Original Article

Jejunoileal Atresia A study of 60 cases in children welfare teaching hospital

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Summary:

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.

Patients and methods: This is a prospective study for analyzing (60)neonates with jejunoileal atresia who were managed at Children Welfare Teaching Hospital in Baghdad over a three years peroid extending from 1st January 2004 to 1st January 2007.

Results: Thirty six patients (60%) had jejunal atresia while ileal atresia was in(24) patients(40%).The most common type of jejunoileal atresia was type IIIa (38.3%) of the cases and the second was the type II (25%). The clinical presentation for jejunal atresia was mainly bilious vomiting and occurred in(100%)of the cases, while failure of passing meconium in the first day of life was the most common presentation in ileal atresia and occurred in (91.7%). Abdominal distention is more frequent in ileal atresia (87.5%) in comparism to (50%) in jejunal atresia. The number of males was (35) and the number of females was (25) and the male: female ratio is 1.4:1. The most common surgical complications were anastomotic leak and wound infection. There are several other factors contributing to the increased mortality rate such as delayed in diagnosis, associated anomalies, neonatal septicemia and aspiration pneumonia.

Conclusion: Jejunal atresia most commonly presents with bilious vomiting while ileal atresia presents with abdominal distention and failure to pass meconium in first day of life. The most common type of the atresia in our study was type IIIa 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.

Fac Med Baghdad
2010; Vol. 52, No. 3
Received Oct. 2009
Accepted Jan. 2010

Keywords: Jejunoileal Atresia

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 mesentry. Stenosis may take the form of (type I) atresia with fenestrated web. The small intestine is of normal length.(1) In atresia type II, the proximal intestines terminate in a bulbous blind end which is grossly distended and hypertrophied for several cintemeters.(4) *Atresia Type III a* (disconnected blind ends), but the blind ends are completely separated. There is always mesenteric defect. (4) *Atresia Type III b* (apple peel, christmas tree): It consist of a proximal jejunal atresia near the ligament of Treitz, absence of the superior mesentric artery beyond the origin of the middle colic branch and of the dorsal mesentery, significant loss of intestinal length, and a large mesenteric defect. . (5, 6) *Atresia Type IV* Multiple atresias can be combination of type I – III. The intestinal length is always reduced often having morphological appearance of sausage. (4, 7)

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Patients and methods:

This study was conducted in Children Welfare Teaching Hospital in Baghdad during the period from 1st January 2004 to 1st January 2007. All our patients were under (28) days old who where admitted and followed up. A full clinical examination and investigations were done, specifically including plain abdominal x-ray in erect and supine position. Less often Ba-enema, and occasionally Ba-meal to rule out patients of partial intestinal obstruction and malrotation. For all patients laparotomy was done through a transverse supra-umbilical incision. The usual type of surgical procedure was wide proximal resection with less so for the distal segment. Other procedures were used in certain situations and are mentioned in the results.

Results:

A total number of (60) neonates with intestinal obstruction due to jejunoileal atresia were admitted to Children Welfare Teaching Hospital for the period from 1st January 2004 to 1st January 2007 .The male to female ratio was 1.4:1, of these cases 36 (60%) were jejunal atresia and 24 (40%) were ileal atresia. The most common presentation of patients with

jejunal atresia was bilious vomiting which occurred in 36 patients: (100%). In 28 patients: (77.8%) there was failure to pass meconium in the first day of life. Abdominal distention occurs in 18 patients:(50%) and only 10 patients:(27.8%) had jaundice. In ileal atresia, failure of passing meconium in the first day of life was the most common presentation and occurred in 22 patients: (91.7%) which was more than jejunal atresia while abdominal distention occurred in 21 patients: (87.5%) and bilious vomiting occurred in 19 patients: (79.2%). Clinical presentation according to type of atresia is illustrated in (table 1). The commonest type of jejunoileal atresia was type IIIa and occurred in 23 patients: (38.3%), while type II occurred in 15 patients: (25%).The least frequent type was type IV 2 patients :(3.3%) while type I occurred in 13 patients: (21.7%) and type IIIb occurred in 7 patients :(11.7%). Types of atresias are illustrated in (table 2). Associated anomalies were seen in 21 patients: (35%). Malrotation was the commonest and was found in 9 patients: (15%) of the total number of patients. Congenital heart disease was found in 3 patients (5%) one of them died. Gastroschisis was recorded in 3 patients: (5%) all of them died within three weeks. Imperforate anus occurred in 2 patients: (3.3%). One of them had jejunal atresia and low type imperforate anus that had primary resection and anastomosis with anoplasty. The second one had ileal atresia in whom primary resection and anastomosis with pelvic colostomy was done for him. Both patients with imperforate anus survived after surgery. There was one patient with omphalocele minor associated with web and he was managed by enterotomy over the web and excision of it was done by electrocautry followed by repair of omphalocele. Associated anomalies with jejunoileal atresia are illustrated in (table 3). All the sixty patients underwent surgery. Operative treatment included wide resection of proximal dilated part for about (5-20) cm. and up to (5) cm. of the distal atretic segment with primary end-to-end anastomosis. The total number of patients who underwent to this procedure in our study was 39 patients: (65%). The second most common surgical procedure was enterotomy with excision of the web and plicathion enteroplasty of the dilated proximal segment which was done in type I atresia 12 patients: (20%). In two patients presenting with perforation and peritonitis, proximal enterstomy was done followed later by end to end anastamosis. In patients with type IIIb atresia 7 patients: (11.7%), six of them had end-to-side anastomosis with plication enteroplasty of the proximal dilated segment to conserve the total bowel length. Only one patient of them had gangrenous distal segment which was resected with proximal stoma, the patient died in the same day of the operation. Tapering enteroplasty of the dilated proximal segment was not done in any patient of this series. The residual bowel length was documented in each patient. We did not use a transanastomotic tube for early postoperative feeding. None of our patients had a total parenteral nutrition after surgery due to it's unavialability in our hospital. Jaundice was resolved in all of our survivors who had it at presentation. We started oral feeding after (4-7) days postoperatively and sometimes it tooks longer. Surgical procedures which were used in the treatment are illustrated in (table 4). Thirty patients developed postoperative complications. Anastomotic leak and wound infection were the most common and occurred in 11 patients: (18.3%). Anastomotic leak was the major cause for postoperative septicemia.The second most common complication was short gut syndrome and occured in 4 patients: (6.7%). Anastomotic stricture occured in 3 patients: (5%) and wound dehiscence occurred in 1 patient: (1.7%). Postoperative complications after surgical procedures for jejunoileal atresia are illustrated in (table 5). The mortality rate was 35% (21 patients). And it was higher among patients with type IIIa atresia 9 patients: (15%). Type IIIb was the second most common mortality (all patients with this type died). The most common cause of death postoperatively was septicemia which occurred in 57% (12 of 21 deaths), the second most common cause of death was prematurity and occured in 19% (4 of 21 deaths).The mortality rate related to the type of atresia is illustrated in (table 6), while the causes of postoperative death illustrated in(table 7).

(Table 1) Clinical Presentation according to the type of atresia in(60) patients with jejunoileal atresia

Findings	Jejunal Atresia 36 patients		Ileal atresia 24 patients	
Bilious vomiting	36	100%	19	79.2%
Failure of passing meconium	28	77.8%	22	91.7%
Abdominal distention	18	50%	21	87.5%
Jaundice	10	27.8%	5	20.8%

(Table 2) Types of jejunoileal atresia in (60) patients

Type	No. of patients with jejunal atresia	No.of patients with ileal atresia	Total No. of patients	%
Type I	9	4	13	21.7%
Type II	8	7	15	25%
Type IIIa	11	12	23	38.3%
Type IIIb	7	---	7	11.7%
Type IV	2		2	3.3%

(Table 3) Associated anomalies with jejunoileal atresia in (21) patients

Congenital anomaly	No. of the patients	%
Malrotation	9	15%
Congenital heart disease	3	5%
Gastroschisis	3	5%
Imperforate anus	2	3.3%
Omphalocele minore	1	1.7%
Meconium ileus	1	1.7%
Meckel>s diverticulum	1	1.7%
Cloaca	1	1.7%

(Table 4) Surgical procedures used in the treatment of (60) patients with jejunoileal atresia

Surgical procedure	No. of the patients	%
Resection &primary end-to-end anastomosis	39	65%
Enterotomy with web excision and plication enteroplasty of proximal dilated segment	12	20%
Initial stoma followed by primary anastomosis	3 -2	5%
End-to-side anastomosis with plication enteroplasty of proximal dilated segment	6	10%

(Table 5) postoperative Complications in (60) patients with jejunoileal atresia

Complications	No. of the patients	%
Anastamotic leak	11	18.3%
Wound infection	11	18.3%
Short gut syndrome	4	6.7%
Anastamotic stricture	3	5%
Wound dehiscence	1	1.7%
Total	30	50%

(Table 6) Mortality rate related to the type of atresia in (60) patients with jejunoileal atresia

Type of atresia	No. of the patients	No. of the deaths	% of deaths
Type I	13	1	1.7 %
Type II	15	2	3.3 %
Type IIIa	23	9	15 %
Type IIIb	7	7	11.7 %
Type IV	2	2	3.3 %
Total	60	21	35 %

(Table 7) Causes of postoperative death in (21) patients with jejunoileal atresia

Causes of death	No. of patients	% of deaths
septicemia	12	57%
Prematurity	4	19%
Aspiration pneumonia	2	9.5%
Progressive wasting	2	9.5%
Associated anomaly	1	5%
Total	21	100 %

Discussion:

The most common type of atresia in this series was type IIIa and accounted for (38.3%) of all cases.This result is similar to the study done by *Nixon_&Taws* (8) in New York. In this series jejunal atresia is more common (60%) than ileal atresia (40%) while in the study of *Nixon &Taws* atresia was distributed equally between jejunum & ileum. Apple peel deformity in this series accounted for (11.7%) of cases while in *Nixon &Taws* it accounted for (31%), in *Ros Mar Etal* (9) (32.2%) , and in *Zeralla &Martin* in Canada was (11%) (7) Which is approximated to our study. In this series bilious vomiting in jejunal atresia was (100%), while ileal atresia presented mainly by failure of passing meconium in the first day of life, (91.7%), and abdominal distention (87.5%). All these results are similar to the results of *Nixon &Taws, & Zeralla &Martin* . Malrotation was the most common associated anomaly in this series, (15% of patients) and it is similar to the study of *Nixon &Taws, &_De Lorimier et_al* (10) in London, but differs from the study of *Kumaran N.* (11) which showed that cystic fibrosis was most common associated anomaly (13%). The most common surgical procedure in this series was wide proximal resection and end to end anastomosis & this was done in (65%) of patients, which differs from *De Lorimier et al*_(10) who used it in (80%) of the patients. *Nixon &Taws,_ & Zeralla &Martin* used this procedure in (90%) of their patients. Postoperative complications in our patients occurred in (50%) of cases, the most common complications were anastomotic leak and wound infection and accounted (18.3%) for each one of them. This result is higher than the study of *Nixon and Taws,* in which the anastomotic leak was (15%). Mortality rate was found to be high in our study (35%), it reached to (100%) in type IIIb. This high mortality rate was due to lack of total paranteral 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 counteries as in Kenya in a study done by *Barrak SM*(12) in 1993 where the mortality rate was (41%). Another study done by *Ameh EA*(13) in 2000 in Nigera also revealed high mortality rate (42%). In the developed counteries mortality rate decreased to a very low rate over the last three decades because of avialabilities of total paranteral nutrition and neonatal intensive care facilatieies, as in study of *Martin &Zarella* (7) in 1976 in Canada in which the mortality rate was (6%) & in study of *Nixon &Taws* (8) in 1971 in New York in which the mortality rate was (30%) & in study of *Smith &Glasson* (14) in 1989 in Australia in which mortality rate was (10%). Septicemia was responsible for most the postoperative deaths (57%) and it was diagnosed mainly on the clinical ground.

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