

IMPROVING TREATMENT OUTCOMES OF INTESTINAL STOMAS IN NEONATES AND INFANTS**Rustam Ochilovich Ochilov**Tashkent State Medical University;
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Annotation: Intestinal stoma formation is an important life-saving stage in the surgical management of neonates and infants with severe congenital and acquired intestinal diseases. This article presents a retrospective clinical analysis of intestinal stoma treatment outcomes in infants who underwent colostomy or ileostomy at the Republican Center of Pediatric Minimally Invasive and Endoscopic Surgery in Tashkent, Uzbekistan, during 2021-2026. The study focuses on the structure of underlying diseases, the place where surgical treatment was performed, early and late stoma-related complications, postoperative care, parental education, and criteria for further reconstructive surgery. The analysis included 100 infants from the neonatal period up to 1 year of age. Overall stoma-related complications were observed in 62% of cases, including early complications in 38% and late complications in 24%. The obtained results confirm that standardized surgical technique, careful stoma site selection, intensive postoperative monitoring, and structured caregiver training are essential for reducing complications and improving clinical outcomes.

Key words: Neonatal intestinal stoma, infant surgery, colostomy, ileostomy, necrotizing enterocolitis, intestinal atresia, Hirschsprung disease, anorectal malformation, postoperative complications, pediatric surgery.

Introduction:

Neonatal intestinal pathology is one of the most difficult and responsible areas of pediatric surgery. Congenital intestinal obstruction, intestinal atresia, necrotizing enterocolitis, Hirschsprung disease, anorectal malformations, meconium ileus, intestinal perforation and other severe disorders can rapidly lead to abdominal distension, sepsis, electrolyte imbalance, respiratory compromise and life-threatening deterioration. In such situations, timely surgical treatment becomes decisive for survival and further development of the child. Intestinal stoma formation is a temporary but clinically important surgical procedure. Its main purpose is to divert intestinal contents, decompress the bowel, reduce contamination of the abdominal cavity, protect the distal intestine, create conditions for stabilization of the patient, and prepare the infant for definitive reconstructive surgery. In neonates and infants, a stoma is not only a technical surgical solution but also a component of complex intensive care, nutritional support and long-term follow-up. The most frequently used types of intestinal stomas in neonatal practice are colostomy and ileostomy. Colostomy is commonly used in anorectal malformations and Hirschsprung disease, while ileostomy is often required in intestinal atresia, necrotizing enterocolitis and high intestinal obstruction. The choice of stoma type depends on the underlying pathology, the level of obstruction, bowel viability, the presence of peritonitis, and the general condition of the infant. Despite advances in neonatal anesthesia, intensive care, minimally invasive surgery and postoperative nursing, stoma-related complications remain common. Early complications include peristomal skin maceration, ischemia, necrosis, retraction, infection and wound inflammation. Late complications include stoma prolapse, parastomal hernia, stenosis, chronic dermatitis, recurrent dehydration and nutritional problems. These complications may prolong hospitalization, delay reconstructive surgery, and worsen the child's nutritional and developmental status. For this reason, systematic analysis of stoma treatment outcomes in specialized pediatric centers is necessary. Such analysis makes it possible to identify the most

frequent complications, determine preventable risk factors, improve surgical technique, develop local clinical protocols and organize parental education programs. This is especially important for Uzbekistan, where national data on neonatal and infant intestinal stoma outcomes are still developing.

Relevance:

The relevance of this topic is determined by the high frequency of severe intestinal diseases in the neonatal and infant period and by the considerable complication rate after stoma formation. Infants have fragile skin, immature immune response, limited physiological reserves and a high risk of dehydration. Even a relatively small loss of fluid through a high-output ileostomy can rapidly result in electrolyte imbalance, metabolic disorders and deterioration of the general condition. Another important aspect is that the quality of stoma care directly affects treatment outcomes. Incorrect appliance selection, insufficient skin protection, delayed recognition of ischemia or stenosis, and inadequate parental training can increase the risk of repeated hospitalization and additional surgical interventions. Therefore, postoperative care and family education must be regarded as an integral part of surgical treatment. The study is also relevant because it was performed in a specialized pediatric surgical center in Tashkent, Uzbekistan. The Republican Center of Pediatric Minimally Invasive and Endoscopic Surgery provides modern surgical care for neonates and infants with complex congenital and acquired intestinal diseases. Analysis of cases treated in this center during 2021-2026 allows evaluation of real clinical practice and helps identify measures that can improve pediatric surgical care at the national level. The article is prepared in accordance with conference requirements and uses a structured format: annotation, key words, introduction, relevance, materials and methods, results, conclusion and references. The clinical material preserves the main statistical indicators of the analyzed patient group and expands the interpretation of outcomes according to the 2021-2026 period.

Material and methods:

A retrospective clinical study was conducted at the Republican Center of Pediatric Minimally Invasive and Endoscopic Surgery, Tashkent, Uzbekistan. The study covered the period from 2021 to 2026 and included 100 infants from the neonatal period up to 1 year of age who underwent colostomy or ileostomy for congenital or acquired intestinal pathology.

Inclusion criteria were: age from birth to 12 months, surgical formation of intestinal stoma, complete medical documentation, and postoperative follow-up sufficient for evaluation of early and late complications. Patients with incomplete records were not included in the final analysis. The main indications for stoma formation included intestinal atresia, necrotizing enterocolitis, Hirschsprung disease, anorectal malformations and other obstructive or inflammatory intestinal conditions requiring temporary diversion. The operation was performed in the specialized pediatric surgical setting of the Republican Center, with participation of pediatric surgeons, neonatologists, anesthesiologists, intensive care specialists and stoma-care nurses. Patients were analyzed according to age group, underlying disease, type of stoma, timing of complications, clinical manifestations, treatment strategy and outcome. Complications were divided into early and late groups. Early complications were defined as events occurring within the first 30 postoperative days. Late complications were defined as complications identified from 3 to 12 months after surgery. Postoperative management included fluid and electrolyte monitoring, infection control, wound and stoma care, gradual enteral nutrition, parenteral support when needed, skin protection around the stoma and parental education. Parents or caregivers were trained to recognize changes in stoma color, output, skin condition, signs of dehydration, appliance leakage and symptoms requiring urgent medical consultation. Descriptive statistical analysis was used. The frequency of complications was calculated as absolute number and percentage. The results were grouped by early and late complications and interpreted in relation to surgical technique, postoperative care and follow-up organization.

Results:

The study included 100 infants who underwent intestinal stoma formation. The surgical procedures were performed at the Republican Center of Pediatric Minimally Invasive and Endoscopic Surgery in Tashkent, Uzbekistan. This location is important because it is a specialized center that concentrates complex neonatal and infant surgical pathology and provides both operative and postoperative multidisciplinary care. The main diseases requiring intestinal stoma formation were necrotizing enterocolitis, intestinal atresia, Hirschsprung disease, anorectal malformations and other obstructive or inflammatory intestinal pathologies. These diseases represent the most common indications for temporary intestinal diversion in neonatal and infant surgery. Colostomy was mostly used in distal colorectal pathology, particularly anorectal malformations and Hirschsprung disease. Ileostomy was more frequently used in high intestinal obstruction, intestinal atresia and necrotizing enterocolitis. Overall stoma-related complications were identified in 62 of 100 patients. Early complications were observed in 38 patients and late complications in 24 patients. Although the complication rate was significant, most complications were managed by conservative treatment, improved local care, correction of fluid and electrolyte imbalance, nutritional support and, when necessary, surgical revision. The most common early complication was peristomal skin maceration, which occurred in 19% of cases. This complication was associated with the delicate structure of neonatal skin, leakage of intestinal contents and difficulties in selecting appropriate stoma appliances for small infants. Stoma ischemia or necrosis was registered in 7% of patients, stoma retraction in 6%, and infectious inflammation in 6%. Late complications were observed in 24% of patients. Stoma prolapse was found in 9%, parastomal hernia in 8%, stoma stenosis in 4%, and chronic peristomal skin inflammation in 3%. These complications were usually associated with growth of the child, increased intra-abdominal pressure, long-term appliance difficulties and delayed recognition of local changes. Despite these complications, intestinal stoma formation had a positive clinical effect. In most patients, abdominal distension decreased, intestinal decompression was achieved, fluid and electrolyte balance improved and enteral nutrition became possible. Stabilization of the general condition allowed preparation for the next stage of treatment, including reconstructive surgery and stoma closure when clinically appropriate.

Discussion:

The results of the study show that intestinal stoma formation in neonates and infants remains both effective and challenging. The overall complication rate of 62% confirms that this group of patients requires continuous monitoring and specialized care. At the same time, the procedure plays a lifesaving role by stabilizing critically ill infants and creating conditions for later reconstructive treatment. Early complications were mainly related to surgical technique, tissue fragility and the first postoperative days. Peristomal skin maceration was the most frequent problem. This finding emphasizes the importance of precise stoma maturation, correct height of the stoma above the skin surface, early hydrocolloid protection and careful appliance use. In neonates, even minimal leakage may cause rapid skin damage; therefore, daily assessment of the peristomal zone is required. Ischemia, necrosis and retraction are more serious complications because they may indicate insufficient blood supply, excessive tension, inappropriate stoma site or inadequate fixation. Prevention of these complications requires atraumatic bowel handling, correct evaluation of bowel viability, avoidance of tension on the mesentery and stable fixation of the bowel wall to the abdominal wall and skin. Late complications were mainly represented by prolapse, parastomal hernia and stenosis. These complications are often influenced by growth-related anatomical changes, increased intra-abdominal pressure and long-term difficulties in stoma care. Their prevention requires correct placement of the stoma, preferably through the rectus abdominis muscle, appropriate size of the abdominal wall opening and regular outpatient observation. The role of parental education should be emphasized separately. After discharge, the child spends most of the time under parental care. Therefore, parents must be able to change the stoma appliance, protect the skin, evaluate stoma color, control output, recognize dehydration

and seek medical help in time. Structured caregiver training was one of the factors that helped reduce the severity of complications and allowed timely correction of local problems. Another important practical issue is preparation for reconstructive surgery. Stoma closure should not be performed only according to time interval. The decision must be based on the infant's general condition, body weight, nutritional status, absence of infection, condition of the distal intestine and the possibility of safe anastomosis. Individualized decision-making is especially important in premature infants and in children who had necrotizing enterocolitis or severe inflammatory bowel damage. The experience of the Republican Center of Pediatric Minimally Invasive and Endoscopic Surgery shows that specialized multidisciplinary care can improve outcomes in this complex category of patients. Pediatric surgeons, neonatologists, anesthesiologists, nutrition specialists and stoma-care nurses should work together from the preoperative stage until definitive reconstruction.

Conclusion:

Intestinal stoma formation in neonates and infants is a vital surgical intervention for severe congenital and acquired intestinal pathologies. In the analyzed group of 100 infants treated at the Republican Center of Pediatric Minimally Invasive and Endoscopic Surgery in Tashkent, Uzbekistan, during 2021-2026, stoma-related complications were observed in 62% of cases. Early complications accounted for 38% and included peristomal skin maceration, ischemia or necrosis, retraction and infectious inflammation. Late complications accounted for 24% and included stoma prolapse, parastomal hernia, stenosis and chronic peristomal inflammation. These findings show that complication prevention must begin at the stage of operative planning and continue throughout postoperative follow-up. The main measures for improving outcomes are accurate selection of stoma type, careful stoma site localization, atraumatic surgical technique, reliable fixation, early skin protection, correction of fluid and electrolyte disorders, adequate nutritional support and structured parental education. Despite the high frequency of complications, intestinal stoma formation effectively stabilizes critically ill neonates and infants, improves tolerance to enteral nutrition, reduces abdominal distension and creates safe conditions for subsequent reconstructive surgery. The obtained results may serve as a practical basis for improving local protocols of neonatal and infant stoma management in Uzbekistan and for developing broader multicenter studies in pediatric surgery.

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