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The times they are a-changing'

T. Hölzenbein

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Introduction

Repair of problems associated to blood vessels has traditionally been a domain of surgeons. Resection of malfunctioning veins, restoring continuity of blocked or injured arteries and veins, or preventing lethal rupture of an aneurysm in the beginning of vascular repair was all done exclusively by open surgical means. Even endovascular surgery has been invented and—at least in the very beginning—been performed by surgeons as well and is as old as open surgery. Short-term survival has always been better for endovascular procedures, but they have failed to demonstrate long-term durability, even with repeat interventions. In the beginning of widespread use of vascular procedures, open surgery dominated the field. The main concern was durability. Patients with a short life expectancy deemed to be no candidates for surgery, because the procedures were lengthy and stressful to the patients, with a high morbidity and mortality. Good long-term results were necessary.

Over time, physicians' education, public awareness and patients' expectations created an increasing demand for this limb- and life-saving procedure. Soon the drawbacks of this exclusively surgical approach became evident. Patients with atherosclerotic vascular disease—those are the ones mostly in need for vascular repair—usually present with a variety of comorbid conditions and therefore need careful planning and guidance through their treatment to avoid loss of limb, consciousness or even life. Cardiac disease, cerebrovascular disease and renal dysfunction necessitate sensitive long-term management, careful indication and judicious perioperative monitoring and good clinical judgement to avoid neurological deficits, cardiac events and loss of life. Ways to treat these patients by means of lesser invasiveness were needed desperately. Now, main intention was to shorten admission to hospital and to avoid lengthy preoperative risk stratification and patient preparation. Balloons, stents and stent grafts proved to be methods curbing these problems, at least for short periods. Again, long-term durability was traded for rapid success. But also patients were older, even more frail, and some drawbacks could be accepted in terms of durability.

Yet, access to endovascular management has changed too. Initially, surgeons performed endovascular procedures in a blind fashion with little or no imaging at all. With most of the now complex treatments, needing x-ray-based guidance and an increasing work load in surgery, surgeons were happy to divert endovascular treatment to specialties with access to x-ray equipment. Radiology, cardiology and other specialities gained access to vascular intervention. After a decade of agony, surgeons regained interest in endovascular procedures. There were many reasons for that. First of all, vascular interventionists focused on the intervention only, leaving preoperative evaluation and postoperative follow-up to the clinical specialists. Admission, work-up, informed consent and in many cases complication management was not in their agenda. On the other hand clinical specialists had no influence on the planning of the procedure, its execution, choice of wires, balloons and stents. There are institutions where the patients are transferred to the ward after the intervention with the access sheath in place and no information about the procedure. This created tension among the different specialities and the advocates for a reunion of endovascular and open surgery increased. The discussion has started in the mid 1990s and continues to this day. But one must never forget that a vast majority of arterial vascular patients are still managed conservatively, and will never undergo

T. Hölzenbein, MD, PhD (✉)
Department of Vascular and Endovascular Surgery, PMU Salzburg,
Müllner Hauptstraße 48,
5020 Salzburg, Austria
e-mail: t.hoelzenbein@salk.at

an intervention, if managed carefully by well-trained physicians.

Future challenges

There are hints that the work of vascular surgeons will change in the future from exclusively open surgery to endovascular treatment and combined management. The gap between open and endovascular surgery is now slowly closing again. The future management of vascular disease will be a "vascular specialist", with knowledge in different diagnostic modalities and skills in ultrasound, percutaneous access for diagnostic procedures as well as skills in open, endovascular and conservative management of vascular disease. Bedsides ultrasound imaging, ultrasound-guided interventions will play an important role in future vascular interventions. The decision whether to intervene in an open, endovascular or combined fashion should be left to one specialist. Of course there will be subspecialisation within the field, and there may be more open surgically oriented specialists as well as endovascular specialists. Yet, it will be necessary to join this workforce to allow for a broader personal spectrum of each individual, a better training of future vascular specialists and better patient care. Nonetheless, in a time of dwindling financial resources and a reduced number of physicians, this will only be possible with considerable savings.

Surgery used to be a male-dominated speciality, due to strenuous work hours and, especially for vascular surgery, long training periods. Female vascular surgeons were rare encounters at the departments or at meetings. This has changed just recently, during the last couple of years. A higher proportion of female medical students also leads to a higher number of female surgeons. We have to accommodate for this change and include maternity leave and nursing leave into our surgical dictionary.

So, it is time for a change.

In this issue of *European Surgery*, dedicated to the late Austrian leader of early Vascular Surgery, Prof. Georg Kretschmer, a variety of traditional and new issues are discussed. Manuela Aspalter discusses the reason, why there have been so few female vascular surgeons in Austria and the neighbouring German speaking countries. This is a hot topic and we will see our male dominance being replaced by gender equality in the future. Training in the future will be affected by the fact that there will be no trained general or cardiac surgeons additionally training in vascular surgery but the new generation will train from the very beginning after medical school. Peter Metzger shows that even carotid endarterectomy can be done safely by trainees under supervision from the very beginning of their training. This has been unheard of, because carotid endarterectomy was always regarded as a high-end procedure. This will gain further importance, as our future vascular trainees will start vascular surgery right after medical school and not after 6 years of surgical training. It is necessary to adopt our training algorithms and strategies to this fact and allow for training under tight supervision to support surgical development and experience, yet caring simultaneously for the safety of our patients. Medical management and recognition of pathophysiologic pathways play an increasingly important role in patients requiring multiple drugs for their disease management. Hypertension has always been a problem in vascular surgery patients, especially in patients undergoing revascularisation of the brain. The carotid body seems to play an important role in the maintenance of haemodynamic stability in the postoperative period, thus preventing ischaemic or haemorrhagic brain infarcts. Klaus Linni showed that not only the carotid body, but also the sinus nerve is involved in this regulation and it may be necessary to differentiate between patients in whom the carotid body, the nerve, both or none of the above are resected during the procedure. Endovascular surgery by surgeons is a hot topic discussed in medical societies all over the world. In Salzburg, vascular surgeons have traditionally been involved with endovascular surgery, having been among the first to perform balloon dilatations in this country. Since 1985, endovascular therapy of all kind is offered by the Department of Vascular Surgery of the St. Johann Hospital, now Department of Vascular and Endovascular Surgery of the Paracelsus Medical University. This is an especially hot topic in supra-aortic branch lesion management. The review of Klaus Linni is based on a thorough literature review and his own results published in peer-reviewed papers. All endovascular procedures in papers published from our department have been performed by surgeons. Therefore, the conclusions of this paper are especially interesting for those who are on the brink of organising endovascular management with their own surgical departments or have to defend their already started endovascular activities. Finally, there is a paper about one of the strongholds of vascular surgery: distal bypass. It has been one of the main procedures of Georg Kretschmer and a lot of his research was devoted to this field of vascular surgery. Doing bypass correctly has always been difficult. Furthermore, doing bypass with vein graft, especially in difficult situations, is an art. It is my personal experience that one can perform all autologous vein bypass in the legs in more than 95 % of the procedures, including revisions and redo bypass surgery. A variety of well-known and published strategies have to be adopted in order to make this concept work. They have been summarised in this review. They have been scrutinised in our department for years, modified and discarded if not effective. This paper is the result of our experience over the last 20 years.

Vascular surgery is an exciting speciality of our surgical profession and it has a bright future. We have to foster the traditional methods, which are performing well, and have to learn the endovascular techniques again. It is time to adapt to the changes in our society and meet

the demands of our ageing population, demanding more and more vascular interventions to prevent stroke, limb loss, aneurysm rupture and organ ischaemia, and adapt for extended survival. It is time for a change, meet the challenges of the future …

Come gather 'round people
Wherever you roam
And admit that the waters
Around you have grown
And accept it that soon
You'll be drenched to the bone.
If your time to you
Is worth savin'
Then you better start swimmin'
Or you'll sink like a stone
For the times they are a-changin'.

From: The Times They Are a-Changin', Bob Dylan, 1964

Conflict of interest
The author declares that there is no conflict of interest.