Microsurgery Training: Does It Improve Surgical Skills?

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Microsurgery is defined as any type of surgery performed with assistance of microscope. It is not a specialty; rather, it is considered a surgical skill that has been used by different surgical specialties. The repair of small arteries, veins, lymphatics, and nerves is facilitated by the use of a surgical microscope or high-magnification loupes and microinstruments that enhances surgeons' visual capacity and improves their manual skills as well.

Performing microsurgery could be a difficult task that usually involves long operating hours and requires physical and surgical training, as well as emotional balance. Typically, an intensive individual laboratory course should be the starting point for gaining experience in microsurgery. It is recommended that a microsurgery training course should have a minimum duration of 1 week (40 hours total), although the authors recommend 2 to 3 months as the duration of the course. This course should include a personalized one-to-one format, which assures step-by-step teaching and the gaining of a perfect microsurgical technique. As a first step, the surgeon should be familiarized with the surgical microscope, microsurgical instruments, proper posture, length of the sessions, methods to avoid hand tremor, and microsuture technique. The success of the microsurgery training course largely depends on the surgeon's ability to use the instruments with fine precision and his/her coordination under the microscope.

Other options to improve microsurgical techniques include the use of microsurgery models. Models could be artificial, live, or a mixture of both.¹ It is recommended to start training with nonliving models such as latex gloves, silicone or silastic tubes, microsuture cardboards, anatomical models (►Fig. 1), or vascular simulators. After a level of comfort is reached and good results have been achieved

with nonliving models, live animal models such as chickens, rabbits, or rats (preferably Sprague-Dawley or Wistar strain) are recommended for training. The limitation is that although many models have been described for research and training on microsurgery, very few have been validated.²

Microvascular training curriculum has shown to improve microvascular surgical skills of residents after an 8-week course and may also improve macrosurgical techniques.^{3,4}

Accordingly, microsurgical courses should be recommended and encouraged by chief residents and program directors. Training will offer residents a better understanding of the texture, shape, and gentle handling of different tissues. It will also enhance surgical precision and highly refined manual dexterity, brain-eye-hand-foot coordination, three-dimensional visualization, ability to concentrate on details and in a very small surgical field, and management of microinstruments and sutures. Furthermore, it will increase the comprehension of vascular and nervous anatomy, and concepts of tissue transfer and reimplantation. In addition, surgeons trained on microsurgery learn how to be patient and to manage frustration. All the benefits of microsurgical training, including the acquisition of surgical skills, make it very useful for future surgical practice in any surgical specialty.

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Fig. 1 (A, B) Microvascular suture in anatomical models.

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