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The Transformation of Vascular Surgeons to Vascular Specialists: Policy or Necessity?

Efthimios D. Avgerinos, ED, MD, PhD, Ilias Dalainas, MD, PhD, and Christos Liapis, MD, PhD, FACS, FRCS

The wide spreading of vascular diseases along with the emergence of minimally invasive endovascular therapies and modern medical therapies is inevitably bringing many disciplines into play. Although by definition, vascular surgery is the clinical and scientific discipline concerned with the diagnosis, treatment, and prevention of vascular diseases, many more radiologists and a significant number of cardiologists become increasingly involved. The question of which specialist among those qualified should carry out medical treatment, open, and endovascular procedures is still suspended, and a professional competition is pronounced. This article discusses the necessity of a vascular specialist who guides the holistic management of vascular diseases: open surgery, endovascular intervention, and medical therapy. The different characteristics of those intending to offer vascular care, the training curricula, the workforce demands, and the role of vascular centers are analyzed to illustrate the keystone role of vascular surgeons who are currently transforming to vascular specialists.

Keywords: vascular surgery; endovascular; vascular specialist; vascular diseases; endovascular therapy

Introduction

Globally, the leading cause of death is cardiovascular disease. It is estimated that 17.5 million people died from cardiovascular disease in 2005, representing 30% of all global deaths. Of these deaths, 7.6 million were attributed to heart attacks and 5.7 million to stroke. Unless appropriate action is taken, by 2015, 20 million people will die from cardiovascular disease annually, with leading causes heart attacks and strokes.[1]

Vascular diseases are spreading out, and this is mainly attributed to the aging population (baby-boomers), the continuing epidemic of obesity, and the increasing incidence of diabetes. Today, in Europe 1 of 5 people[2] and in the United States 1 of 8 people[3] are older than 65 years. The rising demand for vascular interventions (medical, open, and endovascular) is more than ever visible, and it is not only demographics. The vascular workload is currently increasing because of the patient education, the intensive screening, and the advent of new minimal invasive technology.[4] It is estimated that by 2020 more than 1 000 000 vascular operations will be performed annually in Europe and United States, separately.[5,6] Our future patients will need—and deserve—expert and innovative care.

Interspecialty Conflicts—The Leading Role of Vascular Surgeons

During the last 50 years, vascular surgery has been through tremendous changes; however, nothing altered the way of vascular diseases being treated more than the introduction of endovascular therapy and the development of new antihypertensive,

From the Department of Vascular Surgery, University of Athens, Attikon University Hospital, Athens, Greece.

Address correspondence to: Efthimios D. Avgerinos, Department of Vascular Surgery, University of Athens, Attikon University Hospital, Athens, Greece; e-mail: efavgerinos@gmail.com.

antiplatelet, and antilipid medications. The vascular field is expanding inevitably bringing many disciplines into play, each one wanting to maintain its stake in the future. Many more radiologists and a significant number of cardiologists become increasingly involved in the treatment of vascular diseases. The question of which specialist among those qualified should carry out medical treatment, open, and endovascular procedures is still suspended. Cardiologists and interventional radiologists consider endovascular procedures as their task and intend to provide vascular services. Consequently, conflicts have already arisen and a professional competition is pronounced.[7]

Interventional radiology is a discipline with a procedural foundation rooted in diagnostic imaging. Interventional radiologists are those who have the most experience in navigating and maneuvering guidewires and catheters in the vascular territories, but they have the least clinical experience and definitely surgical skill. Furthermore, patient access is restrained. A patient suffering from angina would be referred to a cardiologist as well as a patient suffering from claudication to a vascular surgeon. Radiologists are unknown to the public as therapists.

Interventional cardiologists have the widest experience in coronary angioplasties and a good clinical experience on the ward. Their great advantage is the large pool of patients they handle. However, they have less familiarity with peripheral arterial disease and no surgical experience.

Vascular surgeons have the widest clinical experience and definitely the leading role in the operating theatre in both elective and emergency surgery. They are the most familiar with peripheral arterial disease and have an excellent concept of 3-dimensional anatomy. Their great advantage is their capability to resolve procedural complications, which has become a discriminating factor in favor of the surgeon's fundamental importance in the debate. Even more, during the last 20 years, as the new technologies began to proliferate and a new generation of vascular surgical leadership matured, vascular surgeons have turned their attention to new technologies and are nowadays familiar with catheter-based interventions. The availability of "kinder, gentler" less-invasive procedures has raised public awareness of vascular surgery.[8]

By definition, vascular surgery is the clinical and scientific discipline concerned with the diagnosis, treatment, and prevention of diseases affecting arteries, veins, and lymphatics.[9] Because specialists are not defined by their techniques (open, lap, or endo) but by the system or disease they treat, vascular diseases should be prevented, diagnosed, and treated by vascular specialists. According to the recent guidelines and recommendations of the Society for Vascular Surgery (SVS), a fully trained "vascular surgeon" should be considered a vascular specialist who performs traditional open surgery but who also performs endovascular interventions and is competent to treat vascular diseases with noninterventional and nonsurgical means.[10]

Fragmentation of vascular care does not serve efficiently the patients; it is confusing, unnecessarily repetitive, and costly.[11] Vascular specialties are challenged by therapeutic decisions, and the treatment is often biased toward the skills of the rendering position. A subspecialized vascular specialist could be biased in his decisions not only by his training and technical skills but also by the literature and media, by medical insurers, compensation, and medical reimbursement. A specialist offering 1 treatment option is a biased specialist. Patient care by other specialists not trained fully with the needed skills and knowledge of the natural history and alternative therapies for treating vascular disease is unacceptable. For the fully trained vascular surgeon, there is no conflict. A therapeutic decision is unbiased by the vascular specialist who covers the entire spectrum of the vascular discipline: medical treatment, open, and endovascular surgery, thus he has the ability to freely decide what is best for the patients.

Vascular surgeons collect the vast majority of specialist qualification and are the only specialists devoted completely to vascular care. Interventional radiologists spend on average 30% of their time for vascular care; cardiologists about 10%; and nephrologists, neurosurgeons, dermatologists, and neurointerventionalists even less.[12]

Under the prism of the multidimensional vascular discipline, the role of the vascular surgeon should be redefined to meet the current needs of the specialty: modern medical treatment, open, and endovascular surgery. Vascular specialists must expand their practices by adding new knowledge, new skills, and procedures to their armamentarium. Doing so will provide the means to diminish competition from other specialties.

Modern Training Curricula Guarantee the Efficiency of Vascular Surgeons

For many years, vascular surgery was a subspecialty of general surgery. Now that we achieved independence,

we do not really need to scatter our armamentarium in discrete forms of care (medical, open, and endovascular surgery). Vascular surgery has matured, and for a surgical specialty this means full development and integration of all new and sophisticated surgical, laparoscopic, and endovascular techniques while also integration of diagnostic tools and clinical refinement based on experience and evidence. Vascular specialists can expand their practices in a number of ways. The idea of a holistic vascular specialist, equipped to take responsibility for the complete management of patients with vascular diseases, can be fulfilled by an adequate reform of vascular training, which is currently carried out in most countries.[13] A 7-year training policy could be summarized as follows:

- Years 1 to 2: Introduction of the trainee into the basic surgical procedures and basic sciences. Training in general surgery.
- Years 3 to 6: Training in conventional vascular surgery and basic catheter skills (high volume) along with medical management, vascular laboratory, and duplex ultrasonography.
- Year 7: Advanced training in complex endovascular and open procedures.
- Use of simulators throughout training.

General Surgery Training

Modern vascular curricula incorporate reduced training in general surgery.[13,14] In countries with independent vascular surgery curricula, there is a trend of reducing training time in general surgery, to get more specialized training in vascular surgery.[13,15] The modern vascular specialist certainly needs less general surgery preparation and more dedicated vascular training.

Open and Endovascular Surgery Training

Concerning the core vascular training, curricula in countries with vascular surgery as an independent specialty incorporate 4 years of vascular surgery training.[13] Standard and complex endovascular procedures are nowadays routine in vascular practice. A high volume of open and endovascular procedures during independent vascular surgery training could also guarantee efficiency for the "developing" vascular surgeon. Subsequently, this curriculum reform shortens the "catheter-based" distance between surgeons and radiologists.

Medical Treatment

Approximately 90% of vascular patients need only medical treatment.[16] Thus, it is becoming more imperative that vascular surgeons remain informed about research initiatives related to medication. Vascular trainees must receive instruction in the pharmacology of drugs used in the treatment of vascular pathology and must understand the importance of a comprehensive approach toward treatment of individuals with cardiovascular disease.[17] Currently, medical treatment confines to the management of risk factors and prescription of antiplatelets and statins, a task that seems easy to handle, when sufficiently trained. But even more, vascular training does not end after the 5- or 7-year curriculum. It is a lifelong process so that advanced skills and knowledge will continue to improve throughout the vascular career of the vascular specialist.

Duplex Ultrasonography

Duplex scanning is essential for the diagnosis of vascular diseases, and it is routinely performed within modern vascular surgery units. It aids the surgeon to define a more precise therapeutic strategy offering useful information regarding atherosclerotic plaque quality in the carotid disease, dynamic-angiographic mapping in patient candidates for limb revascularization, and it can be used for quality control after endarterectomy or bypass. Moreover, it is used with increasing frequency in endovascular procedures in terms of intravascular ultrasonography, and radiofrequency saphenous vein amblation or laser saphenous treatment. Vascular specialists should receive proper training and should be licensed to perform vascular duplex ultrasonography.

Vascular Workforce

To meet the future needs, the US population demands by 2030, 160 new vascular surgeons per year, but only 120 are currently graduating annually.[18-20] However, recent curriculum revisions (5-year training programs) have been designed to recruit medical workforce toward this direction, and it is estimated that the workload demands soon will

be covered by vascular surgeons.[20,21] The US Society for Vascular Surgery has recently developed an infrastructure to facilitate vascular fellowships and linking of students/residents to the SVS members.[12] Similar strategies to expand the applicant pool for vascular surgery are taken up by the European Society of Vascular Surgery.

The Role of Vascular Centers

The necessity for Vascular Centers defined as "dedicated centre where patients with vascular disease can receive high quality medical, endovascular, and open surgical treatment by appropriate experts working as a co-ordinated team" emerged by the rising demand of vascular services, along with the broadening of the vascular field in imaging, medical therapy, and endovascular technology.

The US and recent European efforts to set up multidisciplinary vascular centers suggest that multidisciplinary vascular centers can be beneficial for the patients as a setting for global vascular prevention, diagnosis, and treatment.[22-24]

It is important that superspecialized vascular centers offering expertise in various fields of vascular practice are settled to deal with the challenging vascular cases that cannot be managed in everyday practice. In such cases, specialists of all disciplines are needed to collaborate for the optimal patient outcome, under the vascular specialist's guidance.

Conclusions

In conclusion, vascular surgery needs to revitalize itself and redefine the role of the vascular surgeon in the comprehensive management of vascular diseases. We must retrain our existing vascular surgery workforce and reform the training curriculum to cover the full spectrum of vascular diseases. Independent curricula can and should guarantee proficiency in all aspects of vascular practice by transforming the vascular surgeon to vascular specialist. Expanding the specialty might not happen overnight, but the complete vascular surgeon needs to stay abreast of the exciting evolution in all fields of vascular care. The vascular surgeon should be a "center of excellence of one," someone who is able to operate, dilate, and medicate.[25] Vascular surgeons need to recapture their role as leaders in vascular care.

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