Jejunoileal Atresia and Stenosis: a study of 50 cases done in Central Teaching Hospital of Pediatric in Baghdad

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Abstract

Background: Congenital defects in continuity of the intestine are morphologically divided into either stenosis or atresia and constitute one of the most common causes of neonatal intestinal obstruction. Most Jejunoileal atresias result from intrauterine ischemia.

Aims of the study: To Criticize and evaluate the surgical procedures that are used in the treatment of jejunoileal atresia & to Identify the postoperative complications.

Patients & methods: This study was conducted in Central Teaching Hospital of Pediatric in Baghdad for the period from January 2005 to January 2008. All the patients were under (28) days old that were admitted and followed up under the study group. This study for analyzing (50) neonates with jejunoileal atresia .The number of males were (27) and the number of females were (23) and the ratio of/ male to female is 1.17:1.

Results*:* Thirty one patients (62%) had jejunal atresia while ileal atresia was in(19) patients(38%).The most common type of jejunoileal atresia was type I (30%) of the cases and the second was the type IIIa (20%).The clinical presentation for jejunal atresia was mainly bilious vomiting and occurred in(77%)of the cases, while failure of passing meconeum in the first day of life was the most common presentation in ileal atresia and occurred in (89%) .

Conclusions: Jejunal atresia most commonly presents with bilious vomiting while ileal atresia presents with abdominal distension and failure to pass meconium in first day of life. The most common type of the atresia in our study was type I while type IV is the rarest & there are several surgical procedures used in the treatment of atresia but wide proximal resection and end to end anastomosis was the commonest procedure done

Recommendations: Early diagnosis and surgical interference are vital in the management of jejunoileal atresia to reduce postoperative complications especially septicemia.

Keywords: Jejunoileal atresia, bilious vomiting, anastomotic leak.

Introduction

Congenital defects in continuity of the intestine are morphologically divided into either stenosis or atresia and constitute one of the most common causes of neonatal intestinal obstruction. [1,2,3]

Atresia refers to a congenital obstruction caused by complete occlusion of intestinal lumen and account for 95% of cases of jejunoileal obstruction. Stenosis is defined as a localized narrowing of the intestinal lumen without disruption of continuity or defect in mesentery.[1]

In 1955 Lauw and Barnard presented convincing evidence that small bowel atresia were secondary to an in-utero occlusion of all or a portion of the blood supply to the small bowel, i.e., the superior mesenteric artery. The affected bowel scars down to a fibrotic remnant or may be totally resorbed.[4,5]

Although several mechanisms have been postulated to explain the intestinal atresia malformation, the most favored theory is that of localized intrauterine vascular accident with ischemic necrosis of the sterile bowel and subsequent resorption of the affected segment or segments.[6,7]

It was clearly demonstrated that devitalized segments of bowel were rapidly absorbed, the proximal and distal bowel separated from the devascularized segment and seal to form rounded blind ends, and adhesion in the vicinity of pathological process disappeared unless perforation lead to meconeum peritonitis.[8,9,10]

Four types of jejunoileal atresia have been described:

1-Atresia Type I (membrane):

The obstruction is caused by a membrane or web formed by mucosa and submucosa. The dilated proximal and collapsed distal intestine is in continuity and the mesentery is intact. The small intestine is of normal length.[11]

2- ***Atresia Type II*** (blind ends joined by fibrous cord):

In atresia type II, the proximal intestines terminate in a bulbous blind end which is grossly distended and hypertrophied for several centimeters.

The blind end is often peristaltic and cyanosed, and may be necrotic with perforation. The mesantry is normal and the small bowel length is usually normal, the two blind ends connected by fibrous band.[11]

3- ***Atresia Type III a*** (disconnected blind ends):
The appearance is similar to that type II, but the blind ends are completely separated. The fibrous connected cord is absent. The total length varying in size and it is subnormal. There is always mesenteric defect. (11) Cystic fibrosis is commonly associated with this variety. (12)

Atresia Type III b (apple peel, Christmas tree):

It consist of a proximal jejunal atresia near the ligament of Treitz, absence of the superior mesenteric artery beyond the origin of the middle colic branch and of the dorsal mesentery, significant loss of intestinal length, and a large mesenteric defect (1) Occasionally, further type I or type II atresia is found in the bowel closest to the distal blind end. Vascularity of the distal bowel is often impaired.[13,14]

4-Atresia Type IV (multiple atresias):

Multiple atresia**s** can be combination of type I – III. The intestinal length is always reduced often having morphological appearance of sausage.

Patients & Materials

This study was conducted in Central Teaching Hospital of pediatric in Baghdad for the period between January 2005 to January 2008. All our patients were under (28) days old who where admitted and followed up under our care. A standerized data sheet was adopted for collection of information and included the following:

- Name, age, sex, and body weight.
- Clinical presentation.
- Methods of diagnosis.
- Associated anomalies.
- Family history of same problem.
- Type of atresia according to operative finding.
- Type of surgical procedure.
- Complications after operation.
- Time of stay in hospital.
- Fate of the patient.

A full clinical examination and investigations were done, specifically including plain abdominal x-ray in erect and supine position. Less often we did Ba-enema and occasionally Ba- meal to rule out cases of partial intestinal obstruction and malrotation.

Results

A total number of (50) neonates with intestinal obstruction due to jejunoileal atresia and stenosis were admitted to Central Teaching Hospital for Children in period from January 2005 to January 2008 .The male to female ratio was 1.17:1, of these cases 31(62%) were jejunal atresia and 19(38%) were ileal atresia.

The most common presentation of patients with jejunal atresia was bilious vomiting which occurred in (24 patients 77%). In (23 Patients74%) there was failure to pass meconeum in the first day of life. Abdominal distension occurs in (18 patients 58%) and only (10 patients32%) had jaundice.

In ileal atresia, failure of passing meconeum in the first day of life was most common presentation and occurred in (17 patients 89%) which is more than jejunal atresia while abdominal distension and bilious vomiting occurred in (14 patients 74%). Clinical presentation according to type of atresia is illustrated in **(table 1).**

The commonest type of jejunoileal atresia was type I and occurred in (15 patients 30%), while type IIIa occurred in (10 patients 20%).The least frequent type was type IV (3 patients 6%) while stenosis and type IIIb occurred in (7 patients 14%) for each one. Type II occurred in (8 patients 16%), as seen in **table(2).**

Associated anomalies were seen in 19 patients (38%). Malrotation was the commonest and was found in 8 patients (16%) of the total number of patients. Congenital heart disease in four patients (8%) one of them died. Gastroschisis and imperforate anus occurred in (2) patients for each one. Those patients with gastroschisis died within two weeks after surgery. As for those with imperforate anus simultaneous resection and anastamosis with creation of colostomy was done. Both patients survived.

(Table 1) Clinical Presentation according to the type of atresia

Findings	**Jejunal Atresia**		**Ileal atresia**	
	No. (No=31)	**%**	**No. (No.19)**	**%**
Bilious vomiting	24	77	14	74
Failure of passing meconeum	23	74	17	89
Abdominal distension	18	58	14	74
Jaundice	10	32	5	26

(Table 2) Types of jejunoileal atresia

Type	No. of patients with jejunal atresia		No. of patients with ileal atresia		Total No. of patients	%
	No.	%	No.	%	No.	
Stenosis	4	8	3	6	7	14
Type I	9	18	6	12	15	30
Type II	5	10	3	6	8	16
Type IIIa	4	8	6	12	10	20
Type IIIb	7	14	---		7	14
Type IV	2	4	1	2	3	6

We had one patient with omphalocele minor associated with web when enterotomy done over the web and excision of it was done by electrocautey and the omphalocele was repaired. Associated anomalies with jejunoileal atresia and stenosis are illustrated in (**table 3).**

All the fifty patients underwent surgery, in one patient with type IIIb we could not do any thing because the operation was deemed unnecessary as operative finding revealed very short bowel with gangrenous distal atretic segment.

Operative treatment included wide resection of proximal dilated part of about (5-15) cm. and up to (5) cm. distal to the atretic segment with primary end to end anastomosis. The total number of patients who underwent this procedure in our study was (39 patients 78%).

The second most common surgical procedure was enterstomy with excision of the web which was done in type I atresia (4 patients: 8%).

Tapering enteroplasty of the proximal dilated segment with end to end anastamosis was done in (2 patients: 4%), plication enteroplasty of dilated proximal segment was used in (1 patient: 2%), the above two procedures were done in the type IIIb to conserve bowel length.

The residual bowel length was documented in each patient. We did not use a transanastomotc tube for early postoperative feeding. None of our patients had total paranteral nutrition after surgery due to its unavailability in our hospital. Jaundice resolved in all of our survivors who had it at presentation. We started oral feeding after 5-7 days postoperatively and sometimes it took longer. Surgical procedures which were used in the treatment are illustrated in (**table 4).**

Thirty one patients developed postoperative complications, anastomotic leak was the most common and occurred in (13 patients: 26%).The anastomotic leak was the major cause for postoperative septicemia.

(Table 3) Associated anomalies in jejunoileal atresia

Congenital anomaly	*No. of the patients*	*%*
Malrotation	8	16
Congenital heart disease	4	8
Gastroschisis	2	4
Imperforate anus	2	4
Omphalocele minore	1	2
Meconeum ileus	1	2
Meckel's diverticulum	1	2
Total	19	38

(Table 4) Surgical procedures used in the treatment of jejunoileal atresia

Surgical procedure	*No. of the patients*	*%*
Resection &primary anastomosis	**39**	**78**
Enterotomy with web excision	**4**	**8**
Initial stoma fallowed by primary anastomosis	**3**	**6**
Tapering enteroplasty of proximal segment and primary anastomosis	**2**	**4**
Plication enteroplasty of proximal segment and primary anastomosis	**1**	**2**
Nothing done	**1**	**2**
Total	**50**	**100**

The second most common complication was anastomotic stricture and occurred in (5 patients: 10%).Wound infection occurred in (4 patients: 8%) and wound dehiscence occurred in (1 patient: 2%).Postoperative complications after surgical procedures for jejunoileal atresia are illustrated in (**table 5).**

The mortality rate was 40%(20 patients).Type IIIb account for the highest mortality (all patients with this type died)while in stenosis there was no mortality .The most common cause of death postoperatively was septicemia which occurred in 60%(12 of 20 deaths), the second most common cause of death was aspiration pneumonia and occurred in 15%(3 of 20 deaths).The mortality rate related to the type of atresia is illustrated in **(table 6),** while the causes of post operative death illustrated in **(table 7).** The mortality rate in the type IIIb anomalies was 100% mainly due to short bowel syndrome which is not compatible with life without total parenteral nutritional support.

(Table 5) postoperative Complications

Complications	*No. of the patients*	*%*
Anastamotic leak	13	26
Anastamotic stricture	5	10
Gangrene of proximal end of distal segment	4	8
Short gut syndrome	4	8
Wound infection	4	8
Wound dehiscence	1	2
Total	31	62

(Table 6) Mortality rate related to the type of atresia

Type of atresia	No. of the patients	No. of the deaths
Stenosis	7	0
Type I	15	4
Type II	8	2
Type IIIa	10	5
Type IIIb	7	7
Type IV	3	2
Total	50	20

(Table 7) Causes of postoperative death

Causes of death	No. of patients	%
Septicemia	12	60
Aspiration pneumonia	3	15
Prematurity	2	10
Progressive wasting	2	10
Associated anomaly	1	5

Discussion

Over the survey period from January 2005 to January 2008, fifty cases of jejunoileal atresia and stenosis admitted to our hospital and underwent surgical procedures. Three cases were excluded from the study because they died before surgery.

The most common type of atresia in our study was type I and accounted for 30% of all cases**.** This result is different from study done by ***Nixon &Taws*** [15] who showed that type III being the most common and accounted for 46% of cases.

In our study jejunal atresia is more common (62%) than ileal atresia (38%) while in the study of ***Nixon &Taws*** atresia was distributed equally between jejunum & ileum.

Apple peel deformity in our study accounted for 14% of cases while in ***Nixon &Taws*** it accounted for 31%, in ***Ros Mar Etal*** [16] 32.2%**.**, and in ***Zeralla &Martin*** 11%. [17]

Table (1) shows the clinical presentation according to the type of atresia. In our study bilious vomiting is slightly higher in jejunal atresia (77%), while ileal atresia presented mainly by failure of passing meconeum in the first day of life, (89%) , and abdominal distension (74%). All these results are similar to the results of ***Nixon &Taws, & Zeralla***

Malrotation was the most common associated anomaly in our study, (16% of cases) and it is similar to the study of ***Nixon &Taws,*** &***De Lorimier et al*** [18].

The most common surgical procedure in our study was wide proximal resection and end to end anastomosis & this was done in (78%) of patients, which is similar to ***De Lorimier et al*** [18] who used it in 80%of the cases. ***Nixon &Taws, & Zeralla &Martin*** used it in 90% of their patients.

Postoperative complications in our patients occurred in (62%) of cases, the most common complication was anastomotic leak and accounted for (26%) and anastomotic stricture (10%).This result is higher than the study of ***Nixon and Taws,*** in which the anastomotic leak was (15%) &stricture (5%).

Mortality rate was found to be high in our study (40%), it reached *to* (100%) in type IIIb. This high mortality rate was due to lack of total parenteral nutrition in our hospital which is usually required in most of the patients especially those undergoing extensive small bowel resection and in those patients who are suffering from prolonged postoperative ileus, in addition to the fact that neonates often suffer from some degree of wasting owing to prolonged preoperative delay in presentation.

Factors significantly affecting mortality rate were a low presenting body weight which is often associated with prematurity, the presence of associated anomalies and the type of atresia.

This high mortality rate is similar to other studies in developing countries as in Kenya in a study done by ***Barrak SM*** [19] in 1993 where the mortality rate was (41%). Another study done by ***Ameh EA*** [20] in 2000 in Nigera also revealed high mortality rate (42%). In the developed countries mortality rate decreased to a very low rate over the last three decades because of availabilities of total parenteral nutrition and neonatal intensive care facilities, as in study of ***Martin & Zarella*** in 1976 in which the survival rate was 94% & in study of ***Nixon &Taws*** [15] in 1971 in which the survival rate was 70% & in study of ***Smith &Glasson*** [21] in 1989 survival rate was 90%.

Conclusions

Jejunal atresia most commonly presents with bilious vomiting while ileal atresia presents with abdominal distension and failure to pass meconeum in first day of life. Wide proximal resection and end to end anastomosis was the commonest surgical procedure done.

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