

**“THROUGH THE KEYHOLE...
AN INTERVIEW WITH MR ROBIN KENNEDY, CONSULTANT COLORECTAL
SURGEON AT ST MARK’S HOSPITAL”**

Q: Ok, let’s start off with a bit of background...

I started working as a Consultant Surgeon in Yeovil in Somerset in 1992 and was interested in laparoscopic (keyhole) surgery then, setting up a laparoscopic cholecystectomy service - that’s a keyhole operation to remove the gall bladder. At about that time, surgeons in America and France had undertaken keyhole surgery to remove the colon or rectum, and it seemed a sensible idea to me to continue that sort of work. So we started developing laparoscopic colorectal surgery in 1994, although there were a few other centres in the country developing it as well. I then undertook a number of live surgical demonstrations around the country and abroad, and more research, publishing my first paper on this in 1998. From about the year 2000 I began running courses on this surgery and then in March 2006 I joined St Mark’s to set up the laparoscopic surgery service here. In addition it gave me the opportunity to teach other surgeons how to do laparoscopic surgery and to be involved in more research.

The first obvious benefit of laparoscopic surgery is that there are smaller incisions (smaller cuts) and so it’s cosmetically better. But surgeons don’t feel that’s very important in cancer surgery because the primary consideration has to be curing the cancer. My feeling is that if you can do an equivalent operation with keyhole surgery, it’s preferable to have a better cosmetic outcome, because that is important to some people.

The benefits of keyhole surgery are really that because of the small cuts there’s less postoperative pain and people can mobilise, sitting out of bed, walking and getting back to normal more quickly. If we don’t have so much pain then we don’t have to give so many powerful drugs, particularly opium-based drugs - opiates they’re called. Opiates alter consciousness - they make you drowsy, they make you sick, so you can’t eat or drink normally and therefore you can’t take pain medication by mouth, and so you need drips or injections. Also, they essentially force you to lie in bed, and people lying in bed get better more slowly. It’s a traditional concept that people need to be nursed in bed, but actually if we can get them out of bed, walking or sitting, their chest is better, their bowels work better, they can eat and drink normally – everything works better and with less complications. So we need to move on to the concept of vertical nursing, where we’re actually nursing people out of bed where possible, and enabling them to help themselves rather than delivering care to them. We don’t want them to be stuck in a bed. We want them to be able walk to get their meals, and to walk to improve their chest and bowel function as well.

Q: On average how much faster would a patient who has had laparoscopic surgery be up and walking, compared to one who’s had traditional open surgery?

With laparoscopic surgery within an Enhanced Recovery Programme (ERP) we generally would be able to sit patients out of bed on the day following surgery and have them walking the day following surgery. In fact if they have the surgery in the morning, or not too late in the afternoon, then we’d sit them out of bed for at least 2 hours on the night of surgery and let them eat. So it depends on the time of the operation but certainly on the day following surgery, which we call Day 1, patients will be walking, eating and drinking.

Laparoscopic surgery is better than open surgery in my view because (a) there is less post-operative pain, with all the sequelae of managing post-operative pain, and

(b) smaller cuts are used, avoiding the complications that occur as result of having a large wound, such as chest infection, immobility, wound infection, and later on, the chance of incisional hernia. Incisional hernias arise from a weakness of the surgical wound and probably affect 1 in 10 patients who have had open surgery. Many will have an uncomfortable or unsightly hernia and so will require an operation to repair it. The chance of an incisional hernia in laparoscopic surgery, in contrast, is only about 1 in 100, so it's much less common. There is also less chance of adhesions within the abdomen, things becoming bound up together, which can cause a bowel blockage, and so there is less chance of needing re-admission for that. So there are many benefits, and when we see patients in outpatient clinic after their operation, those who have had laparoscopic surgery within an ERP look fully-recovered within 2 to 4 weeks, compared to 2 to 4 months for patients who have had open surgery.

Q: If a patient has laparoscopic surgery but isn't in an Enhanced Recovery Programme, do we still see the same benefits?

Not all of them. The average hospital stay for a planned colonic or rectal removal with open surgery is 10 to 14 days. By undertaking removal of part of the colon with laparoscopic surgery, but without using an ERP, we have reduced the average hospital stay to 7 days. With laparoscopic surgery and an ERP, this is reduced even further to an average hospital stay of around 4 days.

Q: Here at St Mark's would a patient having laparoscopic surgery automatically be in an Enhanced Recovery Programme?

In future, every patient who is coming in for a planned operation will be in an ERP. All my surgical colleagues here with admitting rights to St Mark's have signed up to using an ERP.

Q: Does it take longer to do an operation laparoscopically than in the traditional way of opening up the abdomen?

It does take a bit longer, yes. Laparoscopic surgery currently takes about an hour longer, but it is getting faster. You need a little more operating theatre time but if we have to take longer in order to give patients the best possible deal and improve outcomes, then I think we should do so. Keyhole surgery reduces post-operative complications and so, personally, I don't think any person should be denied it, if it is feasible.

Q: Are there any patients, particularly stoma patients, who aren't suitable for laparoscopic surgery?

Patients who have had a lot of previous abdominal operations aren't suitable because of adhesions. But if a patient has only had 1 or 2 previous operations, we would usually try to undertake laparoscopic surgery. People who are very obese are not suitable. Obesity makes laparoscopic surgery more difficult, and sometimes impossible, because you can't see well enough, and do it safely. Sometimes patients who have tumours that are fixed to something else are not suitable. Only about 1 in 10 or 1 in 20 of our cancer patients who come in for a planned operation aren't suitable though. In approximately 1 in 20 of these operations, we would see if it is possible to do it laparoscopically and if it is technically too difficult then we would convert to traditional open surgery under the same anaesthetic.

Q: How about non-cancer patients, such as those with Inflammatory Bowel Disease (Crohn's Disease or Ulcerative Colitis)?

Between 80% and 90% of IBD patients are suitable. We would try laparoscopic surgery in at least 80% but in about 10% of these we would not succeed and so would convert to open surgery in the same sitting. It does depend on which patient population you look at – here at St Mark's we get a lot more complex referrals than we had in Yeovil and so there are more patients who have had several operations already.

Q: Can we see a time when all surgery is carried out laparoscopically?

I think we'll see a time when the more straightforward surgery is laparoscopic. If you look at gall bladder surgery, which started in this country in about 1989 and it probably took at least 10 years for virtually all of it to become laparoscopic, so it is a gradual process. Colorectal surgery is more difficult, and therefore it will take at least 10 years, I think. I've been doing it now for 13 years and going forward it will be a progressive thing. We're training a lot more people but if we want it to develop more quickly, we'll need a national training programme and we're in discussion with the Department of Health about this possibility.

Even with the right training it is preferable that a surgeon performs a considerable number of these procedures with a trainer present, supporting them. For many trainees this would take 6 to 12 months. As time goes on the trainee would be able to take on more difficult surgery and develop their expertise alone. We know which operations are more difficult and we can guide them as to which operations to do first, when they are less experienced, and which to then move on to.

At the moment we estimate that about 5% of all colorectal surgery in the UK is done laparoscopically. At St Mark's the proportion is higher. Last year my team undertook over 120 colorectal removals laparoscopically and this year it may well be closer to 160. We're also training 4 to 6 trainees per year here at St Mark's, and we train independent consultants elsewhere.

Q: Is laparoscopic surgery more expensive than open surgery?

Yes. In laparoscopic colorectal surgery we use a lot of disposable equipment which is specially designed to go through tiny tubes called ports. These ports are hollow tubes between 5mm and 12mm in diameter which are put into the abdomen and the surgical instruments are then passed through them. During an operation we usually use between 4 and 7 of these ports. In addition we use narrow instruments that cut without bleeding and seal bowel by stapling it. In total we would use between £1,700 and £1,800 of disposable equipment in a rectal operation. This amounts to an excess cost of about £900 over and above what is normally used in open rectal surgery. In colonic operations it's slightly less and the excess cost is around £600. So it does cost more to do laparoscopic colorectal surgery, although in time these costs will come down. At the moment we estimate that only 5% of all colorectal surgery is done laparoscopically, and as the proportion increases and manufacturers produce more instruments, we hope costs will reduce. This has to be balanced against the cost saving with laparoscopic surgery in terms of reduced bed occupancy. The hospital stay is shorter, and readmission rates are lower because of reduced complications.

Q: Can we talk a bit more about the Enhanced Recovery Programme?

The Enhanced Recovery Programme was developed by Professor Henrik Kehlet, an inspirational surgeon in Copenhagen, Denmark. Since at least 1995 and probably before, Professor Kehlet has been trying to improve recovery in patients having major surgery by changing the way we look after patients. He developed what I call the Enhanced Recovery Programme, but which he called 'fast-track surgery'. I don't

call it that because to me the most important thing is to make patients better, and fast-track just implies that we only want to discharge patients from hospital quicker. I feel the important thing is that they're better. As a result they can go home earlier, and therefore the Managers and the Health Economists are very happy and so they also support our developments, which is great. The main aim is not to actually discharge patients from hospital earlier, that's a happy by-product of the developments in enhanced recovery care.

What Henrik Kehlet did was use a number of evidenced-based interventions to improve care and improve recovery. Evidenced-based means that there's research evidence to support the view that something improves an outcome. One intervention is the use of an epidural pain relieving system - that's a fine catheter placed into the back that allows the continuous infusion of a local anaesthetic mixed with a pain relieving medication like an opiate. This is used post-operatively as well as during the operation.

The epidural system is much better at reducing pain than intravenous infusions or intra-muscular injections, and if placed correctly, allows patients to walk, so we have less post-operative pain as well as better mobility. This also blocks what we call the stress response to surgery, the response we get if we have a major operation which makes us sick. Kehlet used epidurals and other evidence-based interventions, such as reduced bowel preparation (clearing the bowel of faeces) before colonic surgery. The research shows that emptying the bowel of faeces may actually increase complications and so we've stopped doing this for colonic operations. It might still be useful in rectal surgery.

Another of Kehlet's findings is that it's probably better to use transverse incisions rather than cutting vertically, as cutting across the abdomen may be associated with less pain post-operatively. It's also better to feed patients up until as close to the time of surgery as possible rather than starve them for 12 or more hours beforehand and make them dehydrated. You do have to restrict what patients eat because different foods empty at different speeds from the stomach, but the idea of a 12-hour fast prior to surgery should be a thing of the past now. I would have patients on a normal diet until 6 hours prior to surgery when I'd stop solids and fats. The patients would also have new special nourishing drinks which would be continued until 3 hours prior to surgery.

We would also ask patients to eat within hours after their operation if they're awake, sitting up and want to eat, and certainly we encourage this the next day. Early feeding after surgery is associated with improved outcome, as is early removal of the urinary catheter. We know that starving people, inflicting a major trauma such as surgery, and keeping people immobile by confining them to bed, causes physiological stress. If we can remove all the things that immobilise patients such as drips, drains, catheters and naso-gastric tubes, then we can improve mobility and reduce physiological stress. We now know that naso-gastric tubes, tubes put through the nose to drain the stomach that have traditionally been used routinely after surgery, actually cause more complications than benefits.

We know that early mobilisation benefits patients, along with early feeding, and avoiding the sickness associated with long-acting opiates. We know that good post-operative pain relief by mouth helps people and so we use a lot of anti-inflammatory medication when people can take it. There are many evidence-based changes we've made and together these make an enhanced recovery programme. There are probably about 30 changes to traditional care that improve recovery, many of which are quite small. If you use them all together as an Enhanced Recovery Programme, you can transform outcome. This is true of outcomes after open surgery as well as keyhole surgery. Whilst replacing open surgery with laparoscopic surgery alone has

brought hospital stay down from 10 - 14 days to a median of 7 days, adding the Enhanced Recovery Programme has reduced this further to 3.5 days.

Q: Do Enhanced Recovery Programme patients require more nursing care and do nurses need special training in Enhanced Recovery?

Yes, whilst patients are in hospital they do have more intensive nursing input both in terms of the pre-operative preparation prior to surgery and post-operatively. Before admission patients have at least half an hour with a nurse in the Outpatient Clinic and are given a lot of information to read. During their inpatient admission, they have more nursing input largely to enable them to help themselves. So rather than nurses doing all the caring, they're informing the patients how they can improve their recovery. Specialist training is required to run an Enhanced Recovery Programme.

Q: How much of a difference does the ERP make with open surgery?

As well as Henrik Kehlet's findings, we've done a randomised controlled trial (RCT) in Yeovil comparing open surgery within an Enhanced Recovery Programme with laparoscopic surgery within an Enhanced Recovery Programme. The reason for that is because if you could get the same results with open surgery as we see with laparoscopic surgery, it would save having to retrain surgeons and money on expensive disposable equipment.

There are 2 studies in the world literature on this - one is from Yeovil which we did, and one is from Henrik Kehlet's Unit in Copenhagen. In Yeovil we found there was roughly a 3 day reduction in hospital stay resulting from laparoscopic surgery, when it was compared to open surgery. There were also other benefits from laparoscopic surgery. Our laparoscopic colectomy patients stayed a median of 3.5 days compared to 6 days for open patients, and our patients undergoing laparoscopic rectal surgery needed 6 days compared to 9 days for open operations.

In Copenhagen they found identical outcomes for laparoscopic and open surgery – with people staying on average 3 days following their operation whether they had keyhole or conventional surgery. There were some outcomes which weren't statistically significant that would suggest laparoscopic surgery might be better, for example they had 3 deaths in the open surgery group but none in the laparoscopic surgery group.

Because there are only 2 studies comparing open surgery with laparoscopic surgery when both treatments use an Enhanced Recovery Programme, we will be running another study which will be a British national multi-centre study. It is called the EnROL trial and is supported by The Bobby Moore Fund for Cancer Research UK which raises money for research into bowel cancer in memory of footballer Bobby Moore. (See <http://www.cancerresearchuk.org/bobbymoorefund/>).

The trial has been peer reviewed and approved by Cancer Research UK's Clinical Trials Advisory and Awards Committee (CTAAC) and is due to start recruiting patients in October 2007 at 9 hospitals throughout the country. The EnROL trial will hopefully give us more information supporting the hypothesis that laparoscopic surgery improves short term outcomes following operation. As well looking at the clinical effectiveness (conversion rates, complications, length of hospital stay) the trial will also assess health economics (cost-effectiveness) and quality of life (patient experience of recovery) following surgery.

After implementation for colorectal surgery, enhanced recovery will in due course probably be applied to other types of surgery, including orthopaedics and urology. Enhanced recovery care is here to stay and is set to transform recovery for patients within the NHS.