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ORIGINAL ARTICLE

Outcome of meconium ileus in a tertiary care hospital

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Abstract

Background: *Meconium ileus is a common form of congenital intestinal obstruction. The condition results from the accumulation of sticky inspissated meconium in distal ileum. In about half the cases, however, the pathologic condition is complicated by volvulus, gangrene, perforation with meconium peritonitis. Relief of the obstruction is commonly accomplished with a variety of operative procedures. A number of operative procedures are in use, including Bishop-Koop enterostomy, Mikulicz ileostomy and primary closure*

Objective: *Aim of this study was to evaluate the outcome of meconium ileus and its complications in two commonly practiced enterostomy procedure.*

Method: *In this retrospective study from July 2007 to Jun 2017, a total of 52 cases of meconium ileus were included. Diagnosis of suspected cases was confirmed after laparotomy. Two commonly practiced ileostomy procedure were Mikulicz ileostomy and Bishop Koop ileostomy in this study. Survivors of all primary enterostomy underwent ileostomy closure after 3-6 months.*

Result: *Mikulicz enterostomy was done in 38 cases and Bishop Koop ileostomy in 14 cases. After primary ileostomy 5 patients died following Mikulicz ileostomy and 2 after Bishop Koop ileostomy Among the 41 cases those who reached ileostomy closure, 35 were survived.*

Conclusion: *Complications were more common after Mikulicz ileostomy and difficult to manage in our observation. Overall survival of meconium ileus was 66% in our study without any facilities of intensive neonatal care.*

Key words: *Meconium Ileus, Outcome, Complications.*

Introduction

Meconium ileus (MI) is a congenital form of mechanical intestinal obstruction caused by inspissated meconium at the level of the distal ileum.1 In the past, meconium ileus was considered to be closely associated with cystic fibrosis (CF). The association between cystic fibrosis (CF) and meconium ileus was first described by Anderson in 1938.2 However, recent studies demonstrate that MI occurs frequently in the absence of CF as well.3,4 Though the exact pathogenesis of meconium ileus, in the absence of CF is not known.

Two forms of MI can be discriminated: uncomplicated (simple) and complicated (complex) MI. About 50% cases of MI, is complicated by associated gastrointestinal pathologies like volvulus, gangrene, perforation with meconium peritonitis, and meconium cyst.1 Classically the new born presents with features of neonatal intestinal obstruction like abdominal distention, bilious vomiting, failure to pass meconium and inspissated meconium in a bowel mass in abdomen. A plain X-ray abdomen also shows features of small bowel obstruction and evidence of calcification in case of intrauterine perforation. A recently described non operative technique using Gastrografin enemas gives promise of consistent success on early presenting uncomplicated cases in advance neonatal setup.5,6 Reliefs of the obstruction in both uncomplicated and complicated cases are almost invariably accomplished with a variety of operative procedures in our country.7 The commonly practiced procedures are resection and some form of temporary exteriorization and rarely resection primary anastomosis.

The aim of this study was to evaluate commonly practiced surgical treatment options for both simple and complex MI and to discuss the outcome of surgical treatment with limited pediatric surgical facilities, based on our 10 year experience.

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Materials and Methods:

A retrospective study was conducted on all patients treated for meconiurn ileus in different institutes of Khulna city over a period of 10 years since July 2007 to June 2017. Those who underwent primary surgical intervention were only included in this study. The following data were collected and evaluated from medical records: gender, birth weight, age at presentation, and details of therapy and outcome. Total of 52 neonates among those of neonatal intestinal obstruction, preoperatively diagnosed as meconium ileus were included in this study. Their ages ranged from 2 hours to 11 days. All patients got preoperative resuscitation after admission by nasogastric suction, intravenous infusion and prophylactic broad spectrum antibiotics and blood was ready for transfusion prior to surgery. Most of the patients had a plain X ray of the abdomen in the erect posture but final diagnosis was confirmed at laparotomy by the presence of abnormal meconium and meconium pellets causing ileal obstruction. The abdomen was opened through right supraumbilical transverse incision under general anaesthesia.

Two form of exteriorization procedures were performed at first stage-resection of the dilated edematous/gangrenous ileum and exteriorization of both end as ileostomy (Mikulicz enterostomy) and resection end to side anastomosis & distal chimney ileostomy (Bishop Koop ileostomy) (Fig 2). Type of enterostomy depended on patient's condition and presence or absence of complication. Peroperatively meconium pellets were cleared from distal intestine by irrigating warm normal saline in every case. Stoma closure was done in all cases after 3-6 months those who survived after primary surgery. Follow up was scheduled two weekly after discharge following ileostomy up to ileostomy closure and single appointment after discharge following ileostomy closure on outpatient basis. Selection of primary enterostomy was on surgeon's choice. Because of inclusion of more complicated MI patients in Mikulicz enterostomy, test of significance was not done to avoid possibility of biasness in this study.

Results:

A total of 52 patients were included, 23 were male and rests were female (Fig 1). Male female ratio was 0.79:1. Birth weights were ranging between 2 kg and 3.5 kg. Age at presentation to surgeon was variable from 2 hours to 11 days. During initial surgery complication was present in 28 cases. The complications were volvulus and gangrene of hugely dilated and thick sticky meconium loaded ileum, perforation of the ileum and meconium peritonitis, meconium cyst and intraperitoneal

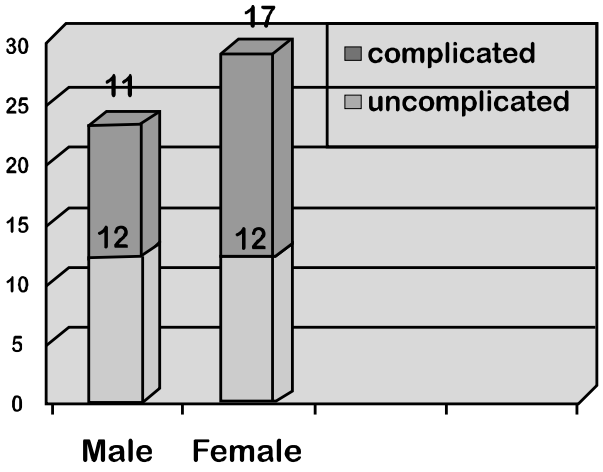

Fig 1. Distribution of sex and type of MI

calcification. Mikulicz enterostomy was done in 38 cases and Bishop Koop ileostomy in 14 cases (Table I). Among those treated by Mikulicz ileostomy, 24 were complicated and 14 was uncomplicated meconium ileus. On the other

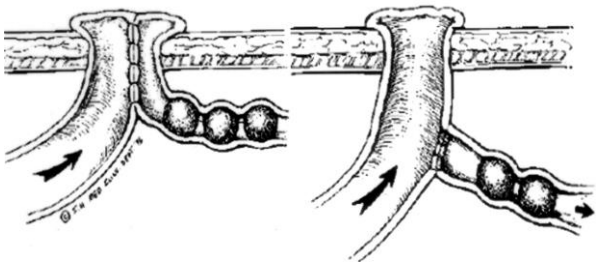

Fig 2. Mikulicz ileostomy (left) and Bishop-Koop ileostomy (right)

hand majority of the patients treated by Bishop Koop ileostomy was uncomplicated variety. Immediate postoperative complication like septicaemia was more after Mikulicz enterostomy

Fig 3. Patients of Mikulicz ileostomy (left) and Bishop-Koop ileostomy (right)

But recovery by bowel movement was rapid in those survived. Major complications after Bishop Koop ileostomy were anastomotic leakage with

subsequent septicaemia and recovery was more delayed. Delayed complications like peristomal excoriation, failure to thrive to severe malnutrition, fluid and electrolyte imbalance were

Table I

comparison of variables between two groups of ileostomy

Variable	Mikulicz ileostomy	Bishop Koop ileostomy
Indication	Uncomplicated MI-14 Complicated MI-24	Uncomplicated MI 10 Complicated MI 04
Operation time (min)	60-90	90-120
Bowel movement (day)	2-3	3-7
Oral feeding (day)	3-4	5-8
Hospital stay (day)	5-8	8-10
Survival	33	12

almost absent in Bishop Koop procedure in comparison to Mikulicz ileostomy (Table-II).

Table II

Complications of two groups of ileostomy

Complications	Name of complications	Mikulicz ileostomy-38(%)	Bishop Koop ileostomy-14(%)
Early	Septicaemia	8(21)	2(14)
Late	Peristomal excoriation	33(87)	1(7)
	Failure to thrive	33(87)	0
	Fluid electrolyte imbalance	21(55)	0

Management of these delayed complications was very challenging and 4 cases were lost before final ileostomy closer. Early ileostomy closure was also influenced by these delayed complications.

Table III

Death distribution

Death event	Total operation	Total death %
Mikulicz ileostomy	38	5(13)
Bishop Koop ileostomy	14	2(14)
lleostomy closure	41	7(17)
Late complication following MI	33	4(12)
Total (52)		18(34)

Ileostomy closure in Bishop Koop procedure was more safe and post operative recovery was excellent but postoperative intestinal obstruction and or anastomotic leakage were common after closure of Mikulicz ileostomy. Overall survival of MI in this study was 66%. Mortality following Mikulicz ileostomy was 13% and Bishop Koop procedure was 14% (Table-III). Again irrespective of initial ileostomy procedure mortality was more in complicated MI.

Discussion

Meconium ileus was the third most common cause of neonatal intestinal obstruction.[8,9] Among 52 cases, 23 were male baby with a male female ratio of 0.79:1. Birth weight of study population varies from 2.0 Kg to 3.5 Kg which is also commonly observed in general. Age at presentation to surgeon was ranging from 2 hours to 11 days. Symptoms of neonatal intestinal obstruction usually became evident within 24-48 hours after birth. Early presentation within few hours was due to routine ultrasonographic study in antenatal care at third trimester of pregnancy. Early presentation was helpful for better preoperative resuscitation and late presentation associated with more complications. We observed complicated MI among female babies 59% and among male babies 48% and in general 54%. Karimi et al also reported complicated MI about 50% in their study. Common complications observed were volvulus and gangrene of meconium loaded ileum, perforation with meconium peritonitis, meconium cyst and intraperitoneal calcification. Two commonly practiced initial exteriorization (ileostomy) procedure in our country is Mikulicz ileostomy and Bishop Koop ileostomy for meconium ileus.[7] In this study Mikulicz ileostomy was made in 38 and Bishop Koop ileostomy in 14 cases. Selection of the enterostomy procedure was arbitrary. Surgeons preferred Mikulicz ileostomy because of more easy and less time consuming. Hospital stay was less and postoperative bowel movement was early after Mikulicz ileostomy. But postoperative complications like peristomal excoriation (Fig 3), malnutrition, fluid and electrolyte imbalance was unavoidable. These delayed complication also caused death of 4 babies before final ileostomy closure in this group. On the other hand Bishop Koop ileostomy procedure was more time consuming, chance of anastomotic failure, delayed bowel movement and prolonged hospital stay.[10] Ileostomy related postoperative delayed complications was almost absent in Bishop Koop ileostomy. Postoperative septicaemia was higher

after Mikulicz ileostomy probably due to more complicated Ml in this group. Mortality related to initial ileostomy was almost same (14% vs 13%) in both these procedure but additional 4 patients died later on due to malnutrition and fluid & electrolyte imbalance after Mikulicz ileostomy. Finally ileostomy closure was done on 33 cases after 3 to 6 month. After ileostomy closure 7 patients died due to anastomotic failure and septicaemia, all were the descendant of Mikulicz ileostomy procedure. No post Bishop Koop ileostomy closure baby was expired. Total mortality of meconium ileus was 18 or 34% in our study and survival was 66%. Survival reported from different specialized pediatric surgical centre is variable from 50% to around 90%.[11,12] Survival was recorded more among the uncomplicated MI. Survival of neonates with meconium ileus has improved over the last two decades because of neonatal intensive care, improved surgical technique and medical treatment. This was a retrospective study with a limited number of patients but this observation may be helpful to improve in surgical outcome in near future.

Conclusion

Immediate survival seems to be similar after both ileostomy but late complications were more common in Mikulicz ileostomy procedure and difficult to manage. So, it is better to exercise Bishop Koop ileostomy where possible. In our observation, survival is near the lower end of updated standard but without any neonatal intensive care facilities 66% overall survival is not unsatisfactory.

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