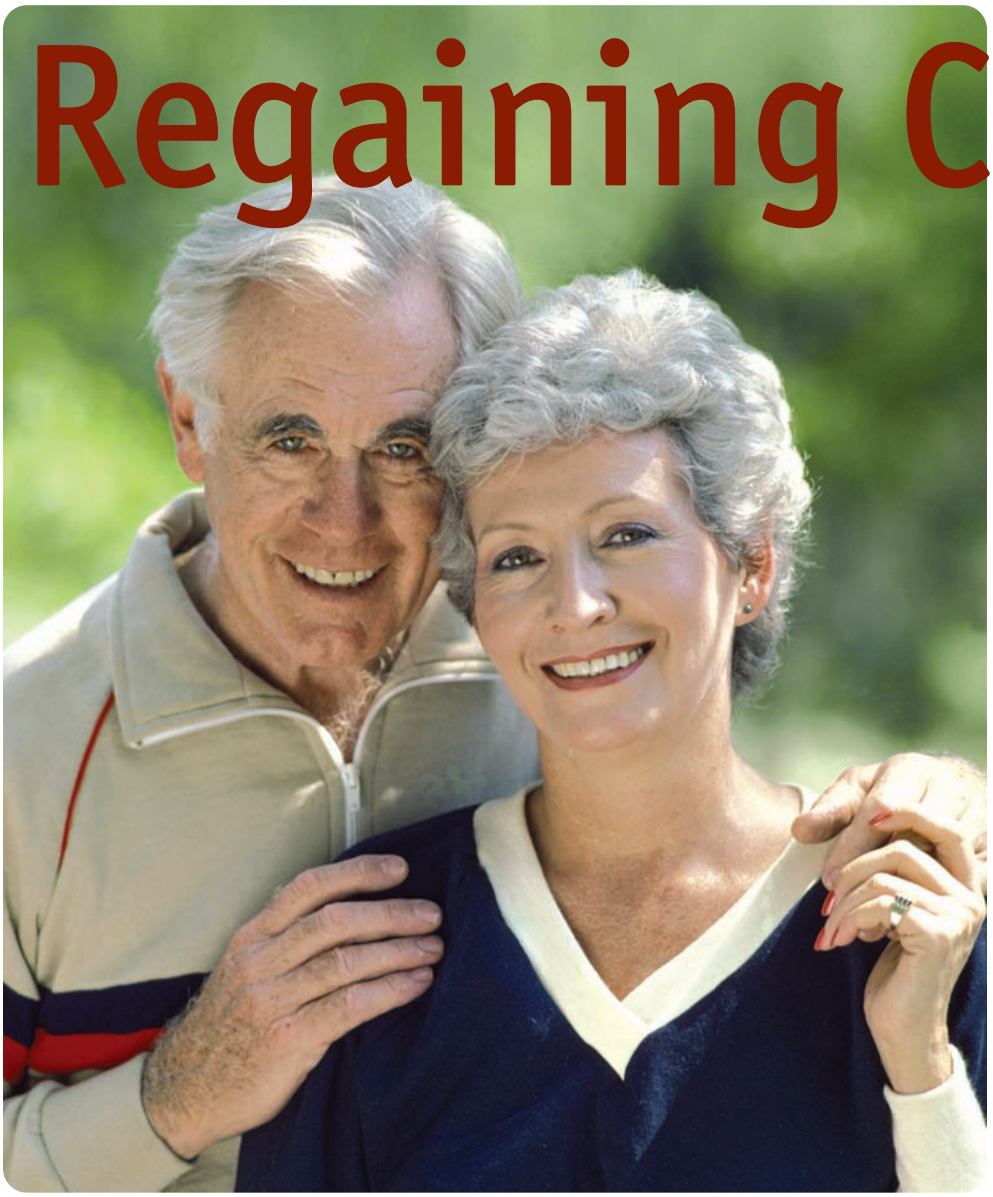
Regaining Control



Thumb Carpometacarpal Arthritis and Arthroplasty

By J. Gordon Rawles Jr., MD

Marjorie is a 50-year-old homemaker whose hands have been aching and bothering her for years. She has tolerated the inconvenience of needing a special jar opener in her kitchen because her hands are not strong enough to open a jar. But during the past six months, taking ibuprofen and running her hands under hot water have not adequately soothed her aching joints. Her fingers are stiff in the mornings, but her thumbs actually hurt, almost constantly. She asks, "What about those arthritis ads for glucosamine, shark cartilage, and herbs? Is there anything else that might ease this pain in my thumbs?"

More often than not, arthritis in the finger joints produces "knobby joints," which are stiff but not painful. A common patient complaint is, "My fingers look like my mothers." But, severe pain in the finger joints is nowhere near as common as disabling thumb pain. And the thumb joint most commonly affected by arthritis is the basal, or carpometacarpal, joint (the joint at the bottom of the large thenar muscle that provides strength to the thumb). The entire thumb may ache at the end of the day or constantly, as in Marjorie's case.

This basal joint of the thumb is built differently from other more mobile joints, such as the shoulder or true finger joints. The finger joints are designed for maximum range of motion (more than 90 degrees), while the basal joint has little range (less than 40 degrees) but is designed to be strong and stable. When the basal joint becomes arthritic, it can swell at times and bone spurs can later develop, causing a bony thickening where the thumb connects to the wrist. As the large thumb muscles squeeze down on the arthritic joint during gripping and pinching activities, pain becomes more frequent.

Conservative Care

Mild osteoarthritis is frequently moderated by a variety of simple home measures. Local heat (either hot water or even a wax bath) can soothe the pain. Medications such as ibuprofen, aspirin, other nonsteroidal anti-inflammatories, or even glucosamine can ease soreness but do not generally relieve severe pain and disabling weakness. Also, side effects can develop from any medication taken in excess. Various tools, such as jar openers, are designed to avoid placing severe stresses on arthritic hand joints.

When pain becomes as severe and continuous as Marjorie's, there are other options available from physicians trained in arthritis care. Physicians and therapists have noted dramatic pain relief from "joint rest." For the thumb, this generally is achieved with a protective thumb splint. Several types (some "off the shelf," some custom-made) have met with success in lessening unusual flares of arthritic thumb pain.

Indeed, simply wearing a light splint overnight can make the next morning much more tolerable. Other individuals swear by wearing their splints while at work. Most importantly, the splint should be a properly

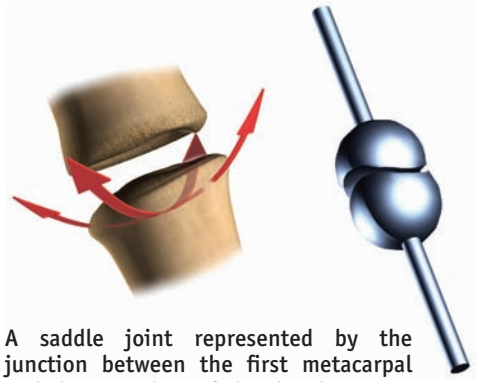
designed thumb "CMC splint," available at most major pharmacies.

Cortisone treatment (either pills or injection) is also an effective means to relieve pain. Patients generally fear shots, but there are newer, relatively painless methods to administer cortisone. Cortisone, however, does not cure the underlying arthritis.

Thumb Basal Joint Arthroplasty

If thumb pain becomes severe, constant, or disabling, joint replacement may be an option. Thumb basal joint replacement, or arthroplasty, is the most successful joint replacement done in the hand. Several factors explain this. First, a small prosthetic (plastic or metal) implant, duplicating the exact anatomy of a finger joint, is needed to replace high-range-of-motion joints, but a low-range-of-motion basal joint can be replaced with a tissue arthroplasty.

The new joint can be resurfaced with a tendon graft rather than other prosthetic materials (particularly plastic) that wear out over time. The tendon graft incorporates with basal joint ligaments and scar tissue to produce a new joint comprised of live tissue. This may not be an exact duplicate of the original joint, but it is consistently stable and painless.

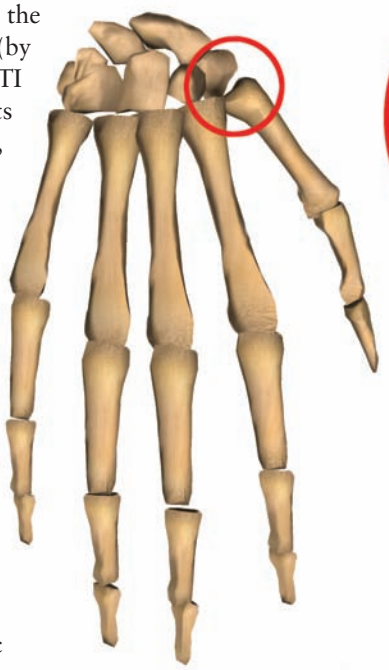


A saddle joint represented by the junction between the first metacarpal and the trapezium of the thumb next to a schematic representation of the joint

Several varieties of interposition arthroplasty have been utilized by hand surgeons in the United States: resection arthroplasty, ligament reconstruction and tendon interposition (LRTI) arthroplasty, and hemiresection arthroplasty. Resection arthroplasty is accomplished by simply resecting the arthritic trapezium bone at the basal joint, after which scar alone fills the space. Unfortunately, results have been inconsistent. Sometimes pain is relieved, but the thumb is usually still weak.

More commonly, complete trapezium resection is followed by rebuilding the joint with a tendon graft from the forearm. The tendon is used for two purposes: ligament reconstruction (to provide strength) and tendon interposition (to resurface the joint). LRTI arthroplasty has an excellent track record for relieving arthritic pain; good results have been duplicated by many hand surgeons throughout the United States and the world.

However, sacrifice of the entire trapezium bone (by either resection or LRTI arthroplasty) has its critics. Steve Glickel, MD, of Roosevelt Hospital, New York, published his solution to this in 1986, describing a trapezium hemiresection arthroplasty with excellent results. With Dr. Glickel et al.'s encouragement, I have performed 105 hemiresection arthroplasties during the past 20 years.



A saddle joint represented by the junction between the first metacarpal and the trapezium of the thumb

Only the distal arthritic portion of the trapezium is removed. Then, the joint is resurfaced by a method similar to LRTI arthroplasty: the flexor carpi radialis tendon is used to restabilize the ligament support at the base of the thumb and then to resurface the joint with live tendon tissue. This results in an even more stable type of thumb joint replacement with excellent relief of arthritic joint pain.

We are in the process of conducting a long-term study that will likely confirm the improvement in outcome after hemiresection compared to LRTI arthroplasty.

Positive Results

Postoperatively, the patient is completely immobilized in a thumb cast for the first three weeks. This allows for initial healing and eases postoperative pain. Hand therapy begins when the cast is removed at three weeks after surgery. The thumb is still protected by a plastic splint, but this may be removed for showers, therapy sessions, and, eventually, light activities. Although arthritic pain typically is relieved in the first few weeks, it may take two to three months for patients to become fully functional without their splints.

Marjorie is presently contemplating the option of an elective thumb basal joint arthroplasty. "It would be hard to go two to three months with limited use of my thumb, but in the end, it would be worth it to be rid of this daily pain!" she says.

When she is ready to invest that time, a pain-free thumb should allow her to return to her usual active lifestyle.

***J. Gordon Rawles Jr., MD**, is a board-certified orthopaedic surgeon specializing in hand surgery and upper extremity reconstruction. He received his Bachelor of Arts from the University of Virginia and his medical degree from the University of Virginia Medical School. He completed a combined fellowship in orthopaedic and plastic surgery at the University of Rochester, as well as an orthopaedic residency at the University of Virginia.*