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THE EXPERIENCE OF TRANSANAL ENDORECTAL RESECTION AND COLONIC RELEGATION AT HIRSCHPRUNG'S DISEASE IN CHILDREN

ABSTRACT

In the surgical department of the Pediatric Center, since 2012, the method of transanal endorectal colonic relegation at the recto-sigmoid form of Hirschsprung's disease according to De La Torre-Mondraqon has been approved and introduced. Ten patients were treated by this method. Earlier, in the treatment of Hirschsprung's disease, methods of Duhamel, Soave-Lenyushkin, and Soave-Bolei were used. The operations were performed through the abdominal perineal access. Totally 32 operations were performed. A comparative evaluation of the outcomes of radical operations showed that in abdominal perineal proctoplasty of Soave-Lenyushkin and Duhamel the patients often have postoperative complications such as postoperative peritonitis, enterocolitis, encopresis, «residual» zone of aganglionosis, which required repeated operations and a long «cost» recovery. Similar complications were not observed after the transanal relegation of De La Torre-Mondraqon.

Keywords: children, aganglionosis, Hirschsprung's disease, complication, anastomosis.

INTRODUCTION

The most common cause of constipation of organic nature in children is Hirschsprung's disease. Treatment of Hirschsprung's disease remains an actual problem of pediatric surgery, despite of the 100th anniversary of the development of pathogenetic well-founded method of correction of the defect [1-3]. The problem of complications after primary radical operation in many patients is topical, some of them need repeated operations. The overall incidence of complications according to different authors is from 22.7% to 38.5%, including stool incontinence from 3.6% to 69%, constipation from 1.6% to 25%, enterocolitis from 1.4% to 28.5%, perianal dermatitis from 2.7% to 27.7% [1, 3, 4]. A large number of various methods of surgical correction of Hirschsprung's disease has been proposed, linked to a reduction of postoperative complications. Currently, the main task of the modern approach to the surgical treatment of colon agangliosis is the minimization of the trauma of a radical operation, primarily by developing various minimally invasive modifications of the widely known techniques of Svenson, Soave, Duhamel. Children's surgeons are trying to find a certain compromise in the differential approach to choosing the method of surgery. The most recent achievement is the radical operation of transanal endorectal colonic relegation without laparotomy, described in 1998 by De la Torre Mondragon and Ortega, which gives excellent results in the recto-sigmoid form of Hirschsprung's disease [4].

MATERIALS AND METHODS OF RESEARCH

For the period 2012-2017 years 10 surgical interventions using the De La Torre-Mondraqon method of transanal endorectal colonic relegation in rectal and recto-sigmoid forms of Hirschsprung's disease were carried out. The age of children ranged from 10 months up to 8 years. Boys prevailed - 9 (90.0%), the girl was alone. Children with extended forms are excluded from this study.

For a comparative study of the results of surgical treatment of Hirschsprung's disease in the surgical department of the Pediatric Center, Republican Hospital №1, National Centre of Medicine, we conducted a retrospective analysis of the outcomes of surgical treatment using the Duhamel and Soave method in the modifications from 1991 to 2011. For that period 32 children were operated (4 by Duhamel method, 28 surgical interventions by Soave modifications).

At the operation by the De La Torre-Mondraqon method the preoperative examination included: general clinical tests, fecal dysbacteriosis, coprogram, irrigoscopy, full-layer biopsy of the rectum (in 2 cases), fibro-esophagogastroduodenoscopy, ultrasound examination of the abdominal cavity organs, ultrasound examination of the heart, brain, examination of the gastroenterologist, neurologist. According to the survey, all children were diagnosed with Hirschsprung's disease with a preliminary picture of the prevalence of aganglionosis zone. The following forms were met among 10 children: rectal - 2 cases; recto-sigmoid - 8.

The complex of preoperative preparation included: assessment of hypotrophy and correction of nutritive status, correction of revealed hemostasis disorders, thorough sanitation and cleansing of the intestines with purifying and siphon enemas, selective decontamination of the intestine with orally administered antimicrobial agents.

All 10 children underwent transanal endorectal reduction of the colon with superposition of a colanal anastomosis. The essence of the operation was as follows: a minimally invasive approach based on transanal endorectal mobilization and reduction of the

aganglionic part of the colon with its resection and formation of a coloanal anastomosis was used. On the operating table, the child was in the lithotomy position on the back with the perineum raised on the platen, the lower extremities dilated and fixed to the posts. Divulsion of the anus was carried with the rectal mirror, on the rectal mucosa 1.5 cm above the scallop line and the skin of the near-anoral region was superimposed with 8 provisional seams for better exposure of the anorectal zone. When tying such seam, an additional «protective» fold is formed, consisting of the wall of the mobile lower ampullar part of the large intestine in the top, and from the bottom - the perianal skin, which protects the internal sphincter from mechanical influences. The anal retractor of Denis-Brown was not used. The operation began with a circular dissection of the rectal mucosa by electrocoagulation above the dentate line by 0.5 cm, entered the submucosal layer. Several seams are applied to the proximal end of the incision of the mucous membrane, which were used for traction. Endorectal excretion was continued in the proximal direction, remaining in the submucosa layer proximally for 5-10 cm, depending on the age of the child. Upon reaching the peritoneum, the rectal muscle was dissected along the entire circumference and the full-ligated rectum and sigmoid colon was mobilized, stretching through the anus. In this case, the vessels of the rectum and sigmoid colon were dissected with the use of ligatures closer to the wall of the intestine. It allowed the distal part of the colon with the anorectal zone and the enlarged site to be freely lowered to the healthy intestine. Aganglionic and dilated colon cuts were cut off, the sigmoid colon was additionally fixed to the muscular case of the rectum and coloanal anastomosis was formed for 0.5 cm above the dentate line by suturing the mucosa in the region of the scallop line to the wall of the inverted sigmoid colon. After that, the provisional seams were cut, which immediately led to the immersion of the anastomosis zone in the lumen of the intestine.

RESULTS AND DISCUSSION

There were no intraoperative complications and no lethality. Blood transfusion was not required in any case. The duration of the operation was 75-120 minutes (an average of 95 minutes). The length of the disrupted pathological area of the intestine was from 25 to 75 cm. In the near postoperative period, the children observed bed rest for 8-10 days, enteral load began in 48-72 hours with therapeutic enteric nutritional mixtures with the transition to the general table by 5-6 days, prolonged epidural anesthesia for 72 hours was carried out. On the 12th day, a finger examination of the rectum was performed. The anastomositis phenomena in 2 patients were stopped by the appointment of physiotherapy procedures, rectal suppositories. There were no indications for bougie anastomosis. The patients were discharged on 12-14 days after surgical treatment. Most children are examined in a catamnesis, the observation period is more than 2 years. The quality of life satisfies patients and their parents. Children do not complain, have a regular independent stool, sometimes in 1-2 days. They develop according to the age. They have courses of complex proctologic rehabilitation 2 times a year (physiological treatment, massage, exercise therapy, appointment of the gastroenterologist).

A comparative assessment of the outcome of radical surgery at Hirschsprung's disease by Duhamel and Soave methods in 1991– 2011 showed that post-operative peritoneal proctoplasty in postoperative period was associated with complications in 10 patients (31.2%): postoperative peritonitis in 4 (12%), encopresis in 2 (6.25%), «residual» aganglionosis zone in 2 (6.25%), 1 case of recto-vesicular anastomosis and stenosis of the «velum». 3 patients died (lethality 9%) - 2 children in the early postoperative period after multiple operations for severe adhesions; 1 child in the late postoperative period after total colectomy and ileo-rectal anastomosis performed at the age of 3 months with the total form of congenital aganglionosis of the colon died in the district due to uncorrected excoxicosis on the background of enterocolitis.

CONCLUSION

Thus, the method of transanal endorectal relegation of the colon in rectal and recto-sigmoid forms of Hirschsprung's disease according to De La Torre-Mondraqon combines radicality and minimal traumatism in the surgical treatment of colon aganglionosis in children. The method is simple, safe, accompanied by a minimum number of complications, it allows to achieve excellent functional and cosmetic results in the near and distant postoperative period. The method is effective in children of any age in the most frequent forms of aganglionosis, except for cases of total and subtotal lesion of the colon. The positive aspects of this technique, unlike traditional operations by Duhamel and Soave methods, include the possibility of early enteral feeding, minimal trauma in the mobilization of the intestine, and a minimal risk of damage to important pelvic structures, absolute «cosmeticity,» no adhesion in the abdominal cavity, and a significant reduction in hospitalization.

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THE IMPROVEMENT OF CLINICAL AND FUNCTIONAL RESULTS OF SURGICAL CORRECTION OF PECTUS EXCAVATUM IN CHILDREN AND ADOLESCENTS

ABSTRACT

The article reflects the relevance of the problem of surgical treatment of pectus excavatum (PE) in children; a comparative analysis of surgical treatment of patients with PE is presented, major part of which was operated by the Nuss-procedure method. The main advantages of this method, aimed at reducing intraoperative and postoperative complications, contributing to the reduction of the period of complete rehabilitation of the patient, are distinguished.

Keywords: children, pectus excavatum, the Nuss thoracoplasty, complications.

INTRODUCTION

Pectus excavatum is a severe dysplastic malformation of the connective tissue of the sternocostal complex [1]. The frequency of this defect, according to domestic authors, varies from 0.6 to 2.3%, according to foreign authors varies depending on the region from 0.2 to 1.3%. Traditionally, the indications for surgical correction are functional disturbances of respiratory and cardiovascular systems, the intensity of which are directly related to the degree of deformation [2, 3]. In adolescence, the leading factor is psychoemotional one, a complex of physical inferiority, which makes one consult a doctor to correct this defect. More than 50 variants of deformation correction have been proposed, most of the generally accepted surgical procedures give good functional results, but they do not completely solve such existing problems as minimally invasiveness, radicalism and cosmeticity. According to the literature postoperative complications, relapse of deformity in children occur in 15-25% of cases. This problem remains urgent and requires further solutions.

In 1998 a surgeon Donald Nuss published a 10-year experience in treating pectus excavatum in children, calling his method as a minimally invasive technique for correction of congenital deformity of the chest [6]. A new approach involves the correction of a deformed sternocostal complex without resection of the costal cartilages and sternotomy. The method is widely used in pediatric surgeons around the world. Since 2009, our clinic has been using the «Nuss-procedure».

MATERIALS AND METHODS OF RESEARCH

For the period from 2009 to 2017in the surgical department of the Pediatric Center of the Republican Hospital No. 1 of the National Center of Medicine in Yakutsk sternochondrodistraction by Nassau was performed for 65 patients in treating pectus excavatum (Table 1).

The majority of patients (63%) were boys. In 56% of cases, the operation was performed at the age of 9 to 14 years. By the degree of deformation of the chest: 40 patients had 3dgrade deformity (61.5%), other 25 children had deformation of the 2nd degree according to Gizhitskaya. In addition, 8 children (12.3%) had an asymmetric deformation at pectus excavatum. Marfan-like syndrome was found in 10% of patients with pectus excavatum, these children were diagnosed with small heart anomalies, signs of disrupted maturation of connective tissue (arachnodactyly, platypodia, carriage disorders). In a complex of preoperative examination, along with conventional methods, chest X-ray in two projections, echocardiogram, according to the indications consultations of cardiologist and genetics were included.

Support plates of titanium alloy BT6, size V-240T up to V-360T (JSC «KIMPF»), width from 15 mm to 20 mm, thickness from 1.7 mm to 2.8 mm and special guide (JSC «KIMPF») were used. The size of the plate was selected beforehand in advance, taking into account the age and dimensions of the child's chest. The shape of the plate bending was formed individually with the technician of the operating unit, depending on the type and degree of deformation. The operation was performed under combined endotracheal anesthesia in combination with epidural anesthesia. The technique of the operation was as follows: the cuts of the skin were made on the axillary lines from both sides, focusing on the deepest point of the funnel-shaped deformation. Under the pectoral muscles along the corresponding intercostal space a tunnel was formed with a help of a special guide. Further from left to the right a supporting titanium plate was carried and rotated 180 degrees, then it was fixed to the corresponding underlying ribs on both sides.

RESULTS AND DISCUSSION

Intraoperative correction of expressed deformity of the chest was achieved in all

Table 1

Distribution of children by age and gender, abs.number (%)

Gender	Age, years					
	4 – 5	6 – 8	9 – 11	12 – 14	15 – 16	All ages
boys	6	8	13	9	5	41 (63)
girls	3	4	7	8	2	24 (37)
total	9 (138)	12 (184)	20 (307)	17 (261)	7 (107)	65 (100)