

A Patient's Guide to **Artificial Joint Replacement of the Thumb**



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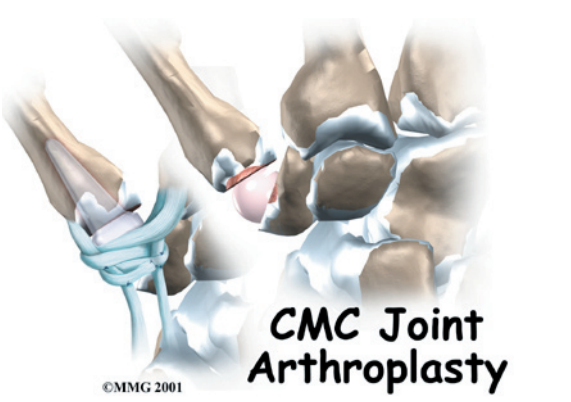


Woodward Coleman, M.D., F.A.C.S. specializes in joint reconstruction, complex fractures, surgery of nerves and arteries, repair and reconstruction of tendons, and fingertip reconstruction. He is Board Certified in Plastic Surgery with additional qualification in surgery of the hand.

Dr. Coleman is a graduate of Millsaps College in Jackson, Mississippi. He earned his Doctor of Medicine at the University of Mississippi. He completed a five-year general surgery residency at the University of South Carolina. Dr. Coleman was then chosen for a fellowship at the Christine Kleinert Institute for Hand and Microsurgery in Louisville, Kentucky. Only eight American Surgeons and six international surgeons throughout the world are chosen to train in this prestigious program. After completion of a full hand fellowship, he continued with a residency in plastic and reconstructive surgery that included further microsurgery training with Dr. Harry Bunckie, considered the pioneering grandfather of microsurgery.



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CMC Joint Arthroplasty

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Introduction

If nonsurgical treatments are not successful in easing problems of thumb arthritis, your doctor may recommend replacing the surfaces of the joint. Joint replacement surgery is called *arthroplasty*.

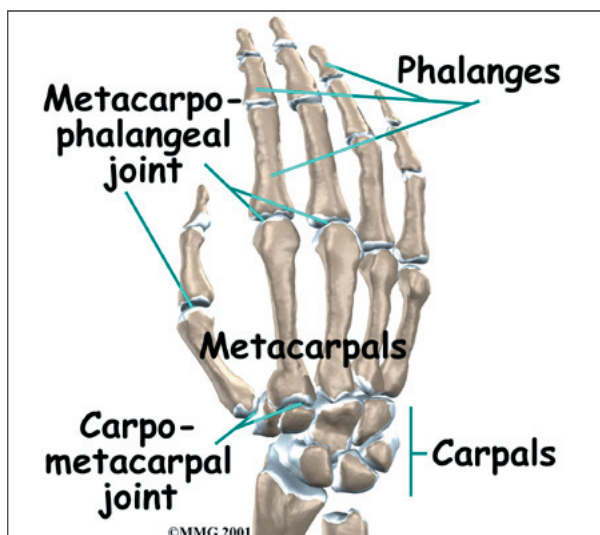
This guide will help you understand

- which parts of the thumb are involved
- how surgeons perform this surgery
- what to expect before and after surgery

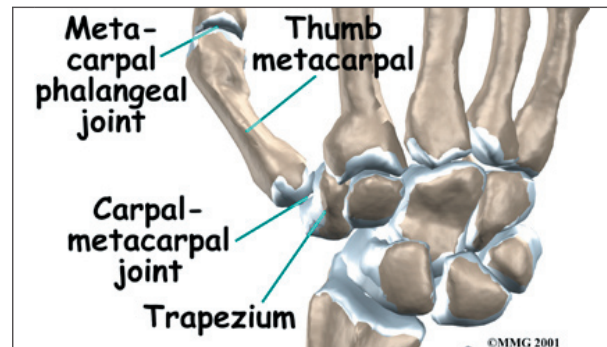
Anatomy

Which parts of the thumb are involved?

The CMC joint (an abbreviation for *carpo-metacarpal joint*) of the thumb is where the *metacarpal* bone of the thumb attaches to

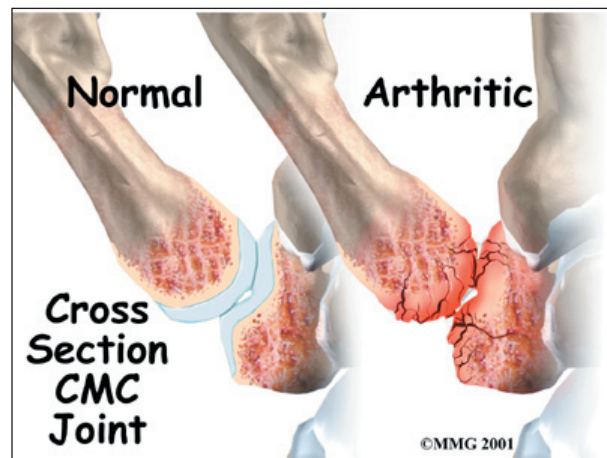


the *trapezium* bone of the wrist. This joint is sometimes referred to as the *basal joint* of the thumb. The CMC is the joint that allows you to move your thumb into your palm, a motion called *opposition*.



Several *ligaments* (bands of strong tissue) hold the joint together. These ligaments join to form the *joint capsule* of the CMC joint. The joint capsule is a watertight sac around the joint.

The joint surfaces are covered with a material called *articular cartilage*. This material is the slick, spongy covering that allows one side of a joint to slide against the other joint surface easily. When this material wears out, the joint develops a type of arthritis called *osteoarthritis* and becomes painful.



Rationale

What does the surgeon hope to achieve?

Arthritic joint surfaces can be a source of stiffness, pain, and swelling. The artificial joint is used to replace the damaged joint surfaces so

patients can do their activities with less pain. Unlike a fusion surgery that simply binds the joint together, arthroplasty can help take away pain while allowing the thumb joint to retain movement.



Preparation

How should I prepare for surgery?

The decision to proceed with surgery must be made jointly by you and your surgeon. You need to understand as much about the procedure as possible. If you have concerns or questions, you should talk to your surgeon.

Once you decide on surgery, you need to take several steps. Your surgeon may suggest a complete physical examination by your regular doctor. This exam helps ensure that you are in the best possible condition to undergo the operation.

A second purpose of the preoperative visit is to prepare you for your surgery. You'll begin learning some of the exercises you'll use during your recovery. And your therapist can help you anticipate any special needs or problems you might have at home, once you are released from the hospital.

On the day of your surgery, you will probably be admitted to the hospital early in the morning. You shouldn't eat or drink anything after midnight the night before.

Surgical Procedure

What happens during surgery?

Before we describe the procedure, let's look first at the artificial thumb joint itself.

The Artificial Thumb Joint

Surgeons have several ways to replace the thumb joint surfaces. One way is to attach the ends of a prosthesis implant into the bones of the thumb joint. A newer method uses a small, marble-shaped implant to form the new joint surfaces. This spherical implant works like a ball bearing to give the joint a smooth arc of movement.

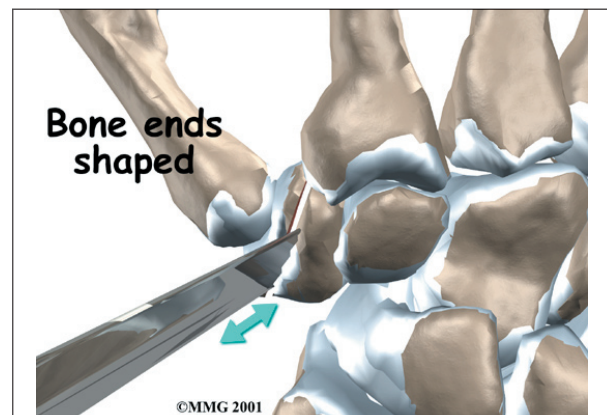
The Operation

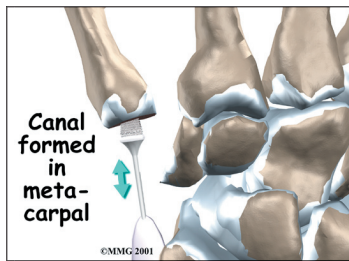
The procedure to put in the prosthesis implant takes about two hours to complete. The newer method using the ball implant takes 30 to 60 minutes. Surgery may be done using a *general anesthetic*, which puts you completely to sleep, or a *local anesthetic*, which numbs only the hand. With a local anesthetic you may be awake during the surgery, but you won't be able to see the surgery.

Once you have anesthesia, your surgeon will make sure the skin of your hand is free of infection by cleaning the skin with a germ-killing solution.

Prosthesis Implant

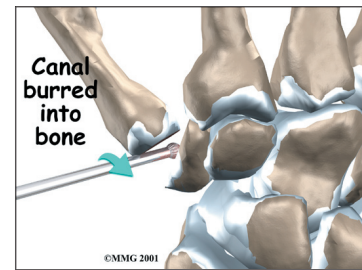
In this procedure, an incision is made across the base of the thumb. The soft tissues are spread apart with a retractor. Special care is taken not to damage the nearby nerves going to the thumb. The joint capsule is opened, exposing the CMC joint. The ends of the bones that form the CMC joint surfaces **are taken off**, forming flat surfaces.



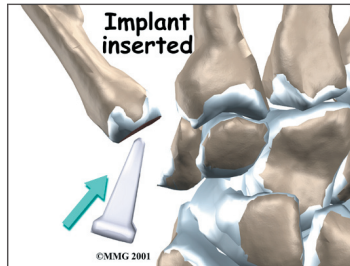


A burr (a small cutting tool) is used to **make a canal** into the bones that form the thumb joint. The surgeon

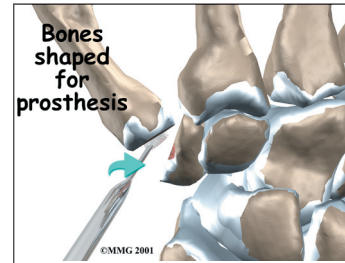
A burr is used to **make a small notch**, or canal, in the ends of the two bones. The surgeon **shapes the notch** so the



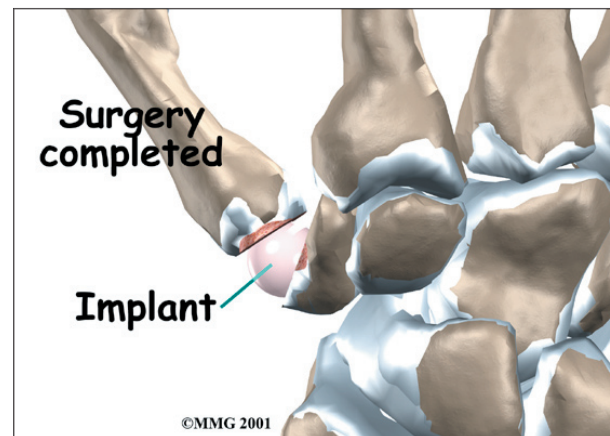
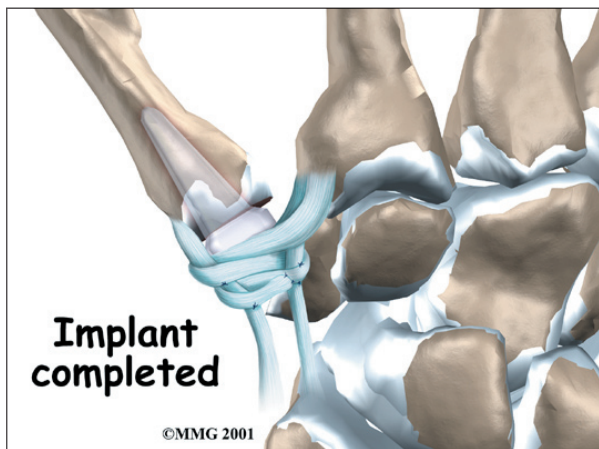
sizes the stem of the prosthesis to ensure a snug fit into the canal and **inserts it**. When the new joint is in place, the surgeon **wraps**



the joint with a strip of nearby tendon. This gives the new implant some added protection and stability. The skin is stitched together and a splint applied.



ball-shaped implant will fit snugly in the joint. The **implant** is placed between the ends of the shaped bones.



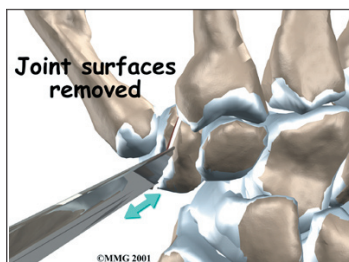
The soft tissues are sewn together, and the thumb is splinted and bandaged.

Complications

What might go wrong?

As with all major surgical procedures, complications can occur. This document doesn't provide a complete list of the possible complications, but it does highlight some of the most common problems. Some of the most common complications following artificial thumb joint replacement are

- anesthesia
- infection
- nerve damage
- prosthesis failure



The ends of the bones that form the **CMC joint surfaces are removed**, forming flat surfaces.

Anesthesia

Problems can arise when the anesthesia given during surgery causes a reaction with other drugs the patient is taking. In rare cases, a patient may have problems with the anesthesia itself. In addition, anesthesia can affect lung function because the lungs don't expand as well while a person is under anesthesia. Be sure to discuss the risks and your concerns with your anesthesiologist.

Infection

Any operation carries a small risk of infection. Replacing the CMC joint with an artificial joint is no different. You will probably be given antibiotics before the operation to reduce the risk of infection. If an infection occurs you will most likely need antibiotics to cure it. You may need additional operations to drain the infection if it involves the area around either implant. In these cases, the artificial joint will need to be removed. A second operation will probably be necessary to fuse the thumb or to perform an arthroplasty that does not require an artificial prosthesis.

Nerve Damage

All of the nerves and blood vessels that go to the thumb travel across, or near, the CMC joint. Since the operation is performed so close to these important structures, it is possible to injure either the nerves or the blood vessels during surgery. The result may be temporary if the nerves have been stretched by retractors holding them out of the way. It is uncommon to have permanent injury to either the nerves or the blood vessels, but it is possible.

Prosthesis Failure

One problem that occurs with artificial replacements is that they can fail. The older silicon-type prosthesis has been shown to break apart and fragment. Most types of prostheses can displace, or move out of the correct position, causing problems. Most of these

problems will require a second operation to remove the prosthesis and may need to be repaired with a procedure called an *excision arthroplasty*.

After Surgery

What happens after surgery?

After surgery, your thumb will be bandaged with a well-padded dressing and a splint for support. The splint will keep the thumb in a natural position during healing. Your surgeon will want to check your hand within five to seven days. Stitches will be removed after 10 to 14 days, though most of your stitches will be absorbed into your body. You may have some discomfort after surgery. You will be given pain medicine to control the discomfort.

You should keep your hand elevated above the level of your heart for several days to avoid swelling and throbbing. Keep it propped up on a stack of pillows when sleeping or sitting up.

Rehabilitation

What should I expect during my rehabilitation?

A physical or occupational therapist will direct your recovery program. The time it takes to rehabilitate depends on the type of procedure used. Recovery takes up to three months after replacement with a prosthesis implant. Patients wear an arm-length cast with the thumb pointing out for about three weeks after this type of joint replacement surgery.

Patients are able to return to normal activity within three to five weeks after having spherical implant surgery. Recovery is faster because the procedure doesn't require the surgeon to disturb the tendons near the joint. Range-of-motion exercises can start within one week after surgery using the ceramic ball.

The first few physical therapy treatments will focus on controlling the pain and swelling from surgery. Heat treatments may be used. Your therapist may also use gentle massage

and other hands-on treatments to ease muscle spasm and pain.

Then you'll begin gentle range-of-motion exercise. Strengthening exercises are used to give added stability around the thumb joint. You'll learn ways to grip and support items in order to do your tasks safely and with the least amount of stress on your thumb joint. As with any surgery, you need to avoid doing too much, too quickly.

Some of the exercises you'll do are designed get your hand and thumb working in ways that are similar to your work tasks and daily activities. Your therapist will help you find ways to

do your tasks that don't put too much stress on your thumb joint. Before your therapy sessions end, your therapist will teach you a number of ways to avoid future problems.

Your therapist's goal is to help you keep your pain under control, improve your strength and range of motion, and regain your fine motor abilities with your hand and thumb. When you are well under way, regular visits to your therapist's office will end. Your therapist will continue to be a resource, but you will be in charge of doing your exercises as part of an ongoing home program.

Notes