



Introducing a new grading method for the diagnosis and grading of internal rectal prolapse in children[☆]

Salahedin Delshad^a, Balal Delshad^a, Parisa Mogheimi^a, Ghabad Heidari^{b,*}

^a Maryam Hospital, Karaj, Iran

^b Department of Pediatric, Faculty of Medicine, Lorestan University of Medical Sciences, Khorramabad, Iran

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ABSTRACT

Introduction: Internal rectal prolapse is an irritating gastrointestinal disease and one of the causes of obstructive constipation in children under 15 years of age. This study aimed to introduce a new method and grading for diagnosing internal rectal prolapse in children. This study is based on the experience of the last ten years, which was re-evaluated as research using a control group.

Method: This is a prospective cross-sectional study. The results of the Delshad-Mash test were analyzed in 60 patients with internal rectal prolapse referred to (XXX) from January 2019 to June 2021. Another 60 children referred for non-digestive surgeries such as hernia and hypospadias with parental consent were selected as a control group. The sensitivity of the Mesh Delshad test in diagnosing and measuring the degree of internal prolapse of the rectum was analyzed by placing the data in STATA software, version II. $P < 0.05$ was considered to show statistical significance.

Results: This study included 120 patients (52 girls and 68 boys) with a body age of 6 months–15 years and a mean age of 45 ± 4.7 years. The study group consisted of 60 patients with symptoms of internal rectal prolapse and 60 patients without the symptoms described in the file. The ROC curve was used to evaluate the accuracy of the test. The ROC curve showed that the sensitivity and specificity for the mesh test as a diagnostic indicator are 89.71% and 92.31%, respectively. The thickness of the folded (prolapsed) mucosa was measured and divided into four degrees according to the rectum's internal prolapse.

Conclusion: According to the results and experiences obtained from this study, the Delshad Mesh method is beneficial for diagnosing internal rectal prolapse that has positive clinical symptoms.

1. Introduction

Internal Rectal Prolapse (IRP) is a gastrointestinal disease which is one of the causes of obstructive constipation in children. It is seen in all ethnicities and races. Constipation, difficulty in defecation, pain during defecation, stiffness of the back during defecation, excretion of feces in small lumps (patches), sweating and discoloration of the face during defecation are among its clinical symptoms [1] 9.

For these reasons, it is different from other constipations. The pathophysiology of internal rectal prolapse in children is as unknown as the disease itself. This condition is also called Internal Prolapsia, Rectoanal Intussusception, and Rectoanal Intussusception [2,3].

Although the disease is known in adults [4–6], it is still unknown in children. This study aimed to introduce a new diagnostic and grading

method for diagnosing the disease in children. Research shows that this is the first study and serves as a simple and appropriate test to evaluate internal rectal prolapse in children. The use of Delshad Mesh to detect IRP results from 10 years of experience was assessed and completed by conducting this research.

2. Materials and methods

This is a prospective cross-sectional study, 60 pediatric patients (36 girls and 24 boys) with an age range of 6 months–15 years and an average of 4.7 ± 0.45 years with symptoms of certain diseases such as constipation with difficulty and pain during defecation, sweating and discoloration of facial skin and stiffening of the back during defecation, and excretion of feces as separate masses attached were studied. Sixty

[☆] This study was approved by the Research Ethics Board of Alborz University of Medical Sciences.

* Corresponding author. Lorestan University of Medical Sciences, Khorramabad, Iran.

E-mail address: md.heidari.gh@gmail.com (G. Heidari).

patients in the control group (39 boys and 21 girls) with the same mean age admitted for hernia and hypospadias surgery were evaluated as the control group with parental consent. Patients in the first group of barium enema were asked that their radiological symptoms were confirmed by the author, confirming internal rectal prolapse (Image1).

The first group of patients underwent general anesthesia. By inserting betadine-impregnated mesh into the anorectum and lifting it into the rectum, it was slowly pulled out of the anorectum. Observation of rectal mucosal outflow (Image2) was confirmed.

The thickness of the mucosal fold determines the degree of internal prolapse of the rectum. According to the new classification, the disease is divided into 4° if the width of the mucosal crease is up to 3 mm. It is considered a mild grade or one. If the thickness of the mucosal fold is 3–5 mm, moderate or grade 2, 5–10 mm grade 3 and more than 10 mm is assessed as severe or 4. The rectum was full of fecal masses. First, the stool was emptied. Anorectoscopy was performed for all patients, and rectal mucosal plications were observed with varying degrees. In the control group, except for two patients (a girl and a boy), no mucosa was observed after pulling the mesh out of the anorectal chin. In the two patients surveyed, grade 2 was evaluated. When recounting the matter to the parents of the latter two, they acknowledged the existence of a history of clinical signs of internal prolapse in their children. With their consent, the injection of the sclerosing solution was performed for both of them. According to the new classification of patients in grades 1 and 2, by injecting a sclerosing solution under the rectal mucosa, for grade 4, mucosal excision is prolapsed, and rectal mucosa is repaired. For grade 3, it is injected twice. (Table 1).

This study was approved by the Research Ethics Board of (XXX).

The methods are stated in accordance with STROCCS 2021 guidelines [7].

Unique identifying number is: research registry:7988.

The obtained data confirmed the accuracy of the initial diagnosis based on clinical signs and radiological findings. In patients who did not have clinical symptoms of rectal prolapse, no rectal mucosal fold was observed in the Delshad mesh test. Data were analyzed prospectively. Data were collected using a researcher checklist. Continuous variables are presented as mean and standard deviation and class variables with ratio (percentage). Age was organized as a class variable. Data were analyzed using STATA software version II, (stata corp LP, college stahon, TX, USA). To show statistical significance, $P < 0.05$ was considered. To enter the data analysis, the diagnosis of IRP in clinical signs and radiology of the Delshad mesh anesthesia test must be confirmed.

3. Results

Out of 60 cases evaluated with an initial diagnosis of internal rectal



Image 2. Observation of rectal mucosal outflow.

Table 1

The degree of internal rectal prolapse (DIRP) in children in order to make decision for treatment.

Severity (Grade)	Size (Millimeter)	Decision
Low (Grade 1)	≤3 mm	Injection
Moderate (Grade 2)	3–5 mm	Injection
High (Grade 3)	5–10 mm	Injection ± Resection
Severe (Grade 4)	≥10 mm	Injection

prolapse under anesthesia with mesh test, 12 cases (20%) as first degree, 24 cases (40%) as second degree, 19 cases as third degree and 5 cases, they were in group 4 (Table 2), and their treatment was performed according to this division (see Table 3).

Table 2

Age distribution of the case group, based on the new grading of IRP in children.

Grading IRP	Age groups (year)				
	≤1	2–5	6–9	10–14	Total
Low (≤1 mm)	2	8	2	0	12 (20%)
Moderate (2–5 mm)	3	14	2	9	24 (40%)
High (6–10 mm)	1	7	1	6	19 (32%)
Severe (≥10 mm)	0	2	3	0	5 (8%)
Total	6 (10%)	31 (51.67%)	8 (13.33%)	15 (25%)	60 (100%)

Pearson chi 2: 17.70, ($P < 0.05$).

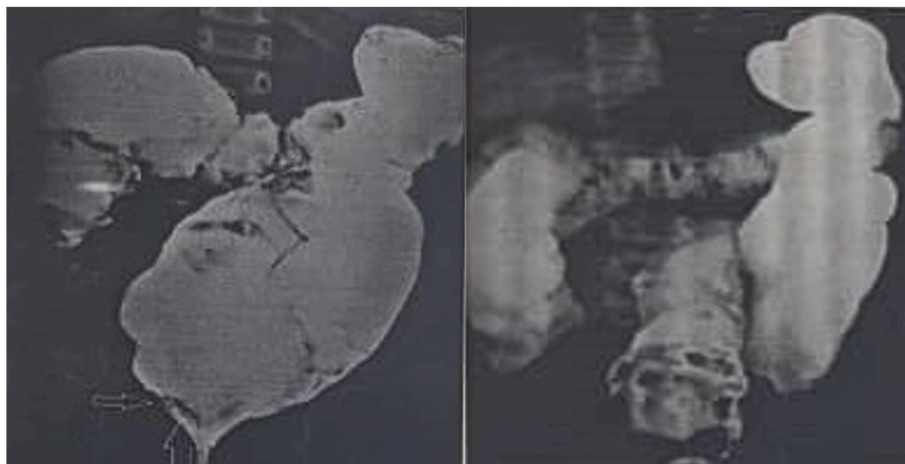


Image 1. internal rectal prolapse.

Table 3
Number of Case - Control & Age mean.

		Case	Control
Sex	Boy	24 (40%)	39 (65%)
	Girl	36 (60%)	21 (35%)
Total		60 (100%)	60 (100%)
Age Mean (year)		4.7 ± 0.45	4.7 ± 0.45

Among all age groups, the highest prevalence of IRP was seen in 6–10 years (43.8%). The next age group was 2–5 years old, 27.45% of patients in this study. The lowest statistics were observed in the age groups of 6 months to 1 year and 11–14 years, 17.64% and 11.11%, respectively. The sensitivity, specificity and accuracy of diagnosis of rectal prolapse with mesh Delshad were 89.71%, 92.30% and 91%, respectively.

The area under the curves (Auc) was used to assess accuracy. The ROC curve showed that the degree of detection accuracy for the Delshad Mesh test as a diagnostic marker CI: 0/8584–0.96160]. A test with an AUC below the curve greater than 0.9 is an excellent diagnostic test.

4. Discussion

Constipation in children is one of the most common referrals of pediatric patients to a pediatric gastroenterologist. Some of these patients undergo surgery with a diagnosis of Hirschsprung and stenosis or dislocation of the anus. Because the clinical signs of rectal prolapse are unknown to many pediatricians, pediatric gastroenterologists, and even pediatric surgeons, they are considered idiopathic constipation and are treated with medication and diet. Many families turn to traditional medicine for lack of recovery. But they still do not get results. Since the leading cause of this type of constipation is intussusception of the inner mucosa of the rectum, which leads to partial obstruction of the intestinal canal, it is not expected to improve with medication. Still, the obstructive factor must be

removed or treated. Unlike Hirschsprung's disease, children with IRP may have daily or one-day defecation due to symptoms that include constipation with difficulty passing stools, but with difficulty, pain, sweating, flushing, and tightening. The back is accompanied during defecation. Patients tighten their backs while defecating and excrete feces in pieces. Massive stools are excreted every 10–14 days. Most of these children refuse to sit on the toilet and defecate in the corner of the room in their shorts and diapers.

In some cases, patients defecate by sticking their hands to the table and bending over to tighten their backs. Some children develop incontinence due to the accumulation of feces in the bowel. Performing barium enema for such patients and observing feeling detected in the rectal mucosa and sometimes rectal lumen stenosis confirms the diagnosis of internal rectal prolapse.

Delshad mesh test under anesthesia confirms the diagnosis, and at the same time, injectable treatment or excision of the rectal mucosa can be performed. Unlike adults, who are diagnosed and treated surgically by surgeons and proctologists [8].

In children, the disease is unknown. The small number of articles in this field, the referral of families with bags full of drugs prescribed by various doctors, and the continuation of their illness and suffering are proof of this claim [9]. Due to the similarity of the barium enema image of such patients with Hirschsprung, some radiologists write Hirschsprung's interpretation, which sometimes misleads surgeons and makes patients candidates or perform for colostomy, pulge and colostomy [10]. The removal of part or all the rectum during pulge surgery and the improvement of the symptoms of the disease induces the impression that the diagnosis is correct to the treating physician [11,12]. This is while accurate and definitive diagnosis with Delshad Mesh prevents the patient from undergoing major and costly surgeries by injecting a sclerosing solution in mild and moderate degrees of mucosal excision in severe degrees, improving time. In short, it prevents the family from

incurring excessive expenses [13].

So far, the authors have divided the disease into two groups: Rectorectal and Rectoanal. In the division of this article, it is graded according to the severity of the disease, based on which the treating physician selects and implements the treatment method [14].

The results obtained from the diagnosis and treatment of patients in this study with two methods of injection of the sclerosing solution under the rectal mucosa and excision of the prolapsed mucosa are so satisfactory that there is no doubt about the diagnosis and treatment with the methods as mentioned above [6]. In 2 patients in the control group and additional explanations of parents who confirmed the signs of internal rectal prolapse and their treatment by injection during the main operation (hernia or hypospadias) and recovery and elimination of symptoms of internal rectal prolapse is another evidence of this, it is claimed [15].

The sclerosing solution used in injectable therapy Author: Phenyl glycerin is used in the ov of the studied and treated patient. No side effects have been observed in the use of sclerosing solutions. Out of 19 cases in the 3rd-degree group, 9 patients needed re-injection due to recurrence of the disease. During a period of 3–4 months of recurrence, they underwent prolapse mucosal excision surgery, and the symptoms of the disease completely disappeared [16].

Managing pediatric patients in pain to cooperate with research was one of the significant challenges in the study. Special counselling was provided by research clinicians and a parent was allowed to accompany children in exception to anorectoplasty. A number of parents and guardians did not consent to be the part of the study, which lead to the loss in our sample size.

5. Conclusion

Due to the unknown nature of rectal prolapse in children, patients undergoing constipation are treated with various drugs, which leads to failure. Delshad mesh test under anesthesia is the best diagnostic method in patients with symptoms. In the same session of treatment is possible to inject sclerosing solution under the rectal mucosa or excision the prolapsed mucosa. The new rating will help clinicians choose one of the above methods to treat this disease.

Provenance and peer review

Not commissioned, externally peer-reviewed.

Please state any conflicts of interest

The authors deny any conflict of interest in any terms or by any means during the study.

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Ethical approval

All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Consent

Not applicable.

Author contribution

Dr. Salahedin Delshad: conceptualized and designed the study,

drafted the initial manuscript, and reviewed and revised the manuscript. Dr. Balal Delshad: Designed the data collection instruments, collected data, carried out the initial analyses, and reviewed and revised the manuscript. Dr. Parisa Mogheimi and Dr. Ghobad Heidari: Coordinated and supervised data collection, and critically reviewed the manuscript for important intellectual content.

Registration of research studies

1. Name of the registry: N/a

Unique Identifying number or registration ID:

2. Hyperlink to the registration (must be publicly accessible):

Guarantor

Dr. Salahedin Delshad.

References

- [1] Wijffels N, Jones O, Cunningham C, Bemelman W, Lindsey I. What are the symptoms of internal rectal prolapse? *Colorectal Dis* 2013;15(3):368–73.
- [2] Dhakre VW, Bhuta P. Combined abdominal and transanal approach for managing obstructive defecation syndrome with internal rectal prolapse and rectocele. *Clinical Case Reports and Clinical Study* 2021;3(2). 3 (2).
- [3] Lindsey I, Nugent K, Dixon T. Internal rectal prolapse. *Pelvic floor disorders for the colorectal surgeon* 2011:93–102.
- [4] Choi JS, Hwang YH, Salum MR, Weiss EG, Pikarsky Aj, Noguera JJ, et al. Outcome and management of patients with large rectoanal intussusception. *Am J Gastroenterol* 2001;96(3):740–4.
- [5] Weiss EG, Molemore EC. Functional disorders : rectoanal intussusception. *Clin Colon Rectal Surg* 2008;21(2):122–8.
- [6] Hateh Q, Steele SR. Rectal prolapse and intussusception. *Gastroenterol Clin N Am* 2013;42(4):837–61.
- [7] Mathew G, Agha R, for the STROCSS Group. Strocass 2021: strengthening the Reporting of cohort, cross-sectional and case-control studies in Surgery. *Int J Surg* 2021;96:106165.
- [8] Stanton M. *Acquired anorectal disorders Prolapse, fistula. And hemorrhoids. Operative Pediatric Surgery* 2020:461–5. CRC Press.
- [9] Durbeck A, Johannessen H-ODrosum A, Johnson E. Very long – term outcome after resection rectopexy for internal intussusception. *Scandinavian journal of Gastroenterology* 2021;56(1):122–7.
- [10] Delshad S, Piri N, Mirmoghdam Z. The most common symptoms of internal rectal prolapse in children referred to Maryam Hospital , Karaj: during 2015 to 2020. *Alborz University Medical Journal* 2021;10(1):105–14.
- [11] Ai- Mubarak L, Aighmadi E, Alharbi S, Almasoud H, Ai-Ali N, Mujurdy S. Air Enema versus barium enema in intussusception : an overview. *Int J Community Med Public Health* 2018;5(5):1679–83.
- [12] Hawkins AT, Olariu AG, Savitt IR, Gingipally S, Wakamatsu MM, Pulliam S, et al. Impact of rising grades of internal intussusception on fecal continence and symptoms of constipation. *Dis Colon Rectum* 2016;59(1):54–61.
- [13] Oka NTsunoda A, Takahashi T, Matsuda S, Kusanagi H. Predictive factors and effects of replaced rectorectal intussusception on functional outcomes in patients with rectoanal intussusception who have undergone laparoscopic ventral rectopexy. *Indian J Surg* 2021;83:79–86.
- [14] Emile S, Elteki H, Youssef M, Farid M, Wexner S. Abdominal rectopexy for the treatment of internal rectal prolapse : a systematic review and meta- analysis. *Colorectal Disease* 2017;19(1):O13–24.
- [15] Tsiaoussis J, Chrysos E, Athanasakis E, Pechlivanides G, Tzortzinis A, Zoras O, et al. Rectoanal intussusception : presentation of the disorder and late results of resection rectopexy. *Dis Colon Rectum* 2005;48(4):838–44.
- [16] de Vergic LC, Venara A, Duchalais E, Frampas E, Lehur P. Internal rectal prolapse: definition , assessment and management in 2016. *Journal of visceral surgery* 2017; 154(1):21–8.