



Big Challenges in Training Young Vascular Surgeons

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“Happiness comes when you are doing something fun and meaningful.”

- Korean proverb-

The old idiom in regard to surgical training during my resident years was, “See one, do one, and teach one.” However, this sentiment does not seem to be true these days for several reasons. Because of the complexity and diversity of modern vascular surgery, it is no longer the right way to teach our young vascular surgeons. The ethical issues are also important. Although at some point, surgical training needs to be done during surgeries to hone the skills of novice surgeons, it should be allowed only when protecting the patients from unnecessary risk to ensure their safety and well-being. Another issue is the increasingly stringent restrictions on surgical residence working hours. It has led to decreasing amounts of experience in complex open or endovascular interventions and emergency surgeries.

The Korean Society for Vascular Surgery (KSVS) is facing big challenges in training young vascular surgeons because of the two recent changes in the resident training system. First, in 2017, the new law restricting the duty hours for residents to less than 80 hours per week was enforced. Second, since 2019, the training period in general surgery has been reduced from four to three years. The official training for the subspecialty of vascular surgery in Korea includes a three-year residency in general surgery and a two-year fellowship in vascular surgery. Many senior surgeons are worried about insufficient education in surgical skills and knowledge with this considerable reduction in training time.

During my sabbatical this past summer, I had a chance to visit several hospitals in Europe and Switzerland, and found that they had similar concerns. The restriction of maximum

working hours for residents is 48 hours in European Unions, and 50 hours in Switzerland. Work-life balance has now become a more important and valued objective than success in a certain specialty. Additionally, according to the hospital’s resources, the quality of training in both open and endovascular surgery is quite dissimilar and diverse. A new problem in the endovascular era is that young surgeons are not fully exposed to open vascular surgery.

Many vascular surgeons and great teachers have tried to work through these problems, and they believe the promising solution to be “simulator training.” Simulation is a promising avenue for both skills training and skills assessment. Simulation-based learning can help mitigate the ethical tension caused by traditional training during surgery by developing skills with simulator surgery while protecting patients from unnecessary risk. Various simulation models are now available including dry lab models, wet lab models, animal models, cadaver workshops, and high-fidelity simulators.

Drs. Aggarwal and Darzi [1] reported that medical education is undergoing a paradigm shift from the traditional experience-based model to a program that requires documentation of proficiency. The technical advances, increasing day surgeries, and the setting of quality-assurance targets have led to a striking reduction in training opportunities for young doctors. Recent advances in endovascular surgical skills and instruments make it difficult for a surgical resident to gain expertise within this new world.

The KSVS has hosted biannual open and endovascular workshops with cadaver models and endovascular simulators for vascular fellows, which received very positive responses from the trainees. However, the program needs to evolve in many aspects, including content, training devices, teaching techniques, assessments, and feedback. Robinson

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et al. [2] reported that a one and a half day intensive vascular surgical skills and simulation course with high-fidelity simulators and cadavers improved procedural knowledge concerning index open vascular and endovascular procedures. The course also improved self-rated procedural competence across all levels of training for open and endovascular procedures.

For open vascular surgery, Duschek et al. [3] reported that simulator training on pulsatile vascular models significantly improves surgical skills and the quality of carotid patch plasty. Although expensive, life-like models exactly simulate live surgery through pulsatile flow by machine pump. The technical points need to be mentioned for establishing and maintaining a successful skills training simulator program. I could acquire some insights for a successful training program through personal communications with Professor Jorg Schmidli in Bern and Professor Florian Dick in St. Gallen. They are long-term experts of simulator training at Vascular International-School for Vascular Surgery. Training the trainers about the training modules is important to teach the same disciplines without any confusion. Step-by-step instruction is the most effective way to teach the basic vascular surgical techniques than just letting the trainee run the simulators themselves. Prompt and schemed feedback systems are important for both the trainees and the mentors. Another issue is easy accessibility by the residents. For skills training, scheduled repeated

education is very important. The best option is to prepare the training center near the hospital with free entry at any time, especially after work duty or on weekends, which may not be available in other centers. Professor Nabil Chakfe in Strasbourg is developing an impressive self-learning simulator program, which includes free access to trainees at any time, self-learning exercise with endovascular simulators, recording of the procedures, and free online feedback by a mentor afterward. I hope this program will have great success as an optimal self-learning and feedback program.

In conclusion, in order to maintain the quality of open or endovascular services while protecting patients from unnecessary risk, the inclusion of a simulator training system should be an essential part of the training of a young vascular surgeon. International societies need to collaborate to make a cost-effective, evidence-based training module with various models of simulations.

CONFLICTS OF INTEREST

Seung-Kee Min has been the editor-in-chief of Vasc Specialist Int since 2019.

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