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# A MODERN METHOD OF SURGICAL TREATMENT OF RECTAL PROLAPSE IN CHILDREN AFTER CORRECTION OF ANORECTAL MALFORMATIONS

**A.A. Gusev[1], E.A. Okulov[1], E.Yu. Dyakonova[1], S.P. Yatsyk[2], S.A. Bekin[1], A.A. Shchukina[1]**

[1]National Medical Research Center for Children's Health, Moscow, Russian Federation
[2]Russian Academy of Sciences, Central Federal District of the Russian Federation

**Objective.** To evaluate the effectiveness and safety of a modern surgical technique for treating rectal prolapse in children previously operated on for anorectal malformations. A retrospective analysis was performed on 38 patients aged 1 to 12 years who were treated at the National Medical Research Center for Children's Health (Moscow, Russia) between 2023 and 2024. All patients underwent a modified surgical procedure based on the authors' patented technique, addressing the anatomical and functional features following anorectal reconstruction. Immediate and long-term outcomes, recurrence rates, complications, and bowel function dynamics were assessed. The results demonstrate high efficacy and safety of the proposed method, with minimal complications and a low recurrence rate compared to traditional approaches. A brief literature review and analysis of the patented invention are also presented.

***Keywords:*** *pediatric surgery; rectal prolapse; anorectal malformations; surgical treatment; modified technique; retrospective analysis.*

**Introduction.** Rectal prolapse in children who have undergone anorectal malformation (ARM) correction remains a pressing issue in pediatric surgery. The incidence of this complication, according to various authors, ranges from 8% to 35% among patients with ARM, due to both the characteristics of the congenital pathology and the technical aspects of the primary surgery. Recurrent rectal prolapse significantly reduces the child's quality of life, leading to chronic pain, pelvic organ dysfunction (perineal obturator apparatus), and persistent social maladjustment.

In recent years, there has been a trend toward improving surgical treatments for rectal prolapse in children. However, there is no universal algorithm for patients with ARM. Conventional surgeries (Delorme, Altemeier, Thiersch, etc.) often carry a high risk of recurrence and postoperative complications in this group of patients. Individualizing surgical approaches, taking into account the anatomical and functional characteristics of the anorectal region being reconstructed, is of particular importance.

A new method for surgical correction of rectal prolapse in children with ARM, protected by a Russian patent, has been developed and implemented into clinical practice at the Federal State Autonomous Institution "National Medical Research Center for Children's Health" of the Russian Ministry of Health.

The technique is aimed at restoring (improving) the functional capacity of the anorectal zone, minimizing tissue trauma and preventing relapse.

The aim of this study is to present the results of using this technique in children with rectal prolapse after correction of anorectal malformations, to analyze the effectiveness and safety of treatment using our own clinical material, and to compare the obtained data with literary sources.

**Materials and methods.** The study is based on a retrospective analysis of the results of surgical treatment of rectal prolapse in children who had previously undergone correction of anorectal malformations, at the Federal State Autonomous Institution "National Medical Research Center of Children's Health" of the Ministry of Health of the Russian Federation for the period from January 2023 to December 2024. The object of observation was 38 patients aged from 1 year to 12 years (average age - 5.2 ± 2.8 years), including 22 boys (57.9%) and 16 girls (42.1%).

***Inclusion and exclusion criteria.*** The study included children with a confirmed diagnosis of anorectal malformation who had previously undergone surgical correction (including PSARP, laparoscopic or open abdominoperineal proctoplasty), as well as those with rectal prolapse confirmed by clinical and instrumental data. Patients with severe neurological impairments, severe comorbidities that significantly increased anesthetic risks, and those whose legal guardians refused to participate in the study were excluded.

***Diagnostic protocol***

*Comprehensive preoperative assessment included:*

Clinical and anamnestic examination: analysis of complaints, duration and severity of symptoms, frequency and nature of relapses, features of the reconstructive surgery performed.

Instrumental methods: rectoscopy to verify the degree of prolapse and exclude concomitant pathology, ultrasound examination of the pelvic organs, and, if necessary, magnetic resonance imaging.

Functional diagnostics: assessment of the state of the sphincter apparatus, in some cases – anorectal manometry.

***Description of the surgical technique***

All patients underwent surgical correction using the original author's technique, protected by Russian Federation patent No. 2794942.

The operation is performed under general anesthesia in the supine position with the lower limbs spread apart.

After applying a circular retractor to the mucocutaneous junction, a fairly dense row of 3/0 atraumatic sutures is placed intrarectally, 7 mm from the skin. This placement is necessary to maintain constant tension for a precise circular incision of the mucosa and to continue demucosation deep into the anal canal. The depth of demucosation depends on the child's age, the degree of prolapse, and the diameter of the neoanus. Careful hemostasis is maintained throughout the procedure.

Next, using non-absorbable sutures, 4 (or 8) sutures are placed to gather the remaining muscular framework. These sutures are tightened sequentially, resulting in a noticeable retraction of the neoanus, visible to the naked eye, during surgery. Excess mucosa is then trimmed so that the mucosal sutures lie without tension.

This restores the integrity of the anal canal. The healing of this row of sutures is facilitated by the reduced tension of the previously applied gathering sutures.

In the postoperative period, a standard rehabilitation program was used, including fixing the patient in bed for at least 4 days, parenteral nutrition, and thorough perineal hygiene.

Early mobilization, a gentle diet, and local treatment of the surgical area were all performed. Pain, bowel function, wound condition, and the patient's overall well-being were assessed daily.

Before discharge, a calibration bougienage of the anal canal was performed under short-term general anesthesia to assess healing and the need for further bougienage at the outpatient stage.

Discharge was carried out with a favorable course on the 7-10th day after the intervention.

***Performance evaluation criteria***

The results were assessed based on the following indicators:

- Complete relief of rectal prolapse symptoms;
- No recurrence during the observation period (6 to 18 months);
- Restoration and maintenance of fecal continence (according to the Wexner scale);
- Frequency and nature of postoperative complications (bleeding, infection, suture failure);
- Frequency of anal canal stenosis requiring outpatient bougienage.

**Results.** The study cohort included 38 patients who underwent surgical correction of rectal prolapse using an original technique (Russian Federation Patent No. 2794942) following previous surgeries for anorectal malformations. All procedures were performed electively, without the need for expanded surgery or emergency conversion.

**Table 1.** Demographic and clinical characteristics of patients

| **Indicator** | **Meaning** |
|---|---|
| Number of patients | 38 |
| Average age (years) | 5,2 ± 2,8 |
| Boys/girls | 22 (57,9%) / 16 (42,1%) |
| Type of previous operation | |
| – PSARP | 27 (71,1%) |
| – Laparoscopic abdominoperineal proctoplasty | 7 (18,4%) |
| – Open abdominoperineal proctoplasty | 4 (10,5%) |

***Demographic and clinical characteristics***

The average age of patients was 5.2±2.8 years (ranged from 1 to 12 years). There were predominantly boys — 22 (57.9%), while there were 16 girls (42.1%). All children had a history of reconstructive surgery for anorectal malformation: 27 patients (71.1%) had PSARP, 7 (18.4%) had laparoscopic plastic surgery, and 4 (10.5%) had open plastic surgery.

***Characteristics of surgical intervention and early postoperative period***

The average surgical duration was 58±12 minutes. All procedures were performed without technical difficulties or the need to resort to alternative methods. In the early postoperative period, no patient experienced significant pain requiring narcotic analgesics; the average visual analog pain scale score did not exceed 3.4±1.1.

Early postoperative complications were reported in 2 patients (5.3%) and consisted of minor bleeding from the suture site, which was managed with conservative measures. No infectious complications, suture failure, or need for repeat surgery were observed.

***Remote results and functional assessment***

The patient follow-up period ranged from 6 to 18 months (median 12 months). During the entire follow-up period, recurrence of rectal prolapse was recorded in only one child (2.6%), which required a repeat minimally invasive intervention with a favorable outcome.

The Wexner continence scale showed a significant improvement: the average score decreased from 7.1±1.9 to 2.3±1.2 ($p<0.01$), indicating restoration of anorectal function. All patients and their parents noted a significant improvement in their quality of life, the disappearance of rectal prolapse symptoms, and an improvement in their psychoemotional state.

The obtained results indicate the high efficiency and safety of the proposed method, which distinguishes it from traditional surgical approaches, where the recurrence rate, according to the literature, can reach 15–25%.

**Discussion.** The problem of rectal prolapse in children who have undergone correction of anorectal malformations remains a pressing issue in modern pediatric surgery. The high recurrence rate, as well as the significant impact of this pathology on the quality of life of patients and their families, necessitate the search for new, more effective, and safer surgical treatment methods.

The results of this study demonstrate the high clinical efficacy and safety of the proposed proprietary technique (Russian Federation Patent No. 2794942). Rapid relief of prolapse symptoms, a minimal complication rate (5.3%), and the absence of severe adverse events were observed early postoperatively. It is important to emphasize that this technique provides additional support for the anal canal and reduces the risk of recurrence.

During the long-term follow-up period, the recurrence rate was only 2.6%, significantly lower than similar figures reported in Russian and international literature, where recurrences are observed in 15–25% of cases after traditional methods. Furthermore, a significant improvement in fecal continence according to the Wexner scale was noted, indicating restoration of anorectal function and an improved quality of life for patients.

It should be noted that the success of surgical treatment is largely determined by a thorough preoperative examination, individualized selection of interventional tactics based on each patient's anatomical and functional characteristics, and comprehensive postoperative care with early rehabilitation. A multidisciplinary approach involving a surgeon, gastroenterologist, physiotherapist, and psychologist is particularly important.

***Evaluation of sphincterometry parameters***

In a subgroup of 21 patients (55.3%), anorectal manometry was performed before and after surgery to objectively assess sphincter function. Preoperatively, most children showed a decrease in maximum voluntary anal sphincter contraction: the average value was 32.4 ± 6.7 mmHg (with an age norm of 45–60 mmHg), and the average resting value was 18.9 ± 4.2 mmHg.

Following surgical correction using the author's technique, positive dynamics were noted: maximum voluntary pressure increased to 44.1±7.3 mmHg, and resting pressure to 26.7±5.1 mmHg

**Table 2.** Dynamics of sphincterometric parameters (n = 21)

| Indicator | Before surgery | After surgery | p-value |
|---|---|---|---|
| Maximum arbitrary pressure, mmHg | 32,4 ± 6,7 | 44,1 ± 7,3 | <0,01 |
| Resting pressure, mmHg | 18,9 ± 4,2 | 26,7 ± 5,1 | <0,01 |

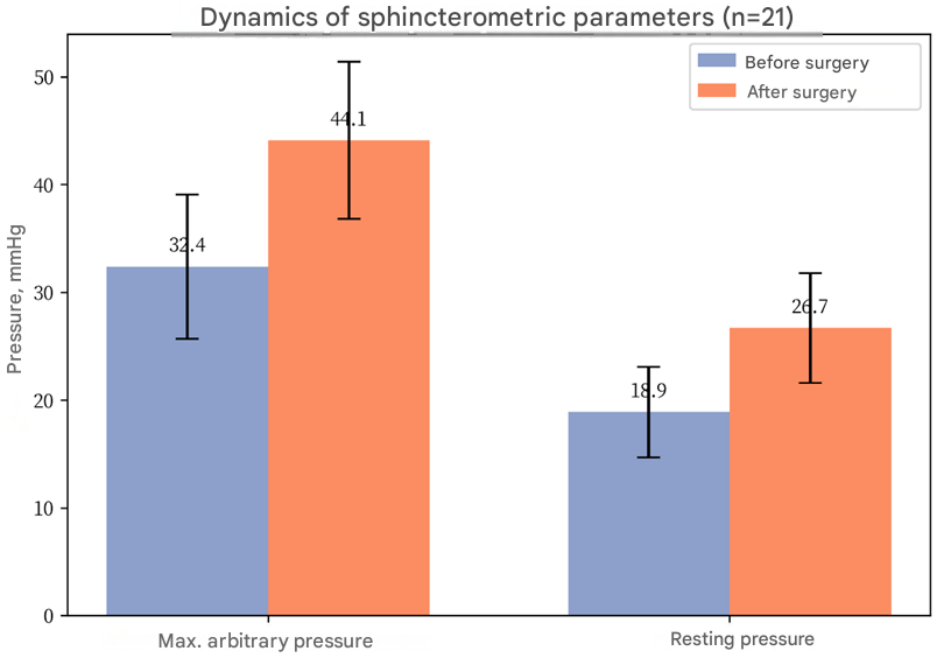


**Figure 1.** Dynamics of sphincterometric parameters

($p<0.01$). All patients who underwent manometric testing demonstrated restoration or significant improvement in sphincter tone, which correlated with a clinical reduction in the degree of fecal incontinence and the disappearance of rectal prolapse symptoms.

Limitations of this study include the relatively small sample size and limited follow-up period. Further multicenter prospective studies with larger sample sizes and longer follow-up periods are needed to fully validate the findings.

**Conclusions:**

1. The use of the original technique for surgical correction of rectal prolapse in children with previously undergone correction of anorectal malformations demonstrated high efficiency and safety.

2. The recurrence rate in the study group was 2.6%, which is significantly lower than with traditional approaches described in the literature.

3. The operation is characterized by minimal trauma, a low incidence of postoperative complications (5.3%) and a short hospital stay..

4. According to anorectal manometry data, a significant improvement in sphincter parameters was noted, which correlated with the restoration of fecal continence function and an increase in the quality of life of patients.

5. The proposed technique can be recommended for implementation in pediatric surgical practice in expert-level institutions for recurrent rectal prolapse in patients after correction of anorectal malformations.

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