

Full-Thickness Rectal Prolapse in Children: Sclerotherapy Versus Lockhart Mummery Rectopexy

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Abstract

Introduction: Rectal prolapse is a relatively common disorder in childhood. In this phenomenon, the whole layers of the rectum protrude throughout the anus. Self-limiting cases of rectal prolapse are more common in children below four years old, and overall prevalence is higher in the first year of life, with a predominance of male children. Formerly, the therapeutic efforts insisted on surgery. Nowadays, noninvasive methods like Sclerotherapy have entered the arena.

Materials and Methods: This study aimed to compare the efficacy and postoperative complications of 56 children suffering from full-thickness rectal prolapse retrospectively

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Keywords

- Lockhart-Mummery operation
- Rectal prolapse
- Sclerotherapy

randomized in two groups of conventional surgery and Sclerotherapy referring to the Mofid children's hospital from 2017 to 2020. The authors have used Lockhart mummery rectopexy and Sclerotherapy methods with hypertonic dextrose 50%.

Results: Our results revealed a statistically significant difference in mean hospital stay (P-value <0.0001) and follow-up time (P-value=0.009) in the sclerotherapy group compared to other group, but surgical complications (P-value=0.58) and recurrence rate (P-value= 0.62) were statistically non-significant in both groups.

Conclusion: careful selection of patients based on symptoms has a vital role in the success of the chosen method for treating rectal prolapse in children.

Introduction

Rectal prolapse is one of the relatively common disorders in infancy and early childhood¹, in which the whole layers of the rectum herniates throughout the anus.² Self-limiting cases of rectal prolapse are primarily seen in children below four years old, and overall prevalence is higher in the first year of life.³ Those affected children showing the symptoms after four years old usually have an underlying disease.² The literature reveals that rectal prolapse in childhood is more predominant in males than females.⁴⁻⁵ There are two types of prolapse, and in the partial type, we see the protrusion of the mucosa only, in which

medical care is satisfactory. The other type is complete, which is less common and it is sometimes called Procidentia.⁶ This term refers to the complete herniation of all rectal layers even higher from the anal canal that is more prevalent in children 1-5 years old than adults.⁷⁻⁸ The treatment plan contains trying to avoid excessive Valsalva during defecation using laxatives and stool softeners and constipation prophylaxis. Treatment continues with the prevention of any inflammatory and parasitic rectal diseases.⁹ The surgical intervention is indicated when all of the above-mentioned attempts fail.¹⁰⁻¹¹ Generally, Sclerotherapy

has the highest rate of success, minor complications, and easy availability and for that, it seems to be an ideal medical procedure.¹²⁻¹³ Thus, it should be the preferred method for initially treating the patient and recurrence.¹⁴ Surgical methods such as Ekehorn rectopexy, Delorme's procedure, abdominal rectopexy, and Thiersch operation are alternatives if Sclerotherapy fails.¹⁵ Generally, compared to other methods, Sclerotherapy and laparoscopic rectopexy have the most advantages and the lowest complication rate.¹⁶⁻¹⁷ Finally, choosing the therapeutic method depends on different factors such as prolapse degree, the severity of symptoms, relating disorders, and the physician's experience.¹⁸ In this study, we aimed to compare the results of Sclerotherapy and the Lockhart mummery procedure in children with full-thickness rectal prolapse.

Materials and Methods

This cross-sectional study was conducted from March 2017 to February 2020 at the Department of pediatric Surgery of Mofid children's hospital. Of a total of 200 registered children with rectal prolapse, 100 patients were managed conservatively.

Forty four cases with partial prolapse (protrusion of the mucosa less than 2 cm long.) were excluded and 56 children with complete prolapse(at least two times a week in three months), who failed the medical treatment were included. After obtaining the consent of the patients' parents, they were randomly divided into two groups: 24 patients in the group of sclerotherapy with hypertonic dextrose 50 % (group I) and 32 patients in the group of Lockhart mummery technique (group II). The two groups' demographic information, postoperative complications, recurrence rate, mean hospital stay and therapeutic achievements were compared.

In the group I, dextrose 50% was used as the sclerosing agent. Bowel evacuation with saline enema the night before the operation was performed. The procedure was done under general anesthesia. With the patient in lithotomy position, under the guidance of a finger inserted into the anal canal, 10 ml of dextrose 50% was injected into the rectal submucosa at 3-4 sites in a linear fashion through the mucocutaneous junction with a wide-bore needle.

In the group II, we dissected 10 cm in-depth behind the rectum and in front of the coccyx with a posterior perianal incision and packed the space with a gauze-mesh

for eight days to act as a trigger for adhesion formation which supports the rectum.

We used fisher exact and chi-square tests for qualitative data analysis. Quantitative data from the following normal distribution were analyzed by the Kolmogorov-Smirnov test, then the t-test comparison was made. All statistical analyses were performed at GraphPad prism version 8.

Results

Over the three-year course of the study, 36 (64.28%) male patients and 20 (35.72%) female patients were included. All the patients had complete prolapse, and none of them suffered from mucosal type. Twenty-four (42.85%) patients were placed in the group I and 32(57.14%) cases in the group II. No underlying disease was found as malnutrition, parasitic infections or chronic coughs. Their age at the time of diagnosis was $3.39 \text{ yrs.} \pm 1.91$, and at the time of surgery was $4.41 \text{ yrs.} \pm 3/06$. The mean hospital stay was 24.1 ± 3.75 days.

Only four patients showed relapse in both groups, one of them (1.78%) underwent redo sclerotherapy, and the rest (5.35%) from group II were treated by standard open rectopexy.

There was no significant difference in patients' sex, age, and gender. P-values of 0.57, 0.97 and 0.21 were calculated accordingly. The chief presenting symptoms of patients before the first intervention has been shown in **Table 1**. According to the surgical method, symptoms in patients are summarized in **Table 2**, and the frequency of surgical complications is depicted in **Table 3**.

Our results revealed that the two groups had a statistically significant difference (P-value < 0.0001) for mean hospital stay and follow-up time (P-value=0.009), specifically less for the sclerotherapy group. Surgical complications (P-value=0.58) and recurrence rate (4.16% in-group I, 9.37% in-group II) (P-value= 0.62) were statistically non-significant in both groups.

Table 1: Patients' symptoms by the first surgery.

| | Sclerotherapy | Lockhart mummery |
|--------------------------------------|---------------|------------------|
| Rectorrhagia (Yes/No) | 6/18 | 11/21 |
| Vascular compromise (Yes/No) | 0/24 | 1/31 |
| Mucus leak (Yes/No) | 0/24 | 0/32 |
| Mass extrusion (Yes/No) | 24/0 | 32/0 |
| Pain (Yes/No) | 10/14 | 6/26 |
| Abdominal pain (Yes/No) | 0/24 | 1/31 |
| Fecal incontinence (Yes/No) | 0/24 | 1/31 |
| Weight loss (Yes/No) | 0/24 | 2/30 |
| Abdominal distention (Yes/No) | 0/24 | 1/31 |
| Tenesmus (Yes/No) | 0/24 | 1/31 |
| Anal itching (Yes/No) | 0/24 | 0/32 |

Table 2: Frequency of additive symptoms in patients according to the surgical method used

| Symptom | Intervention | |
|---|---------------|------------------|
| | Sclerotherapy | Lockhart mummery |
| Rectal bleeding + mass extrusion | 2 | 5 |
| Rectal bleeding + mass extrusion + abdominal pain | 0 | 1 |
| Mass extrusion + pain | 6 | 3 |
| Rectal bleeding + mass extrusion + pain | 2 | 2 |
| Weight loss + painful defecation | 0 | 1 |
| Rectal bleeding + mass extrusion + weight loss | 0 | 1 |
| Pain + mass extrusion + fecal incontinence | 0 | 1 |
| Mass extrusion + tenesmus | 0 | 1 |
| Mass extrusion + abdominal distention | 0 | 1 |

Table 3: Frequency of surgical complications in patients according to the methods used.

| Complication | Frequency | | Total |
|-----------------------|---------------|------------------|-------|
| | Sclerotherapy | Lockhart mummery | |
| Soiling | 1 | 3 | 4 |
| Fever | 2 | 2 | 4 |
| Anal abscess | 1 | 0 | 1 |
| Free of complications | 20 | 27 | 47 |
| Total | 24 | 32 | 56 |

Discussion

Rectal prolapse is a well-known disorder among children. In developing countries, parasitic diarrhea or dysentery, malnutrition and amoebiasis are the leading underlying causes.¹⁹ Conservative care in 90 % of patients is successful. However, conservative management if failed, surgical intervention is mandatory. But there is no evidence-based coherent approach for choosing the best treatment method. Surgical procedures vary from less invasive Sclerotherapy²⁰ to more invasive techniques such as abdominal or perineal intestinal resection, trans-anal suture rectosacropexy,²¹ posterior plication of the rectum and posterior sagittal incisions.²² Hence, this study aimed to compare the success rate and complications in sclerotherapy by glucose 50% and

Lockhart mummery rectopexy in full-thickness rectal prolapses in children under five years of age. This study demonstrated that sclerotherapy, compared to surgery, had a shorter mean hospital stay and follow-up duration, and complications such as soiling were also more commonly seen in the Lockhart mummery method. There was a noticeable decrease in a relapse in the sclerotherapy group compared to the surgical one. However, this was not significant statistically. In another similar study performed in Birmingham between the years 1995 and 2003 in children under five years of age, 83% recovered with Sclerotherapy.

In cases of unsuccessful Sclerotherapy, sensitivity to the sclerosing substance was raised. Children above five years old

suffering from full-thickness rectal prolapse were resistant to sclerotherapy injections. They were surgically treated.²³ Antono et al. conducted a study on 49 children complaining of rectal prolapse symptoms with a mean age of 2.6 years and a conservative treatment history. Twenty four of them received further sclerotherapy, the Thiersch method, anal traction, prolapse tape and rectopexy. Fifteen out of these 24 patients recovered without relapse. Of note, there was an underlying disease in 84% of the conservation group versus 54% of the intervention (P-value=0.019). As a result, in children younger than four years, rectal prolapse is usually resolved spontaneously or responds to non-operative management within one year.²⁴ In the current study, the mean age of the patients at the time of surgery was 4.41 ± 1.91 . According to the literature, we encounter lower rates of complications and need for reoperation at similar ages. It seems to be an appropriate age range for such a less invasive method as sclerotherapy. In another survey reviewing the 27 studies, the primary success rate of sclerotherapy was estimated to be 79.5%.

Ethanol, for its higher success rates in direct injections, low rates of complications, and availability, seemed to be the best sclerosing agent. This study concluded that Sclerotherapy and laparoscopic rectopexy have high success and common complications.²⁵ We chose the hypertonic glucose 50% as a sclerosing agent with a success rate of 96%. It comes to mind that more comprehensive studies are needed to select the optimal sclerosing agent. The prospective study of Ejrish et al. aimed to evaluate the different types of rectal prolapse treatment in children on 80 patients between the years 2014 to 2015. They introduced Sclerotherapy as the best treatment method in patients under the age of three, especially in the cases of prolapse with partial-thickness.²⁶ The success rate in the present study was significantly higher, which appears to be due to the correct selection of the patient as the candidates for sclerotherapy based on the patient's symptoms. Therefore, it is decisive to select proper cases indicating sclerotherapy and even the optimal sclerosing agent in success rate and lowering the relapse rate and complications.

Conclusion

It is considered that the careful selection of patients based on the symptoms plays the most critical role in the success of the chosen method for surgery of rectal prolapses in children.

Ethical Consideration

The Ethics Committee in Medical Research of Shahi Beheshti University of Medical Sciences has approved this study with the code: "IR.SBMU.RICH.REC.1399.033"

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Conflict of interests

The authors declare no competing interests relating to this original work.

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