

Megarectosigmoid for chronic idiopathic constipation, sigmoidectomy with robot in the pediatric patient. First case in Mexico

Megarrectosigmoides por constipación crónica idiopática, sigmoidectomía con robot en el paciente pediátrico. Primer caso en México

Anali Meza-Gallegos*, Pedro S. Jiménez-Urueta, Sergio Terriquez-Rodríguez, Alejandro F. Tamayo-Oliver, and Enrique I. Hernández Sánchez

Pediatric Surgery, 20 de Noviembre National Medical Center, Institute of Security and Social Services for State Workers, Mexico City, Mexico

Abstract

We present the first pediatric case of Da Vinci Xi robot-assisted video sigmoidectomy in a 9-year-old male with chronic idiopathic constipation refractory to medical treatment and megarectosigmoid. He underwent sigmoidectomy with primary anastomosis without exceeding the peritoneal reflection. Sigmoidectomy in patients with intractable chronic constipation results in dramatic improvement, with reduction or elimination of laxative measures. Robot-assisted sigmoid resection is a safe minimally invasive alternative in the pediatric patient.

Keywords: Megarectosigmoid. Chronic idiopathic constipation. Robotic surgical procedure. Da Vinci Xi. Pediatric surgery.

Resumen

Se presenta el primer caso pediátrico de sigmoidectomía videoasistida por robot Da Vinci Xi en un varón de 9 años con constipación crónica idiopática refractaria al tratamiento médico y megarectosigmoides. Se le realizó sigmoidectomía con anastomosis primaria sin rebasar la reflexión peritoneal. La sigmoidectomía en pacientes con constipación crónica intratable resulta en una notable mejoría, con reducción o eliminación de medidas laxantes. La resección del sigmoides con asistencia de robot es una alternativa de mínima invasión segura en el paciente pediátrico.

Palabras clave: Megarectosigmoides. Constipación crónica idiopática. Cirugía robótica. Da Vinci Xi. Cirugía pediátrica.

Introduction

Chronic idiopathic constipation, also known as functional constipation, is defined as difficult and infrequent defecation without an identifiable organic cause (i.e., anatomical, metabolic, or neurological)¹. Regardless of the cause, as constipation progresses it can result in a

cycle of fecal retention and rectal dilatation. This, in turn, affects normal colorectal motility, and leads to worsening stool retention and increased rectal dilatation with varying degrees of severity, generating a wide spectrum of symptoms. The medically intractable group of patients that represents the more severe side of the spectrum may benefit from the surgical intervention². The first

*Correspondence:

Anali Meza-Gallegos

E-mail: analimezagallegos@hotmail.com

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Figure 1. Colon by enema showing megarectosigmoid.



Figure 2. Da Vinci Xi Robot.

descriptions of megarectosigmoid date back to the 1950s. The medical-surgical management of chronic idiopathic constipation has varied over time. Since the

use of anorectal sphincteromyectomy in the 1980s to treat chronic idiopathic constipation³, more and more surgical alternatives have emerged from modified techniques used in anorectal malformations, colon aganglionosis, and idiopathic constipation. Both sigmoidectomy and rectosigmoidectomy, as well as appendicostomy⁴ with sigmoidectomy are the techniques that have been used in the last two decades to manage these patients. The traditional approach has been through transanal or video-assisted laparotomy⁵. Robotic sigmoidectomy in adult patients has been sufficiently described; the causes of resection are diverse, such as colon and rectal cancer, diverticulitis, among others⁶. In pediatric patients, colorectal diseases have different etiologies. Surgical management of chronic idiopathic constipation has been reintroduced by Dr. De la Torre and includes transanal rectosigmoid resection.

The purpose of this report is to share the first case of sigmoidectomy without rectal dissection, video-assisted by Da Vinci Xi robot, in a pediatric patient with chronic idiopathic constipation, performed in Mexico.

Clinical case

9-year-old male whose condition started at the age of 1 year. It was managed for 8 years with various laxatives and enemas with relative improvement, but persisted with pain, straining, bleeding, a pattern of one bowel movement per week, and a Bristol 2. The lack of response to treatment and worsening symptoms prompted referral to our hospital. The diagnosis of megarectosigmoid was confirmed by colon enema with a recto-pelvic index of 0.75 (Fig. 1). Preoperative laboratory parameters were reported within normal limits.

Surgical technique

Assisted by third generation Da Vinci Xi robotic system (Fig. 2) in modified lithotomy position, with lower robotic *docking* (assembly) where the target anatomy, in this case, the sigmoid, was selected for configuration. The first trocar for the endoscope was placed 10 cm from the target, and the remaining trocars were spaced 8 cm apart in a straight line perpendicular to the target anatomy. This arrangement placed the robotic arms in an optimal configuration and maximized their ranges of motion (Fig. 3). After dissecting the inferior region of the mesosigmoid, localizing, and ligating the sigmoid artery (Fig. 4), the first cut was made with a 60 mm linear stapler 3 cm above the peritoneal reflection (Fig. 5). The second

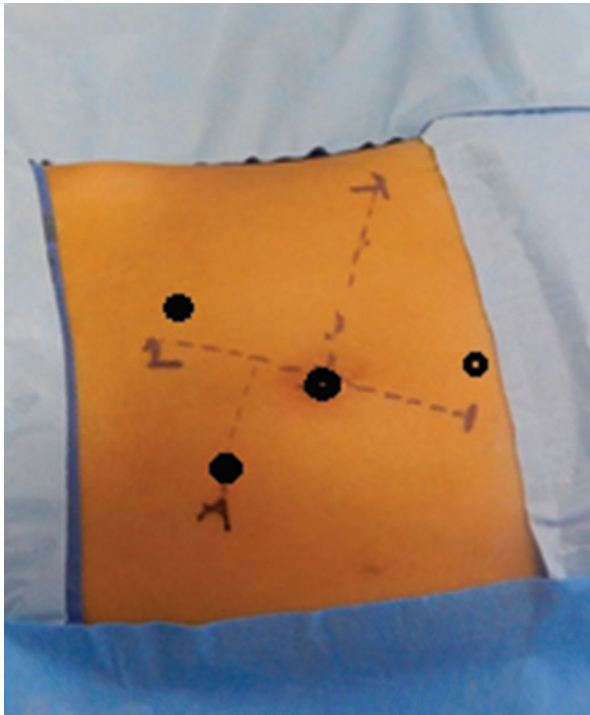


Figure 3. Marking and positioning of ports for optics and work.

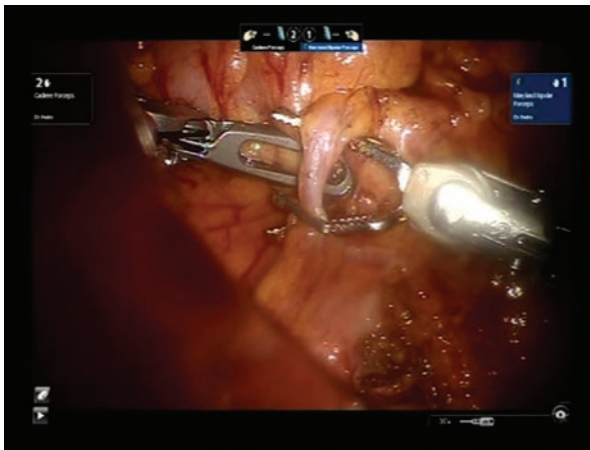


Figure 4. Dissection and clipping of the sigmoid artery.

cut was at 18 cm from the first, where a colon of normal caliber was observed, thus achieving an adequate mobilization without having to free the splenic flexure. This allowed a comfortable intestinal restitution by means of an end-to-end anastomosis with a 29 mm circular stapler (Fig. 6). Finally, a Penrose drain was placed and the procedure was terminated. Surgical time was 180 minutes.

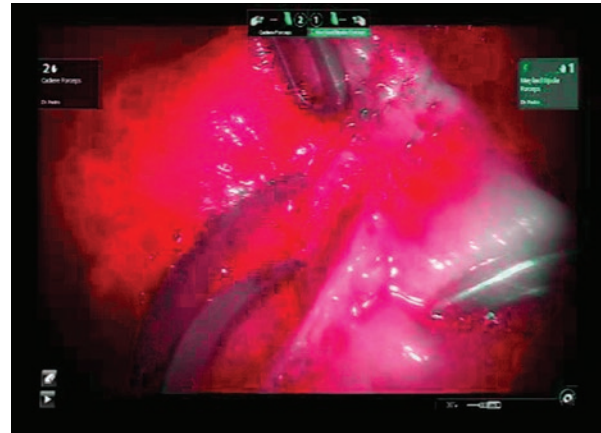


Figure 5. Distal sigmoid stapling above the peritoneal reflection with 60 mm white staple, row of staples, and cutting of the unseparated end.

Follow-up and results

With satisfactory postoperative course, intestinal function returned within 72 hours and the oral route of administration was started on the fourth day with adequate tolerance, no abdominal distension, with gas passing and evacuation, and with minimal drainage output, which was withdrawn on the third day. He was discharged home on the fifth postoperative day without complications. The pathology report of the resected sigmoid shows presence of ganglion cells.

Discussion

In the last two decades, surgical treatment of primary megarectosigmoid due to chronic idiopathic constipation or secondary to surgery for anorectal malformation, cleft spine, etc. has several approach modalities for colon resection. For example, restorative proctocolectomy, rectosigmoid resection by traditional open or laparoscopic-assisted endorectal extraction, rectosigmoid resection by a posterior sagittal approach, sphincter myectomy, sigmoidectomy with primary anastomosis, and sigmoid resection with preservation of the rectal reservoir by laparoscopy or transanal procedure⁷. The case we present was managed by robotic video-assistance, the Da Vinci Xi system, which allows standardized access for colorectal surgery by universal port placement^{8,9}. Robot-assisted sigmoid colon resection reported in the literature in adult patients is effective, offers technical advantages, its recovery is achieved in a shorter time,

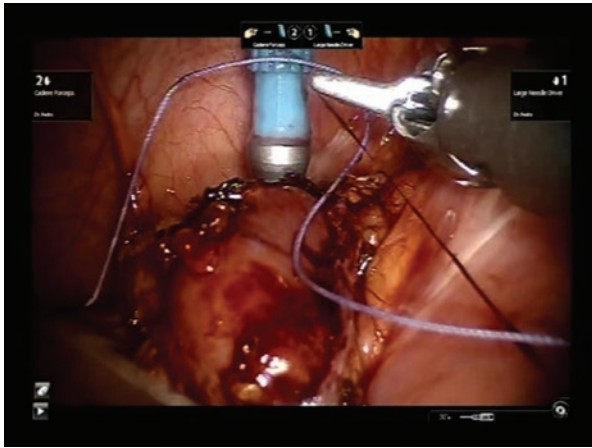


Figure 6. Placement of the anvil for colorectal anastomosis with a 29 mm caliber circular stapler.

there is less blood loss, and the reoperation rates are lower¹⁰.

Surgical indications have been, for example, failure of medical treatment, lack of adherence to treatment, or significant growth of the sigmoid and rectum that complicate management¹¹. Patients undergoing these procedures should be studied in a prospective manner¹². According to Glasser et al.¹³, when the diagnosis of megarectum has been established there is no justification for postponing surgery, as delaying it aggravates the patient's social and emotional problems. Therefore, if the patient is diagnosed early, surgery should be considered at that time. The goal of the surgical treatment is to resect the dilatation and hypomotility segment of the rectum and colon identified with the contrast enema, and to bring down the normal caliber bowel, which starts somewhere in the sigmoid¹⁴. The procedure is performed at an ever younger age, as shown by De la Torre et al.¹⁵ in their clinical case material, who perform transanal rectosigmoidectomy even in infants.

Regarding the level of the segment to be resected, the techniques used have been anatomic sigmoidectomy without surpassing the peritoneal reflection and sigmoidectomy that surpasses the reflection, with variable resections of the rectum. De la Torre et al.¹⁵ performed the rectosigmoidectomy with a transanal approach, leaving 5 cm of rectum with the intention of preserving a small rectal pouch that would avoid the risk of fecal incontinence and impaction. Therefore, we performed an anatomical sigmoidectomy without surpassing the peritoneal reflection.

We performed an exhaustive review in Medline and PubMed, and found no reports of robot-assisted sigmoidectomy in the national and international literature, thus this would be the first specific report on robot-assisted sigmoidectomy in a pediatric patient with megarectosigmoid secondary to chronic idiopathic constipation.

Conclusions

Knowing that chronic idiopathic constipation covers a broad clinical spectrum, where surgical intervention has a role in unmanageable cases, we propose robot-assisted sigmoidectomy as a safe, minimally invasive alternative in the pediatric patient. The Da Vinci robotic technology by its tridimensional magnified vision, high power optics with optimized visualization and depth of field, finer movements, and excellent ergonomics, allows greater precision to perform the dissection and resection of the megasigmoid, as well as the colorectal anastomosis. Therefore, this procedure offers a safe alternative with less risk of leakage or anastomotic dehiscence in the pediatric patient. This results in a dramatic improvement, with reduction or elimination of laxative measures, enemas, and fecal incontinence, which impacts directly on the quality of life of pediatric patients.

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Conflicts of interest

The authors declare that they have no conflicts of interest.

Ethical disclosures

Protection of people and animals. The authors declare that no experiments were carried out on humans or animals for this research.

Data confidentiality. The authors declare that they have followed their center's protocols on the publication of patient data.

Right to privacy and informed consent. The authors have obtained the informed consent of the patients and/or subjects referred to in the article. This document is in the possession of the corresponding author.

References

1. Cheng LS, Goldstein AM. Surgical management of idiopathic constipation in pediatric patients. *Clin Colon Rectal Surg.* 2018;31:89-98.
2. Levitt MA, Peña A. Surgery and constipation: when, how, yes, or no? *J Pediatr Gastroenterol Nutr.* 2005;41(Suppl 1):58-60.
3. Rush F, Leenders E, Conter C, Capesius C, Lamesch A. [The value of anorectal sphincteromyectomy for the diagnosis and treatment of chronic constipation in children]. *Acta Chir Belg.* 1983;83:261-5.
4. Levitt MA, Soffer SZ, Peña A. Continent appendicostomy in the bowel management of fecally incontinent children. *J Pediatr Surg.* 1997;32:1630-3.
5. Vilanova-Sánchez A, Levitt MA. Surgical interventions for functional constipation: an update. *Eur J Pediatr Surg.* 2020;30:413-9.
6. Pedraza R, Ramos-Valadez DI, Haas EM. Cirugía robótica por laparoscopia en colon y recto. Revisión bibliográfica. *Cir Cir.* 2011;79:384-91.
7. Levitt MA, Carney DE, Powers CJ, Tantoco JG, Caty MG. Laparoscopically assisted colon resection for severe idiopathic constipation with megarectosigmoid. *Pediatr Endosurgery Innov Tech.* 2003;7:285-9.
8. Pérez D, Woestemeier A, Ghadban T, Stein H, Gómez-Ruiz M, Izbicki JR, et al. Standardized access options for colorectal surgery with the da Vinci Xi system. *Chirurg.* 2019;90:1003-10.
9. Lee JL, Alsaleem HA, Kim JC. Robotic surgery for colorectal disease: review of current port placement and future perspectives. *Ann Surg Treat Res.* 2020;98:31-43.
10. Giordano L, Kassir AA, Gamagami RA, Lujan HJ, Plasencia G, Santiago C. Robot-assisted and laparoscopic sigmoid resection. *JSL S J Soc Laparosc Robot Surg.* 2020;24:1-12.
11. Borg H, Bachelard M, Sillén U. Megarectosigmoid in children with anorectal malformations: long term outcome after surgical or conservative treatment. *J Pediatr Surg.* 2014;49:564-9.
12. Wood RJ, Yacob D, Levitt MA. Surgical options for the management of severe functional constipation in children. *Curr Opin Pediatr.* 2016;28:370-9.
13. Glasser JG, Nottingham JM, Durkin M, Haney ME, Christensen S, Stroman R, et al. Case series with literature review: surgical approach to megarectum and/or megasigmoid in children with unremitting constipation. *Ann Med Surg.* 2018;26:24-9.
14. Levitt MA, Martin CA, Falcone RA, Peña A. Transanal rectosigmoid resection for severe intractable idiopathic constipation. *J Pediatr Surg.* 2009;44:1285-91.
15. De la Torre L, Cogley K, Cabrera-Hernández MA, Frías-Mantilla JE, Wehrli LA. Transanal proximal rectosigmoidectomy. A new operation for severe chronic idiopathic constipation associated with megarectosigmoid. *J Pediatr Surg.* 2019;54:2311-7.