INTERNATIONAL MULTI DISCIPLINARY JOURNAL FOR RESEARCH & DEVELOPMENT
eISSN 2394-6334 Impact factor: 7,854 Volume 12, issue 12 (2025)

"DIAGNOSIS AND SURGICAL TREATMENT OF CHILDREN WITH ANORECTAL MALFORMATIONS"

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Abstract: Anorectal malformations (ARMs) are among the most common groups of congenital anomalies in pediatric coloproctology, occurring at a frequency of 1 in 5,000 newborns. This article presents an analysis of the surgical treatment of 56 children with anorectal malformations conducted at the Republican Scientific and Practical Center for Minimally Invasive and Endoscopic Pediatric Surgery between 2019 and 2023. The study provides data on the classification of patients by types of malformations, describes diagnostic and surgical approaches, including minimally invasive techniques. Particular attention is paid to postoperative outcomes, complications, and the effectiveness of rehabilitation measures. The results demonstrate that the use of modern minimally invasive techniques and a staged approach in the treatment of high forms of anorectal malformations significantly reduces the frequency of complications and improves functional outcomes.

Keywords: anorectal malformations, children, surgical treatment, minimally invasive techniques, rehabilitation

I. INTRODUCTION

Anorectal malformations (ARM) are the main group of diseases in pediatric proctology, accounting for 85% of the total number of colorectal defects. The average frequency of ARM in children is 1 in 5000 newborns [1, 2]. According to statistics, it is more common in boys than in girls. Today, surgeons have more than 20 methods of surgical correction of anorectal defects. Unsatisfactory results of treatment of anorectal According to statistics, defects make up from 10 to 60% [3, 4]

This is due to a combination of factors: the variety of anatomical variants of the defect, the combination with other developmental anomalies, incomplete preoperative diagnostics, and the high trauma of traditional methods of correcting anorectal defects, which determines the presence of unsatisfactory functional results against the background of good anatomical reconstruction. Rehabilitation measures are a necessary stage of further treatment of children with anorectal defects [5, 6] . In order to improve and refine the methods of diagnosis and treatment of ARD, about 40 classifications have been proposed, based on clinical, embryogenetic and anatomical features of defects. The most important were the classifications of Ladd and Gross , I.K. Murashova, A.M. Aminyeva, A.I. Lenyushkina, G.A. Bairova, Krikenberg , Melbourne classification, and A. Pe ň a [7, 8] .

To improve the results of diagnostics and surgical treatment of congenital anorectal malformations by substantiating and implementing laparoscopic technologies in children.

II. MATERIALS AND METHODS

In 2019-2023, 56 children with anorectal malformations were examined at the Republican Scientific and Practical Center for Minimally Invasive and Endovisual Surgery. Of these, 46 (82%) were boys, 10 (18%) were girls. There were 50 full-term children (89%), 6 premature children (11%).

All patients were classified according to Krickenberg.

1. The main clinical groups are 53 (95%): of which 3 (5.4%) are recto-perineal cutaneous fistula, 7 (12.5%) are recto-urethral fistula, 2 (3.6%) are recto-vesical fistula, 6 (10.7%) are recto-vestibular fistula, 1 (1.8%) is cloaca. Types without fistulas : atresia ani 24 (42.7%), atresia ani et recti 10 (17.8%) (Fig . 1).
2. Rare types 3 (5.4%), of which “rectal pouch” (Pouch Colon) – 2 (3.6%), H-type 1 (1.8%) (Fig. 2.).

Fig. 1. Rectal pouch - type 1 (POUCH COLON)

Fig.2/ H-type

According to our data, out of the total number of patients (56), 11 (30%) patients had a single defect, and in the remaining 39 (70%) it was found that the defect was accompanied by 2 or more concomitant defects (Fig. 3).

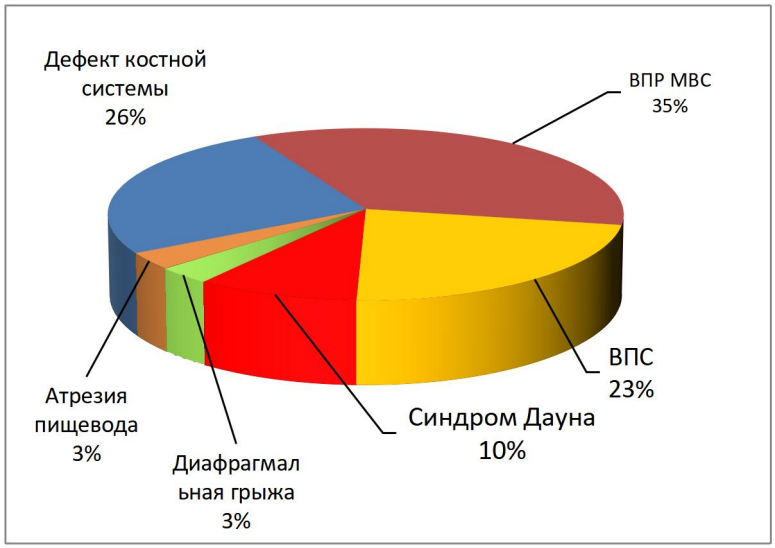


Fig. 3. Diagram. Associated pathologies.

In diagnostics of all patients, laboratory examination and the following instrumental research methods were used: general radiography of the chest and abdominal organs, Vanguard-Rice invertogram (Fig. 4), Cross-Table radiography (Fig. 5), determination of the sacral index, ultrasound of the perineum and abdominal organs, fistula-irrigography, catheterization of the bladder, distal colostometry, neurosonography, Exo-CG.

All patients with ARM underwent general radiography of the abdominal cavity and chest organs to identify the underlying and concomitant diseases. Radiological signs of intestinal obstruction were detected in 53 (95%) patients.

The Wangensteen-Rice invertogram is used to determine the degree of atresia in children with ARM. This method is considered to have high diagnostic accuracy in congenital types of fistulas with AM. It was performed in 49 (87.5%) patients who came to us, in the remaining cases (rectovestibular fistula, recto-intermediate fistula, H-type). All patients were examined within 16-22 hours.

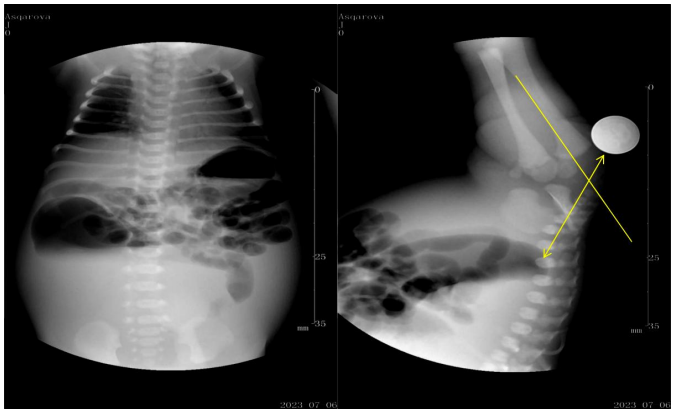


Fig. 4. Invertogram according to Wangestyn-Rice.

The lateral radiography method according to the Cross Table is considered a modified version of the Wangenstein method and allows for earlier determination of the type of ARM. In this case, X-rays are taken from the side of the patient with a roller under the abdomen on the X-ray table. This check can be done after 12 hours. Our observations showed that the accuracy of the study compared to the Wangenstein method was higher in patients who were undergoing treatment.

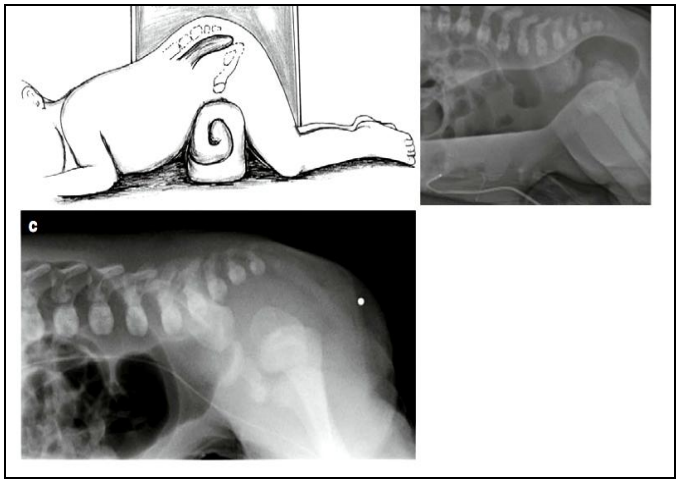
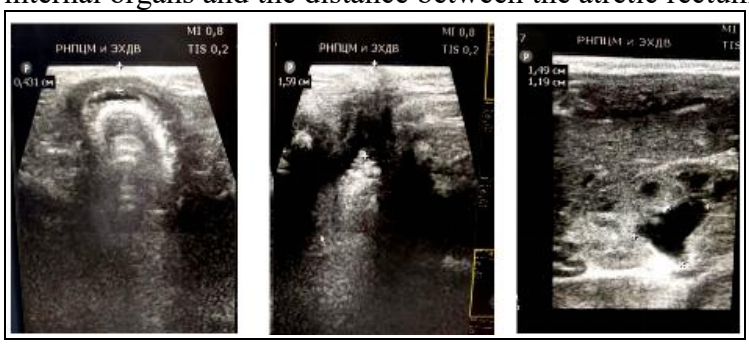


Fig. 5. Invertogram according to Cross Table.

Ultrasound of the perineum and abdominal organs allows us to identify additional defects of internal organs and the distance between the atretic rectum and the skin (Fig. 6).



Diastasis 0.431sm | Diastasis 1.59 sm | Hydronefrosis

Fig. 6. Ultrasound of the perineum and abdominal organs

To calculate diuresis in patients with ARM, the urinary bladder was catheterized during diagnostic and preoperative preparation. Catheterization was performed 10 hours after the birth of the child. In 48 (86%) of the total number of patients, the urinary bladder was catheterized, 4 of them had meconium excretion through the catheter, later on during the examination, the ARM form of rectovesical fistula was diagnosed, which was established as associated with ARM. urinary tract (Fig. 7).

Fig. 7. Catheterization of the urinary bladder.

Recto-urethral fistula was detected in 7 patients, meconium leakage through the external urinary tract was noted in 4 patients within 10 hours from the initial visit, subsequently the diagnosis of

ARM recto-urethral fistula was established by distal colosography. In 3 patients, recto-urethral fistula was detected only by distal colonoscopy (Fig. 8 - 9).

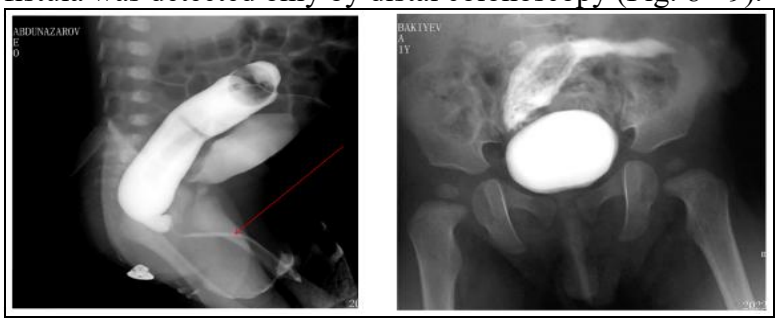


Fig. 8. Distal colostometry.

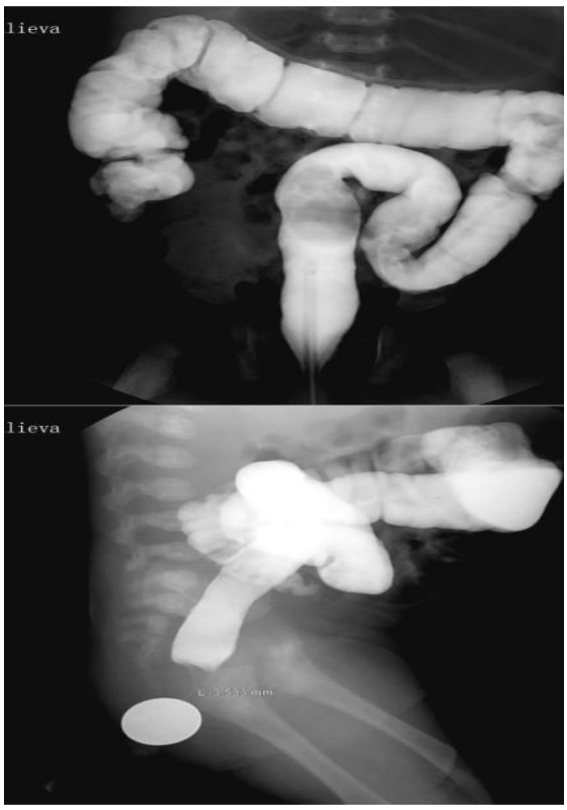


Fig. 9. Fistuloirrigography .

Atresia of the anal opening and rectum with a rectourethral fistula. CAS imposition of a sigmastomy

ARM of rectovesical fistula

III. RESULTS AND DISCUSSION

We performed the following surgical interventions: 24 perineal proctoplasties, 4 Stone-Benson operations, 25 primary colostomy (sigmastomy) followed by radical surgery (3 abdominoperineal proctoplasties, 2 Stone-Benson operations, 16 laparoscopic video-assisted abdominoperineal proctoplasties, 1 intussusception extirpation according to Lenushkin), and in 3 patients radical surgery for a wide fistula was performed at the age of 3-6 months. (Fig. 10-11.)

Fig.10. Stone-Benson operation .

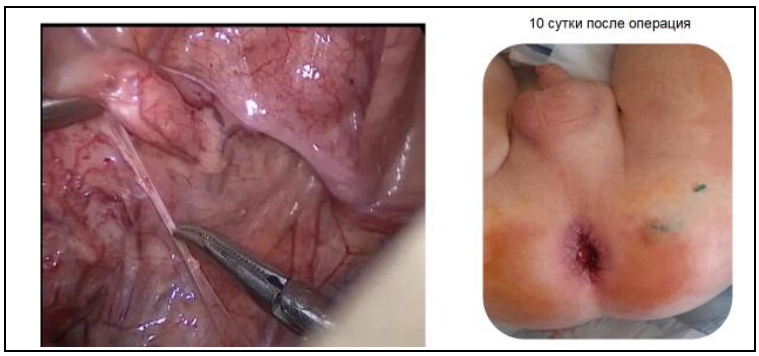


Fig. 11. Laparoscopic removal of rectourethral fistula. Laparoscopic video-assisted abdominoperineal proctoplasty.

In low forms of anorectal malformations, 24 (43%) patients underwent perineal proctoplasty using the Dieffenbach method (Fig. 12-13). All patients underwent rehabilitation measures in the postoperative period (anal bougienage according to the scheme + local anti-scar treatment with Kontratubeks gel until the end of the course) (Fig. 14).

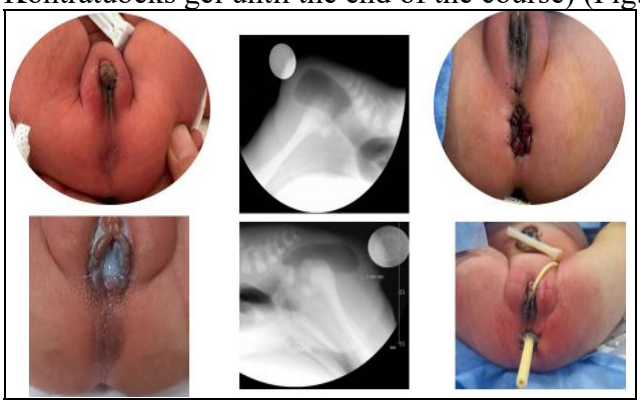


Fig. 12. Perineal proctoplasty in girls.

Rice. 13. Perineal proctoplasty using the Dieffenbach method

Fig. 14. Rehabilitation. Bougienage + Contratub gel

The rehabilitation measures performed gave a positive result in slowing down, stopping and preventing scarring. As a result, all patients who underwent perineal proctoplasty did not have cicatricial narrowing of the neoanus. Postoperative incontinence in these patients showed satisfactory and good results during examination. Repeated operations were not performed on all patients. In 3 patients, anorectal malformations in the form of a recto-perineal, recto-vestibular fistula with a wide fistulous tract were performed on a planned basis 3-6 months after birth. In the postoperative period, all patients underwent intestinal intubation with a gas-discharge tube through the neoanus for better primary wound healing.

In high forms of anorectal malformations and forms of urinary tract fistulas, patients after birth primarily underwent sigmastomy and assendostomy operations. Then, in some cases, distal colostomy was performed before radical surgical interventions. In 5 patients, the distal part of the stoma was located close to the atretic part and fistula tract, in connection with which these patients underwent sigmastomy elimination and abdominoperineal proctoplasty during radical surgery. In 14 patients, stomas were located in the initial section of the sigmoid colon, in connection with which laparoscopic video-assisted abdominoperineal proctoplasty was performed without stoma elimination, which positively contributed to the primary healing of the neoanus after surgery and a significant decrease in postoperative complications. At the next stage, the patients underwent surgery to eliminate the sigmastomy (Fig. 15.).

Fig. 15. Positive results after operations.

In patients after surgical treatment for high anorectal malformations the following complications were observed: 3 patients had prolapse of the rectal mucosa; 3 patients had evagination of the

stoma; 1 patient had purulent orchiepididymitis; 2 patients had cicatricial stenosis of the neoanus; in one patient the neoanus was located outside the sphincter; 5 patients had fecal incontinence (Fig. 16).

Prolapse of the rectal mucosa | Stoma evagination | Purulent epidedymitis | Inflammation of the perianal region | Cicatricial stenosis of the neoanus

Fig.16. Postoperative complications.

IV. CONCLUSION

1. The results of surgical intervention for anorectal defects are closely related to diagnostic, tactical, technical errors, as well as the type of defect and associated developmental anomalies.
2. Staged treatment for high forms of anorectal defects and the use of modern minimally invasive methods can significantly reduce postoperative complications.

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