

Laparoscopy and Anorectal Malformations

Repair of Anorectal Malformations in Males

[Anorectal malformations](#) in male patients have been repaired all over the world for the last 25 years with an incision between both buttocks, the posterior (situated behind) sagittal (situated on the plane that divides the body into left and right) approach. Ninety percent of all anorectal malformations in male patients can be repaired through this incision. Ten percent of male patients with anorectal malformations traditionally have required a laparotomy, an operation that opens up the abdomen, to reach a rectum that is located very high in the abdomen.

When [laparoscopy](#) was introduced, it became very obvious that the 10% of patients who required a laparotomy could potentially benefit from laparoscopy, thereby avoiding the disease potential related to the opening of the abdominal wall. Yet, even in that small group of patients with very high malformations, laparoscopy is not universally applicable because sometimes the bowel is located so high that the pull-through is rather difficult to perform laparoscopically. Then laparoscopy may become an adjunct and is called "laparoscopic assisted repair of anorectal malformation."

Some surgeons are using this minimally invasive technology to repair anorectal malformations that normally do not require entering the abdomen. This is a controversial issue. Using the posterior sagittal approach, this group of anorectal malformations can be repaired with an incision between both buttocks without opening the abdomen, in an operation that takes between 2 and 4 hours. The patients stay in the hospital for 24 to 48 hours, experience very little pain, and are able to eat the same day as the surgery. For this particular group, laparoscopy would require entering the abdomen, albeit with small incisions.

When these anorectal malformations are repaired using a posterior sagittal incision, the surgeon only mobilizes the part of the rectum necessary to reach the skin. When these defects are repaired laparoscopically, the surgeon must separate and mobilize the entire rectum, regardless of its height, subjecting patients to an unnecessarily extended dissection of the rectum. The implications of this are unknown. We do know that patients born with a very high rectum require a full mobilization, and the functional prognosis in these patients is not good.

Surgeons who perform this operation justify their approach by saying that they divide less sphincter (the ring-like band of muscles that opens and closes the anus) than with the posterior sagittal approach. Experimental studies have demonstrated, however, that the posterior sagittal division of the sphincter is of no consequence and does not interfere with bowel control.¹

There are several key steps used in the posterior sagittal approach to avoid rectal prolapse, a condition in which the rectum slips down and protrudes from the anus.² In the laparoscopic technique, the method of avoiding prolapse is to suture the rectum to the pelvic floor. It remains to be seen whether that maneuver keeps the incidence of prolapse low.

During the laparoscopic procedure, the surgeon must use a sharp surgical instrument to insert a drainage tube from the perineum (the area between the anus and the genitals) into the abdomen. This is done while watching through the laparoscope and if not done properly can potentially lead to injuries to the urinary tract. The essence of the posterior sagittal approach is good visualization of all structures and no blind maneuvers.

Within the 90% group of malformations that can be traditionally repaired posterior sagittally, there are some in which the rectum is located a little higher (prostatic fistula) and others in which the rectum is located lower (bulbar fistula). A fistula is an abnormal opening between two organs or between an organ and the outside of the body. The bulbourethral glands sit below the prostate gland and secrete a fluid that forms part of the semen. Perhaps some of the very high prostatic fistulae could be approached more easily laparoscopically, particularly if the surgeon does not have experience with the posterior sagittal approach. For a bulbar fistula, the most common anorectal defect in males, the rectum is very reachable through a posterior sagittal incision and we believe that the laparoscopic procedure is not ideal. It is important to distinguish between a laparoscopically minimally invasive operation and a laparoscopic maximally invasive procedure. In the case of a rectourethral bulbar fistula, laparoscopy could be considered more invasive.

Repair of Anorectal Malformations in Females

Females born with anorectal malformations have different anatomic defects than males. The most benign form is called rectoperineal fistula, an opening between the rectum and the perineum. This defect can be treated through a very small incision in the perineum with an operation that takes approximately 1 hour. All patients with this defect should achieve bowel control. Laparoscopy would not be an appropriate method to treat this defect.

The next malformation in terms of complexity is called rectovestibular fistula, an opening between the rectum and the vestibule of the vagina. This malformation is treated currently with a 2-hour posterior sagittal procedure. The results using the posterior sagittal repair show that 95% of patients with rectovestibular fistula have bowel control when the operation is done correctly. Laparoscopy is not applicable for this type of defect.

For both rectoperineal and rectovestibular fistulas, the distal rectum already reaches the perineum; it is just in the wrong location, either too far forward or too close to the vagina. Therefore, mobilization of that rectum from an abdominal approach using laparoscopy would be unnecessary.

The next malformation in terms of frequency is called [cloaca](#), a complex malformation which involves a fusion of rectal, vaginal, and urinary channels into a single common channel. There are a few published studies about attempts to repair cloacal malformations laparoscopically, but they describe only the rectal component of the malformation, with the vagina and urethra left together as a single channel (urogenital sinus). Those patients lost their best opportunity to have their entire malformation repaired in a single operation, and they required another operation.³

Cloacal malformations comprise a spectrum of defects, including those located very low and very high, with multiple types in between. The repair of a cloaca requires an extensive dissection between the common wall of the rectum and the genitourinary tract. In the lower type, the urogenital component can be repaired with a maneuver called total urogenital mobilization. There is no need for a laparoscopic approach in this kind of malformation. As technology advances, it is likely that surgical instruments will be more refined and eventually we will be able to separate laparoscopically the three structures that are abnormally attached in a cloacal malformation (bladder, rectum and vagina).

Summary

Laparoscopy represents a major advancement in the repair of congenital malformations. The view of the anatomy of the region through a laparoscope is the best that we have ever had in surgery. The instruments currently used, however, are still mechanically manipulated and do not allow the whole range of motion of the human hand and wrist. Most likely, in a relatively short time, ingenious engineers will be able to create finer instruments with more versatile movements. Progress is already being made in this regard in the area of robotic surgery which will one day



allow the surgeon to have tactile sensation through the instrument, and allow for very meticulous dissections like those required for the repair of cloacas.

Laparoscopic procedures applied to the surgical treatment of anorectal malformations are not free of complications. A high incidence of rectal prolapse is being reported as a consequence of laparoscopic procedures. At the Colorectal Center at Cincinnati Children's, we have treated two patients operated on elsewhere who had problems that resulted from the separation of the rectum and the urinary tract during a laparoscopic procedure. We have also reoperated on a patient with rectal retraction after a failed attempted laparoscopic repair of an anorectal malformation.

Minimally invasive procedures are here to stay. The use of the technology, however, must progress gradually, and must always be performed in a judicious way. When applied to the appropriate patient, laparoscopic procedures offer the benefits of technological advance. We should stay vigilant to be sure that new procedures are always used with the specific purpose of improving the quality of life of children.

References

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Contact the Colorectal Center at Cincinnati Children's

For more information or to request an appointment for the Colorectal Center at Cincinnati Children's Hospital Medical Center, please [contact us](#).