

Fragmentation of General Surgery: Burning to Death or Rising from the Ashes

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In recent years it has become obvious that general surgery is threatened by a shortage of surgeons. Clearly, surgery is losing its appeal and is becoming one of the least competitive medical specialties [1]. This shortage is evident in the United States, Europe and Israel as well. The topic is widely discussed in surgical journals, at surgical meetings and by the leadership of various surgical societies. The statistics coming out of the USA are clear and ominous. In 1981, 12.1% of senior medical students selected general surgery as their first choice of specialty. Twenty years later, in 2001, only 6% chose surgery as a career. A recent U.S. survey of 70 medical schools in 35 states reported shortages of surgeons that approximate 20%. A survey by the Massachusetts Medical Society puts the shortage of general surgeons at 32% [2].

The very same process is happening also in Israel. Although we lack good statistics, it is postulated that only 1%–2% of medical school graduates in Israel choose surgery as a specialty and that 10%–20% of general surgery residency positions remain vacant (in the U.S. there were 7% unfilled training positions in 2001). Moreover, some, certainly not all, of the vacant surgery residency positions have been filled by graduates of international medical schools, mainly from Europe. This increase in graduates from foreign medical schools may partially compensate for the shortage, but it brings with it the problem of a less than optimal medical education and the resultant need for efforts to improve the knowledge and performance of these international medical graduates.

There are several reasons why medical graduates are not choosing general surgery as a career, among them:

- A change in the medical work force and demographics, with many more women going to medical school, about 45% in the year 2000, but not into surgery (less than 20%)
- The long and arduous training (all surgical residencies are

longer than others, but even among surgical residencies general surgery is long and exceptionally arduous)

- Medical students' perception of surgery as too demanding, with its long hours and busy nights on call. They prefer a more controllable and balanced career offered by professions with shorter training and greater opportunity for recreation, personal time and time with family and friends [3]
- Women surgeons and the issue of childbearing, another pressing lifestyle issue. This unfavorable lifestyle perception seems to be a critical concern that influences students not to choose a surgical residency
- The high attrition rate among surgical residents, both in Israel and the USA. In the U.S. the attrition rate is about 20%, average, 4% per year, and is highest for postgraduate year 1 and 2 residents
- A bad medical school surgery clerkship experience, a phenomenon observed both in Israel and in the USA. Students seek a role model during their various medical school clerkships, and although many surgeons are fine role models for their residents and fellows they do not make the same effort towards their medical students, thus failing to attract the finest and brightest to surgery. Therefore, improved role modeling and increased mentorship by surgeons early in students' medical education may prove to be the most effective strategy to regain students' interest in surgery as a career.

In a recent national study of 218 senior medical students in Israel [4] we observed the following:

- Only 22% considered surgery for training, and this was before their surgical clerkship that many later described as disappointing
- Factors for choosing a residency were mainly professional interest and satisfaction and an amiable working atmosphere
- The strongest deterrents from surgery were surgeons' interrelationships and a compromised lifestyle perception
- Monetary rewards did not appear to have a paramount impact on the choice of a residency.

In general, medical students are given too little exposure to surgery. As a partial remedy, a study from the University of Wisconsin stressed the importance of surgical residents

as effective educators and mentors in influencing medical students to pursue surgical careers [5].

The American College of Surgeons states that General Surgery is the basic core specialty within the discipline of Surgery and that the general surgeon is a surgical *specialist* engaged in the *comprehensive* care of surgical patients. There is a strong emphasis on "comprehensive" and "specialist" which will be discussed later in this article.

The American Board of Surgery defines general surgery as a central core of knowledge embracing anatomy, physiology, metabolism, immunology, nutrition, pathology, wound healing, shock and resuscitation, intensive care, and neoplasia. When combining ACS and ABS requirements we end up with a definition of general surgery that is impossible to accomplish:

- The general surgeon is a broadly educated physician exposed to the many and various areas of surgery
- He or she is expected to acquire a broad and specialized knowledge and wide practical experience, skills and competence in diagnosis and in preoperative, operative and postoperative management – a kind of jack of all trades who is expected to master the alimentary tract, abdomen and its contents, as well as breast, skin and soft tissues, head and neck, vascular system, trauma and critical care, surgical oncology, the endocrine system, and transplantation.

Moreover and due to the explosion of knowledge, General Surgery is continuously expanding in scope and in the sophistication of diagnostic and therapeutic modalities. It is obvious that no single person can deliver such comprehensive, effective and safe health care to this broad range of disease states, and many general surgeons, particularly the younger ones, fresh out of training, will choose to limit the scope of their practice by choosing subspecialization. In the USA about 1000 general surgeons complete their residency training each year. Approximately 70% of graduating surgical residents pursue additional specialization training. Similarly, many Israeli general surgeons seek advanced training in the USA and Europe. Obviously, this trend leads to a further decline in the number and availability of general surgeons.

The problem is clear and imminent. However, solutions are less clear and require a profound conceptual change. First of all, departments of surgery will have to direct their efforts to education of students and residents. General Surgery must continue to be the core of surgical education. On the other hand, we have to limit the scope of General Surgery to something more manageable without losing its standing or its appeal. To this end we should create, for the lack of a better title, the "general surgery specialist" or the "abdominal surgery specialist." Furthermore, we should establish additional subspecializations

in selected organs/disease states [1,6]. The "abdominal surgery specialist" or the "general surgery specialist" should be trained during a structured and focused 5 years (replacing the current 6 year program). The program should comprise a defined core curriculum that will teach what surgeons will ultimately practice. This program should eliminate all rotations except for a 3 month critical care rotation and should also eliminate the "basic science" period. Also eliminated should be aspects of surgery residency that have no direct training or educational value. We should minimize surgery of high-complexity cases and change the balance between service and education towards more and better education. Surgical education must focus on the understanding of disease processes, decision making and skills acquisition. Of the utmost importance is to improve skills training, mainly by simulation and virtual reality. The "abdominal surgery specialist" or "general surgery specialist" will deal with abdominal procedures, non-complex biliary surgery, anti-reflux procedures, colonic procedures, acute care surgery, abdominal wall hernias, straightforward breast surgery, and routine laparoscopic procedures. All this, while maintaining the role of provider of comprehensive care for the surgical patients in all disciplines. Obviously, this is only a preliminary list of suggested operative procedures that will be further refined and modified by the appropriate professional forums.

The "abdominal/general surgery specialist" will satisfy the needs of many hospitals and the current shortcomings of surgical services in Israel [7] such as routine surgical procedures in community hospitals, ambulatory surgical services for the various health funds, and acute care surgery and trauma services in the periphery of the country. All this without touching on the need for surgeons in the military and the need for surgeons during mass casualty events.

Following this shorter and more focused basic training we should also enable subspecialization. Subspecialization will be achieved for selected organs/diseases by 1–2 year fellowships (preferably 1 year). These fellowships will be limited in the number of positions for training and to a few designated medical centers only. Table 1 is a suggested list of subspecialties. Again, consensus will have to be reached by the various

Table 1. List of possible subspecializations

- Foregut
- Hepato (pancreatic) Biliary
- Colorectal
- Endocrine
- Skin & soft tissues
- Hernia
- Trauma & Intensive Care Unit
- Transplantation
- Bariatric (minimally invasive)
- Breast
- Surgical oncology

ACS = American College of Surgeons
ABS = American Board of Surgery

professional societies, although my personal preference is to limit the number of subspecialties.

The advantages of advanced specialization are clear.

- It adds competence in the face of an explosion of knowledge and developments
- It will limit the type and number of surgical procedures practiced by an individual surgeon, leading to greater expertise (volume)
- Most importantly, it will respond to the increased demand by society as patients and insurers opt for specialized care [8].

SUMMARY

General Surgery is losing its appeal and is facing a critical shortage of surgeons. It therefore has to change and adapt to this new reality and we surgeons are responsible for meeting this challenge. If we want students and residents to embrace surgery we need to show them the rewards and satisfaction that we derive from the profession. A 5 year curriculum is needed to train the “abdominal surgery” or “general surgery specialist,” who will maintain and teach comprehensive care of the surgical patient and practice a more limited scope of surgical procedures. In addition, we should train a limited number of disease-oriented specialists by means of 1–2 year fellowships.

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