

A jejunal atresia type I in newborn: A case report

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ABSTRACT

Background: Intestinal atresia is a common cause of neonatal intestinal obstruction. Jejunal atresia occurs more frequently than duodenal or colonic atresias, while single atresias are most commonly encountered. This case report aims to evaluate the recent management of jejunal atresia type I in newborn.

Case Description: We report one case of jejunal atresia types I. A 8-days old newborn was born with signs of upper gastrointestinal obstruction. Bile-stained vomiting was reported on the third day of life. Postnatal abdominal X-ray showed the triple bubble sign. Laparotomy was performed at 9th days of life when it revealed the type of jejunal

atresia type 1. The resection procedure on the atresia, such as tapering and end to end anastomosis, was performed. Laparotomy revealed the type I Jejuno-ileal atresia 20 cm from Treitz ligament then resection on the atresias, tapering, and end to end anastomosis was performed. Post-operative, the baby was admitted to NICU with total parenteral nutrition and continued antibiotics due to sepsis.

Conclusion: The case was referred to the neonatal intensive care unit post-surgery with a carefully monitored fluid balance, temperature, and sign of sepsis. A definitive antibiotic was given due to sepsis, as well as total parenteral nutrition.

Keywords: Jejuno-ileal Atresia, Sepsis

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INTRODUCTION

One of the most common causes of intestinal obstruction in newborns is intestinal atresia.¹ Atresia of the jejunum and ileum is the most common in the neonate, with one-third of infants born prematurely or small for gestational age.¹ Prognosis of intestinal atresia is excellent in developed countries, while in the developing countries delayed in looking for medical support and limited resources will give worse intestinal function after surgery and finally will decrease overall survival rates.¹

Intestinal atresia is a congenital disorder characterized by complete occlusion of the bowel lumen.^{1,2} It is one of the three common causes of neonatal intestinal obstruction, the other two being Hirschsprung's disease and anorectal malformations. The incidence of jejunoileal atresia is 1-3 per 10,000 live births.^{1,2}

Many types of intestinal anomalies can be detected, but few theories have been focused on embryologic etiopathogenesis.³ Failure of recanalization and vascular accident or any other intestinal injuries are main approaches that explain the formation of atresia. Recently, studies in the animal model have shown that some forms of atresia were hereditary and resulted from dysregulation of proliferation and apoptosis of the developing intestine through the fibroblast growth factor pathways.³

Jejuno-ileal atresia occurs more frequently than duodenal or colonic atresias while single atresias

are most commonly encountered, 6–12% of infants are diagnosed with multiple atretic segments. Jejuno-ileal atresia classified into 4 types.^{2,4} Type I is marked by a mucosal (septal) atresia, stenosis (a localized narrowing of the intestinal lumen without disruption of continuity or defect in mesentery) of the intestine. Type II is marked by a fibrous cord (band) that separates both atretic segments, the mesentery is usually intact, and the length of the intestine is normal. Type III has two sub-divisions: type IIIa indicates both blind ends are entirely separated without a fibrous cord between them.^{2,4} The atresia has a V-shaped mesenteric gap, and the intestine is shortened. Type IIIb (apple peel or Christmas tree deformity) indicates both separated intestinal segments and a large mesenteric defect. Type IV indicates multiple atresias refers to any number and combination of atresias type I to III, and the intestinal length is always reduced often having the morphological appearance of sausage.^{2,4}

Intestinal atresias are frequently associated with polyhydramnios.^{5,6} Therefore, many of these patients are born prematurely and often are small for their gestational age, the latter due to the inability to absorb nutrients from the amniotic fluid in patients with proximal intestinal obstructions. Intestinal atresia should be suspected in any newborn showing evidence of bowel obstruction (bilious vomiting, abdominal distention, and failure to pass meconium).^{5,6} Findings on physical

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examination are frequently not very revealing. Most patients will have some degree of abdominal distention. In most patients, a simple abdominal x-ray with anteroposterior (AP) and either cross-table or left lateral decubitus projection are adequate to make the diagnosis based upon the presence of dilated, air-filled intestinal loops and air-fluid levels.^{5,6}

All patients should receive proper fluid hydration prior to operative intervention. Besides, a nasogastric or orogastric tube should be passed to empty the stomach and decrease the risk of vomiting with aspiration. The most common post-operative complication is a functional obstruction at the site of anastomosis. Other less commonly observed complications include anastomotic leak and adhesive obstructions.^{7,8} Based on those mentioned above, this case study aims to evaluate the recent management of jejunal atresia type I in newborn.

CASE DESCRIPTION

A-8 days old boy delivered from a private hospital with extensive vomiting. He has been vomiting since the 3rd days of life, brown then turn greenish. No meconium pass after the first day of life, soon after born he passed meconium once, small amount with grey color. Physical examination revealed a distended abdomen. Urgent exploration laparotomy planned.

From past medical history, he born in a private hospital with 2,620 grams of body weight by cesarian section. Cry immediately as a vigorous baby. The mother did receive appropriate prenatal care. There is no history of congenital disorders in the family. At 3rd day of life, symptom begins with vomiting dan jaundice. Because of excessive vomiting and no meconium pass, baby gram taken and distended upper gastrointestinal was appeared as bubble sign with lung infiltrate (Figure 1). Small bowel obstruction suspected as jejunal atresia assessed on working diagnostic before referred.

Exploratory laparotomy performed, in operation site, we find jejunal atresia type I, were 20 cm from Treitz ligament. Proximal site of atresia distended and widened, resection and tapering performed with stapler then end to end jejunal-jejunal anastomose done (Figure 2). Once it was complete, the abdomen was closed and the patient transferred to NICU in stable condition. The procedure tolerated well. The nasogastric tube remained in place, and total parenteral nutrition (TPN) continued. A few days after surgery, the patient finally had his bowel movement, started oral feed.



Figure 1 Baby Gram shows bubble sign with lung infiltrate

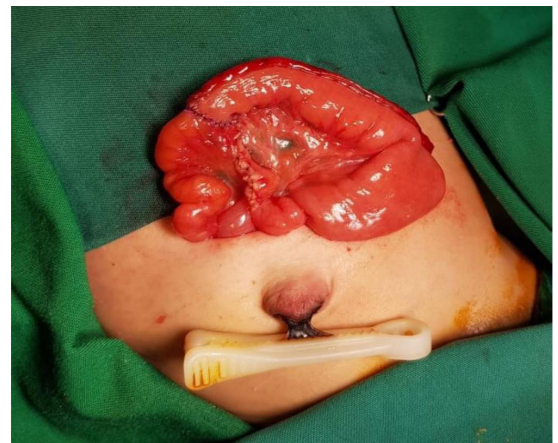


Figure 2 Post resection and anastomosis performed

DISCUSSION

The accepted classification of jejunal atresia is the Grosfeld modified Louw classification, with type I having mucosal atresia, type II having two atretic ends connected by a fibrous band, type III having two atretic ends separated by mesenteric defect, with subtype (a) having only a defect and subtype (b) having Christmas tree or apple peel atresia, and type IV having multiple atresias.⁹ In type I Jejunal atresia, it usually occurs secondary to a membrane or web formed by both mucosa and submucosa, while muscularis and serosa main intact.⁹ On gross inspection, bowel and mesentery look in continuity. However, the proximal intestine distended and distal bowel look collapsed. As with stenosis, there is no shortening in bowel length in atresia type I.¹⁰ In this case, it is with type I jejunoileal atresia.

Jejuno-ileal atresia usually occurs in male and term infants with weight at the presentation of more than 2000 grams.¹¹ In this case, the patient was male, born with preterm at 33 weeks of gestation and accordant birth weight. In almost all cases, the symptoms are presented at the age of less than 7 days.¹¹ Abdominal distention and bilious vomiting are cardinal clinical findings of neonatal intestinal obstruction that may necessitate urgent operative intervention. Other manifestations include jaundice present in one-third of the infants and failure to pass meconium in the first 24 hours. The patient's ability to pass some meconium does not exclude intestinal atresia. Cellular debris and swallowed amniotic fluid and lanugo form meconium, explaining this finding; this formation occurs earlier in gestation than the insult that produces the atresia.^{12,13} In this case, the patient was diagnosed within the third day of life with the symptom of bilious vomiting and moderate abdominal distention. The patient also was once to pass meconium in the first 24 hours, but no production after it, and he also had jaundice.

On plain x-ray, the gas shadows can be seen up to the level of atresia with proximal bowel dilatation.¹⁴ The "triple bubble" sign is usually demonstrable on the erect plain abdominal radiograph after the first 4 hours of life. The appearance is caused by a distended and gas-filled stomach and proximal jejunum. This is unlike ileal atresia, where the bubbles are more in number, and the dilated intestinal loops may be challenging to differentiate from the austral colon of the neonate. Contrast studies are usually not necessary and may be associated with aspiration if attempted. Distal bowel gas indicates stenosis or incomplete membrane.¹⁵ In this case, the plain abdominal radiograph showed gastric dilatation, and the case showed a classical triple bubble sign.

The patient was performed resection about 8 cm at the atresia site, then tapering the dilated proximal jejunal by stapler and performed end to end anastomosis. The indication for tapering was the proximal atretic is grossly dilated, to equalize lumen size for anastomotic and to improve function in persistent dilated non-functioning jejunum.¹⁶

Post-surgery, the infant's vital signs were monitored closely. Temperature maintained, respiratory status, and fluid status followed closely. Infection is a significant concern and one of the leading causes of mortality. Signs of sepsis, including hypothermia, lethargy, respiratory distress, jitteriness, and pallor should be closely monitored. Sepsis is one of the significant factors that affect morbidity and mortality of patients, and it is correlated with

peristaltic achievement, low gestational age, and born weight.^{17,18} The patient was assessed as sepsis by the high value of septic marker, observed tightly in NICU to prevent unwanted risk. Oral feeding started since the 5th day after surgery. His condition is getting better and stable.

CONCLUSION

This is a case of jejunal atresia in newborns. Physical examination revealed moderate upper abdominal distention. Postnatal abdominal X-ray showed the triple bubble sign on an abdominal x-ray. Laparotomy performed at 9th days of life revealed the type of jejunal atresia type I then resection on the atresia, tapering, and end to end anastomosis was performed. Cases were referred to neonatal intensive care unit post-surgery with a closely monitored fluid balance, temperature and sign of sepsis. They were given definitive antibiotics due to sepsis and total parenteral nutrition.

CONFLICT OF INTEREST

There is no competing interest regarding the manuscript.

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AUTHOR CONTRIBUTION

All of the authors are equally contributed to the study from selecting cases, treatment, until reporting the outcome through publication.

REFERENCES

- Balanescu R, Topor L, Stoica I, Moga A. Associated Type III and Type IV Multiple Intestinal Atresia in a Pediatric Patient. *Chirurgia*. 2013;108(3):407-10.
- Sirelkhatim EE, Mohamadain AA, Hamza AA. Small Bowel Atresia in Khartoum Teaching Hospital. *Global Journal of Medical Research*. 2013;13(6):1-5.
- Korkmaz M, Buyukunal SC. Proximal Jejunal Atresia Consist of Two Membranous Septa. *The Medical Journal of Kocatepe*. 2011;12(2):101-4.
- Khalaf AA, Al-Obaidy MA, Khalaf KF. Jejunoileal Atresia A study of 60 cases in children welfare teaching hospital. *J Fac Med Baghdad*. 2010;52(3):1-4.
- Akinola RA, Osuji RL. Apple Peel Small Bowel, A Review of Four Cases: Surgical and Radiographic Aspects. *J Nepal Paediatr Soc*. 2011;31(3):227-34.
- Schwartzberg D, Burjonrappa SC. Pseudo Double Bubble: Jejunal Duplication Mimicking Duodenal Atresia on Prenatal Ultrasound. *Journal of Neonatal Surgery*. 2013;2(4):1-4.
- Machmouchi M. New successful one-step surgical repair for apple peel atresia. *Open Access Surgery*. 2011;4:53-6.

8. Kurbet SB, Patil HS, Dhaded SM, Bhandankar MR, Mane RS. Apple peel jejunal atresia: Successful management of a rare case. *Journal of the Scientific Society*. 2012;39(1):29-31.
9. Louw JH, Barnard CN. Congenital intestinal atresia: Observations on its origin. *Lancet*. 1955;269(6899):1065-7.
10. Aguayo P, Ostlie DJ. Duodenal and intestinal atresia and stenosis. In: Holcomb GW, Murphy JP, editors. *Ashcraft's pediatric surgery*. United states of America. 2005.p.408-24.
11. Kshirsagar AY, Desai SR, Nagvekar MA, Vasisth GOP. Apple-peel atresia presenting as foetal intestinal obstruction. *African Journal of Paediatric Surgery*. 2011;8(2):235-6.
12. Shahjahan M, Ferdous KMN, Mitul MAR, Islam MK. Management of Jejunoileal Atresia: Our 5 year Experience. *Chattagram Maa-O-Shishu Hospital Medical College Journal*. 2013;12(3):52-5.
13. Sondheimer JM. Gastrointestinal tract. In: Hay WW, Hayward HR, Levin MJ, Sondheimer JM, editors. *Current pediatric diagnosis & treatment*. 16th ed. New York: The McGraw-Hill Companies, Inc; 2003. p. 614-92.
14. Vecchia LKD, Grosfeld JL, West KW, Rescorla FJ, Schere LR, Engum SA. Intestinal Atresia and Stenosis. A 25-Year Experience with 277 Cases. *Arch Surg*. 1998;133:490-7.
15. Sahu S, Dhavala SS. Apple-Peel Syndrome A Case of Malrotation with Atresia of Proximal Small Bowel. *Ind J Radiol Imag*. 2006;16(2):189-90.
16. Tröbs RB, Tannapfel A. Apple peel small bowel. *Imaging case book*. *J Perinatol*. 2009;29(12):832-833.
17. Rahmaania JC, Sastiono. The relationship between sepsis and timing achievement of peristaltic function in congenital duodenal obstruction. *The New Ropanasuri Journal of Surgery*. 2019;4(1):24-26.
18. Kardana IM. Incidence and factors associated with mortality of neonatal sepsis. *Paediatrica Indonesia* 2011;51(3):144-148.



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