Editorial

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Laparoscopic surgery in Europe

Development and education: a German perspective

Laparoscopy was first described in Europe and subsequently developed by a number of European physicians working in a variety of different specialities. Although it was only reintroduced 10 years ago as a surgical approach, laparoscopy was described as early as 100 years ago by the Dresden surgeon Georg Kelling (1866–1945) as a so-called *Kölioskopie,* which he performed experimentally in dogs and first reported in 1901 [5]. Working independently of Kelling, Hans Christian Jacobaeus (1879–1937), a Swedish internist from Stockholm, reported on his experience with *laparothoracoscopy* in humans in 1910 [3].

Over the following decades, the method was further enhanced by technical and instrumental innovations, introduced primarily by nonsurgeons such as the German internist Heinz Kalk of Berlin [4]. Kalk introduced the forward-viewing oblique (135°) optical system and the double-trocar technique. This ingenious invention was largely responsible for the widespread acceptance and growth of laparoscopy in Europe [7]. Kurt Semm, a gynecologist from Kiel, Germany, who advocated the so-called *Pelviskopie,* developed a number of different techniques that ultimately resulted in the first laparoscopic appendectomy in 1982 [9].

At this point in time, the vast majority of German surgeons rejected this new technique and argued against it. Even the first description of laparoscopic cholecystectomy in 1985 via the so-called *Galloscope* by Erich Mühe, a professor of surgery in Böblingen, Germany, did not help to speed the development of modern laparoscopic surgery [6]. The Galloscope had side-viewing optics, an instrumentation channel with valves, a light conductor, and a duct for creating the pneumoperitoneum. However, this innovative technique was not accepted. Mühe was largely ignored and faced severe criticism from the German medical establishment. Laparoscopy did not achieve medical respectability until 1987, when Philippe Mouret of Lyon, France, performed the first videoendoscopic cholecystectomy.

Reports of successful use of laparoscopy in larger clinical studies performed simultaneously in France and the United States, led to the rapid development of minimally invasive surgery (MIS) beginning in 1989 in Germany as well as the rest of Western Europe. However, there were large regional differences. In Germany, the acceptance of this novel surgical procedure was poor at first, especially at most of the large university hospitals. Instead, MIS in Germany found its advocates among a number of enthusiastic surgeons working in community hospitals. The work of these surgeons was questioned by university surgeons and came under considerable criticism. The rapid — perhaps at times too rapid—development of MIS resulted in part from the interests of industry in these new techniques and products necessary for this. But most of all it was due to the increasing number of patients who requested minimally invasive surgery. This is one of the reasons why patients who were treated during the early days of MIS had to pay the price of the higher risks and novel complications associated with this new technique. Indeed, reports of increasing numbers of complications led to severe public criticism.

As the early years of minimally invasive surgery and the experience gained with this novel procedure have shown, the traditional system of surgical education was not adequate to introduce such a novel and demanding technique within a short period of time. Novel techniques of teaching and learning had to be developed—e.g., training living animals or virtual reality.

However, in Germany, very few hospitals have the necessary facilities to set up their own training programs. Therefore, it was extremely helpful that medical companies opened or supported training centers where courses dealing with various aspects of laparoscopic surgery could be given. It was of upmost importance that the courses were planned and supervised by experienced independent surgeons. The companies provided the instruments and facilities and organized the courses and workshops. Thus, the industry lent financial and practical support to the introduction of these new techniques and to continuing surgical education. However, these commercial companies were accused of emphasizing their own products and techniques to promote their own financial interests, even though the superiority of these techniques over established methods had not yet been proven except for a few indications. Premature published data and the euphoric reports of these methods in the media increased the expectations of patients for these new techniques. This over optimistic reaction could have been an additional driving force for surgeons to adopt these new techniques, even if they were not completely convinced of their advantages.

In time, these initial problems were corrected. The

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medical industry now offers well-organized courses at training centers under the control and guidance of surgical organizations, such as the German Surgical Society and the European Association for Endoscopic Surgery and other Interventional Techniques (E.A.E.S). The subjects of the classes are under continual review and depend on the suggestions of independent consultants, thus guaranteeing that the students are kept abreast of current practical knowledge. This system also allows an exchange of knowledge between the medical industry (producers) and clinical practitioners (users), which can be very effective both in improving existing products and developing new technologies.

The legal preconditions are excellent in Europe. For example, in Germany, there are no legal obstacles that prevent the clinical introduction of new technologies and methods. Our judicial system is quite open to new developments. German law allows physicians to choose their method of treatment freely as long as they have the patient's consent. It does not matter whether a given method is part of the traditional school of medicine or originates from alternative medical areas. However, the law is based on the assumption physicians will principally chose the treatment method that they personally believe to be the most effective. They are not obliged to refer the patient to another colleague if a new alternative method exists that they have not yet mastered. However, the risk and the success rate of the established method must be comparable. Surgeons who introduce a new technology or new techniques such as laparoscopic procedures in their department are strictly regulated in their professional behavior and liability. This means that the surgeon and his or her team must guarantee a high operative standard, and they must be very competent in the treatment of the disease. The means of acquiring sufficient theoretical and practical knowledge for novel techniques are the surgeon's own responsibility. Although certified courses can be helpful, they are not necessarily required to perform novel surgical procedures. In cases of medical malpractice, the physician has to prove that he or she has received sufficient education and training and also has the necessary manual skills to perform the technique. It is more and more common for judges and juries as well as appointed medical experts to ask for proof of participation in speciality certified training classes.

As in many other European countries, as early as 1993 [1], the German Surgical Society adopted basic regulations recommending that laparoscopic skills should be acquired during an intensive 5-day training course consisting of a basic and an advanced section. The training includes acquired clinical procedures at selected medical training hospitals. A number of specially qualified surgical centers are now available for this surgical training. The suggestions of the German Surgical Society are being reviewed by the recently founded Surgical Working Group for Minimally Invasive Surgery (C.A.M.I.C.). Thus, in Europe, guidelines for the training and assessment of competence already exist and are continuously updated [2]. Online recommendations will be added based on updated E.A.E.S. consensus development conferences [8]. Our own institution belongs to the group of medical training hospitals and has already trained >60 residents in minimally invasive surgery. We also offer a two-step training program that has to be passed by every resident. In the first part of the 5-day training period, which includes a basic theoretical introduction, at least 10 laparoscopic procedures must be attended, followed by intensive training on models as well as isolated animal organs. Special attention is paid to the prevention, detection, and management of complications. During the second part, the trainee must assist in 20 cholecystectomies before performing 10 under the supervision of an experienced laparoscopic surgeon. Following the training program, the surgeon is then allowed to perform laparoscopic cholecystectomies, but no other laparoscopic procedures.

Surgeons who want to introduce new advanced laparoscopic procedures in their departments should also attend special training classes and visit other hospitals to optimize their practical skills. These advanced procedures include the surgical intervention at the gastroesophageal junction and the diaphragm, as well as the hernioplasty, the splenectomy, and the adrenalectomy, all of which are becoming increasingly more accepted as standard procedures in laparoscopic surgery. Although resections of the colon and rectum are not considered standard procedures, training classes are available for these procedures. Nonetheless, it is important that these procedures, especially those for the treatment of malignant disease, only be performed in controlled studies. The same is true for the surgical therapy of morbid obesity. Experimental studies are already considering the possibility of MIS for malignant diseases of the stomach, esophagus, and liver. However, only a few surgical centers are able to offer the complete laparoscopic spectrum.

Another important aspect of responsible education, especially in large-volume clinics, is the continuous training of young surgeons in more advanced endoscopic procedures. To avoid the problems associated with the initial learning curve, the training procedures must always be performed under the continuous guidance of a highly experienced surgeon. The training phase is likely to be relatively long; for example, in laparoscopic colectomy, a learning curve of ~50 cases is assumed.

A number of innovations can be expected in the United States and Europe due to the development of 3-D miniendoscopy, robotic surgical systems, and surgical training by virtual reality and interactive simulations. A forum on the current state of the art in this area was recently presented at the World Congress on High-Tech Medicine in Hanover, Germany, in October 2000. Telesurgery may allow for the opportunity to perform operations over a long distance. However, outside of larger countries such as the United States and Australia, there seems to be no real need for the application of these methods at this point in time. Furthermore, in most European countries, as in Germany, so-called long-distance operations are not allowed.

The phenomenon of globalization has also had a notable impact on minimally invasive surgery. As opposed to the early beginnings of laparoscopy, a worldwide exchange of information has led to comparable levels of development and education, especially in the United States and Europe. There is no doubt that this technique has led to a revolution surgical training. It is the duty of surgical societies to oversee these new developments in surgical training. In our view, the British Royal College of Surgeons has already accomplished this goal in an excellent manner.

References

1. Deutsche, Gesellschaft für Chirurgie, Mitteilungen (1993). Emfehlungen der chirurgischen Arbeitsgemeinschaft für Endoskopie (CEA) der Deutschen Gesellschaft für Chirurgie und des Berufsverbandes der Deutschen Chirurgen (BDC) zum Erlernen der intrakavitären - hier laparoskopischen - Chirugie 93/I, in: Mitteilungen der Deutschen Gesellschaft für Chirurgie 3/1997. Demeter Verlag, Balingen/ Deutschland, 1993
2. [E.A.E.S.] European Association for Endoscopic Surgery. (2000) Guidelines for training and assessment of competence. E.A.E.S., available on request of the European Association for Endoscopic Surgery and other international techniques (E.A.E.S.), Eindhoven, Netherlands
3. Jacobaeus HC (1910) Ueber die Möglichkeit der Zystoskopie bei Untersuchung seröser Höhlungen anzuwenden. Münch Med Wochenschr 57: 2090–2092
4. Kalk H (1929) Erfahrungen mit der Laparoskopie. Z Klin Med 111: 303–348
5. Kelling G (1901) Die Tamponade der Bauchhöhle mit Luft zur Stillung lebensgefährlicher Intestinalblutungen. Münch Med Wochenschr 48: 1480–1483 1535–1538
6. Litynski GS (1998) Erich Mühe and the rejection of laparoscopic cholecystectomy (1985): a surgeon ahead of his time. J Laparoendosc Surg 2: 341–346
7. Marlow J (1976) History of laparoscopy, optics, fiberoptics, and instrumentation. Clin Obstet Gynecol 19: 261–275
8. Recommendations for evidence-based endoscopic surgery: the updated E.A.E.S. Consensus Development Conferences. (2000) E. Neugebauer, S. Sauerland (eds), Springer-Verlag France, Berlin, Heidelberg
9. Semm K (1983) Die endoskopische Appendektomie. Gynäkol Prax 7: 131–140

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