

LAPAROSCOPY AND ANORECTAL MALFORMATIONS

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Laparoscopy is a relatively new technology created with the specific purpose of allowing a minimally invasive approach to the repair of congenital malformations or other conditions, and is now widely used in children all over the world. This modern technology is used to decrease the pain and suffering, as well as the potential morbidity related with the opening of cavities in the human body using traditional large incisions. Laparoscopy, thoracoscopy and other minimally invasive techniques are becoming the preferred way of treating many different conditions. Advances in technology including more and more accurate surgical instruments and optical devices will continue to improve the quality of the surgical procedures performed with this kind of technology.

For the past several years, this technology has been applied in the surgical treatment of some anorectal malformations. There are several centers in the world, including ours, where this technology is being used routinely. It is important to emphasize that we believe that this treatment modality is indicated only for a specific group of patients. There remains a great deal of controversy about the use of this technology in the remaining majority of anorectal malformations.

MALES:

Anorectal malformations in male patients have been repaired via a posterior sagittal approach all over the world for the last twenty-five years with an incision between both buttocks. Ninety per cent of all anorectal malformations in male patients can be repaired through this incision. Ten per cent of male patients with anorectal malformations traditionally have required a laparotomy to reach a rectum that is located very high in the abdomen.

When laparoscopy was introduced, it became very obvious that the ten per cent group of cases that required a laparotomy could potentially benefit from this technology, and thereby avoid the morbidity related to the larger incision involved with opening of the abdominal wall. All agree with the idea that laparoscopy is useful to replace a laparotomy (opening of the abdomen) and therefore, its application in these very high malformations (ten per cent of the cases) is obvious.

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." Also, sometimes the distal rectum is very dilated and requires tapering. This is very difficult to do with laparoscopy.

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 two to three hours. The patients can eat the same day of surgery, stay 24-48 hours in the hospital, and experience very little pain. Laparoscopy, when applied to this particular group, requires entering the abdomen, albeit with small incisions.

When these malformations are operated via 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. In other words these patients are subjected to a potentially unnecessary extended dissection of the rectum, the implications of which 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 than with the posterior sagittal approach. However, experimental studies have demonstrated that the posterior sagittal division of the sphincter is of no consequence and does not interfere with bowel control. [1] In addition, in hundreds of patients with low malformations, division of the sphincters and reconstruction of them has not impacted their excellent bowel control following surgery.

There are several key steps used in the posterior sagittal approach to avoid rectal prolapse. [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.

Also, during the laparoscopic procedure, the surgeon must pass a trocar from the perineum into the abdomen, watching with the laparoscope. This is a relatively blind maneuver if not done properly that 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. In addition, during the posterior sagittal approach, the surgeon finds the very end of the rectum, and lifts that up to separate it from the urinary tract. In laparoscopy, there is potential to leave the very bottom of the rectum attached to the urinary tract. This could lead to problems later. We call this problem a posterior urethral diverticulum.

Within the group of malformations that can be traditionally repaired posteriorly (90%), 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.) 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. However, for a defect known as bulbar fistula, (which is the most common defect in males), we believe that the laparoscopic procedure is not ideal, as the rectum is very reachable through a posterior sagittal incision. 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.

FEMALES:

Females are born with different anatomic defects. The most benign form is called rectoperineal fistula. This defect can be treated through the perineum with an operation that takes approximately one hour, and utilizes a very small incision. All patients with this defect should have bowel control. Laparoscopy would not be an appropriate modality to treat this defect. The next malformation in complexity is called rectovestibular fistula. This malformation is treated currently with a two hour procedure, posterior sagittally. Laparoscopy is not applicable for this type of defect. In both of these cases the distal rectum already reaches the perineum, it is just in the wrong location, i.e. it is too far anterior (forward), and too close to the vagina. Therefore, mobilization of that rectum from an abdominal approach using laparoscopy would be unnecessary. The results using the posterior sagittal repair show that 95% of patients with rectovestibular fistula have bowel control when the operation is done correctly.

The next malformation in terms of frequency is called cloaca. There are a few publications related to attempts to repair cloacal malformations laparoscopically. Unfortunately, in these descriptions, the surgeons repaired only the rectal component of the malformation and left the vagina and urethra 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 a reoperation. [3] In the very rare case of a low urogenital sinus and a high rectum, laparoscopy might be applicable.

Cloacal malformations comprise a spectrum of defects, including very low cloacas and very high cloacas, 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.

In the future, when technology is more advanced, 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

There is no question that laparoscopy represents a spectacular advancement in the repair of congenital malformations. The exposure (the view,) of the anatomy through a laparoscope is the best that we have ever had in surgery. However, the instruments that are used presently are still mechanically manipulated and do not have 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 that treatment. We have already treated two cases of patients operated on elsewhere who had problems with this approach occurring during the separation of the rectum and the urinary tract, and have 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, it is a wonderful advance. We should maintain a certain degree of autocriticism to be sure that the procedures are always used with the specific purpose of improving the quality of life of children.

References

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