Original article

Five years experiences in the diagnosis and management of jejuno-ileal atresia in Kanti children's hospital

Anupama Thapa Basnet[1], Bijay Thapa[1], Prativa Dhoubadel[2], Anuj Kayastha[1]

Abstract

Introduction: Jejuno-ileal atresia is a major cause of neonatal intestinal obstruction. The aim of this study is to evaluate the incidence, clinical presentation, management, and outcome of jejunoileal atresia at our institute over a period of five years.

Methods: The medical records of the patients with the diagnosis of jejunoileal atresia during a period of five years (April 2014 to April 2019) were obtained from the hospital record section and surgical intensive care unit, and were reviewed and analyzed.

Results: There were 61 cases of jejunoileal atresia among 144 cases of intestinal atresia. Twenty-nine (47.5%) of them were male. Laparotomy with resection of atretic part with anti-mesenteric tapering enteroplasty and end to end anastomosis was done in 15, and resection without tapering enteroplasty with end to end anastomosis was done in 39 patients. Thirty-eight patients (62.3%) were discharged while Twenty-three (37.7%) cases were lost to mortality.

Conclusions: Although the mortality and morbidity rate are high in jejunoileal atresia, early diagnosis, improvement in surgical technique, modern ventilatory support and advanced in intensive care unit has led to the significant increase in the survival rate.

Key Words: Complications; Jejuno-ileal atresia; Tapering Enteroplasty.

Author affiliations:

[1] Department of Paediatric Surgery, Kanti Children's Hospital, Maharajgunj, Kathmandu, Nepal.
[2] National Academy of Medical Sciences (NAMS), Kathmandu, Nepal.

Correspondence:

Dr. Anupama Thapa Basnet, Associate Professor and Consultant Paediatric Surgeon, Kanti Children's Hospital, Maharajgunj, Kathmandu, Nepal.

Email: anupama_basnet@hotmail.com
ORCID: https://orcid.org/0000-0002-3873-3299

Disclosures:

Ethical Clearance: IRB of KCH

Conflict of interest: None

Financial aid: None

How to cite this article:

Basnet AT, Thapa B, Dhoubadel P, Kayastha A. Five years experiences in the diagnosis and management of jejuno-ileal atresia in Kanti Children's Hospital. J Soc Surg Nep. 2020 Dec;23(2):4-8.

DOI:
https://doi.org/10.3126/jssn.v23i2.35794

Introduction

Jejuno-ileal atresia (JIA) is a common cause of intestinal obstruction in neonates with, rarely associated other anomalies. Survival rates in most developed countries are more than 90%, however survival rates in developing counties are still lower.[1] Surgically, resection of the proximal dilated portion along with the atretic loop and end to end anastomosis of small bowel is the gold standard procedure. But the outcome of these cases depend upon multiple factors like gestational age, associated anomalies, timing of presentation and pre and post-operative management.[2]

Methods

This is a retrospective study of 61 patients diagnosed and treated for jejunoileal atresia (JIA) among 144 cases of intestinal atresia (we have excluded pyloric atresia, duodenal atresia and colonic atresia) at Kanti Children's Hospital (KCH) from April 2014 to April 2019. Approval was obtained from the Institutional Review Board of Kanti Children's Hospital before collecting data. All patients were admitted in neonatal surgical intensive care unit (SICU). The medical records of the patients were reviewed from the hospital record section and surgical intensive care unit and analyzed for sex, age, birth weight, signs of presentation, diagnosis, pre and post-operative management, complications and outcome (mortality /discharge) of these patients were studied. We have studied the in-hospital events and not included any follow-up data on these patients. Descriptive statistics were used for the analysis.

The provisional diagnosis was made based on the clinical presentation (abdominal distension, bilious vomiting and failure to pass meconium) and erect X-ray abdomen. In 14 cases gastrografin® meal and follow through was done whereas in seven cases Barium enema was done. The patients were resuscitated with intravenous fluid, Nasogastric (NG) tube decompression, and intravenous antibiotics (cefotaxime, tobramycin, and metronidazole) were given and continued till 7 to 10 postoperative days. Decision of surgery was taken based on clinical findings and radiological evaluation. Informed consent was taken from the parents. NG tube was removed between 7th to 15th post-operative days depending upon the volume of NG aspirate. Feeding was started when NG aspirate was less than 10ml, and the child had no abdominal distention and started passing stool, with 10% dextrose 2ml every two hourly and increased gradually to expressed breast milk. When the babies were active, sucking well and wound healing was satisfactory they were discharged.

Results

There were 61 cases of jejunoileal atresia among a total of 144 cases of intestinal atresia (02 pyloric atresia, 78 duodenal atresia, 22 jejunal atresia, 39 Ileal atresia and 3 colonic atresia). Twenty nine (47.5%) patients were male and 32(52.5%) were female. There were 22(36%) cases of jejunal atresia and 39(64%) cases of ileal atresia (**Table 1**).

Table 1. Sex wise distribution of patients

Sex	Jejunal Atresia	Ileal Atresia	Total
Male	10	19	29(47.5%)
Female	12	20	32(52.5%)

The median age of presentation was 3.5 days (range 1-18days) and the mean weight was 2.7kg (range 1.8-4.0kg) respectively. Most of our babies (37.7%) presented to emergency at 2nd to 3rd days. Nine cases presented after seven days (**Table 2**).

Table 2. Age at presentation to emergency

Age at presentation	Numbers	Percentage
Day 0-1	13	21.3%
Day 2-3	23	37.7%
Day 4-7	16	26.2%
After day7	9	14.7%

The most common presentation was abdominal distension in 49 cases, bilious vomiting in 47 cases, and failure to pass meconium in 54 cases. None of our cases was diagnosed antenatally. Plain X ray abdomen showed varying degree of dilated small bowel loops with multiple air-fluid levels (**Figure 1**). Barium enema showed microcolon. Barium meal and Follow through showed dilated proximal loop / obstruction (**Figure 2**).

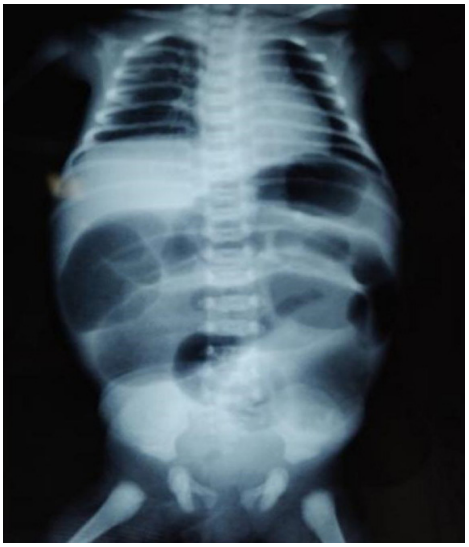

Figure 1. Plain abdominal radiograph showing dilated bowel loops in a day old baby with history of bilious vomiting

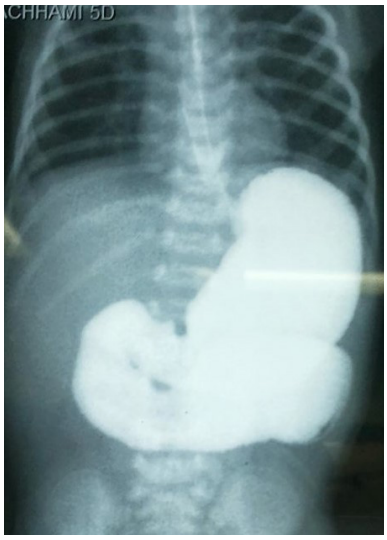

Figure 2. Barium follow through of baby showing jejunal obstruction

All the cases were operated within one and five days of admission depending upon the patient's condition. Operative findings included proximal dilated blind loops with distal micro bowel (**Figure 3** and **Figure 4)**. During operation minimal resection of proximal bowel (less than 10 cm) with anti-mesenteric tapering enteroplasty and end to end single layer anastomosis with 5-0 Vicryl® was done in 15 cases and minimal resection of proximal bowel without enteroplasty with end to end anastomosis with 5-0 Vicryl® was done in 39 cases. Ileostomy was performed in seven cases (proximal bowel perforation was found in three cases during surgery and type-IV atresia in four cases).

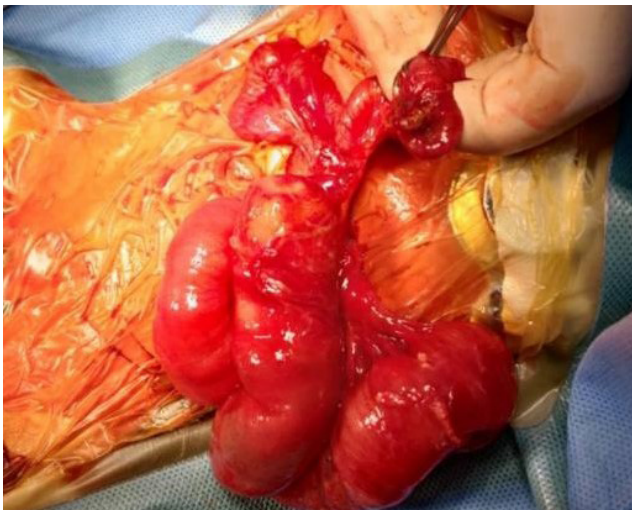

Figure 3. Proximal dilated bowel with small caliber of distal ileum.

Post-operative complications included anastomotic leakage in four cases. Prolonged bile drainage (more than 10 days) from NG tube due to functional obstruction was seen in 11 cases. Post-operative contrast study of these patients showed passage of contrast through the anastomotic site. Sepsis was seen in 17 cases. Wound Infection (superficial) occurred in four cases. Jaundice was seen in three cases (**Table 3)**.

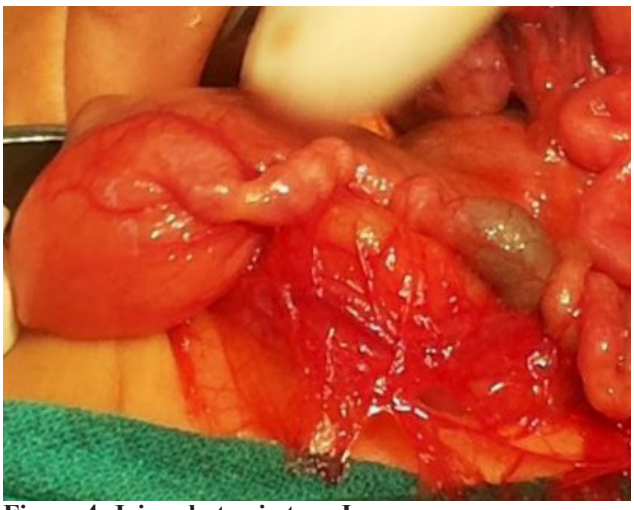

Figure 4. Jejunal atresia type I.

Table 3. Postoperative complications

Complications	N (%)
Anastomosis leakage	4 (6.5%)
Functional obstruction	11 (18%)
Wound infection	4 (6.5%)
Sepsis	17 (28%)
Jaundice	3 (4.9%)

Mean hospital stay for survivors was 13 days (range 9-28 days). In our series 23(37.7%) cases had in-hospital mortality and 38(62.3%) cases were discharged (**Table 4**).

Table 4. Survival / mortality distribution of cases

	Survival	Mortality
Jejunal Atresia	18	12
Ileal Atresia	20	11
Total	38 (62.3%)	23 (37.7%)

Discussion

Jejunoileal atresia (JIA) is the most common cause of neonatal intestinal obstruction. The vascular accident takes place in the antenatal period resulting in the atresia of the bowel.[3] The incidence rate of jejunoileal atresia is about 1 to 3 in 10,000 live births with both males and females being affected equally. Although associated anomalies are less common in JIA, cyctic fibrosis, malrotation and gastroschisis are seen in 10% of the cases.[4]

As usual, common presentation in our series was abdominal distension in most of the cases with bilious vomiting and failure to pass meconium. The provisional diagnosis was made based on the clinical presentation and an erect X-ray abdomen. Basu and Burge reported that 31% of patients with small bowel atresia can be diagnosed by prenatal ultrasound.[5] However, there was no history of prenatal diagnosis in this study, maybe because majority of the

deliveries are made at home in rural Nepal due to lack of education, early marriages, and other social factors.

Other studies have shown the mean age at presentation to be around 2.5 days.[6] In our study, the mean age at presentation was 3.5 days. This delayed presentation is likely linked to the availability of tertiary level hospitals only in the capital city of Kathmandu, delayed referrals from other centers, a poor primary healthcare infrastructure, and a lack of a proper public transportation system in our country. Shakya et al had reported that delayed presentation might be because of false impression of passage of mucus as meconium by health worker as well as the parents.[7] In our study, nine cases presented after day seven. They all assumed that the babies were passing meconium.

Surgical procedure should be individualized according to the general condition of the patient, site and type of atresia, and proximal segment dilatation. The most common procedure performed for JIA was resection of proximal dilated bowel and end to end anastomosis. According to several authors, ultra-short bowel syndrome was the most common cause of procedure leading to high morbidity and mortality in JIA.[8,9] Proximal tapering enteroplasty or intestinal plication for JIA has been recommended as alternative procedures to preserve small bowel with a satisfactory outcome.[10-13] In our series, tapering enteroplasty was done in 15 cases and limited resection of proximal bowel without tapering enteroplasty was done in 39 cases. Some of the study had avoided stoma in JIA which may increase mortality.[1,7] In our series stoma was performed in complicated cases for proximal bowel perforation, anastomosis leakage and type-IV atresia.

In our series, the most common complications were functional bowel obstruction and sepsis. This may be because of preservation of dilated bowel to prevent the incidence of short bowel syndrome, unavailability of parenteral nutrition for neonates and cross infection in SICU. Yet another issue we faced in our hospital was that the limited number of beds in SICU could not facilitate the influx of patients from all over the country, leading to constant transfers to wards before patients have made a complete recovery in order to provide intensive care for new patients.

The first successful surgical repair of a patient with small intestinal atresia was performed in 1911.[14] However, for many years to come, the mortality rate remained high for this surgical correction, even in the pediatric institutions.[14,15] In last few decades overall mortality rate have been reduced to 10-16% because of advances in surgical techniques, improvement in post-operative management and availability of parenteral nutrition.[16-18] However, in our study, mortality rate is 37.7%, meaning that the condition in our part of the world has not changed significantly. The high mortality rate may be due to lack of education, delays in seeking and accessing health care, delayed referral, poor infrastructure, and limited number of trained manpower. Besides that, neonatal surgery requires expert special training to minimize the duration of surgery and well- equipped SICU with trained manpower.[1,19] In our experiences, despite this relatively high mortality rate, it has certainly decreased in recent years as compared to the rate from previous years. This downward trend can likely be attributed to an improvement in surgical techniques, neonatal anesthesia, modern ventilatory support, and advanced intensive care management.

Conclusion

JIA is the most common cause of intestinal obstruction in neonates with both males and females being affected equally. The morbidity and mortality rate in our part of the world is still high compared to western countries.

Acknowledgements: None

References

1. Gupta S, Gupta R, Ghosh S, Gupta AK, Shukla A, Chaturvedi V et al. Intestinal Atresia: Experience at a Busy Center of North-West India. J Neonatal Surg. 2016 Oct;5(4):51.
2. Narang M, Kaushik JS, Sharma AK, Faridi MMA. Predictors of mortality among the neonates transported to referral centre in Delhi, India. Indian J Public Health. Apr-Jun 2013;57(2):100-4.
3. Rao KL, Chowdhary SK, Suri S, Narasimhan KL, Mahajan JK. Duodenal atresia: Outcome analysis from a regional neonatal center. Indian Pediatr. 2001 Nov; 38(11):1277-80.
4. Cochram WJ. Jejunoileal Atresia [Internet]. New Jersey: Merck & Co., Inc.; [revised Aug 2019; cited Dec 2020]. Available from: https://www.merckmanuals.com/professional/pediatrics/congenital-gastrointestinal-anomalies/jejunoileal-atresia.
5. Basu R, Burge DM. The effect of antenatal diagnosis on the management of small bowel atresia. Pediatr Surg Int. 2004 Mar;20(3):177-9.
6. Mohammed M, Amezene T, Tamirat M. Intestinal obstruction in early neonatal period: A 3-year review of admitted cases from a tertiary hospital in ethiopia. Ethiop J Health Sci. 2017 Jul;27(4):393-400.
7. Shakya VC, Agrawal CS, Shrestha P, Poudel P, Khaniya S, Adhikary S. Management of jejunoileal atresias: an experience at eastern Nepal. BMC Surg. 2010 Nov;10:35.
8. Kamal A, Khan K, Rahman I, Khan A. Small gut

atresia in neonates. J Ayub Med Coll Abbottabad. Apr-Jun 2010; 22(2):64-6.
9. Dalla Vecchia LK, Grosfeld JL, West KW, Rescorla FJ, Scherer LR, Engum SA. Intestinal atresia and stenosis: A 25-year experience with 277 cases. Arch Surg. 1998 May;133(5):490–6.
10. Weber TR, Vane DW, Grosfeld JL. Tapering enteroplasty in infants with bowel atresia and short gut. Arch Surg. 1982 May;117(5):684-8.
11. de Lorimier AA, Harrison MR. Intestinal plication in the treatment of atresia. J Pediatr Surg. 1983 Dec;18(6):734-7.
12. Kimura K, Perdzynski W, Soper RT. Elliptical seromuscular resection for tapering the proximal dilated bowel in duodenal or jejunal atresia. J Pediatr Surg. 1996 Oct;31(10):1405-6.
13. Dewberry LC, Hilton SA, Vuille-Dit-Bille RN, Liechty KW. Is Tapering Enteroplasty an Alternative to Resection of Dilated Bowel in Small Intestinal Atresia? J Surg Res. 2020 Feb;246:1-5.
14. O'Neill JA. Duodenal atresia and stenosis. O'neill JA GR, Rowe MI, Grosfeld GL, Et Al Eds. Pediatric Surgery. 5th Ed. St Louis, MO: Mosby; 1998.
15. Spitz I, Coran AG. Duodenoduodenostomy. Spitz L, Ed. Pediatric Surgery. 5th Ed. London, England: Chapman and Hall Medical; 1995.
16. Calisti A, Olivieri C, Coletta R, Briganti V, Oriolo L. Jejunoileal Atresia: Factors Affecting the Outcome and Long-term Sequelae. J Clin Neonatol. 2012 Jan;1(1):38–41.
17. Kumaran N, Shankar KR, Lloyd DA, Losty PD. Trends in the management and outcome of jejuno-ileal atresia. Eur J Pediatr Surg. 2002 Jun;12(3):163-7.
18. Stollman TH, de Blaauw I, Wijnen MHWA, van der Staak FHJM, Rieu PNMA, Draaisma JMT, et al. Decreased mortality but increased morbidity in neonates with jejunoileal atresia; a study of 114 cases over a 34-year period. J Pediatr Surg. 2009 Jan;44(1):217-21.
19. Puri A, Lal B, Nangia S. A pilot study on neonatal surgical mortality: A multivariable analysis of predictors of mortality in a resource-limited setting. J Indian Assoc Pediatr Surg. 2019 Jan-Mar;24(1): 36-44.