Modified Thiersch’s operation for partial rectal prolapse in children

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Abstract

Prolapse of the rectum can affect the human at any age but it is more common in children and elderly, it is either partial (mucosal) or complete (procidentia). Objectives Is to show the efficacy of the modified Thiersch’s stitch by the use of nylon suture in watch spring shape around the anus in the treatment of the partial prolapse of the rectum in children. The present prospective study is concerned with partial rectal prolapse in children of age ranging between 1-12 yrs treated in Samarra general Hospital and Tikrit Teaching Hospital from 1992 to 2004. For Twelve years, 81 cases of partial rectal prolapse have been treated, 30 cases (Group A) were treated by Thiersch’s stitch with a single circle nylon suture around the anus, and 51 cases (Group B) underwent modified Thiersch’s operation (making double circles by one zero gauge nylon suture under the skin around the anal verge) under general anesthesia. The methods gave a 96% cure rate of prolapse, With 20% complication rate (fecal impaction) in Group A, and 100% cure rate and 2% complication rate in Group B. As a conclusion, the watch spring shape stitch by nylon around the anus is easy to apply, comfortable to the patient and effective as a treatment for partial rectal prolapse in children with less complication rate than other methods.

Keywords: Partial prolapse, Thiersch’s stitch, Nylon suture, Watch spring.

Introduction

Rectal prolapse was described as early as 1500 BC. Rectal prolapse occurs when a mucosal or full-thickness layer of rectal tissue slides through the anal orifice. Problems with faecal incontinence, constipation, and rectal ulceration are common. The precise cause of rectal prolapse is not defined; however, a number of associated abnormalities have been found. As many as 50% of prolapse cases are caused by chronic straining at defecation and constipation. A deep pouch of Douglas, a shallow sacral curvature, weakness of the pelvic floor, and decreased resting anal sphincter pressure also have been associated with rectal prolapse.

Rectal prolapse was more common 50 years ago than now, and this decreased occurrence is thought to be due to improved nutrition and hygiene in industrialized countries. Prolapse of the rectum may involve only the mucosa for not more than 1.25-3.75cm, which is the least serious form and is most common in the pediatric population, or it may involve all layers of the rectum protruding through the anus (procidentia).

Most cases of childhood prolapse occur in patients younger than 4 years, with the highest incidence in the first two years of life. Anatomic considerations related to this early presentation include the relatively low position of the rectum in relation to other pelvic organs, the increased mobility of the sigmoid colon, the relative lack of support by the levator ani muscle, the loose attachment of the rectal mucosa to the underlying muscularis, and the absence of Houston valves in about 75% of infants.

Other predisposing factors include diarrhea, parasitic and neoplastic disease, cystic fibrosis, malnutrition (loss of ischiorectal fat pad), ulcerative colitis, Hirschsprung disease, Ehlers-Danlos syndrome, meningomyelocele, pertussis, rectal polyp, and postsurgical repair of an
anorectal malformation. Although cystic fibrosis is not a likely diagnosis in patients who present with rectal prolapse, a sweat test is indicated in all patients who present without an underlying anatomic abnormality. Rectal prolapse occurs in 20% of patients with cystic fibrosis who are aged 6 months to 3 years. 8,20,21,22

The original Thiersch's operation designed to treat this condition used silver wire gauge 20 applied around the anal verge subcutaneously using a long large bore hollow needles to help the employment of the silver wire. 5,10,11

The procedure is then modified by the use of a single circle of nylon suture (Fig. 6) or a rebon of Dacron 11,23,24

The present study added other modification by doing double circle of the nylon suture around the anus. (Fig, 4) The aim of the study is to investigate the usefulness and advantages of the new modification of Thiersch operation for rectal prolapse in children.

Patients and Methods

The present study is concerned with the partial prolapse in children in which the rectal mucosa and the submucosa (not the entire wall) protrude from the anus for not more than 1.25 - 3.75 cm.

For 12 years, from the 1st of June 1992 to the 1st of June 2004, we treated 81 children, ages ranged 1-12 yrs. (Table 1.) in Samarra General Hospital and Tikrit Teaching Hospital. The number of males was 37 (45.5%), the number of females was 44 (54.5%). (Fig. 1.)

These cases did not respond to conservative treatment which included

1- Treatment of constipation or diarrhea.
2- Treatment of parasitic infestation and intestinal infections.
3- Correction of malnutrition.

4- Prevention of the squating position of the child on the pan for defecation by using a chair with pan.
5- Reduction of the prolapsed rectum manually by the mother or medical personnel by wrapping the distal two-thirds of the index finger with Kleenex tissue, the finger is inserted into the protrusion and the mass is eased into place, Gently the finger is withdrawn, leaving the Kleenex tissue to disintegrate. 5

The patients were divided into 2 groups: Group A (30 patients) treated by applying a single circle nylon suture, and Group B (51 patients) treated by applying a double circle nylon suture.

The method of employment of the stitch is by giving the child general anesthesia, in lithotomy position, we do a 0.5 cm length vertical incision in the midline one centimeter distance anterior to the anal verge and other 0.5 cm length incision one centimeter distance posterior to the anal verge in the skin and subcutaneous tissue. (Fig. 4)

We use one zero nylon suture attached to a big curved needle (1/3 rd circle, 50 mm) we introduce the needle in the anterior incision subcutaneously backwards around the anal verge on one side, then emerge the tip of the needle out from the posterior incision, pulling it out, then introduce it into the same incision going anteriorly, subcutaneously around the anal verge on the other side of the anus till the needle appears from the anterior incision, the suture is tied in this step in case of a single circle (Group A) (Fig. 6), or we repeat the procedure again, so that the nylon suture will round double times around the anus (Group B)(Fig. 4). We ask the assistant to introduce his little finger into the anus of the child and then we tie the two ends of the nylon suture which appear from the anterior
incision lightly, knotting it seven times. We keep the nylon suture in its site for one month as an average time, then we remove it by pulling the knot which is usually apparent on the skin, but if it is hidden under the skin we use 0.5 cc 2% lidocain local anesthetic solution injection by a hypodermic needle to incise the skin over the knot to pull it, we cut one side of the suture and pull the other side smoothly without pain.

**Results**

Table 1 shows the distribution of age in patients with rectal prolapse, 81 patients were included in this study, 44 (54%) were females and 37 (46%) were males (Fig. 1). The patients were divided into 2 groups, Group A (30) patients treated by applying a single circle nylon suture, and Group B (51) patients treated by applying a double circle nylon suture.

In Group A, 6 (20%) patients had a difficulty in defecation and developed constipation in the 1st post operative week, 4 of them responded to rectal enema to start with, followed by the use of mild oral laxative, the remaining 2 patients stay constipated in spite of these measures and needed removal of the stitch, reemploying and tying it on a bigger size finger (index finger). So the failure rate of the first trial is 7% and nil after the 2nd trial.

From the 16 males and 14 females (total 30), 28 (93%) patients cured from the disease while 2 (7%) patients required redoing the operation. The complication rate (constipation) was (20%) however all the members of the group have been cured from their prolapse after the removal of the stitch one month later including the reoperated patients. (Table 4)

In Group B, from the 21 males and 30 females, total 51 patients, one (2%) patient constipated 2 days after the operation, treated by the use of rectal enema followed by mild oral laxative. All the patients were cured after removal of the stitch one month later with successful rate of 100% and complication rate of 2% with P-value less than 0.01 (Table 4).

**Discussion**

In Group A, 6 patients developed constipation, however 4 of them responded well to rectal enema and mild laxative while 2 patients did not respond to this conservative treatment and needed to open the stitch and reemploying it again on a bigger size finger or dilator. This complication is less in Group B with the present modified design of double circle watch spring shape nylon stitch.

The advantages of the nylon suture compared with the original Thiersch silver wire are:

1. It is soft and easily malleable.
2. Easily employed around the anus.
3. The knot is not injurious.
4. Easy removal of the stitch with no pain specially if the knot is apparent as it is usual, or it may needs local anesthesia if the knot is hidden in the wound.\(^5\)\(^,\)\(^11\)

The superiority of the double circle over the single circle shape is by:

1. In double circle shape, it is possible to manipulate the stitch by adding a free knot by a separate suture below the original knot for tightening the appliance in case of persistence of prolapse in spite of the presence of a loose stitch (Fig. 5), and omitting one circle of the suture for loosening the appliance by pulling the knot, cutting one side of the knot, pulling the inner circle thread from the anterior incision by a fine curved mosquito hemostat, and tie the suture on a bigger size finger (Fig. 6) with no need for general anesthesia.

2. The watch spring shape suture gives the appliance an ability for stretching to some extent in front of the faecal mass when it passes through the anus giving the patient more
comfort during defecation and avoiding fecal impaction by the following biomechanics:

The resting tension of the double circle nylon stitch keeps the tissues of the anal verge in position preventing anatomical distortion and rectal prolapse, when the fecal materials pass through the anus it slightly distend and stretch the inner circle to outside to allow the faeces to pass(Fig.7 arrow 1), and by the same time the thread of the inner circle will pull on the thread of the outer circle (Fig.7 arrow 2) reducing its diameter(Fig.7 arrow 3) holding the tissues in between the two circles in position.

There are other methods for treating the partial rectal prolapse like submucosal injection of 30% hypertonic saline, 5% phenol in almond oil or 70% alcohol (Table 5). It gives a high success rate but it may be difficult and painful if done without anesthesia, it may needs to be repeated and sometimes has a serious complications like

1- Sloughing of rectal mucosa
2- Rectal stricture.
3- Perirectal abscess.
4- Urine retention.
5- Damage to the nerve supply of the urinary bladder 25,26,27

While the present study dose not carry such complications

As a conclusion, the present study concluded that in non responding cases of partial rectal prolapse in children to conservative treatment, Modified Thiersch's stitch around the anus in double circle by one zero nylon suture in watch spring shape, which is removed after one month, is very effective, with high successful rate, less complications and more comfortable than the use of the single circle nylon suture or some of the injection methods.(Table 5)

References

1. Lynn K Flowers , Rectal Prolapse Last Updated: June 13 , 2004;topic496.htm- 82
2. Lisa S Portiz, Rectal Prolapse. Last Updated: February 6, 2003. topic 3533.htm-84
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Table (1): Age distribution of patients with rectal prolapse

<table>
<thead>
<tr>
<th>Age</th>
<th>1-3 yr</th>
<th>3-6 yr</th>
<th>6-9 yr</th>
<th>9-12 yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of patients</td>
<td>59</td>
<td>12</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Percentage</td>
<td>72 %</td>
<td>15 %</td>
<td>10 %</td>
<td>2 %</td>
</tr>
</tbody>
</table>

*The oldest patient was 12 yr old.
** Mean age was 4.2 years

Table (2): Duration of rectal prolapse

<table>
<thead>
<tr>
<th>Duration</th>
<th>1-3 months</th>
<th>3-6 months</th>
<th>6-12 months</th>
<th>1-2 yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of patients</td>
<td>40</td>
<td>18</td>
<td>16</td>
<td>7</td>
</tr>
<tr>
<td>Percentage</td>
<td>50 %</td>
<td>22 %</td>
<td>20 %</td>
<td>8 %</td>
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</table>

Table (3): Type of reduction of rectal prolapse.

<table>
<thead>
<tr>
<th>Types of reduction</th>
<th>Spontaneous</th>
<th>Manual</th>
<th>Irreducible</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of patients</td>
<td>51</td>
<td>28</td>
<td>2</td>
</tr>
<tr>
<td>Percent</td>
<td>63 %</td>
<td>35 %</td>
<td>2 %</td>
</tr>
</tbody>
</table>

Table (4): Comparison between Group A & Group B

<table>
<thead>
<tr>
<th>Study</th>
<th>male</th>
<th>%</th>
<th>female</th>
<th>%</th>
<th>total</th>
<th>*Fecal impaction</th>
<th>%</th>
<th>*Anal soiling</th>
<th>%</th>
<th>*success</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td>16</td>
<td>53</td>
<td>14</td>
<td>47</td>
<td>30</td>
<td>6</td>
<td>20</td>
<td>3</td>
<td>10</td>
<td>28</td>
<td>93</td>
</tr>
<tr>
<td>Group B</td>
<td>21</td>
<td>41</td>
<td>30</td>
<td>59</td>
<td>51</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>51</td>
<td>100</td>
</tr>
</tbody>
</table>

*P value is less than 0.01 therefore it is highly significant.
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Table (5) : Comparison of success rate of different injection procedures

<table>
<thead>
<tr>
<th>The study</th>
<th>Type of treatment</th>
<th>Success rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kayon Zachary (1970)</td>
<td>Injection 30% saline</td>
<td>100%</td>
</tr>
<tr>
<td>Malyshev (1973)</td>
<td>Injection 70% alcohol</td>
<td>96%</td>
</tr>
<tr>
<td>Dutta (1977)</td>
<td>Injection 30% saline</td>
<td>100%</td>
</tr>
<tr>
<td>Wyllie (1979)</td>
<td>Injection 5% phenol in almond oil</td>
<td>100%</td>
</tr>
<tr>
<td>Wrmman (1985)</td>
<td>Injection 30% saline</td>
<td>100%</td>
</tr>
<tr>
<td>Fehri (1988)</td>
<td>Injection 70% alcohol</td>
<td>98%</td>
</tr>
<tr>
<td>H. Abdurrasoul, H. Hindi (2004)</td>
<td>Injection 30% saline</td>
<td>100%</td>
</tr>
<tr>
<td>present study</td>
<td>Modified Thielsch stitch double circle nylon</td>
<td>100%</td>
</tr>
</tbody>
</table>

Fig (1): Sex distribution of patients with rectal prolapse
**Fig (2):** Types of reduction of rectal prolapse (Total no. = 81 patient)

**Fig (3):** Factors precipitating the attack of rectal prolapse
(Total no. =81 patients)
Figure (7): Diagram of the biomechanics of the double circle suture. The distances are exaggerated for explanation purposes.