

A Simple and Cost-effective Method for Practicing Microsurgery

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Summary: Practicing microsurgery is usually expensive. This is because living animals, artificial vessels, and synthetic models are not always available. Here, I report a simple and cost-effective method to practice microsurgical techniques by using sterile gloves. (*Plast Reconstr Surg Glob Open* 2019;7:e2146; doi: 10.1097/GOX.0000000000002146; Published online 14 March 2019.)

Practicing microsurgical techniques is both time-consuming and expensive for inexperienced surgeons. In general, animal and synthetic models have been used for practicing microsurgery.¹⁻⁴ However, the extended use of these models is limited by cost, time, and ethical considerations. Sterile gloves have also been used.^{5,6} Here, I report a simple and cost-effective technique to practice microsurgical techniques by using sterile gloves in a novel way.

TECHNIQUE

First

Open a sterile gloves pouch. You require only one glove for this step (Fig. 1).

Second

Cut the glove parallel and close to the rolled cuff as much as you can (Fig. 2).

Third

Cut the rolled cuff at any place. Now, you have 2 ends that resemble artificial vessels (Figs. 3, 4) (see video, Supplemental Digital Content 1, which displays the technique step by step. This video is available in the "Related Videos" section of the Full-Text article at PRSGlobalOpen.com or available at <http://links.lww.com/PRSGO/B4>).

DISCUSSION

Microsurgery is considered a cornerstone in plastic surgery training. Continuous practice is needed to master the

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techniques involved in microsurgery. The use of animal and synthetic models for practicing techniques is well reported in the literature.¹⁻⁴ However, cost, time, and ethical considerations limit the extended use of animals in acquiring proficient microsurgical techniques. In addition, synthetic models are usually expensive and not widely available.

Crosby used sterile gloves to practice microsurgery since 1995.⁵ His technique includes cutting and suturing the gloves on itself to create a tube resembling the blood vessels.⁵

In my technique, there is no need to suture the gloves to create a tube, thus helping in saving time and effort.

Hsieh also published his techniques to practice microsurgery using sterile gloves in 2017.⁶ In his technique, the glove is transected at the tip and the phalangeal base, creating a finger latex tube. Then two strips of micropore tapes were applied over the middle portion of the finger latex tube on both the surfaces. This obliterated the inner space of the finger latex and synthetic vessels were



Fig. 1. Sterile glove.

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Fig. 2. Rolled cuff resembling a blood vessel after cutting the edge.

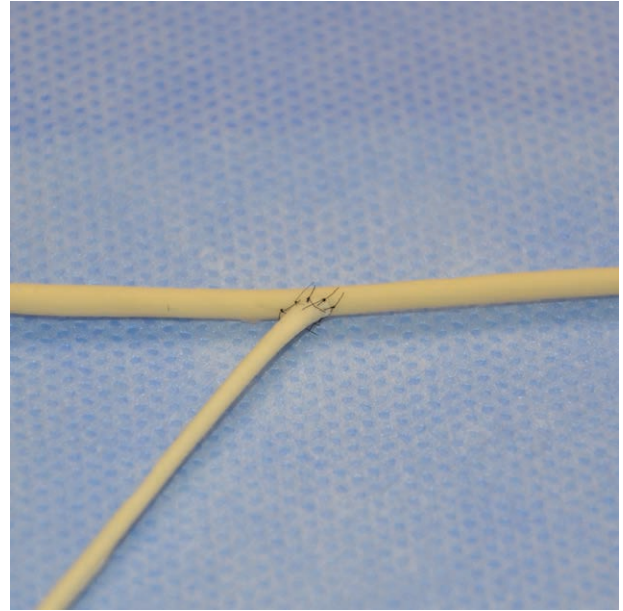


Fig. 4. End-to-side anastomosis.

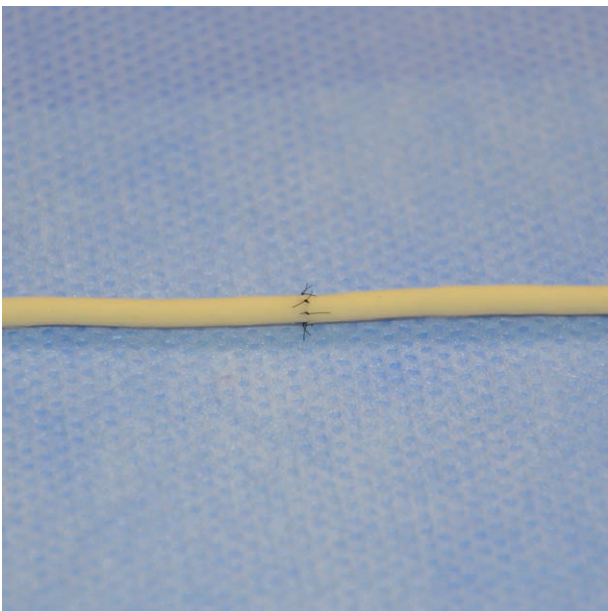


Fig. 3. End-to-end anastomosis.



Video Graphic 1. See video, Supplemental Digital Content 1, which displays the technique step by step. This video is available in the “Related Videos” section of the Full-Text article at PRSGlobalOpen.com or available at <http://links.lww.com/PRSGO/B4>.

created.⁶ In my technique, there is no need to use micro-pore tapes. This makes it less expensive.

However, the limitation of my technique is that not all gloves have rolled cuff. Also, the rolled cuff is usually thick and does not resemble the exact pliability of blood vessels. Thus, atraumatic handling and dissection of thin-walled vessels is difficult to practice. Moreover, the glove material is tough for the microneedle and can blunt the tip on frequent suturing. Also, the rolled cuff is usually not a laminated structure. Thus, testing the patency after performing an anastomosis is not possible.

This technique helps decrease the cost associated with the preparation of animals and synthetic models. However,

a significant cost is still associated with the acquisition of microsurgical instruments and sutures. Also, sterile gloves with rolled cuff might be difficult to find in an area that has a resource scarcity.

Due to the simplicity of this technique and its limitations, we suggest this technique for junior surgeons who are just starting to learn holding and suturing using micro-instruments. It can be used as a bridging exercise before actual vascular anastomoses.

This technique is an application of microsurgery simulation. It offers a new alternative to using live animals and synthetic materials. Unfortunately, the application of simulation in the microsurgery field lags behind in comparison with other specialties.⁷ Application of simulation in general surgery showed improved visuospatial awareness, which is essential in microsurgery.⁸ Therefore, wider

application of simulation could improve the outcomes in microsurgery.

In the future, the true outcome of my technique, along with feedback from trainees, needs to be investigated and evaluated vis-à-vis other existing techniques.

SUMMARY

Animal and synthetic models are used in training plastic surgeons on microsurgery. A simple and cost-effective method has been described here. This technique is one of the applications of microsurgery simulation. It offers an easy alternative.

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