SURGICAL TECHNIQUE

Laparoscopic Rectopexy: Is It Useful for Persistent Rectal Prolapse in Children?

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ABSTRACT

Rectal prolapse is a relatively common, usually self-limiting illness in children. Peak incidence is between 1 and 3 years. The intervention is required for the persistent rectal prolapse (PRP). Only scanty experience is available with laparoscopic rectopexy in children. There is available work using both mesh and suture laparoscopic rectopexy in literature. This work is unique in that it presents our clinical experience with both mesh and suture laparoscopic rectopexy in children.

This is a prospective clinical study for the outcome of laparoscopic rectopexy (LRP) by both mesh and suture technique in children with persistent rectal prolapse.

Materials and methods: Fourteen cases of PRP were managed with LRP from February 2008 to August 2012.

Results: Of the 14 children, 10 (71.42%) were males and 4 (28.57%) were females. Male to female ratio was 2:1. The mean age of presentation was 5 years (3-8 years). The presenting complaints were mass descending per rectum along with bleeding per rectum lasting from 1 to 3 years. All had rectal prolapse of 5 to 7 cm in length. Twelve out of 14 children had recurrence even after sclera-therapy before referral to laparoscopic rectopexy. The mean duration of surgery was 30 minutes (20-60 minutes). No intraoperative complications were reported, only one case get constipation and managed conservatively and no recurrence.

Conclusion: LRP is safe, feasible in children and gives satisfactory results after failure of all conservative even sclera-therapy injection.

Keywords: Laparoscopy, Rectopexy, Rectal prolapse.

INTRODUCTION

Rectal prolapse describes a condition in which the entire layer of the rectal wall protrudes through the anal canal. Rectal prolapse is classified into two types: complete or full-thickness prolapse and incomplete or partial thickness prolapse. Complete prolapse represents a protrusion of the entire layer of the rectum to the outside of the anus and, thus, shows concentric folds. Incomplete prolapse is defined as a condition in which the protruding rectal wall is limited to the inside of the anal canal, which is also referred to as occult rectal prolapse or internal rectal intussusception. In clinical practice, mucosal prolapse is readily confused with rectal prolapse. Mucosal prolapse is not a protrusion of the whole layer of the rectal wall, but a portion of the rectal wall or only the anal mucosa. It should be differentiated from rectal prolapse as the surgical treatments are different.

Rectal prolapse in children is a relatively common, usually self-limiting illness in children. Peak incidence is between 1 and 4 years.[1,2] The intervention is required for the persistent rectal prolapse (PRP). Laparoscopic rectopexy (LRP) is in vogue for adults; however, only scanty experience is available with this technique in children. We present our experience with laparoscopic rectopexy for persistent rectal prolapse at the pediatric surgery unite.

MATERIALS AND METHODS

This is a prospective clinical study of 14 children managed with LRP (mesh and suture techniques) for PRP from April 2008 to September 2012. The conservative management of nutritional support, bowel habit regulation, and dietary manipulation for managing the prolapse had failed in all cases and were referred for surgical intervention. Twelve of the 14 patients were managed with sclerotherapy using ethanolamine oleate injected submucosally in three to four sittings before being referred to laparoscope rectopexy. Cases with rectal prolapse who did not respond to conservative management over 2 years were defined as PRP and were subjected to LRP. The decision to operate was based on the age of patient, duration of conservative management was more than 18 months, and frequency prolapse was more than two episodes requiring manual reduction per month, rectal bleeding, edema, ulceration, difficult reduction. The age, sex, weight, and initial presentation, duration of symptoms, precipitating events and comorbidities were maintained. Preoperative evaluation included history and physical examination, routine laboratory investigation, MRI pelvic floor muscle and spinal bone and lateral view, defecography,

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proctoscopy and EMG anal sphincter and pelvic floor in all patients. Computed tomography (CT) scan was done for the two children with neurological problem. The authorized person was informed by the full details about the procedure and consented.

All children were given enemas each 6 hours 1 day before the surgery. Prophylactic antibiotics were given at the time of induction of anesthesia. All were operated under general anesthesia with endotracheal intubation. After full anesthesia and under complete sterilization catheter inserted to evacuate the urinary bladder. Supraumbilical transverse skin incision was done for 5 mm Ethicon XCEL port with 5 mm 00 scope introduction to the peritoneum under vision on the laparoscope monitor, then CO_2 insufflation to peritoneum up to 12 mm Hg intra-abdominal pressure was operand with hemodynamic and respiratory monitoring by anesthesia. Introduction of 5 mm, 30° scope at umbilicus port and two 5 mm working ports in midclavicular line followed this over the line joining midinguinal point and both costal margins. The position of the working ports varied with the child height and abdominal cavity size, ensuring acceptable ergonomics according to the child body built. Trendelenburg position removed the bowel away from the pelvis.
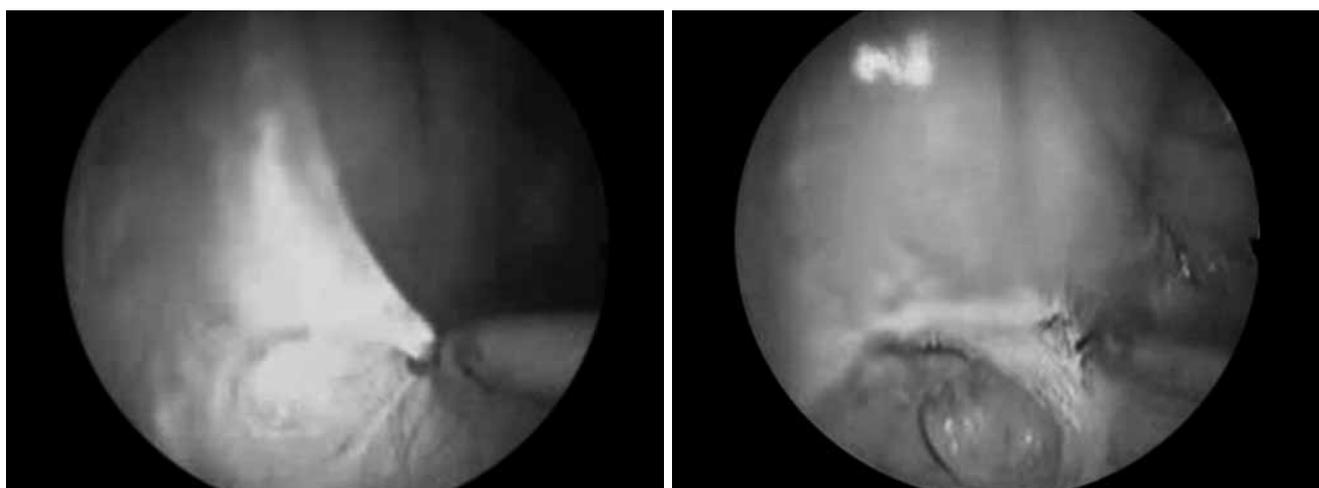
The rectosigmoid was grasped and mobilized after dividing the right side peritoneal fold starting from the sacral promontory (Fig. 1) and posterior rectal wall dissection to create a cave between the sacrum and the rectum with out opening the left peritoneal fold (Fig. 2). Both the ureters were identified and safe guarded. Rectum was mobilized from the sacral promontory to the lateral ligaments, and until the surface of the sacrum was clearly felt with an instrument and continue dissection down to the anal sphincter (Fig. 3). Ethicon Physiomesh® was inserted between the rectum and the sacral surface (Fig. 4). Rectum was then pulled up and fixed with the presacral fascia, mesh and the bone of sacral promontory of the sacrum on either side with two to three

(2 cm between each suture in the rectum) seromuscular sutures of PDS size 3/0 using intracorporeal knotting (Fig. 5). Closure of the right peritoneal window with interrupted 3/0 absorbable suture was done to cover the mesh and close the cavity (Fig. 6). Patients were kept nil orally till the return of bowel sounds. Postoperatively, stool softeners were routinely prescribed for at least 12 weeks.

RESULTS

Of the 14 children, 10 (71.42%) were males and four (28.57%) were females. Male to female ratio was 2:1. The mean age of presentation was 5 years (3-8 years). The presenting complaints were mass descending per rectum along with bleeding per rectum lasting from 1 to 3 years. All had rectal prolapse of 5 to 7 cm in length. Two children were under neuropsychiatric treatment and one had walking problem. The two neuropsychiatric children were both males and weighted 17.4 and 18.2 kg at ages 7 and 9 years, respectively. The child with walking problem was a female aged 6 years and weighted 13.8 kg, which was below the 5th centile as per NCHS weight for age charts. The remaining 11 out of 14 children were normal in weight and fell between the 20th and 50th centile by NCHS standards.

The mean duration of surgery was 30 minutes (20-60 minutes). No intraoperative complications were reported. Redundancy of rectosigmoid was noticed in all patients except the two with neuropsychiatric problem. Pelvic floor laxity was found in those two cases. No intraoperative problems were encountered and no case required conversion. Mean postoperative hospitalization was 3 days (2-5 days). All were followed up for an average of 10 months (4-12 months), with no recurrence reported in any case during the follow-up period. One child complained of postoperative constipation, which improved with dietary manipulation and stool softeners. Also, there was no urinary or fecal control problem in all cases at the follow-up period.
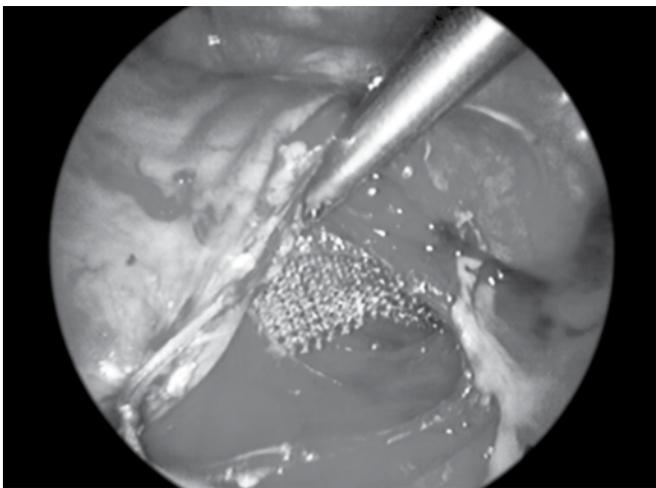

Fig. 1: Dividing the right side peritoneal fold starting from the sacral promontory
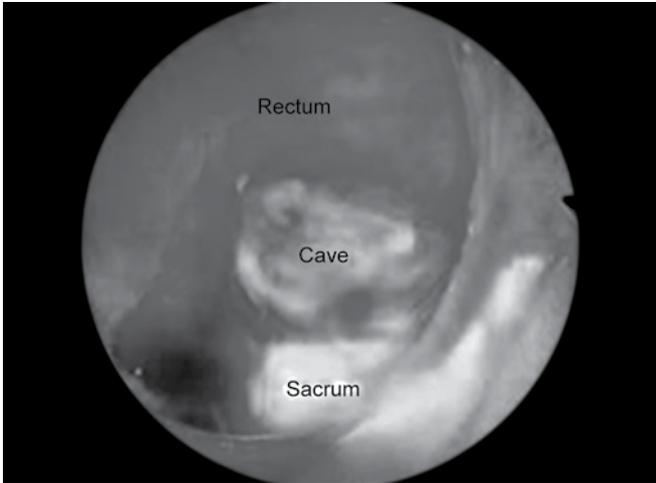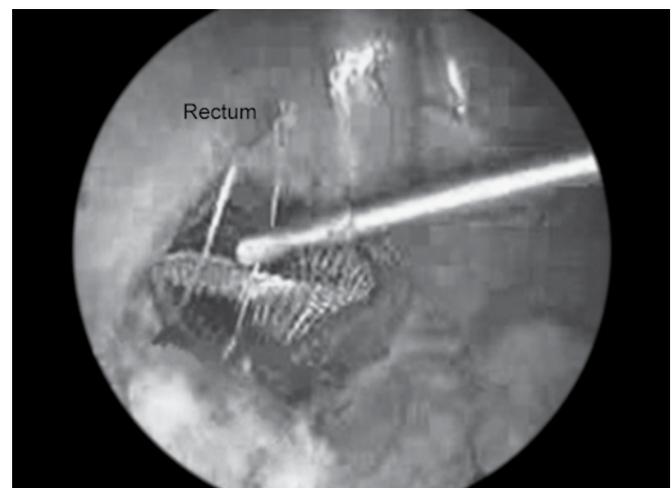
Fig. 2: Dissection to create a cave between the sacrum and the rectum
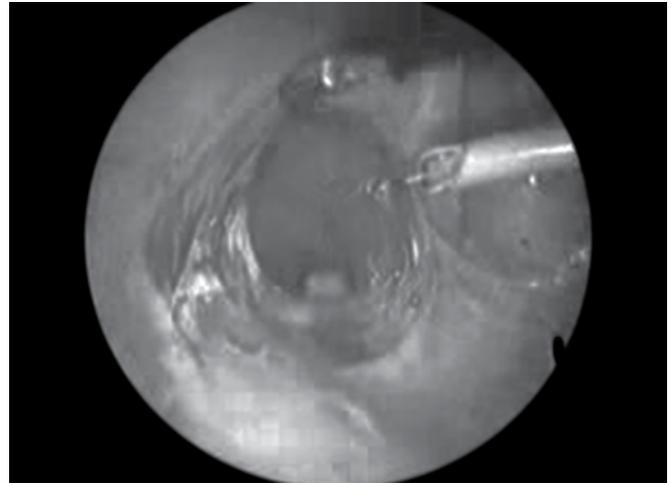
Fig. 3: Dissection continued down to the anal sphincter

Fig. 4: Mesh was inserted between the rectum and the sacral surface

Fig. 5: Rectum fixed with the presacral fascia, mesh and the bone of sacral promontory of the sacrum

Fig. 6: Closure of the right peritoneum reflection

DISCUSSION

The etiology of rectal prolapse in children is unknown. Several anatomic considerations were suggested to be a cause of rectal prolapse in children, such as shallow or vertical configuration of the sacrum, disorders of the sacral nerve root innervations, greater mobility of the sigmoid colon, and a loosely attached rectal mucosa to the underlying muscularis, absence of Houston's valves in approximately 75% of infants younger than 1 year of age was suggested, vertical course of the rectum, poor levator support, relatively low position of the rectum in the pelvis, loss of retrorectal fat due to malnutrition, chronic constipation, and/or straining during defecation.[3-5] The extent of the herniation varies from 1 to 2 cm to extensive prolapse that may result in incarceration of the rectal wall with vascular compromise.[1] Patients with rectal prolapse have lowered basal and squeeze pressures with anorectal manometry than normal control subjects.[6,7] Rectal prolapse usually presents as a self-limiting disorder in children younger than 4 years of age.[8,9] In the pediatric population, the condition is usually diagnosed by the age of 3 years, with an equal sex distribution.[10] Male preponderance has been noted by Shalaby et al[11] and our study reaffirmed a male preponderance with 70% of patients being males.

Conservative treatment is usually successful,[9] however, the prolapse may persist indefinitely in some children,

requiring surgical intervention. The percentage of children requiring surgical intervention, eventually, after failure of conservative management varies from 14 to 20%.[5] Surgery is indicated in rare cases with intractable rectal prolapse and may be considered in patients who are not spontaneously cured in 12 months of follow-up.[5] The mean period of conservative management in this study could actually be ascertained as this study was conducted at a tertiary care hospital, whereas the patients were managed from the start. However, a trial of at least 24 months of conservative management was given before the patients were referred to laparoscopic rectopexy.

Literature is replete with several treatment modalities, such as conservative treatment by regulation of toilet habit and modulation of diet,[4] injection of sclerotherapy,[13-15] linear cauterization,[16] encircling the anus,[17,18] trans anal resection, abdominal rectopexy,[19] posterior repair and suspension.[3,12] Each one of these techniques has its advantages and limitations which is a testimony to the lack of consensus over an ideal procedure. The operative procedures can be classified as abdominal[20] or perineal.[3,12,21,22] the less invasive procedure as injection sclerotherapy and encircling the anus reported success rate of nearly 90% in different series.[9,15] In this study, the conservative procedure was tried. Injection scleratherapy and liner cauterization was triad also before referral to laparoscopic rectopexy. This makes our procedure an effective valuable method for management of the persistent rectal prolapse in children with evident recurrence.

Pediatric surgeons gained good experience in laparoscopic approach and improved the surgical results.[5,23,24] Laparoscopic surgery has the advantages of good accessibility, butter visualization of the narrow pelvic space anatomy during surgery, less postoperative pain, shorter hospital stay and early recovery, as compared with laparotomy. Apart from these advantages, the results are similar to those with the open procedures irrespective of the method used (suture, resection or posterior mesh).[10] We used the rational that was described by Ashcraft et al in 1990 as the 'levator repair and posterior suspension procedure' for rectal prolapse.[3] The technique surgically accomplishes the objectives of nonoperative and operative methods of treatment through minimal invasive procedure. Advanced laparoscopic techniques in children need experience and require specific settings that may not be available in all centers but our technique is easy to be performed.

Both conventional and laparoscopic abdominal rectopexy approaches still carries the risk of bladder dysfunction and impotence.[17] This is not observed in our procedure due to the minimal pelvic dissection. Laparoscopic mesh rectopexy could avoid the morbidity of a large perineal or abdominal incision. It has been reported that prosthetic materials are not necessary in all cases.[25]

Shalaby et al, in their study, reported the mean duration of surgery as 40 minutes (30-55 minutes).[11] Rintala et al reported a median operation time of 80 minutes (62-90 minutes) for laparoscopic suture rectopexy and a median hospital time of 6 days (3-8 days).[5] The mean hospitalization time was 3 days.[11] Experience with LRP in this study further reinforces these findings; also continuous laparoscopic use will improve the operative procedure, operative time, and make the hospital stay shorter. The mean duration of surgery was 30 minutes (20-60 minutes). No intraoperative complications were reported. Mean postoperative hospitalization was 6 days (4-10 days).

The recurrence rates reported for PRP are as much as 6.9% at 5 years and 10.8% at 10 years.[11] Recurrent cases can be treated by laparoscopic resection rectopexy with or without mesh.[15,24] Some investigators reported that laparoscopic rectopexy with or without mesh is safe, rapid, and effective and can improve functional outcome without recurrence.[11] However, Rintala and Pakarinen prefer laparoscopic suspension of the rectum to anterior sacrum without mesh and they claimed that this approach is successful in several patients.[5] In this study, after a mean follow-up of 6 months, we had no recurrence because the sutures will fix the rectum strongly in the sacral promontory that acted as a dock, while the mesh is going to create a port for the rectum to seal over it.

Shalaby et al reported only one case of postoperative constipation out of 52 cases operated with laparoscopic mesh rectopexy.[11] Rintala[5] reported two patients with postoperative constipation. They added that constipation is the only postoperative problem and is frequently worsened. In this study, we had just one case of postoperative constipation, managed conservatively in spite the longer use of the postoperative laxative and diet manipulation to prevent the constipation. This stands in stark contrast to high rate (35%) of postoperative constipation reported earlier by Kariv et al. All our 14 children were continent to solid with some difficult control of gas and fluid at the time of presentation. None of them had any incontinence issues in the postoperative setting even the gas and fluid improved.

Although this is a single center experience without a control group, the results are satisfactory. Whereas larger randomized control studies are required to secure conclusive evidence for the superiority of our procedure over the conventional open procedure and also other laparoscopic technique, paucity of PRP cases in a single center remains the limiting factor. We conclude that LRP is an effective and safe minimal invasive procedure alternative to the open and laparoscopic procedures with similar success rates and no additional complications.

REFERENCES

1. Siafakas C, Vottler TP, Andersen JM. Rectal prolapse in pediatrics. Clin Pediatr 1999;38:63-72.
2. Qvist N, Rasmussen L, Klaaborg KE, Hansen LP, Pedersen SA. Rectal prolapse in infancy: conservative versus operative treatment. J Pediatr Surg 1986;21:887-888.
3. Ashcraft KW, Garred JL, Holder TM, Amoury RA, Sharp RJ, Murphy JP. Rectal prolapse: 17-year experience with the posterior repair and suspension. J Pediatr Surg 1990;25: 992-995.
4. Sanaka MR, Ferguson DR, Ulrich S, Sargent R. Polyp associated with rectal prolapse. Gastro Intest Endosc 2004;59:871-872.
5. Rintala RJ, Pakarinen M. Disorders of the anus and rectum, anorectal function. In: O'Neill JA, Coran AG, Fonkalsrud E, Grosfeld JL, editors. Pediatric surgery. 6th ed. Philadelphia: Mosby; 2006. p. 1595-1596.
6. Gourgiotis S, Baratsis S. Rectal prolapse. Int J Colorectal Dis 2007;22:231-243.
7. Theuerkauf FJ Jr, Beahrs OH, Hill JR. Rectal prolapse: causation and surgical treatment. Ann Surg 1970;171:819-835.
8. Corman ML. Rectal prolapse in children. Dis Colon Rectum 1985;28:535-539.
9. Abes M, Sarihan H. Injection sclerotherapy of rectal prolapse in children with 15% saline solution. Eur J Pediatr Surg 2004;14: 100-102.
10. Madiba TE, Baig MK, Wexner SD. Surgical management of rectal prolapse. Arch Surg 2005;140:63-73.
11. Shalaby R, Ismail M, Abdelaziz M, Ibrahem R, Hefny K, Yehya A, et al. Laparoscopic mesh rectopexy for complete rectal prolapsed in children: a new simplified technique. Pediatr Surg Int 2010;26:807-813.
12. Pearl RH, Ein SH, Churchill B. Posterior sagittal anorectoplasty for pediatric recurrent rectal prolapse. J Pediatr Surg 1989;24: 1100-1102.
13. Chan WK, Kay SM, Laberge JM, Gallucci JG, Bensoussan AL, Yazbeck S. Injection sclerotherapy in the treatment of rectal prolapse in infants and children. J Pediatr Surg 1998;33:255-258.
14. Dutta BN, Das AK. Treatment of prolapse rectum in children with injections of sclerosing agents. J Indian Med Assoc 1977; 69:275-276.
15. Fahmy MA, Ezzelarab S. Outcome of submucosal injection of different sclerosing materials for rectal prolapse in children. Pediatr Surg Int 2004;20:353-356.
16. Hight DW, Hertzler JH, Philippart AI, Benson CD. Linear cauterization for the treatment of rectal prolapse in infants and children. Surg Gynecol Obstet 1982;154:400-402.
17. Sander S, Vural O, Unal M. Management of rectal prolapse in children: Ekehorn's rectosacropexy. Pediatr Surg Int 1999;15:111-114.
18. Abcarian H. Prolapse and procidentia. In: Shackelford RT, Zuidema GD, editors. Surgery of the alimentary tract. 2nd ed. Philadelphia: Saunders; 1991. p. 331-348.
19. Berman IR. Sutureless laparoscopic rectopexy for procidentia. Technique and implications. Dis Colon Rectum 1992;35:689-693.
20. Safar B, Vernava AM. Abdominal approaches for rectal prolapse. Clin Colon Rectal Surg 2008;21:94-99.
21. Tsugawa C, Matsumoto Y, Nishijima E, Muraji T, Higashimoto Y. Posterior plication of the rectum for rectal prolapse in children. J Pediatr Surg 1995;30:692-693.
22. Wyllie GG. The injection treatment of rectal prolapse. J Pediatr Surg 1979;14:62-64.
23. Saxena AK, Metzelder ML, Willital GH. Laparoscopic suture rectopexy for rectal prolapse in a 22-month-old child. Surg Laparosc Endosc Percutan Tech 2004;14:33-34.
24. Bonnard A, Mougenot JP, Ferkdadji L, Huot O, Aigrain Y, De Lagausie P, et al. Laparoscopic rectopexy for solitary ulcer of rectum syndrome in a child. Surg Endosc 2003;17:1156-1157.
25. Laituri CA, Garey CL, Fraser JD, Aguayo P, Ostlie DJ, St Peter SD, et al. Fifteen-year experience in the treatment of rectal prolapse in children. J Pediatr Surg 2010;45:1607-1609.