

## Beyond Cholecystectomy: Advanced Laparoscopic Surgery in Practice and Training in the Caribbean

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Since its introduction in the mid-1980s in the treatment of cholelithiasis, laparoscopic surgery has revolutionized the practice of general surgery. By the early 1990s, it was accepted as the standard of care for symptomatic cholelithiasis (1) whilst gaining widespread application in a range of general surgical operations. Its advantages over open surgery include better cosmetic outcome, reduced post-operative pain, less disturbance in respiratory and gut function, shorter hospitalization and a faster return to normal activity and thus productivity (2–4). There is now good class 1 evidence of its superiority over open surgery in the management of gastro-oesophageal reflux disease (5), bariatric surgery (6) and benign and malignant colonic disease (7, 8). The literature also supports the laparoscopic approach to surgery for achalasia (9). In addition, it is the expert opinion that its clear advantages in splenectomy and adrenalectomy will prevent the usual prospective randomized studies being done (9).

Appendicectomy, though not conferring a significant advantage when done through the laparoscopic approach (10) has a clear advantage when large numbers of patients are evaluated (11). It should also be an option for patients who prefer this approach.

With the increasing abundance of evidence of the advantages of laparoscopic approach to various procedures, it becomes a challenge for developing countries to incorporate laparoscopic surgery in everyday care of surgical patients. The reasons include: 1) the cost involved in purchasing the hardware (monitors, cameras, insufflators) and various other single use devices (trochars, graspers, scissors, retractors) necessary for various laparoscopic procedures, 2) lack of expertise as most of the senior surgeons in charge of training programmes are themselves in need of training in the laparoscopic approach and 3) reluctance and skepticism of some surgeons to change their approach despite the accumulating evidence because they are obtaining good results with open surgery.

The addition of routine laparoscopy to the surgical training programme (even when the cost associated with

these technologies including redesigning of the operating theatre set-up is met) is one that will be great and ongoing given the added time necessary to do various procedures laparoscopically. Compounding the problem is the rapid pace at which procedures are being introduced making it difficult to keep up with evolving techniques and technology. Thus, here in the Caribbean (as is the case in most surgical units in developing countries) teachers of surgery are in addition to learning this evolving approach to organ resection, have to decide which operations can be introduced to everyday patient care and residency training in a cost effective manner.

Laparoscopic cholecystectomy has been successfully integrated in the postgraduate surgical training programme at The University of the West Indies (UWI) since 1993 and the results obtained are similar to those of first world countries (12). Since then, there has been widespread acceptance of the laparoscopic approach to other procedures. Accordingly, progressing beyond cholecystectomy and incorporating additional advanced laparoscopic procedures as a part of our routine practice and training are necessary if the University Hospital of the West Indies (UHWI) is to remain competitive as a centre of surgical excellence in the Caribbean and have a viable and relevant residency training programme satisfying the needs of an increasingly aware public.

Lessons learned from the introduction of laparoscopic cholecystectomy need not be abandoned as we seek to introduce advanced laparoscopic procedures. Firstly, one needs to identify established procedures which are performed regularly at the regional hospitals via the open method and for which the evidence shows superiority of the laparoscopic approach. Splenectomy and colectomy come readily to mind but bariatric surgery and anti-reflux surgery performed in a minimally invasive manner are areas of increasing prevalence and potential income earners once the hospitals can be identified as offering excellence in laparoscopic care.

As with most advanced procedures in surgery, institution and individual specialization have been shown to give better results (13, 14). Therefore, the entire surgical staff need not be retrained in advanced laparoscopic techniques. Most are already equipped with the basic skills to perform diagnostic laparoscopy and cholecystectomy which form the bulk of all laparoscopic procedures done. As the premier training institution in the Caribbean, UWI should lead the

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way with an initial team of individuals trained in advanced laparoscopic techniques and most additional procedures should be routed through this minimal access unit. The UHWI could be the base for Jamaica and this might allow various procedures to be safely introduced in a controlled manner and done in sufficient numbers to gain the required proficiency necessary for practice and teaching. Programmes could be designed for established surgeons and for residents with a system of regular evaluation for both these programmes and a means of evaluation and certification of participants. This is not to suggest that advanced laparoscopy should be limited to the UHWI. The UHWI, however, should lead the way in preceptorship, mentorship and gathering outcome data in a prospective manner so that other parts of Jamaica and the wider Caribbean region can benefit from this research. In addition, various modifications to the equipment, operative technique and training methods to make them cost effective for the lesser developed countries should also be a major part of its emphasis. An example of an area of research that is relevant to most developing countries' laparoscopic programme is the use of reprocessed single use devices (SUD). The reuse of SUD in laparoscopic surgery is a major source of cost saving (15). The literature remains inconclusive regarding the safety of re-sterilization (using glutaraldehyde and ethylene oxide) of disposable laparoscopic equipment (16). The institution could focus on this area as a targeted area for research development thus getting the necessary support and auxiliary staff in place to achieve success. This may involve incorporating the assistance of other locally based university centres such as the International Centre for the Environment and Nuclear Sciences (ICENS) to examine sterilization of SUD by irradiation. This may be another source of revenue for the University, once it is shown to be safe and effective.

The minimal access unit surgical team can undertake procedures across surgical disciplines until an adequate service has been developed in the various subdivisions of surgery. Already, we are seeing movement in this direction with the successful introduction of laparoscopic colectomy at the UHWI and various advanced laparoscopic procedures including splenectomy and bariatric surgery at the San Fernando General Hospital in Trinidad and Tobago. In this era of cost containment, the teaching of laparoscopic skills to residents outside the operating room is widely practiced in developed countries (17) and the recently held workshop by the Royal College of Surgeons of Edinburgh in conjunction with the Caribbean College of Surgeons in teaching basic and advanced laparoscopic skills to surgical residents is certainly a move in the right direction. This includes the integration of information technology and surgical simulation in surgical training. Will this lead to competency in advanced laparoscopy at the end of a surgical training programme? Not for the average resident, but, for others with some additional training, this could form the core of trained surgeons offering advanced laparoscopy to our populations.

How can technology cost be overcome? This can be done by fostering relationships with private sector companies who are willing to invest in the health of their workforce in a manner similar to the Leapfrog initiative seen in the United States of America (8). Equipment manufacturing companies such as Ethicon® and Tyco® Corporations should be encouraged to invest in a surgical skills lab or sponsor workshops in exchange for exclusive contracts for their products (as they have done in some universities in North America). Surgeons need to master techniques such as extracorporeal suturing and knot tying thus reducing reliance on expensive disposables such as endostaplers. Wise investment in reusable trochars and graspers instead of the disposable ones is also essential, in addition to industry proven durable and safe equipment. Most importantly however, it is for the University and the Tertiary Care Divisions at the Ministries of Health in the region to realize that the time to act is now, and failure to do so is courting the risk of losing relevance in offering standard surgical care for certain diseases and retarding postgraduate surgical training in the 21<sup>st</sup> century.

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