At the cutting edge

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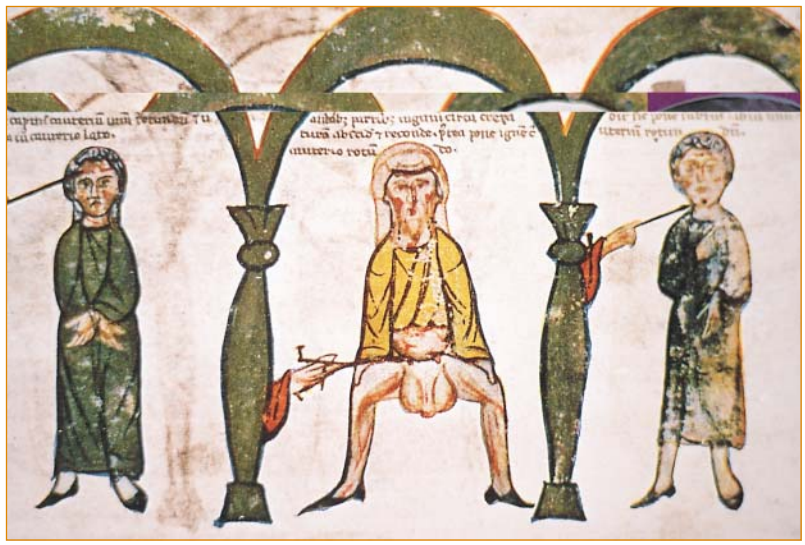
The 1990s have ushered in dramatic changes in surgical practice, changes that rival anesthesia, antisepsis, asepsis, the management of shock, our understanding of the physiology of injury, antibiotics and the revolution in imaging. Modern changes in surgical practice have been driven by at least 2 imperatives: economics and technology. Society has been spending too much on health care and, in Canada, governments have been faced with huge deficits that needed to be brought under control. Space age technology has been introduced to medicine and is evident in all areas, particularly diagnostic imaging and procedure-linked specialties. Surgeons have perhaps benefited the most: preoperative diagnoses are more precise, minimally invasive techniques (involving new technology) have served the patient very well, and advances in anesthesia and other disciplines have benefited surgical practice, in particular allowing the shift to ambulatory surgery.[1,2]

General surgery has in many ways seen the most dramatic changes. Laparoscopic cholecystectomy leads the way. It is now 7 or 8 years since the introduction of this procedure in Canada. Generations of surgeons have had to learn an entirely new way to operate. Elective cholecystectomy should now be a day procedure,[3] followed by a prompt return to work. The techniques of hernia repair, also done as day surgery, continue to change, and tension-free repairs (laparoscopic or open) are now all the rage in North America. Gastroesophageal reflux disease is increasingly common, and when patients tire of proton pump inhibitors, there is a laparoscopic antireflux procedure that, in experienced hands, yields good results. In recent years there has been an increasing trend for complex procedures to be done in large centres with great experience. The most discussed of these is pancreatoduodenectomy (the Whipple procedure), usually for cancer of the pancreas, the duodenum, the distal bile duct or the ampulla of Vater. Rates of death in the range of 3% to 4% and lower are now common for this operation.[4] The same excellent results are evident for hepatectomy and esophagectomy performed in specialist units. Not only are there fewer deaths, but rates of associated illness and complications have declined, which has led to reduced length of stay and earlier return to normal life. Patient-centred outcomes are increasingly the focus of practice and evaluation.

There have been dramatic improvements in outcomes after surgery for patients with breast and colorectal cancer. Mesorectal excision — a classic cancer operation newly described — together with adjuvant chemotherapy or radiotherapy (or both) are changing the prognosis and rates of colostomy for patients with rectal cancer. The sentinel node biopsy now directs radical node dissection in melanoma of an extremity. This method shows great promise in breast cancer, and it is likely that node dissection will be eliminated in many women, further reducing the surgical impact of this disease.



Surgical training is becoming more intense as technology evolves and new procedures (e.g., laparoscopy) are introduced. The trend toward decreased service and increased teaching, accompanied by the introduction of newer educational techniques, has made the surgical residency less of an apprenticeship. Didactic courses at junior and senior levels to cover the increasing volume of information and specific courses to teach techniques are

becoming more common. Increased specialization has led to subspecialization within disciplines. Within orthopedics, for example, surgeons may specialize in ankle and foot, elbow and shoulder, hands, arthroscopy, spine or tumour. The benefits to patients are better outcomes after complex procedures and to students and residents, enhanced expertise.

The classic specialty of cardiovascular and thoracic surgery has been divided into cardiac, vascular and thoracic surgery, and there are specific Royal College tracks for each. The impact of technology in these 3 specialties has been dramatic and highlights the difficulty of being a master of each. Video-assisted thoracic surgery, analogous to laparoscopy, has changed practice and will continue to do so. Although it is unlikely to change resection practices in cancer, its role in biopsy of the lung and pleura, management of malignant effusion, staging of cancer, and management of spontaneous pneumothorax and esophageal disease is apparent.

Endovascular prostheses are being evaluated and are now available for specific types of aortic aneurysm. They are usually placed by a radiologist and a vascular surgeon working together. It can be predicted that such prostheses, along with dilatation and stenting, will completely revolutionize vascular surgery. The lines between specialties are blurring, as such collaborative procedures between radiologist and surgeon show. Our specialty organization will continue to diversify as imaginative new approaches evolve.

Cardiac surgery is also a part of the minimally invasive juggernaut. Several different techniques now make it possible to do aortocoronary "bypass" surgery on a beating heart without using a bypass. One technique involves an apparatus that immobilizes the surface of the beating heart, effectively suspending the heart from a set of suction cups while the coronary artery is incised and the anastomosis done. The benefits to the patient are evident in reduced length of stay and rapid recovery.

Economic constraints have had a significant impact on all surgical specialties, and reduced access to beds, equipment, inventory and new technology has led to much unhappiness among surgeons.[5] It is becoming increasingly clear that the health care revolution is having and will continue to have important implications for surgical practice. Pre-hospital evaluation and work-up is de rigueur, and there are simpler criteria for pre-anesthetic evaluation. Risk factors are better understood and can be mostly managed on an outpatient basis, so that many patients undergoing elective surgery can be admitted the morning of the operation. Postoperative pain control, continuous epidural, and pre-emptive or patient-controlled anesthesia have significantly changed postoperative care, and as a result hospital stays are shorter.

Of necessity, the role of surgeons in the management of resources is expanding. The December issue of the *Canadian Journal of Surgery* includes a discussion of the imperatives of physician leadership in the organization of care, use of resources, and technology evaluation, and how these must be linked to patient-centred outcomes to provide society with the best bang for its buck. The hypothesis is that good fiscal management and evaluation of technology, together with evolving surgical practice, will lead to better outcomes. Join us in 5 or 10 years to see where the pendulum has swung.

References

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