

Journey of a Laparoscopic Colorectal Surgeon

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Abstract

We practice colorectal surgery at an exciting time when laparoscopic techniques are being developed so rapidly that the individual surgeon must make a careful judgement regarding his or her place in the progress of the technique. The evidence base for laparoscopic colorectal surgery is considered and some personal observations are made.

It is both exciting and challenging to be practicing surgery at a time when new technology is becoming available faster than surgeons can assimilate the opportunities that are provided. Innovations have moved fast in all specialities but it is the techniques of laparoscopic colorectal surgery that I focus on in this article. Progress has been enabled by microchips, cheap plastics technology and the evolution of optical systems; the absence of any one of which would stifle delivery of minimal access surgery. As each of us considers the role we wish to play in this revolution we must take stock of a number of factors that will determine the depth of our involvement as individuals, as a profession and as institutions. Our ability to gauge this responsibly is vitally important. Any new technique will tend to evolve through a series of extremes. The crackpot new idea, the panacea, then vilification and finally the mature treatment with its place in the fold. But that place in the fold may be tiny or a total sea change in practice. The time scale of the process could be overnight or a decade. The driving forces are complex and we have to recognise that the pace is not always driven by the pure light of science. It can be the less

virtuous but perhaps more persuasive sway of commerce, the unbridled perhaps uncritical enthusiasm of the surgeon or even the shear force of the patient as a health shopper.

As exactly this saga is played out in the field of laparoscopic surgery we witness three laparoscopic techniques in their different stages of evolution and it would be a brave man indeed to predict the state of play in 20 or even 10 years time. I refer to the mature field of laparoscopic cholecystectomy, the promise of laparoscopic colorectal surgery and the new kid on the block; NOTES. It is interesting that laparoscopic cholecystectomy and laparoscopic colectomy were reported within a few years of each other (1987 and 1991) but their incorporation into practice has been rapid in the former¹ and tentative in the later. There are some sound and some not so sound reasons for this difference. One could argue that cholecystectomy became widespread before being fully backed by evidence as a superior technique. One could be concerned that the benefits of laparoscopic colectomy have been slow to disseminate across the colorectal community; assuming one accepts that there exist any benefits to speak of. Where does the conscientious surgeon place himself in the race to take on new and improved practice? Our mentors taught us 'be not the first by which the new

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is tried, nor the last to cast the old aside'. In truth the answer must be more individual and complex.

Just to focus on laparoscopic surgery for a moment. Why are we drawn to it? It is not obvious if we consider the environment we are compelled to work in. We are transferred to a world of two-dimensional vision with a narrow field of view. Not only can we not always see an image through misting, soiling of the lens, poor light or poor focus but when we do see it can be difficult to orientate in the anatomy. The camera assistant may have the picture tilted or up side down. The camera assistant would ideally have a clear idea of exactly what are the steps and objectives of the procedure in order to keep track of activity. Often this is not the case. Consequently your instrument may not be in the picture and if it is your assistants may not be. The instrumentation, whilst a marvel of innovation and modern manufacturing method, has nothing like the range that we have grown used to in open surgery. There are more types of open scissors than there are laparoscopic instruments in total. And we are denied the repertoire of angles we enjoy in open surgery. Those manoeuvres like pinching off the oedematous gall bladder, encircling the oesophagus at the hiatus or flipping the vagus from behind the oesophagus are denied us. Putting pressure on a bleeding vessel is more difficult. What then is the appeal? For myself it lies in the potential for astonishingly rapid recovery. Seeing an 85 year old patient eat dinner on the same day as having a sigmoid colectomy and go home 2 days later is bound to be a solid advert for the laparoscopic approach.

Any surgeon considering the journey into laparoscopic colorectal surgery will appraise the published data. In fact series to date present a picture more in keeping with

equivalence than outright superiority. Interestingly the evidence base did not really explain the rapid acceptance of laparoscopic cholecystectomy. To some extent we must recognise that practice is driven by our concept of what *ought* to happen. Patients after laparoscopic cholecystectomy went home because we sent them home. Subsequently we find that it is possible to send home patients with open cholecystectomy. A similar phenomenon has captured the practice of colectomy where early discharge has been pioneered by an 'open' surgeon but championed by the laparoscopic community.² We have discovered a natural synergy between enhanced recovery protocols and laparoscopic colorectal practice.

How has the evidence base evolved? After the initial description of laparoscopic colectomy the pace of progress was slower than with laparoscopic cholecystectomy. Firstly because the former technique is more difficult and secondly because there were genuine doubts about the merit of minimal access in colectomy; particularly in malignant disease. A patient with malignant disease, in my view, does not put the same premium on rapid recovery as does a cholecystectomy patient. The priority is cure and any compromise is unacceptable. Therefore any advantage in the technique cannot be at the cost of impaired cure or recurrence rate. Initially there were exactly such doubts. Port site recurrence was reported a problem³ and anxiety was raised about lymph node harvest and margin clearance. Hence when I was beginning my series of laparoscopic colectomies I offered this surgery to patients with benign disease; for the most part complicated diverticular disease. NICE, our UK independent evaluating agency, sanctioned laparoscopic colectomy in malignant disease only in the context of a trial. In the early part of my series I did not

qualify to be a trialist but continued under the umbrella of the CLASSIC trial⁷ to gain more numbers. Close audit was encouraging with successful early discharge and complications in line with open surgery. As data emerged putting the port site issue to rest and indeed suggesting at least equivalence for the technique the way ahead began to look more clear for laparoscopic colorectal surgery.⁴ At this point I could have made a sea change conversion to laparoscopic surgery and taken on all comers or I could continue in my fairly careful and selective approach with avoidance of overweight or otherwise taxing cases. In the event I took the latter route but, with hindsight, I would be reluctant to recommend this policy to others. When performing this very difficult surgery relatively infrequently I now believe practical lessons are easily forgotten between cases and the learning process is overly extended. Easy cases will always be easy and they are not, in my opinion, a proving ground for the more challenging problems of obesity, complex disease or previous surgery. Having said that I shielded myself from the disappointment of frequent conversion and the frustration of failure. More latterly data on the merit of laparoscopic colorectal surgery has become available in abundance.^{5,6} We have data indicating faster recovery,⁷ fewer adhesions, less incisional herniation,⁸ reduced impact on the immune system (tempting the belief cure may be enhanced), better cosmetic result, speedier bowel recovery⁹ and reduced pain.^{10,11} The magnitude of the benefit is not large but it is in the right direction and will surely grow as we learn how to bank on the advantages. In 2006 NICE issued a more positive appraisal¹² and there is a feeling in the UK and around the world that the technique is here to stay. Indeed, as the technique gains acceptance there is the added prospect of more widespread and

standardised practice improving on the performance of the surgeons involved in laparoscopic colorectal resections.¹³

With all this as a background what is the ideal journey for laparoscopic surgeon setting out today? Initially I would not embark on a gradual build up of cases with careful selection as has been my policy. Whilst this keeps the surgeon in a comfort zone it will also make conversion to a fully laparoscopic practice slow; perhaps too slow. Many of the most successful leaders in the field have aimed at taking on challenging cases from the start and thereby have surmounted hurdles early on.¹⁴ This approach may be arduous initially but I feel sure the rewards are adequate compensation. In any case it is useful to know what are the hurdles so that one can take them on forearmed.

Firstly there can be no doubt that obese patients are a challenge. Gaining a good exposure is hampered by lack of space and fat tissue falling across the field. Raising inflation pressure, steep head down and extra assistance help but accepting a tactical exposure i.e. exposing the main target of dissection only, can sometimes be the only option. However, in the UK at least, if these patients are excluded you may find there are few remaining patients for your series. Patients with major previous surgery will mean an extra phase of the procedure to take down adhesions that, whilst not necessarily difficult, is always time consuming. Extensive diverticular disease will sometimes require a more extensive dissection. These patients will force a mobilisation of the splenic flexure. Above all make sure you know exactly where the tumour is situated. A lesion in the sigmoid colon is the perfect laparoscopic case but remember that an estimate at colonoscopy or flexible sigmoidoscopy can be grossly inaccurate. Lesions estimated to be in the

sigmoid or at 20cm are sometimes in the mid rectum in my experience; so make sure you have inked the lesion, have a CT scan or have done your own examination. Don't be caught out not knowing what to resect or having to perform a very low laparoscopic resection that is beyond your skills. Do not relearn the lessons of your open surgery. Particularly I have in mind the blood supply of the bowel. If the blood supply is not good you invite leaks and failure. Convert to rectify the problem of poor blood supply if necessary, as, although it is disappointing after a long otherwise successful dissection, it is less disappointing than a leak. I have avoided, for the most part, low rectal lesions. The angle of approach for the current generation of cross stapling devices is not ideal and, although new angled guns are becoming available, I feel there is still some work to do before the bulk of us venture into this territory. Right-sided resection has been the initial training ground of the open surgeon but the parallel does not translate to laparoscopic surgery in my view for two reasons. Firstly, even in open surgery right hemi-colectomy can sometimes be achieved through a small incision, although in practice extension is often required. Secondly I have found the technicalities of the anatomy and manipulation more difficult than on the left side. The transverse colon is loose and planes can become unclear. Whilst many will not share my view I do not feel starting laparoscopic surgery on the right side represents an easy option.

What equipment is required? I cannot be exhaustive but a table that will tilt head down and to the side enough to expose the colon (20 degrees at least) is essential. The patient must be supported by bolt-on shoulder and side rests or he or she will slide. Good sharp diathermy scissors are adequate but an ultrasound energy source is better in my opinion. However, by using this option or the

Ligasure, which some favour, you will immediately be exposed to significant disposable costs. Your laparoscopic cholecystectomy camera equipment will be satisfactory. You do not need two monitors. Again stapling devices must be available for left sided surgery that can be consumed at an alarming rate, especially if the distal bowel needs several cartridges to transect. But don't be faint hearted as we hope these costs will be recouped in early discharge savings.

Put plenty of time aside for the first cases to avoid time pressure that is definitely something unwelcome on your first outings. A mentor or preceptor to support the first group of cases is invaluable. Ideally you will observe and/or assist in 10 cases before your mentor helps you with a similar number. Expect to perform 30 cases before becoming comfortable. The anaesthetist must be prepared to offer steep head down without complaint. Whilst alarming to behold this position does not cause major problems but for occasional facial oedema, scleral oedema, and in one of my patients, conjunctival haemorrhage, all transient and minor sequelae, ask the anaesthetist to avoid N₂O which tends to inflate the small bowel. Encourage allegiance from a specialist scrub team and share your results with them. The news of satisfied patients going home on day 2 or 3 after major surgical resections will be the single most persuasive factor in keeping theatre staff motivated.

Your patients will not go home unless you send them home. Enhanced recovery and laparoscopic surgery are naturally synergistic¹⁵ so avoid NG tubes, bowel preparation and fasting before and after surgery. Glucose drinks 2 hours before surgery and immediately after surgery aid rapid recovery and avoids the fasting state of insulin resistance. This change in practice

Table 1 : Mortality and complications following laparoscopic colonic resections 2000-2008

	Total Malignant	Mortality	Total Benign	Mortality
AP resection	1			
Sigmoid colectomy	40	1 ^A	27	
Total colectomy			2	
Left Colectomy	2			
Anterior resection	21	1 ^B	4	
Resection rectopexy			2	
Right Colectomy	5	1 ^C	1	1*
Total	69	3	36	1

* on table haemorrhage; ^A pneumonia; ^B Myocardial infarct; ^C Faciitis

Morbidity includes 2 anastomotic leaks, 1 pelvic abscess, 1 MI, 1 bed sore, 1 late stricture, 1 readmission with adhesions.

requires not weeks or months but years of constant reinforcement. Even now, after 10 years of practice, I find patients fasting 24 hours after major surgery awaiting passage of wind or bowel sounds because a junior doctor does not know the protocols or a nursing colleague is not comfortable with feeding after bowel resection. Such is the pace of change.

The results of my series so far, just over a hundred cases of laparoscopic resection, tell a story of staying in an area of confidence with efforts to advance relatively infrequent. My AP resection case eventually had a satisfactory recovery albeit with some bladder dysfunction but only after I was forced to dissect so far up from the perineal end that I became quite unfamiliar with the territory. An emergency total colectomy for colitis was very lengthy with the scrub team quite unsure of the kit. After many hours I completed the operation but it was complicated by a bowel injury and subsequent abscess. Of two leaks one has been in low anterior resection that, since I have done just a hand-full, is not encouraging. I am cautious in right-sided surgery since 2 of my 4 deaths occurred here. One from a necrotising faciitis

and the other a fatal on-table bleed. These are all personal experiences but, such as they are, they have fashioned my view that the best results can be obtained in the vanilla sigmoid tumour.

NOTES? With the laparoscopic journey yet to complete I am confident only that I will never be a notes surgeon but it is a privilege to witness the dawn of incision free surgery.

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