A Brief Update on Laparoscopic Assisted Colectomy

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Current status of Laparoscopic Assisted Colectomy

Since the first reported laparoscopic assisted colectomy (LAC) for endometriosis in 1991, the laparoscopic approach has been applied in the treatment of many colorectal conditions. Different techniques were described, and innovative approaches were developed. This development has been at least in part facilitated by advances in medical technology—the advent of mechanical endostaplers, ultrasonic dissectors, hand access devices and laparoscopic ultrasonography etc. all contributed.

Compared to open surgery, there is now a wealth of evidence indicating that LAC results in definite short term clinical benefits in terms of diminished pain, earlier return of bowel function, better preserved pulmonary function, decreased abdominal wound infection rate, reduced incidence of postoperative adhesive obstruction, and shorter hospitalisation. Admittedly the last benefit on reduced length of stay is only marginal, as hospital stay varies widely in different parts of the world and depends as much on health care finance and insurance system as on patients’ condition.

For reasons stated above LAC should be recommended without reservation to patients with benign colorectal conditions. Thus LAC is widely applied and practised in patients with diverticular disease and inflammatory bowel disease in Western Countries. However, neither of these conditions are prevalent in Hong Kong, where malignancy constitutes the main volume of work for coloproctologists or general surgeons.

Data from recently published randomised trials have helped to alleviate the sceptism in the applicability of LAC to patients suffering from colorectal cancer. Indeed evidence from all these trials fails to demonstrate any detriment in oncological parameters such as disease recurrence and patient’s survival subsequent to the laparoscopic approach. Moreover, data from the Barcelona trial showed that, after stratification according to TNM staging, in patients with stage III tumour the laparoscopic group was independently associated with reduced risk of recurrence and cancer-related death, and improved overall survival. In other words, aside from technical feasibility, LAC also appears oncologically feasible. This message is of paramount importance and has a great impact on the management of colorectal carcinoma worldwide, including Hong Kong. The current consensus is that, provided expertise is available, the utility of laparoscopy in potentially curable colorectal carcinoma can be judiciously extended.

Commonly Asked Questions about LAC

Many quoted advantages of LAC like less blood transfusion and analgesic requirement, reduced length of stay, earlier return of GI function etc. are not obvious in the patients’ perspective. Are there any real health-related benefits of LAC?

Yes. Various studies have consistently showed that LAC is associated with reduced incidence of chest infection, decreased wound complications including infection, dehiscence and hernia, as well as reduced incidence of postoperative adhesive obstruction.

Are there any patients who are contraindicated for LAC?

There are very few absolute contraindications. Of course, caution needs to be exercised in patients with severe pulmonary disease or congestive heart failure; while these patients withstand a prolonged operation with protracted pneumoperitoneum poorly, they are also at increased risk of developing chest complications should open surgery be used. In difficult cases close collaboration with an anaesthetist experienced in laparoscopic surgery is necessary to ensure a safe and smooth procedure.

Though laparoscopic surgery may prove difficult in patients with extensive intra-abdominal adhesions, adhesions can only be considered as a relative contraindication. Likewise, patients with high body mass index are only relatively contraindicated.

What about case selection? Which kind and what stage of tumour are suitable for LAC?

In the past there was worry that advanced tumour with serosal or extramural spread would result in unacceptably high incidence of trocar site recurrence subsequent to LAC. As experience accumulates, it is now evident that, while the exact mechanism of trocar site recurrence remains unknown, this can occur even in T1 tumours, this phenomenon had been over-reported previously and its true incidence is no more than wound recurrence after open surgery.

On the other hand, lessons learned from conversions did give some lights on case selection. Many published
reports on LAC did not give reason for conversion. For those that did so, instrumental or equipment failure, adhesions, iatrogenic injury, and bulky or fixed (locally advanced) tumour appeared to be common reasons. While conversion rate depends on surgeon’s expertise, conversion due to the last reason is unlikely to be altered by surgeon’s experience or improvement in technology. The weight and bulk of some of these locally advanced tumours make mobilisation using long and thin instruments difficult, and render these tumours susceptible to traumatisation during mobilisation. Thus locally advanced, sizable tumour (e.g. palpable tumour per abdomen) might not be a good case for LAC, especially for surgeons in the learning phase. In the author’s opinion, tumours with contiguous organ involvement are contraindicated for LAC.

Who should be doing LAC? Colorectal surgeons or laparoscopic surgeons?
The correct emphasis should be placed on proper training. In the past, surgical training was based on a master-apprentice model in the operating room. But this concept of training has been changed after the introduction of laparoscopic technique in the general surgery field. Laparoscopic surgery requires specialised dexterity different from open surgery due to translation of a 2-dimensional image into a 3-dimensional working area, decreased tactile feedback, varied hand-eye coordination, and fulcrum effect. For advanced procedure like LAC, more time and effort are needed to overcome the learning curve. Thus the training programme should first involve a credentialing process led by a dedicated credentialing committee. Formal training programme in form of courses, hands on practice or simulators (training box, virtual reality system), live animals or human cadaver should be provided. The candidate can then involve himself in human operation under supervision of the mentor in his own unit, and should go through the role as camera assistant, scrub assistant, or first assistant in a surgeon’s role. Performance should be monitored periodically by a separate proctor, with audit of operative outcomes.

Conclusion: The Way Forward
Laparoscopic surgery has a significant impact on the management of colorectal cancer in the past decade. The magnified view under the laparoscope and the use of alternative energy source other than electrocautery have led to more understanding of surgical anatomy and indeed have even changed the way how open surgery is being performed. Although most of the evidence came from LAC; increasingly rectal cancer resections are being performed laparoscopically as experience and confidence grow—laparoscopic sphincter-preserving, nerve-sparing total mesorectal excision has already been reported at the turn of the century. Moreover, there is a recent enthusiasm for hand assisted laparoscopic surgery as well as endoluminal stenting (Fig. 1). It is hoped that these techniques can help to broaden the applicability of the laparoscopic approach so that patients with bleeding or obstructing (Fig 2) tumours could still benefit from this minimally invasive technique. Data are still limited to draw any definite conclusion at the moment, however.

References