

EDUTORIAL

Open Vascular Surgery Education: Need for the Second Step

Two recently published articles in the *European Journal of Vascular and Endovascular Surgery* promote the need for improvement of open surgery skills and safe assessment of these skills in models before clinical training.^{1,2} However, no matter the improved armamentarium and availability of training models, dedicated fellowships in aortic or complex aortic surgery are needed. In certain patient subgroups with aortic pathology open repair is still recommended, while after a failed endovascular procedure successful open conversion is even more challenging.^{3,4}

Clearly, with further development and enhancement of endovascular technology, the experience in open aortic surgery among new vascular surgery fellows is decreasing. Also, the evidence from practical stations in the Fellow of the European Board of Vascular Surgery (FEBVS) examination is disturbing. A decade ago, the numbers of candidates failing the proximal aortic anastomosis section were low, to the point that it was not discriminatory; however, it is now the most common section that is failed among participants.⁵

Surgical training on simulators, as explained in OPERATE strategy¹ and relaunched by the European Society for Vascular Surgery (ESVS) Academy, provides a good first step into acquiring technical skills for open aortic surgery. Simulators are a way for surgeons to practice, but they are expensive and typically simulate only a single procedure. Another possibility is virtual reality that has revolutionised simulation by being more accessible, effective, and affordable. Its portability and ease of use allow practice of skills and techniques anytime, anywhere. However, the opportunity that probably provides the best training of all is exposure to live cases. This should be the second step of clinical training, as explained by Nayahangan *et al.*;¹ however, in the real world the low volume of open procedures makes this a huge challenge for Europeans as well as trainees worldwide. Based on this concept, 10 years ago we proposed a more intense exchange of residents and young vascular surgeons between high volume centres performing mostly endovascular or mostly open vascular surgery.^{5,6} Since then, 33 young vascular surgeons and residents from all corners of Europe (Belgium - 2; Italy - 13; Estonia - 1; North Macedonia - 3; Spain - 9; Ukraine - 1; Croatia - 1; United Kingdom - 1; Slovenia - 1; Sweden - 1) have had hands on education (one to six months) at our clinic. One of the last individuals (co-author RM) to receive this education

Table 1. Example of the logbook with the level of involvement of one vascular surgery resident from Italy who spent six months training in open surgery at the Clinic for Vascular and Endovascular Surgery, Belgrade, Serbia

Procedure	Operations (n = 218)
<i>Carotid endarterectomy</i>	62
Second assistant	45
First assistant	13
Performed supervised	4
<i>Elective open AAA repair</i>	61
Third assistant	38
Second assistant	16
First assistant	5
Performed supervised	2
<i>Ruptured open AAA repair</i>	20
Third assistant	16
Second assistant	4
<i>AFF bypass</i>	19
Third assistant	8
Second assistant	5
First assistant	4
Performed supervised	2
<i>Femorodistal bypass</i>	26
Second assistant	13
First assistant	10
Performed supervised	3
<i>Thrombo-embolctomy</i>	7
First assistant	3
Performed supervised	4
<i>Retroperitoneal tumour</i>	1
Second assistant	1
<i>Carotid aneurysm</i>	1
First assistant	1
<i>Carotid body tumour</i>	3
Second assistant	2
First assistant	1
<i>Popliteal aneurysm repair (medial and dorsal approach)</i>	10
Second assistant	5
First assistant	5
<i>Open TAAA repair</i>	3
Third assistant	3
<i>Visceral debranching + TEVAR</i>	3
Second assistant	1
First assistant	2
<i>Vascular trauma</i>	1
Second assistant	1
<i>Visceral artery aneurysm</i>	1
Second assistant	1

AAA = abdominal aortic aneurysm; AFF = aortobifemoral; TAAA = thoraco-abdominal aortic aneurysm; TEVAR = thoracic endovascular aortic repair.

before the COVID-19 crisis, spent 6 months at our clinic and assisted in more than 200 open procedures (see Table 1).

Recently based on this idea, a platform was developed by the European Vascular Surgeons in Training (EVST), and this can be found on the ESVS website (<https://www.esvs.org/career-opportunities/>). There is an interactive map from which each trainee can locate the vascular surgery centre of interest and find basic data regarding the procedures performed. The ESVS is contributing by connecting these hospitals and supporting this co-operation, but there remains a lot of work to be done.

The current situation with COVID-19 presents an additional challenge; however, we should not allow this to cause suspension of practical training for vascular surgery trainees. With the second wave of COVID-19, the situation becomes even more problematic. We emphasise that practical training is crucial to our specialty, and current digital tools (e.g. Vascupedia, MedTube) should complement, not substitute. It is hoped that, in a distinct future when the COVID-19 crisis is over, travel restrictions and other associated problems should not prevent us from continuing to be united for education.

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Lazar B. Davidovic

*School of Medicine, University of Belgrade, Belgrade, Serbia
Clinic for Vascular and Endovascular Surgery, Clinical Centre of Serbia,
Belgrade, Serbia*

Ricardo Milloro

2nd Division of Vascular Surgery, IRCCS Policlinico San Donato, Milan, Italy

Igor Koncar

*School of Medicine, University of Belgrade, Belgrade, Serbia
Clinic for Vascular and Endovascular Surgery, Clinical Centre of Serbia,
Belgrade, Serbia*

Petar Zlatanovic*

*Clinic for Vascular and Endovascular Surgery, Clinical Centre of Serbia,
Belgrade, Serbia*

*Corresponding author. Clinical Centre of Serbia, Clinic for Vascular and Endovascular Surgery, Koste Todorovica Street No 8, Belgrade, 11000, Serbia.

Email-address: petar91goldy@gmail.com (Petar Zlatanovic)