



Minimally Invasive Surgery Expanded Version

OVERVIEW

There are a variety of diseases and conditions of the colon and rectum for which surgery is recommended. In addition to the decision to undergo surgery, patients are often faced with a choice of traditional or minimally invasive surgical techniques. In order to participate fully in the decision-making process, patients need information about the following issues:

- How is traditional “open” surgery performed?
- What is “minimally invasive colon and rectal surgery”?
- A description of the minimally invasive surgery techniques available
- The benefits and risks of minimally invasive surgery
- The types of operations and diseases for which minimally invasive surgery is appropriate
- Individual patient factors that must be considered
- Questions to discuss with the surgeon

Minimally invasive colon and rectal surgery is a continually changing field. Every year brings new information based on further refinements and increasing use of these techniques. The information and opinions in this material are based on the current state of the art in 2013.

HOW ARE TRADITIONAL OPEN COLON AND RECTAL OPERATIONS PERFORMED?

In order to perform operations inside the abdomen, surgeons must make an incision large enough to offer adequate visibility, provide access to the abdominal organs and allow the use of hand-held surgical instruments. These incisions may be placed in different parts of the abdominal wall. Depending on the size of the patient and the type of operation, the incision may be 6 to 12 inches in length. There is a significant amount of discomfort associated with these incisions that can prolong the time spent in the hospital after surgery and can limit how quickly a patient can resume normal daily activities. Because traditional techniques have long been used and taught to generations of surgeons, they are widely available and are considered the standard treatment to which newer techniques must be compared.

WHAT IS MINIMALLY INVASIVE SURGERY?

Minimally invasive procedures use advanced technologies to avoid the need for the large incisions used in traditional open surgery. The development of these techniques has been an important advance for the benefit of patients and is useful for the treatment of many conditions. “Laparoscopic surgery” is a specific type of minimally invasive surgery, but the term is sometimes used to refer to minimally invasive surgery in general.

HOW IS MINIMALLY INVASIVE SURGERY PERFORMED?

There are several different techniques that surgeons can use to perform minimally invasive surgery. The goal of all of these techniques is to decrease pain and speed recovery by eliminating the need for a large abdominal incision. All minimally invasive surgeries are performed with the patient asleep under a general anesthetic. All of the techniques listed below are considered “minimally invasive,” but vary slightly in their advantages and disadvantages. All require advanced technical skills and specialized equipment. Surgeons often have more experience with some techniques than others and can discuss with you the specific technique recommended for your operation.

Laparoscopic surgery refers to a technique where the surgeon makes several small incisions about ½" in size, instead of a single large incision. For most colon and rectal operations, 3-5 incisions are needed. Small tubes, called "trocars," are placed through these incisions and into the abdomen. Carbon dioxide gas is used to inflate the abdomen in order to give the surgeon room to work. This allows the surgeon to use a camera attached to a thin metal telescope (called a laparoscope) to watch a magnified view of the inside the abdomen on operating room monitors. Special instruments have been developed for the surgeon to pass through the trocars to take the place of the surgeon's hands and traditional surgical instruments. Surgical stapling devices to divide and reconnect intestine as well as energy devices to cut and cauterize tissues and blood vessels have also been adapted for laparoscopic use. For most operations, one slightly larger incision (about 2-4 inches in length) must be made in order to remove tissue (sometimes called a "specimen") from the abdomen.

"Laparoscopic-assisted surgery" is used to describe a procedure that is performed largely laparoscopically and then completed through a small abdominal incision. Strictly speaking, many "laparoscopic" procedures are actually laparoscopic-assisted because some part of the operation may be performed through the specimen-removal incision.

"Hand-assisted laparoscopic surgery" refers to another variation of laparoscopic surgery in which a device is placed in a small (2-3 inch) incision that allows the surgeon to pass a hand into the abdomen to assist in performing the operation. The surgeon still uses the laparoscope to view the operation on monitors and uses the same instruments, staplers and energy devices as in traditional laparoscopic surgery. The specimen is removed through the device used by the surgeon to place a hand in the abdomen. The main advantage of this procedure is that the ability to use the surgeon's hand may be very helpful in performing the operation. The disadvantage is that the incision required might be slightly larger than would otherwise be necessary. Studies have shown hand-assisted techniques to provide the same recovery benefits as purely laparoscopic procedures.

"Single incision surgery" or "single site surgery" is another minimally invasive option. With this technique, both the laparoscopic camera and the operating instruments are passed through a single, small incision (about 2 inches in length) that can also be used to remove the specimen. The primary advantage of this technique is less visible scarring since no additional small trocar incisions are necessary. The disadvantage is that most surgeons find this technique more difficult than traditional laparoscopic surgery because the instruments are placed so closely together.

“Robotic surgery” or “robotic-assisted surgery” is a newer variation on minimally invasive colon and rectal surgery. The technique is very similar to standard laparoscopic surgery in that instruments are passed into the abdomen through trocars. Rather than manipulate the instruments manually, the surgeon sits at a console, or special computer desk, and manipulates small controllers while observing the inside of the abdomen with a 3-D monitor. A sophisticated computer system translates the movements of the surgeon’s hands to the robot, which then moves the surgical instruments. Because the robot is only capable of working in a relatively small part of the abdomen at a time and is difficult to reposition, it is often used for only a portion of an operation. The remainder of the operation is usually performed laparoscopically. Robotic surgery is gaining popularity primarily for rectal operations because the robotic instruments are well suited to operating in the pelvis where laparoscopic surgery is more difficult. Because it is a newer technique, there is less evidence available to compare the outcomes of robotic surgery with traditional open surgery or the more established minimally invasive techniques. Potential advantages include better visibility and greater ability to perform minimally invasive procedures on the rectum. Disadvantages include the high cost of the robot, which may limit its availability, and the need for additional training.

Although many patients have heard the term “laser laparoscopic surgery,” this term is left over from the very early days of laparoscopic gallbladder surgery. Lasers are not currently used in minimally invasive surgery.

WHAT ARE THE BENEFITS OF MINIMALLY INVASIVE SURGERY?

Because the incisions are much smaller than those used in traditional surgery, there is usually less discomfort following minimally invasive surgery. This has been shown to result in a shorter hospital stay, less need for prescription pain medications, an earlier return to normal activities and less visible scarring. While some experts have suggested a long-term benefit to minimally invasive surgery, it is generally accepted that the primary benefits are seen in the initial recovery from surgery and that the long-term outcomes of traditional and minimally invasive surgery are similar.

IS MINIMALLY INVASIVE SURGERY NEW?

Initially, gynecologists used laparoscopic surgery for relatively simple procedures. In the early 1990s, general surgeons began using the laparoscopic technique for gallbladder operations. The popularity of laparoscopic gallbladder surgery led to the use of laparoscopic techniques for other procedures, including colon surgery. While minimally invasive colon surgery has been performed since 1990, the technology and techniques continue to evolve and improve. This has been one of the most exciting areas of progress in surgical care over the past 25 years.

IS MINIMALLY INVASIVE SURGERY SAFE?

Minimally invasive colon and rectal surgery techniques are accepted as standard surgical procedures and are not considered “experimental.” However, every surgical procedure, whether minimally invasive or traditional, carries some risk of complications. Risks common to both open and minimally invasive colon and rectal surgery include bleeding, infection, post-operative bowel blockage and leakage from an intestinal anastomosis (reconnection). Other risks, such as heart problems, pneumonia and blood clots exist with any major abdominal surgery requiring general anesthesia.

Minimally invasive surgery has been thoroughly studied in numerous clinical trials from around the world and, in general, the risk of complications is similar to that seen with traditional open surgery. Occasionally, a surgeon will encounter conditions during surgery that would make continuing with minimally invasive surgery unsafe. In this situation, the incision is enlarged to allow traditional surgical techniques to be used to complete the operation. This is referred to as a “conversion” to traditional surgery and should be considered an exercise in good surgical judgment rather than a complication. It is important for you and your surgeon to discuss the risks associated with your specific condition and the operation required in the context of your own personal health history.

WHAT COLON AND RECTAL OPERATIONS CAN BE DONE WITH MINIMALLY INVASIVE SURGERY?

Minimally invasive surgery can be successfully performed for a variety of common benign colon and rectal conditions including diverticulitis, colon polyps, inflammatory bowel diseases (Crohn's Disease and Ulcerative Colitis,) and rectal prolapse. It can be used to remove the entire colon and rectum or just a portion, or segment, of the colon. Minimally invasive techniques can be used to create an ostomy (surgically created opening between an internal organ and the body surface). They may be either a colostomy (connecting a part of the colon to the skin of the abdominal wall) or an ileostomy (connecting the last part of the small intestine, or ileum, to the skin of the abdominal wall). Also, minimally invasive techniques can be used to reconnect the intestine from a temporary ostomy. Complex reconstructive surgeries, such as ileal pouch creation can be performed in a minimally invasive fashion. There are very few traditional abdominal colon and rectal procedures that cannot be performed in a minimally invasive manner.

WHAT ABOUT COLON CANCER?

There is strong evidence that minimally invasive surgery can be safely used to remove cancers of the colon. This is important because over 100,000 new cases of colon cancer are diagnosed in the United States each year. Because the benefits of minimally invasive surgery are primarily seen in the short-term, it was important for surgeons to be sure that minimally invasive surgery provided the same long-term cure rates as traditional surgery. Multiple studies from around the world have established that properly performed minimally invasive surgery is an appropriate treatment for colon cancer. The American Society of Colon and Rectal Surgeons (ASCRS) has adopted the position: "Laparoscopic colectomy for curable cancer results in equivalent cancer-related survival to open colectomy when performed by experienced surgeons."

WHAT ABOUT RECTAL CANCER?

There is less evidence comparing minimally invasive surgery to traditional open surgery for the treatment of rectal cancer. The general consensus, and official position of the ASCRS, is that minimally invasive surgery is appropriate in the hands of well-trained surgeons following accepted cancer surgery principles. Clinical trials are ongoing that hope to remove any doubt about the long-term results of minimally invasive rectal cancer surgery.

IS MINIMALLY INVASIVE SURGERY RIGHT FOR ME?

Some patients are not candidates for minimally invasive surgery. Factors such as the specific reason for your operation, prior abdominal surgeries, severe obesity and a history of serious medical conditions (such as severe heart or lung disease) must be considered. In addition, some operations cannot be done with these techniques. Only you and your surgeon can decide the best surgical technique for your condition.

QUESTIONS FOR YOUR SURGEON:

1. Does minimally invasive surgery offer me any benefit?
2. Am I an appropriate patient for minimally invasive surgery?
3. Which minimally invasive technique(s) are you most comfortable with?
4. What is the chance that you will have to convert to traditional surgery and what will happen if you do?
5. What can I expect after surgery in terms of hospital stay, restrictions on my activities, help required at home and return to work?
6. What options do I have for anesthesia with an operative procedure?
7. How do you plan to address my pain after surgery?
8. What will happen if I don't want any treatment?

WHAT IS A COLON AND RECTAL SURGEON?

Colon and rectal surgeons are experts in the surgical and non-surgical treatment of diseases of the colon, rectum, and anus. They have completed advanced surgical training in the treatment of these diseases, as well as full general surgical training. Board-certified colon and rectal surgeons complete residencies in general surgery and colon and rectal surgery, and pass intensive examinations conducted by the American Board of Surgery and the American Board of Colon and Rectal Surgery. They are well versed in the treatment of both benign and malignant diseases of the colon, rectum and anus and are able to perform routine screening examinations and surgically treat conditions, if indicated to do so.

DISCLAIMER

The American Society of Colon and Rectal Surgeons is dedicated to ensuring high-quality patient care by advancing the science, prevention and management of disorders and diseases of the colon, rectum and anus. These brochures are inclusive but not prescriptive. Their purpose is to provide information on diseases and processes, rather than dictate a specific form of treatment. They are intended for the use of all practitioners, health care workers and patients who desire information about the management of the conditions addressed. It should be recognized that these brochures should not be deemed inclusive of all proper methods of care or exclusive of methods of care reasonably directed to obtain the same results. The ultimate judgment regarding the propriety of any specific procedure must be made by the physician in light of all the circumstances presented by the individual patient.

WORKS CITED

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FURTHER READING

Young-Fadok, T. (2011). Advanced Laparoscopic Colorectal Surgery. In D. Beck, P. Roberts, T. Saclarides, A. Senagore, M. Stamos, & S. Wexner, *The ASCRS Textbook of Colon and Rectal Surgery*, 2nd Editions (pp. 597-623). Springer. This is a more detailed description of the use of minimally invasive techniques for a variety of conditions.

National Cancer Institute. (n.d.). Colon Cancer Treatment (PDQ). Retrieved November 26, 2012, from National Cancer Institute:

<http://www.cancer.gov/cancertopics/pdq/treatment/colon/Patient> This government supported website offers a wide variety of information regarding colon and rectal cancer.

The information presented on The American Society of Colon and Rectal Surgeons (ASCRS) website is solely intended to provide you with information that will help educate you on various conditions. No information provided on this website or otherwise offered by ASCRS is intended to replace or in any way modify the advice of your health care professional.

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