

BroadcastMed | Corneal Suturing, Part 5-Suturing the Wound

LEO MAGUIRE: Welcome to part five of our series of short videos that discuss a curriculum for corneal suturing we've used to train our residents over the past 15 years. Hello again, I'm Leo McGuire, one of the corneal specialists here at Mayo Clinic. And today in this fifth video we'll teach how to tie the knot once you successfully pass the suture through both the corneal graft and the host.

Our goal is to obtain good tissue approximation, either too loose or too tight at the wound margin. We want that proper compression to occur as soon as the first throw of the knot is complete. The second and final throws will lock it in permanently. So how do we do that? As we pull this suture through the wound, we want the entire length of the suture to orient on the same plane as the suture that is passed through the cornea.

We pull the needle side of the suture through on that line until the opposite end of the suture reaches the opposite cornea limbus. Then we cut the suture about four millimeters from where it exits the host cornea. This maneuver gives the student the proper length of suture for tying.

Next, pull the suture through the wound until four millimeters of suture is left on the graft side of the wound. Next, we make what we call the T. We place the long portion of the suture on the host, and place it perpendicular to the short graft suture. The long suture should point towards the non-dominant hand. And the two ends should intersect, where the short suture enters the graft.

This T position will be the same for every suture you place around the graft perimeter. We'll spend a lot of time on this next slide, which shows the starting position for the two tying forceps. The straight forceps is held in the non-dominant hand. It should be oriented perpendicular to the graft surface, and grabs the end of the long suture at its tip. The suture should exit the straight tying forceps perpendicular to the forceps.

That perpendicular positioning keeps the first few millimeters of the nylon sutures straight, and makes it much easier to curl around the curve forceps later. The holder should be parallel to the long suture, and the tips of the sutures should be in a grab position just to the right of the short suture. We just gave you a lot of information. So let's study it in text form here.

To start to tie, move the straight tying forceps to the short suture, but keep the curved tire in position. Place three loops around the curve tire. Gently separate the tire tips and press the side of the inferior tip into the graft surface until the short suture slides over the lower tip. Then slide the curve forceps up the short suture until you reach the tip of the suture and grab there.

Then move the short suture towards the host side of the wound. Do it on a line parallel to the suture that is through the graft host interface, and pulled gently so there's still slack in the system. And now make a series of stop and go tugs that pull the same amount on the short and long suture. And between tugs, observe the wound edge to see if it is starting to compress. When the wound shows the compression you want, put mild tension on the long suture, put mild tension on the short suture, and move the short suture toward the graft parallel to the long suture.

Then pull hard on both the long and the short suture to lock the first row into place so it cannot tighten or loosen. Then lay the short suture on the corneal surface. When you let go of the short suture, keep the curve tire perpendicular to the short suture in a pickup position, place the straight tire perpendicular to the short suture in the same T position as you used for the first throw, loop, and grab the short suture at its tip. Then pull with the same tension on both the long and short suture. Equal tension on both the long and the short will make a circle of the loop, and will keep it over the first throw of the knot.

Pull gently on both ends until the knot is secure. Then make the T again to start the third throw, and go through the same steps you used to do the second throw. And the knot is complete. And now we will run through the slides quickly to make it an animation.

[MUSIC PLAYING]

I hope you've found this fifth segment on tying the suture are very helpful. And stay tuned for our next segment, where we basically integrate everything we've learned in the first five videos and put it all together. I'm Leo McGuire, and thank you for watching.