The power of surgery

Martin Grabenwöger*

Department of Cardiovascular Surgery, Hospital Hietzing, Vienna, Austria

* Corresponding author. Department of Cardiovascular Surgery, Hospital Hietzing, Wolkersbergenstrasse 1, 1130 Vienna, Austria. Tel: +43-1-801102390; e-mail: martin.grabenwoeger@wienkav.at (M. Grabenwöger).

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Our profession of cardiovascular and thoracic surgery is more and more challenged by the rapid development and increasing application of interventional techniques. At numerous meetings, we are confronted with grandiose announcements proclaimed by cardiologists: ‘Currently we treat almost all coronary patients, in the future we will also take over the cardiac valve business’. It is quite natural that, within the surgical community, these developments are accompanied by a certain degree of anxiety and restlessness. The existing system is pressurized by the implemented changes and fear arises. Man is a creature of habit and it is difficult to cope with our current fast-moving times, in which nothing will be the same as it is today.

Many dynamic developments are based on technical innovations and do not only concern us but also several other branches. I will give three examples, which are representative of numerous events. The fact that banking operations are being done to an increasing extent online resulted in closing of a growing number of branch offices. Traditional media and newspaper publishers are having a hard time in the era of Internet, Google and Co. News is no longer purchased at newsstands, but is read on the iPad. In the USA, radiologists are feeling the pressure of the implemented changes and technical innovations. At some hospitals in India and Australia, the evaluation of CT scans is delegated to doctors.

Having all these radical changes in mind, I am not concerned. I am deeply convinced of the fact that the fully trained cardiovascular surgeon will always be able to meet the requirements of our constantly changing times, under one condition that we are willing to experience change and are open for new information and skills.

Aristotle said: ‘I can’t change the direction of the wind, but I can adjust my sails to always reach my destination’.

The fact that surgeons have always done so is demonstrated in the history of surgery. Looking into the past makes us aware of the enormous changes and developments that lie behind us. Let us take a look at our workplace and compare an operating theatre today with one in the early days (Figs 1 and 2). Illumination, hygiene, clothing and devices are worlds apart and we have not spoken about the actual work of a surgeon yet. The heart was regarded as a taboo zone for a long time. While brain operations were being performed, the heart was still avoided. Interventions on the motor of life were considered presumptuous.

At the beginning of the 19th century, the surgeon’s principal task was to amputate arms and legs. At the time, of course, these operations were performed without anaesthesia. Every effort was made to complete the procedure as soon as possible so that the patient would be exposed to the intolerable pain for a minimum period of time. An almost incredible story is handed down from those times:

A surgeon, who was known for working fast, inadvertently cut-off the finger of one of his assistants while performing an amputation. The patient and the assistant subsequently died of sepsis. One of the observers was overwhelmed by the drama of the operation. He experienced a heart attack and also died. This is the only operation I know of with a mortality rate of 300%.

However, the surgeons of earlier generations are known not only for their unimaginable working conditions, unconditional swiftness and peculiar events. They are also known for their innovative drive, courage and joy of discovery. One of the most well-known persons among these medical adventurers was the German surgeon Werner Forßmann. As a 25-year-old assistant in 1929, he proved—on his own body—that one can insert a long, flexible catheter from the crook of the arm into the heart. Forßmann had to perform the procedure in secret because his seniors had forbidden the experiment. With this discovery, Forßmann laid the foundations of modern cardiac medicine. Cardiac defects and many heart diseases could only be diagnosed with the catheter. This achievement was not appreciated at all at the time. His contemporaries reacted, at best, with disinterest. Some reacted with mockery or disapproval. It was 10 years later that two American scientists transformed his pioneering achievement into a breakthrough. A further 17 years later, Werner Forßmann received the Nobel prize for medicine in 1956.

The history of surgery is clearly one of persistent change. Charles Darwin stated: ‘It is not the strongest of the species that survive, nor the most intelligent, but the one most responsive to change’.

Surgeons of the past were pioneers with a willingness to broach new pathways. Time and again, they demonstrated their courage and willingness to take risks. If this had not been the case, we...
would not have the drastically different basic conditions, techniques and options we have today to help our patients. We would have no anaesthesia or transplantations, and no artificial heart. We must now continue to walk this path and consistently look for new options to improve the treatment of our patients and reduce their trauma.

It is of utmost importance to have visions like the chemical engineer Paul Thomas from the University of Manchester. For several years now, he has been working on the development of a special respiratory mask that will identify pathological changes in the patient’s respiratory air and show tumours in the lung. With no imaging tool and no blood test whatsoever. Simply by having the patient breathe into the mask. The underlying technology is derived from detectors used to trace weapons.

Obviously, the history of surgery is not just one of advancement, positive changes and success. It is also a history of complications, errors and failures. It appears that success is inevitably accompanied by failure. These failures should not be perceived at the personal level; if we learn from our own errors so that we evolve further and become better and not be stagnant at our level of science, then new achievements can arise out of errors and failed attempts. We are constantly confronted with complications in our work, with failures and losses and in consequence with death. Death is so terrifying for us, because it signifies loss of control, which is of enormous significance in our lives. Our mind tries to arrange the world in a logical way and we are always looking for explanations that will help us to predict life and control it. However, control—like many other things in life—is a fragile illusion. Coping with death is one of the most difficult tasks imposed on us by life. In essence, we all have to handle this task alone and the only support we get in facing death is derived from our own selves.

How to deal with the fact of defeat is perfectly demonstrated by other professions. At the Winter Olympics in Nagano in Japan in 1998, the Austrian skiing champion Hermann Meier experienced a terrible fall in the downhill run. He stood up after this dramatic accident and took part in the next ski races. Hermann Meier competed in the giant slalom and the super-G not the following season or year, but during the following days after his terrible fall. In both competitions, he won a gold medal and became a 2-fold Olympic champion. This absolutely incredible achievement in terms of sports and mental strength catapulted Hermann Meier to incredible heights in the world of skiing. His ability to fall and stand up again, try again and be successful was a source of inspiration for people all over the world.

Meier’s story is reminiscent of Arnold Schwarzenegger’s legendary statement ‘I’ll be back’. Arnie returned to the movie theatres last summer in his famed role as Terminator and said something true in an interview about this film:

I can stand up after I’ve fallen. Losers remain lying on the ground. Winners stand up. They brush off the dust and walk on. They don’t try to make excuses for themselves. They are the first to admit their mistake. And learn from it.

When we thoracic and cardiovascular surgeons return to the operating room after a failure, we do not have television cameras and millions of viewers around us. We have no mental coach at our side and we have no Olympic gold medal or international film prize waiting for us. But we still bring forth the mental strength demanded of us. That is what makes our profession very special. That is what makes us different from other human beings, and even different from other medical specialists. Coping with defeat, and especially preventing defeat, requires two things: training of outstanding quality and intensive further training.

In his bestseller ’The Outliers’, the Canadian author Malcolm Gladwell addresses the following question: what makes a person achieve exceptional heights? In a variety of sectors, he investigates the factor or factors that make people achieve exceptional success. The core of his answer is: 10 000 h of training. Only with 10 000 h of practice, practice and more practice—says Gladwell—is exceptional success achieved. Now you may say, ‘Yes, but what about Mozart? He was exceptional even as a child. No matter how much or how little he practiced. So the theory must have a flaw’. But then—although Mozart is known to have been a child prodigy and a boy wonder, he actually wrote his first masterpiece at the age of 21 years. It was the piano concert no. 9, number 271 in Köchel’s catalogue. Ten thousand hours of practice are necessary to bring forth a peak performance. That is 5 h per day over a period of five and a half years.

If our young colleagues due to the European Working Time restrictions work for no more than 48 h a week, which is a much discussed issue in current times, then I ask myself: How are they supposed to achieve their training? How can they bring forth their peak performance? Working time restrictions in the present form obstruct the achievements, success and work quality of thoracic and cardiovascular surgeons and it is our duty to point out this issue.

However, a surgeon’s strength is not based on training alone; it is based on very specific qualities. We have spoken about mental strength, about flexibility and innovative strength, which became
evident very early in the history of surgery. Furthermore, surgeons are persistent and tough. Think for a moment of the repair of the thoraco-abdominal aorta. Three-dimensional imaginative power is of utmost importance if reconstruction techniques of the aortic root or mitral valve are applied. Minimally invasive interventions are impossible without dexterity and precise craftsmanship. I think we have good reason to be proud of these qualities and the performance we bring forth, based on these qualities. We can be confident about our strength and need not worry about alleged threats or impending hardships.

I want to tell you about the term ‘Kaizen’ from Japanese culture. Kai means ‘change’ and Zen means ‘for the better’. Kaizen is not a specific method or project, it is a mental attitude and a way of thinking, which I am very fond of. Let us view the evolution of our profession as Kaizen, as a change for the better, for the benefit of our patients.

Summarizing all the characteristics of a fully trained thoracic and cardiovascular surgeon, I am convinced that our profession will walk towards a successful future in a balanced multidisciplinary team together with our medical partners. This partnership has the potential to embrace the challenge of the future.

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REFERENCE