DUODENAL ATRESIA - LATE RESULTS

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Abstract

Background: Duodenal atresia and stenosis are frequent cause of congenital intestinal obstruction. Current operative techniques and contemporary neonatal critical care are result of 5% decrease of morbidity and mortality rate. Late complications are not uncommon. Material and Methods: In this retrospective review has been shared the experience of Clinic for Pediatric Surgery - University Hospital "St. George "- Plovdiv for period of 20 years (1995- 2015), to identify long term results after operation for different forms of duodenal atresia. Results: Duodenal atresia or stenosis were identified in 60 patients. Late results are checked in 16. Nine children have required additional abdominal operations after initial repair including fundoplication (1), three children underwent revision of their initial repair: tapering duodenoplasty or duodenal plication (2), insufficiency of anastomosis (3) Conclusions: Late complications occur in 11 patients with congenital duodenal anomalies and associated anomalies, we have observed by 7 of them. Follow-up of these patients into adulthood is recommended to identify and describe late results.

Key words: duodenal atresia, late results, children

Introduction

Duodenal atresia and stenosis is a frequent cause of duodenal obstruction with frequency 1: 10 000 live births. Boys are affected more common than girls. Associated anomalies have observed more than 50% of cases. Down's syndrome occurs more than 30% of patients, polyhydramnion - to 50% of cases, and more than 40% are premature. Other associated anomalies could be found such as - pancreatic anomalies, esophageal atresia, malrotation, congenital heart anomalies, Meckel's diverticulum, imperforate anus. Anomalies of biliary tract are rarely observed.

In recent years, early postoperative survival rate has improved from 60% to 90%. With contemporary neonatal intensive care and improved operative techniques, the early morbidity and mortality rate is very low- around 5%. A few reports suggest that the late complications may occur around 15% of patients. The true incidence of long term complications and late results after initial repair of duodenal atresia is unknown. The availability of such information would be helpful for long- term care plan for these patients as they progress into childhood and adolescence.

Materials and Methods

For a 20- years period (1995- 2015) 60 infants with different forms of duodenal atresia have been operated in Clinic for Pediatric Surgery - University Hospital "St. George "- Plovdiv, Bulgaria. Late results checked in 16

Results

This study includes late results in 16 patients with different forms of duodenal atresia or stenosis. There are 9 girls and 7 boys. The oldest patient was 20 y.o, and the youngest - 2 y.o. Associated anomalies are observed in 7 patients: Down's syndrome- 3 patients, cardiac desieases -2 patients, craniostenosis- 1 patient, disorder of NPD- 1 patient. Late results are described on Table 1.

In two of the children as a late result of surgical treatment, we have observed gastric outlet obstruction has been determined, in two of these cases the contrast persists in the stomach more than 6h. after the procedure. After the first 12h. of the contrast investigation, no offset has been found in the stomach of all the patients. In two of the cases, after eating of dry food abdominal discomfort has been established by the parents. Gastroesophageal reflux is found in 2 of the patients. Three patients have defecated once per 2-3 days, which we have accepted as a constipation.

We have analyzed the latest results in 16 patients and we have compared them to the following indicators:

1. Food.

In 13 of the cases (81.2%) there are no problems neither complaints with the feeding after discharging. In 3 of the cases (18.8%) the liquids are more tolerated since they have an inability to take hard meals. (Table 2.)

2. Stool.

Defecation is one of the main criteria for checking. In 10 (62.5%) of the followed patients, the defecation is regular with normal consistency. We have found that in three of them, the stools were irregular during the first 1- 2 years after the operative treatment. Very often the children have a stimulated stool.

Example 1: Patient B.X., 2 y.o, has been operated as a newborn because of a membranous form of duodenal atresia. According to anamnesis, during the first year the child has had every day stimulated defecations. The GIT contrast study doesn't detect pathological changes in the duodenal region and the rest of the gastrointestinal tract (Figure 1). There is no evidence of contrast in the stomach (Figure 2) at the first hour.

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Late results	No
Gastroesophageal reflux disease	2
Megaduodenum	3
Gastric outlet obstruction	2
Abdominal discomfort	2
Constipation	3
Without complaints	5
All	16

Table 1. Late results.

	Frequency	%
Common food	13	81,2
Liquid food	3	18,8
Total	16	100,0

Table 2. Feeding at home.

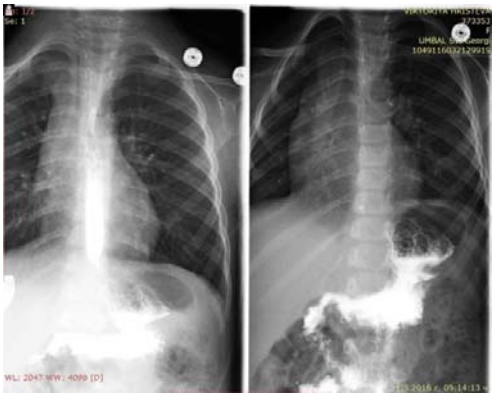

Fig. 1 The contrast material passed smoothly from the stomach to the duodenum, presented a normal shape and dimensions.

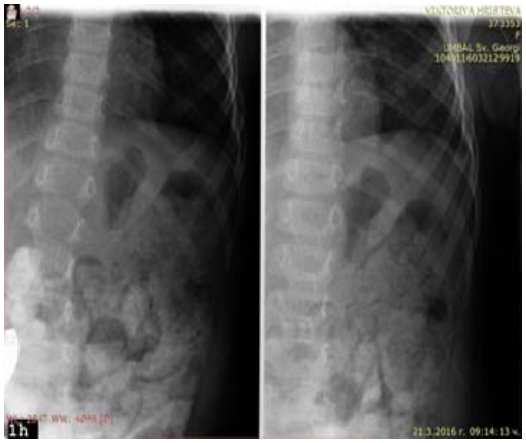

Fig. 2. No contrast material in the stomach after the 1st hour.

Vomiting	Frequency	Percent
Yes	13	81.3
No	3	18.7
Total	16	100

Table 3. Vomiting.

Passage description	Frequency	Percent
Without specifics	12	75
With specifics	4	25
Total	16	100,0

Table 4. Passage description.

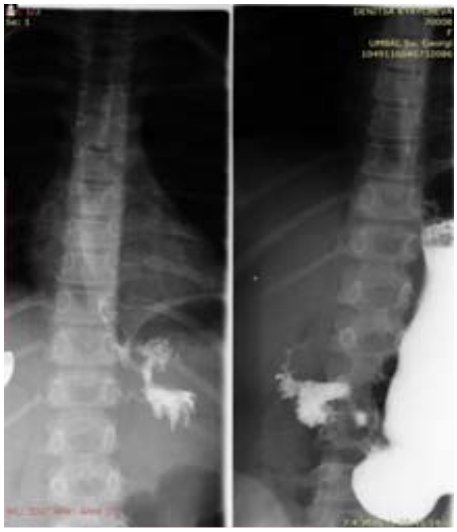

Fig.3. After introducing the contrast-stomach extended to the pelvis is visualized.

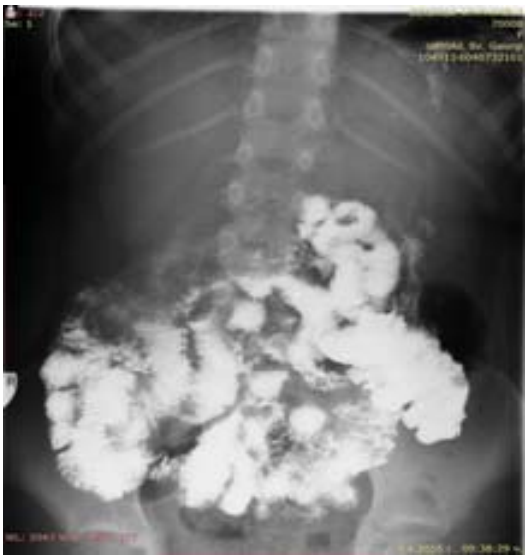

Fig. 4. At the second hour, the small intestine is completely in the right half of the abdomen.

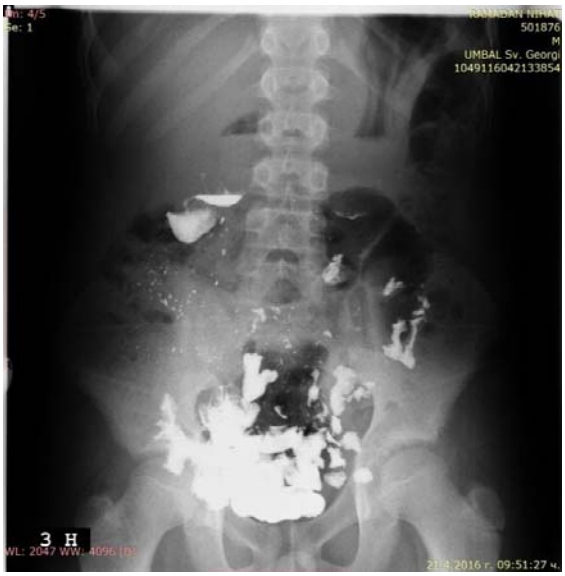

Fig. 5. 3 hours after the start of the study, a small part of contrast is visualized in the duodenum.

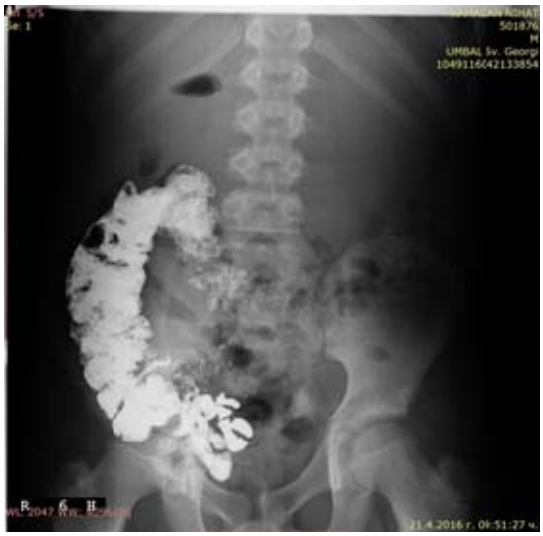

Fig. 6. 6 hrs. contrast reaches Colon transversum, and a small amount is in the terminal ileum.

In two (12.5%) patients defecations are irregular, and they needed enema stimulation every day. In these patients have been detected associated anomalies as craniostenosis and Down's syndrome.

1. Vomiting.

Vomiting is the other important symptom which is checked. In three of the cases (18.7%) vomiting is fixed after extra quantity feeding. (Table 3.)

2. GI contrast investigation.

GI contrast imaging is the main diagnostic method we use in all patients. It gives us the information of GIT condition and detects some possible pathology. (Table 4.)

Our 16 patients are followed by a contrast GIT investigation. In four of them (25%), we have detected deviations such as: megaduodenum, stomach dilatation, intestinal malrotation and GIT dismotility due to persistence of contrast in stomach and small intestine 3h after initiation of study.

Example: Patient D. K., 7 y.o. As a newborn, the child is operated because of a membrane form of duodenal atresia and Bride de LADD. When performing the contrast test, we found a strongly prolonged stomach reaching the pelvis without visualizing the bulbus duodeni, as well as malrotation of the intestine. (Figure 3,4)

Example: Patient R.N. 10 y.o. As a newborn child is operated because of duodenal atresia by performing duodeno - ileo anastomosis. According to the anamnesis, the child was eating well and has developed normally with regular defecation. From the contrast study a curved stomach was found. The contrast forms are horizontal level in the bulbus duodeni area and at the third hour a small amount of contrast is still in the duodenum (Picture 5). At the sixth hour the contrast reaches the transversal colon, but a small portion still appears in the field of the terminal ileum (Picture 6).

Discussion

The late results by our patients out of the given study are quite good. The oldest patient in our study is 20 years old female and she has no problems with feeding, body weight and stools. No megaduodenum and gastric outlet obstruction in contrast study is discovered. She is without associated anomalies. The youngest patient in our study is 2 y.o girl, she is operated because of duodenal obstruction - membrane form with no complications in the early postoperative period. She eats and gains weight normally. Defecations are problematic only with enemas and medicaments. Associated anomaly of this patient is Down's syndrome. Another patient is 5y.o. girl, who underwent operative treatment for duodenal atresia with duodeno - duodeno anastomosis, with no complications in early postoperative period. She has a cardiac defect as associated anomaly. Without vomiting till this moment, but she eats only liquid foods and lags behind the NDP. The patient has normal defecations.

Long - term problems may also occur because of other structural or chromosomal anomalies, the most common of which is trisomy 21. (2) Combination with Duodenal atresia or stenosis, malrotation and trisomy 21 can be found at rate of 10-20%. Relatively high mortality rates for duodenal obstructions associated with trisomy 21 have also been reported. That is unlikely in our cases. The effect of Down's syndrome on the death rate in our cases did not correlate with results reported in other studies. This rate may have significantly higher incidence of congenital heart anomalies. In later series, decreasing mortality rates have been reported. The overall survival rates of infants with anomalies associated with duodenal obstruction have improved over at the past several decades.

Early postoperative survival after the repair of duodenal atresia has steadily improved over the past 40 years, from approximately 60% to over 90% in practice, owing to improved neonatal and anesthesia management, total parenteral nutrition and more aggressive treatment of associated anomalies [3].

According to Nicola Lewis, long-term follow-up of these patients with different forms of duodenal atresia reveals that most of these children are asymptomatic with a normal nutritional status. Approximately 12% of patients develop late complications. Late deaths occur in approximately 6% of patients, and 50% of these are related to complex cardiac conditions. Fewer than 10% of patients require fundoplication for gastroesophageal reflux, and fewer than 10% require revision of the initial repair. (4)

Our results are comparable to those of the authors. When analyzing the late results of our patients, we have identified a absence of subjective complaints in a most of them. They have a normal nutritional status.

According to Escobar MA, Ladd AP, et al. Late complications occur in 12% of patients with congenital duodenal anomalies and the associated late mortality rate is 6%, which is low but not negligible.(5)

In our study we have found late complications in 20% of patients with duodenal atresia.

Intestinal malformations are common anomalies of the newborn and they must be treated in experienced centers. Reports of long-term follow-up and associated complications are insufficient and leading to misinterpretation of clinical symptoms later in childhood. To prevent treatment errors, it is important to keep in mind the late complications of duodenal atresia.

This study contributes to the treatment of duodenal obstructive pathology and its late postoperative results. Long lasting follow up of these patients gives an important information of quality of life of patients with this congenital anomaly.

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