COMPLICATIONS IN LAPAROSCOPIC REPAIR OF RECTAL PROLAPSE IN CHILDREN. CASE REPORT AND REVIEW OF LITERATURE

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Abstract

Aim of study: Literature review of complications in laparoscopic repair of complete rectal prolapse in children and reporting of unusual presentation of adhesive bowel obstruction.

Materials and method: We present the case of an 11-year-old healthy girl who has been referred with persistent rectal prolapse. Patient underwent laparoscopic rectosigmoidopexy with mesh. Two months post-surgery, she presented with symptoms of bowel obstruction. Laparotomy findings confirmed 2-bands of adhesions adherent to mesh. Post-operative was uneventful. We also review published English language literatures.

Discussion: Six series adopted laparoscopic treatment for persistent rectal prolapse in childhood. Median age was 6.9 years. No intraoperative complications were reported. Postoperative complications were reported with no significant morbidity and mortality. We report first case with adhesive bowel obstruction post laparoscopic mesh repair.

Conclusion: Small number of trials reported role of laparoscopy in management of complete rectal prolapse becomes common and improving functional outcome. Surgical complications can still happen; however current practice doesn’t show significant morbidity and mortality.

Keywords: laparoscopic repair, rectal prolapse, children, complications.

Background

Rectal prolapse is a relatively common condition in children. It is usually a self-limited problem and requires no surgical treatment. For children with persistent rectal prolapse, a variety of surgical procedures have been described with relative success. Recently, there are many reports addressing successful use of different laparoscopic approaches for complete rectal prolapse which becomes the standard choice for management. Laparoscopic non-absorbable mesh or suture rectopexy are frequently used. It is a feasible and safe procedure; however, complications may occur.

This article is reporting the first case of adhesive bowel obstruction post laparoscopic mesh repair of complete rectal prolapse in children and reviewing similar and further complications of the procedure which may happen.

Materials and Method

We reviewed English language articles published in Medline, PubMed and Cochrane database. The search is based on key words: complications, laparoscopy, complete rectal prolapse and children. Published reviews and articles are retrospective studies carried out after ethical approval is granted from local institutes. Permission from parent has been granted to report the case. The rest of published data have been gathered, tabulated and analysed using the percentage ratio, mean, median and the range for calculations.

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Case report

An 11-year-old girl, well and healthy, has been referred from her GP with 10-month history of persistent rectal prolapse which becomes more frequent and difficult to reduce spontaneously. She has been brought to the A&E in few occasions for manual reduction. It is coming to an embarrassing point which is interfering with her usual daily physical activity. She has no previous history of diarrhoea or constipation. On physical examination, abdomen is soft, lax and no masses were felt. Digital rectal examination excluded rectal ulcers, fissures and any gross pathology. Oral laxative has been prescribed by gastroenterologist but with no successful response which was followed by unremarkable colonoscopy. Routine blood test and Sweat test results are normal.

The patient underwent laparoscopic rectosigmoidopexy with mesh applied to fix the redundant sigmoid colon to the sacral promontory. Post-operative period was uneventful and patient recovered smoothly and regained bowel function on second day before being discharged home. Oral laxative has been prescribed for three months. On follow-up appointment in 6 weeks, she looked well with no active abdominal complaint and no symptoms of recurrence.

A week after, she has been brought to the A&E with symptoms of bowel obstruction (vomiting, abdominal distension and no bowel movements for 3 days). After resuscitation, conservative management commenced with nasogastric tube on free drainage, IV drip and close monitoring for her response. Abdominal X-ray has shown distended bowel loops. Decision has been made for laparotomy and proceeds, which revealed thick fibrous bands obstructing distal ileal loops and firmly adherent to the mesh on the sigmoid colon. Excisions of the obstructing bands, release of intra-abdominal simple adhesions and partial omentectomy have been performed. Smooth post-operative recovery was reported. Patient had satisfactory outcome during out-patient follow-up.

Discussion

Scanty series and few case reports, 6 different series, adopted laparoscopic approach as a standard surgical treatment for persistent rectal prolapse in childhood. The trials are included with total number of 144 patients. All reviews are retrospective studies. Male to female ratio is variable, however boys are predominant. Their median age was 6.4 years (range, 0.4-19 years). The coincident pathologies and underlying pathologies are identified. Patients in available trials are exposed to stool softener, laxative and abundant straining during defecation as conservative management for variable period. However, the persistency of rectal prolapse caused significant distress, pain, occasionally anal bleeding and embarrassment for patients and their families. Post-operative complications are collected and categorized according to the laparoscopic procedure (Table 1). Rectal prolapse is ranging from intermittent protrusion of rectal mucosa that is spontaneously reduced to full thickness rectal wall that requires manual reduction. Complete rectal prolapse is the result of complete circumferential protrusion of 6 to 8 cm of full rectal wall thickness from the anal verge and advanced through the anal canal, evertting onto the perineum [7]. It usually happens during defecation. Precipitating factors are weakness of pelvic floor muscles and loosely attached mucosa to underlying muscle coat. However, anatomic variation should be taken in consideration. Patients with primary prolapse tend to have more vertical course of rectum, flatter coccyx and relative low position of rectum [4] Other cofactors are: malnutrition, parasitic disease, straining during defecation and long period of sitting on toilet seat, diarrhoea or constipation [1,3,4]. Approximately 75% of rectal prolapse is associated with constipation. Boys are commonly affected than girls but no statistical significance [1-5]. Peak age is between 1 and 3 years old [3]. However, 20% of cases initially presented between 3 months to 6 years of age due to cystic fibrosis [7].

The vast majority of cases with rectal prolapse don’t need surgery. However, the indication for surgical intervention was warranted to some cases with intractable prolapse and not spontaneously cured. Basically, surgical intervention is not recommended until 1 year of conservative therapy. However, wait and watch period is preferred and could be individualized according to each case. Patients older than 4 years of age require surgery more than younger children [8]. Recently, the laparoscopic approach becomes standard choice for the management of complete rectal prolapse in children or failed other surgical procedures; e.g. posterior sagittal rectopexy and local nonsurgical forms of therapy; e.g.: sclerotherapy [4]. This procedure is used as replacement of trans-abdominal open technique. The rectum is mobilized, retracted from pelvis and fixed to the peristeum of sacral promontory. This can be carried out by using mesh applied in the retro-rectal space [2,3,7] or just suturing the recto sigmoid in multiple locations posteriorly and/or laterally [1,2,3,5,7]. Further retro-rectal dissection and division of lateral rectal ligaments are not recommended by
Potter et al. [5]. This is due to risk of injury of blood supply and nerves running through this plane. However, careful exposure of sacral promontory can be achieved [2,3]. The specific goals are to eradicate the external prolapse, improve bowel motility and reduce recurrence [2]. Through laparoscopic view, cases showed redundant recto-sigmoid colon and sigmoid colon resection was reported [2]. The procedure is completed laparoscopically without any conversion to open [2,5]. Use of colonic preparatory rectal enema is documented [2,3] but evolved by Potter et al. later with no documented complications [5]. Antibiotic regime frequently used on induction is cephalosporin and metronidazole [2,5]. Preferable position is supine position [2] or Trendelenburg [5]. Procedure was carried out through three trocars 5mm which are applied by open method and under vision. However extra working trocar for laparoscopic retractor was occasionally applied [2,4]. 30 scope and pressure 10-12mmHg are sufficient [2,3,5], 45 scope was used by Laituri et al. [4]. Prolene sutures have been preferred by Ismail et al. [2] however silk suture has been used by Laituri et al. [4]. Choosing between solely suturing or mesh application depends on pelvic floor laxity [2]. The mean duration of surgery was 90 min (range, 40-110 minutes) for mesh and 60 min (range 50-90 minutes) for sutures. Short stay after surgery in most of case series and mean postoperative hospitalization ranges between one day and 6 days [2].

No intraoperative complications were reported such as bleeding, bowel injury [5] one case reported with port-site hernia and wound infection [1]. Postoperative complications and follow up events were reported with no significant morbidity and mortality. Although few cases were lost to follow-up, but the majority were available ranging between 7.2 months and 36 months [2,5]. Although relatively short follow-up period, recurrence is not documented with laparoscopic mesh [2]; however, it is documented when only sutures are used. 5% total recurrence and 11% partial mucosal prolapse have been reported (5). Constipation happened that responded well to oral laxative treatment. Karvin et al reported 35% incidence of constipation after laparoscopic rectopexy (9). However, Demirbas et al reported reduction of colonic transit time in 50% of patients postoperatively (10). All patients with chronic constipation or anatomical anomalies have commenced laxative medications after surgery. However, only 16% were laxative free post rectopexy on long term follow up (5). Temporary colonic fistula treated conservatively was reported (2). Improvement of postoperative

Table 1. Literature review

<table>
<thead>
<tr>
<th>Author/ Source</th>
<th>Number of cases</th>
<th>Median duration &amp; type of surgery</th>
<th>Mean hospital stay</th>
<th>Post-operative complication</th>
<th>Follow-up duration</th>
<th>Median age at surgery (range)</th>
<th>Underlying pathology and relative medical background</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awad K et al. J Laparoendosc Adv Surg Tech 2016</td>
<td>20</td>
<td>77.5 minutes (range, 30-150) multiple sutures</td>
<td>1 day (range, 1-4)</td>
<td>1 recurrence 1 mucosal prolapse 1 port site hernia</td>
<td>14 months (range, 6.6-29)</td>
<td>4.4 years (range 2.11Y)</td>
<td>All primary prolapse 11 failed conservative 9 post injection sclerotherapy</td>
</tr>
<tr>
<td>Ismail M et al. J Pediatr Surg 2010</td>
<td>40</td>
<td>90 minutes-Mesh 60 minutes-sutures</td>
<td>3 days (range, 2-5)</td>
<td>1 constipation 1 colonic fistula no recurrences</td>
<td>36 months</td>
<td>9 years (range 0.4-14 Y)</td>
<td>37 primary prolapse 3 redundant recto-sigmoid colon due to neuropathy (spina bifida)</td>
</tr>
<tr>
<td>Shalaby R et al. Pediatr Surg Int. 2010</td>
<td>52</td>
<td>40 minutes-Mesh</td>
<td>2 days</td>
<td>2 constipation no recurrences</td>
<td>36 months</td>
<td>6 years (range, 2-14 Y)</td>
<td>Primary prolapse</td>
</tr>
<tr>
<td>Laituri CA et al. J Pediatr Surg. 2010</td>
<td>5</td>
<td>Multiple sutures</td>
<td>N/A</td>
<td>no recurrences</td>
<td>7.2 months</td>
<td>6.8 years (range 0.4-19 Y)</td>
<td>All with constipation</td>
</tr>
<tr>
<td>Potter DD et al. J Pediatr Surg. 2010</td>
<td>19</td>
<td>72 minutes (±23 minutes) 3 Sutures</td>
<td>1 day (±0.8D)</td>
<td>1 recurrence 2 mucosal-prolapse</td>
<td>1.9 years (±1.4 years)</td>
<td>6.2 years (±3.6)</td>
<td>6 chronic constipation 2 sacrococcygeal teratoma 1 Hirschsprung’s disease 1 Prader Willi syndrome 1 Cystic fibrosis 7 health colon and rectum</td>
</tr>
<tr>
<td>Rintala R et al. Surg Endos. 2006</td>
<td>8</td>
<td>80 minutes. Multiple sutures</td>
<td>6 days (range 3-8 D)</td>
<td>2 constipations no recurrences</td>
<td>13 months</td>
<td>6.5 years (range 0.8-16.8Y)</td>
<td>Primary prolapse 5 mental retardation</td>
</tr>
</tbody>
</table>
EMG studies during rest and squeezing in all cases was reported except those secondary to neuropathic origin (2).

In the current case, we report the first paediatric patient, published in literature, who developed adhesive bowel obstruction post laparoscopic mesh repair of primary complete rectal prolapse. No outstanding laparoscopic operative findings have been noticed. Optilene™ non-absorbable mesh has been applied with no intra-operative difficulties or complications. Surgical procedure was completed in 35 minutes. Post-operative period was uneventful. Laxative has been prescribed from day one and patient was reviewed well in out-patient clinic with no recurrence of rectal prolapse has been documented. Very short onset (less than 2 months), she developed symptoms of bowel obstruction which is not responding to usual conservative treatment. Intra-abdominal fibrous thick bands caused small bowel obstruction. These bands anchor on the mesh from one side and lateral abdominal wall from other end, however it compresses the small bowel underneath. Surprisingly no bowel ischemia has happened.

Conclusion
Small number of trials have been identified in the paediatric age group. Relative short period of follow-up was noticed. The use of laparoscopy in the management of complete rectal prolapse becomes common and is improving functional outcome. Surgical complications can still happen; in spite of this, current practise doesn’t show significant morbidity and mortality.

R E F E R E N C E S