

Surgical treatment of rectal prolapse in pediatric patients: A single-center experience from Iran

Naser Sadeghian¹, Sareh Pourhassan¹, Nasibeh Khaleghnejad Tabari¹, Anahita Sadeghian¹

1-Pediatric Surgery Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

Corresponding author: Naser Sadeghian, Pediatric Surgery Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran. Email: dr.nsadeghian@yahoo.com

Abstract

Introduction: Rectal prolapse refers to extrusion of mucosa or the full thickness wall of the rectum through the anal sphincter, which is more common between infancy and 4 years of age and has a high incidence in the first year of life. It is considered as a sign of an underlying clinical condition causing an increased intra-abdominal pressure, pelvic floor weakness or poor root innervations as seen in Hirschsprung's disease; and not a distinct entity. Also many different methods of surgery exist for treating this condition. We reviewed our experience with regard to treatment and outcome of rectal prolapse in a tertiary center.

Materials and Methods: All patients with rectal prolapse who were managed at Mofid Children's Hospital between 2005 and 2014 were evaluated. Clinical information was obtained from their hospital records. Main study variables were age and sex, the type of prolapse, clinical findings and type of surgery performed and complications.

Results: Of a total 111 patients, 82 (73.9%) were boys and 29 (26.1%) were girls with a mean age of 3.5 yrs \pm 2.3 SD at the time of diagnosis and a mean age of 4.3 yrs \pm 3SD at the time of surgery. The most frequent type of rectal prolapse was mucosal. Conservative treatment mainly consisting of constipation therapy was carried out in 24.3% of our patients. The most common surgical procedures used in our center were Lockhart mummery and excision of the redundant mucosa (32.4% & 23.4% respectively). Performance of other methods depended on the attending surgeon's preference. Almost 90% of our patients showed no post operative complications. In our study we had 9 cases with recurrent prolapse after surgery. The mean hospital stay was 3.9 \pm 3.2 (ranging from 1 to 24 days).

Conclusions: According to the obtained results, it could be concluded that treatment of rectal prolapse would result in improvement in nearly nine out of ten children and a low rate of postoperative complication are expected. However further studies should be performed to obtain more definite results.

Key words: rectal prolapse, rectopexy, anorectal malformation, pediatric surgery

Introduction

Rectal prolapse refers to extrusion of mucosa or the full thickness wall of the rectum through the anal sphincter^{1,2}, which is more common between infancy and 4 years of age and has a high incidence in the first year of life^{3,4}. Rectal prolapse is a relatively common problem in young children and causes great distress for both children and their parents^{5,6}. It varies from intermittent mucosal prolapse that reduces spontaneously to full-thickness prolapse, which often requires manual reduction^{4,6}. It is considered a sign of an underlying clinical condition causing increased intra-abdominal pressure, pelvic floor weakness or poor root

innervations as seen in Hirschsprung's disease; and not a distinct entity^{3,6}.

Prolapse should be reduced promptly to prevent vascular compromise^{6,8}. Rectal prolapse in children is likely precipitated by weakness of the pelvic levator musculature and a loose attachment of the rectal submucosa to the underlying muscularis mucosa^{4,6}. Many different surgical methods exist for treating this condition⁹⁻¹¹. In this study the treatment methods of rectal prolapse in a tertiary referral center and contributing outcomes were studied.

Materials and Methods

In this case-series of children with rectal prolapse, all patients with rectal prolapse, who were managed at a general children's hospital during 2005 to 2014, were included. Inclusion criteria were pretreatment history of rectal prolapse and an age of less than 16 at the time of treatment. Children with an incomplete hospital record and also those who had a history of previous treatments for rectal prolapse in other healthcare centers were excluded.

Main study variables were age, sex, type of prolapse, clinical findings, type of surgery, surgical outcomes, and procedural or postoperative complications. The data from 120 hospital records were extracted from which 111 cases were eligible and their complete data were extracted and analyzed. Data analysis was performed in 111 children, using SPSS (version 18.0) software [Statistical Procedures for Social Sciences; Chicago, Illinois, USA]. Continuous data

are presented as mean (\pm standard deviation [SD]). Chi-Square tests were used and were considered statistically significant at P values less than 0.05.

Results

Of a total 111 children, 82 (73.9%) were boys and 29 (26.1%) were girls. Mean age of our patients at diagnosis was 3.5 ± 2.3 years (ranging from two months to 12.5 years) and the mean age at the time of surgery was 4.3 ± 3 years (ranging from 3 months to 16 years). Mean duration of hospital stay was 3.9 ± 3.2 days (ranging from 1 to 24 days).

The mucosal type rectal prolapse was seen in 57.7% and procidentia type was present in 5.4%; in the remaining 41 cases, the type of prolapse was unknown. In 35 patients (31.5%) the prolapse could be reduced spontaneously and in 32 children (28.8%) it was manually reducible. Four of 111 cases were irreducible. Table-1 shows some of the predisposing factors.

Table 1- Known predisposing factors in children with rectal prolapse

Predisposing Factor	Frequency	Percent
Chronic Constipation	41	36.9
Iatrogenic	23	20.7
Rectal Ulcer	5	4.5
Acute Diarrhea	4	3.6
Chronic Diarrhea	4	3.6
Acute Constipation	4	3.6
Neurological Causes	2	1.8
Rectal Polyp	2	1.8
Dehydration	1	0.9
Cystic Fibrosis	1	0.9
Trauma	1	0.9
Parasitic Infection	1	0.9
Malnutrition	0	0
Behavioral Disorders	0	0

Conservative treatment was carried out in 27 patients (24.3%), mainly as treatment for constipation. The most common surgical

procedure used was Lockhart mummery (28.8%) and excision of redundant mucosa (23.4%). Other methods were also used

according to the surgeon's preference (Table-2). Nine cases (8.1%) showed recurrent prolapse after surgery, all of them except two improved after the second surgery. Those two cases dropped out during follow up probably because the second

surgery was performed in another center. Only nine patients (8.1%) experienced post-surgical complications including fever in two cases, soiling in two patients, rectorrhagia in two cases and one anal abscess.

Table 2- Surgical methods used in children with rectal prolapse

Predisposing Factor	Frequency	Percent
Lockhart mummery	32	28.8
Excision of redundant mucosa	26	23.4
Sclerotherapy	12	10.8
Standard Open Rectopexy	1	0.9
EkehornRectopexy	5	4.5
Posterior Sagittal Approach	1	0.9
Rectopexy with transanal resection of prolapsed rectum	4	3.6
Thiersch	2	1.8

Preferred type of surgery used in children was unrelated to age and sex ($P>0.05$). Type of surgery had no significant association with recurrence and postoperative complications ($P>0.05$); no significant association was detected between postoperative complications or recurrence with either age or sex ($p>0.05$). Technique of surgery was not related to duration of hospital stay ($P>0.05$). Medical versus surgical treatment had no significant association with age, sex, and type of prolapse ($P>0.05$).

Discussion

Rectal prolapse is a common condition among children referred to pediatric surgery centers requiring predominantly surgical procedures^{3, 4}. Since rectal prolapse is usually a self-limiting condition in infancy, the attending cases are generally those who need prompt treatments¹². However most referred cases also would respond to conservative treatments and surgery is occasionally required in cases that are intractable to conservative modalities⁸.

In our study the most common predisposing factor for rectal prolapse was chronic constipation seen in 37% of cases followed by iatrogenic causes (mainly after PSARP) in 21% of cases. Zempsky et al¹³ reported that rectal prolapse was attributed to chronic constipation in 28% and acute diarrhea in 20%. These differences may be due to ethnic factors and even may cause different surgical outcomes.

Laituri et al¹⁴ reported their single-center series in 20 patients and 23 surgical procedures. The similarities between their study and our study are the prevalence of use of posterior sagittal rectopexies and sclerotherapy, whereas they indicated that different applied techniques is the main cause of difference between surgical outcomes in various studies as well as surgeon abilities¹⁵; However we could not find a significant association between used surgical methods and patient's condition. Marderstein and Delaney¹⁶ believed that each surgery is suitable for some patients and probably non-optimal for the others.

Currently, laparoscopy is the treatment of choice in children with rectal prolapse. Due

to some restriction in our existing conditions none of the children in the current study were operated on using minimal invasive techniques. This technique, as reported by Ismail et al¹⁷, is a safe technique with a low recurrence rate and postoperative complications which result in shorter hospital stay. In the current study the mean hospital stay was four days. The Modified Lockhart mummery operation has resulted in improved results and reduced recurrence rate and hospital stay¹⁸. Packing retrorectal space by Sponge instead of the Vaseline gauze in conventional Lockhart mummery operation was performed by Balde et al and was reported to be effective in all cases in one of the initial case series¹⁹. Also this modified technique was the preferred method by Scheyeet al²⁰. It is also the recommended method according to our current study results.

Lack of association between the children's age and sex and recurrence rate was a noticeable finding in our study; therefore in children who are referred for rectal prolapse, an individualized treatment is recommended for each patient. Numerous factors may lead to delay (in presentation) including parents and physicians neglect. Therefore, an emphasized education on 'how to definitely diagnose a rectal prolapse' in emergency departments may result in earlier presentations, though not necessarily better therapeutic outcomes in children.

Conclusion

Finally, according to our results, almost nine out of ten children will have an improvement in their condition following treatment of rectal prolapse and post operative complications are expected to be low. However for more definite results, further studies are required.

References

1. Shin EJ: Surgical treatment of rectal prolapse. *J Korean Soc Coloproctol* 2011; 27(1):5-12.
2. Goldstein SD, Maxwell PJ 4th: Rectal prolapse. *Clin Colon Rectal Surg* 2011; 24(1):39-45.
3. O'Brien DP 4th: Rectal prolapse. *Clin Colon Rectal Surg* 2007; 20(2):125-32.
4. Yoon SG: Rectal prolapse: review according to the personal experience. *J Korean Soc Coloproctol* 2011; 27(3):107-13.
5. Zganjer M, Cizmic A, Cigit I, et al: Treatment of rectal prolapse in children with cow milk injection sclerotherapy: 30-year experience. *World J Gastroenterol* 2008;14(5):737-40.
6. Calkins CM, Oldham KT: Acquired anorectal disorders. In: George W. Holcomb III, J. Patrick Murphy. Daniel J. Ostile. *ASHCRAFT's Pediatric Surgery*. London, New York, Oxford Philadelphia St Louis Sydney Toronto, ELSEVIER SUNDERS, 2014, pp 526-528.
7. Sifakas C, Vottler TP, Andersen JM: Rectal prolapse in pediatrics. *Clin Pediatr* 1999; 38(2):63-72.
8. Antao B, Bradley V, Roberts JP, et al: Management of rectal prolapse in children. *Dis Colon Rectum* 2005; 48(8):1620-5.
9. Madiba TE, Baig MK, Wexner SD: Surgical management of rectal prolapse. *ArchSurg* 2005; 140(1):63-73.
10. Flum AS, Golladay ES, Teitelbaum DH: Recurrent rectal prolapse following primary surgical treatment. *Pediatr Surg Int* 2010; 26(4):427-31.
11. Poole GV Jr, Pennell TC, Myers RT, et al: Modified Thiersch operation for rectal prolapse. Technique and results. *Am Surg* 1985; 51(4):226-9.
12. Freeman NV: Rectal prolapse in children. *J R Soc Med* 1984; 77 Suppl 3:9-12.
13. Zempsky WT, Rosenstein BJ: The cause of rectal prolapse in children. *Am J Dis Child* 1988; 142(3):338-9.
14. Laituri CA, Garey CL, Fraser JD, et al: 15-Year experience in the treatment of rectal

- prolapse in children. *J Pediatr Surg* 2010; 45(8):1607-9.
15. Fahmy MA, Ezzelarab S: Outcome of submucosal injection of different sclerosing materials for rectal prolapse in children. *Pediatr Surg Int* 2004; 20(5):353-6.
 16. Marderstein EL, Delaney CP: Surgical management of rectal prolapse. *Nat Clin Pract Gastroenterol Hepatol* 2007; 4(10):552-61.
 17. Ismail M, Gabr K, Shalaby R: Laparoscopic management of persistent complete rectal prolapse in children. *J Pediatr Surg* 2010; 45(3):533-9.
 18. Scheye T, Marouby D, Vanneuville G: Total rectal prolapse in children. Modified Lockhart-Mummery operation. *Presse Med* 1987; 16(3):123-4.
 19. Balde I, Mbumbe-King A, Vinand P: The Lockhart-Mummery technique in the treatment of the total rectal prolapse among children. Concerning 25 cases. *Chir Pediatr* 1979; 20(5):375-7.
 20. Scheye T, Vanneuville G, Marouby D, et al: Total rectal prolapse in children. Diagnostic and therapeutic trends. Statistics apropos of 52 cases. *J Chir (Paris)* 1996; 133(1):16-9.