My name is Deepak Kapila, and I am an orthopaedic hand surgeon. I am also the Chairman of the Department of Surgery at Broward General Medical Center. Today’s procedure is going to be a release of a carpal tunnel, which is carried out for the condition of carpal tunnel syndrome. Carpal Tunnel Syndrome is a neuropathy where the median nerve gets compressed at the level of the wrist, giving rise to numbness, tingling, pain, sleepless nights and a progressive weakness of the hand affecting function of the hand. The surgery for carpal tunnel syndrome consists of a release of the transverse carpal ligament, and it involves making an incision in the palm of the hand and then releasing a ligament that is putting pressure on the median nerve.

This is the procedure of carpal tunnel syndrome release, release of the carpal tunnel, for the condition of carpal tunnel syndrome. At this point in time, we have the patient under anesthesia. We have the hand prepped. Great. And then, the hand is sitting on a hand table, and the hand has been positioned with this metallic equipment, piece of equipment, called the Lead Hand. For the procedure itself, I am going to utilize this particular crease in the palm of the hand, and by making the incision in the crease of the hand, it lends itself to faster healing and also it lends itself to eventually a scar that practically disappears and is not visible over a period of time. You can barely see a surgical scar. My incision is going to extend from about here to about here, and I am going to use the crease. In this area, I am going to go over a little bit like so, and then I am going to come back. I am using a skin marking pencil to outline my incision, and I will make a couple of cross hatches here to facilitate the closure when I close the skin.

I am now going to make my incision in the palm. I made the incision in the skin, and then, I am just going to spread the skin on the tissues. The fibers that are becoming visible now – knife -- are called the palmar aponeurosis. These are the shiny, white fibers of the palmar aponeurosis, and I am going to incise them now. This yellow structure that you see is a layer of fat in the area of the wrist. The white structure that you see now after having incised the aponeurosis is the transverse carpal ligament, and the ligament extends from about here and deep beneath this retractor.

I am now making an incision in the palmar aponeurosis and in the transverse carpal ligament. This is the ligament that forms the front of the carpal tunnel, and it’s the ligament that we incise to release the carpal canal. The carpal tunnel is made up of a series of bones on the back part of the tunnel, and in the front of the tunnel, it’s covered by this ligament, and then, through the tunnel pass the tendons and the nerves. So, right beneath this ligament is going to be the nerve. I’ve just gone through the ligament, and the yellow structure that you see beneath the ligament is the tissue now within the carpal canal. So, I’ve just incised the transverse carpal ligament in its entirety, but it’s important to get this portion of the transverse carpal ligament, which is kind of deep inside, and it’s actually beneath this bridge of skin right in here. So, I’ve incised this ligament all the way to about here, and then, there’s another layer of tissue that comes in from the forearm and it merges into the transverse carpal ligament, and it is important to make an incision in that tissue to completely release the nerve.

Now -- this is the nerve, the median nerve, this structure in here, this yellowish-white structure, and if you look at it very closely, it has small strands like telephone wires running on the surface, and it’s actually composed of multiple, small, very tiny nerves that is very much like a telephone cable with multiple small components to it. The white structure here is the tendon, and these are the structures that go to power the fingers in the front. The movement of the fingers is because of these tendons. The lining that I am removing right now is called, tenosynovium, and this is the lining of the tendons that will sometimes increase in size, giving rise to the increased pressure --. This is the lining of the tendons, and it’s called tenosynovium.
We will save this lining for pathology, for examination by the pathologist, but this lining is the incriminating structure in carpal tunnel syndrome. As it increases in size, the pressures within the carpal canal increase, and there is increased pressure on the nerve. We see that the movement of the fingers moves the tendon, and -- I don't whether you can visualize the movement of the tendons as I move the fingers, the tendons are gliding back and forth. But, I have a -- and if I was to put some traction on the tendon, we will see that the fingers will move, so this is what moves the fingers -- the pull on the tendons by the muscles is what brings the fingers down. 

And so, in terms of the carpal tunnel, the nerve has been released. The nerve is now free of any pressure. The ligament has been incised in its entirety. There is a very important branch of this nerve, it's called the motor branch. And this branch of the nerve supplies these muscles of the forearm, the base of the forearm. The motor branch supplies these muscles, these are called the muscles of the thenar eminence of the base of the thumb, and these muscles begin to atrophy and disappear with carpal tunnel syndrome. That branch of the nerve is right here -- of the motor branch, it may be difficult for you to see that well, but its right in here, that's where the motor branch is, and it supplies this.

That is the conclusion of the procedure, and at this point, now, I will release the tourniquet. As you notice, there was little or no bleeding during this procedure. That's because we have a tourniquet on the arm that stopped the supply of blood into the hand. The tourniquet has now come down, and we will get to see some bleeding. The hand now pinks up, and you can see that there is a little bit of bleeding from the skin edges, which we will use an electric cautery to control the bleeding.

So, this is the closure of the incision, and as you can see, the incision is in the crease of the palm, so that will [hese] up. It becomes part of the crease. The scar almost disappears. This procedure is known as the Open Carpal Tunnel Release because you open it, and you directly visualize the nerve and you can see the tendons, you can see any change or any anomaly to the normal anatomy, you can see if there is any tumor or any growth within the carpal tunnel.

There is another procedure to release the carpal tunnel, and that's known as the endoscopic carpal tunnel release. In that procedure, an incision is made in the forearm somewhere here, and a second incision is made here, and then through one incision you put a camera inside the carpal canal, and through the second incision you put a knife to cut that same transverse carpal ligament. Some of the disadvantages of the endoscopic procedure are that you don't get as good a visualization of the nerve and the structures within the carpal canal as with the open procedure. And so, there is a higher risk of injuring either the nerve or the tendon or the artery within the endoscopic procedure. The majority of carpal tunnels, in this country and around the world, are done by this open procedure.

Now, I am going to put a dressing on this. I've just cleaned up the wound. The dressing that we use is a thing called Xeroform gauze, which is an antiseptic non-adhesive gauze, so it does not stick to the scar when I take this dressing off when the patient comes back to see me. And that's the procedure.