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Case Report

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Acquired jejunal atresia in a neonate after repair of ileal atresia: a case report

Fatima Al Zahra[1], Muhammad Abdullah[2], Aleena Ihtasham[3], Parena Maheshwari[4], Sana Shaik[5], Abu Bakar Saddique[2], Muhammad Mughees[2], Adnan Memon*[6]

[1]Department of General Surgery, King Saud Hospital, Unaizah, Saudi Arabia
[2]Department of Medicine and Surgery, Health Sciences Campus, Bahria University, Karachi, Pakistan
[3]King Edward Medical University, Lahore, Pakistan
[4]Department of Medicine, Jinnah Sindh Medical University, Karachi, Pakistan
[5]Tbilisi State Medical University, Tbilisi, Georgia
[6]Liaquat University of Medical and Health Sciences, Jamshoro, Pakistan

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***Corresponding Author:** Adnan Memon, adnanahmedmemon0@gmail.com

ABSTRACT

Acquired small bowel atresia is unusual clinical entity and is rarely reported in the clinical literature. We report a case of acquired jejunal atresia in a neonate following surgical repair of ileal atresia. A premature 2-day-old neonate: not passing stool, abdominal distension, bilious nasogastric aspirates. Imaging revealed intestinal obstruction. Exploratory laparotomy identified type III ileal atresia with a mesenteric defect. An ileostomy was created due to marked luminal discrepancies. After ileostomy reversal, the infant developed bilious vomiting and abdominal distension. Imaging suggested intestinal obstruction. Re-exploration revealed a newly developed atretic segment in the jejunum comparable to type II jejunal atresia, while the previous anastomosis had remained intact. Resection of the atretic segment with end-to-end anastomosis was done, and the patient recovered well. Adhesive bands, postoperative vascular compromise, and previous surgery could have contributed to localized ischemia and eventual atresia.

Keywords: Atresia, acquired intestinal atresia, neonatal intestinal obstruction, stoma

INTRODUCTION

Atresia is defined as complete congenital or acquired absence of continuity of the lumen of a hollow viscus or tubular structure. Intestinal atresia is most frequently congenital and is closely linked to embryologic developmental defects, usually due to intrauterine vascular occlusion resulting in ischemia, necrosis, and the resorption of segments of the developing intestine, with ultimate cause of bowel lumen discontinuity.[1,2] For the past decades there have been many investigations of pathogenesis and surgical treatment for congenital intestinal atresia. On the other hand, less attention has been given to acquired forms of postnatal atresia. Acquired intestinal atresia is a rare phenomenon, as the literature documents only limited reports of cases. Discovering possible contributing factors, such as possibly iatrogenic causes, might help minimize the incidence and enhance postoperative surveillance in neonates undergoing abdominal surgery. Here, we present a rare case of acquired jejunal atresia occurring after surgical repair of ileal atresia in a neonate, highlighting the diagnostic challenge and possible mechanisms responsible for this unusual presentation.

CASE

A 2 day old infant in neonatal intensive care department admitted for the reason of prematurity was unable to pass stool. The abdomen was mildy full in upper aspect and patient had marked greenish aspirates on nasogastric decompression. The meconium was passed in first 24 hours after birth. Paediatric surgical consultation was sought on which after history and physical examination an X-ray abdomen was requested.

X ray of the abdomen revealed multiple air fluid levels and paucity of gas in rectum.

The diagnosis of small bowel atresia was made and patient was prepared for exploratory laparotomy. On surgical exploration the patient was found to have ileal atresia type III, where two blind ends were accompanied by a mesenteric defect. The small gut was followed all the way up to ligament of treitz and was found to be normal, similarly the distal gut was also examined and declared free of any abnormality and was found patent.

The discrepancy between the two blind loops was remarkable and did not allow for primary anastomosis of two ends even if we opted for Benson and Nixon technique for that purpose. An ileostomy was thus formed with an idea of stool recycling to allow for distal lumen to increase in diameter with instillation of stool from proximal loop. After surgery the patient remained fine and was allowed orally on 4th post operative day when the diminished aspirates gave an evidence of normal bowel motility. Patient tolerated feed well and was gradually built up on feed till patient tolerated demand feed and was passing adequate stool. Patient was then discharged to home with detailed counselling of parents in regard of stool recycling of stoma. An elective stoma reversal date was scheduled in a month time. Patient revisited hospital in out patient department and had no complaints. After a month elapsed re admission was done in NICU for stoma reversal. Although the patient had crossed the neonatal period but owing to prematurity and low weight on centiles patient was entertained by NICU. Patient was taken for surgery where both the loops were mobilized, inspected thoroughly for patency and then meticulous single layer anastomosis was achieved (**Figure 1**).

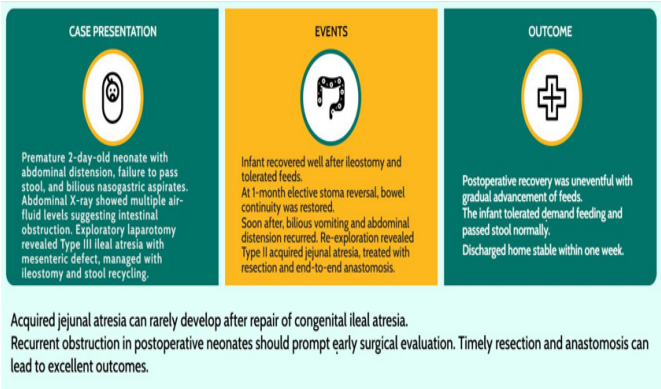

Figure 1. Clinical summary of the case of acquired jejunal atresia following repair of congenital ileal atresia

The illustration summarizes the initial presentation of a premature neonate with intestinal obstruction on day two of life due to type III ileal atresia with mesenteric defect, managed with ileostomy and stool recycling. After elective stoma reversal, the infant developed recurrent obstruction due to an acquired type II jejunal atresia. Surgical resection and end-to-end anastomosis resulted in successful recovery and discharge

Following stoma reversal, the patient developed recurrent bilious vomiting, abdominal distension, and failure to tolerate feeds. Abdominal radiography again showed multiple air-fluid levels suggestive of intestinal obstruction. Re-exploration was performed, which revealed a newly developed jejunal atretic segment proximal to the previous ileal anastomosis. The previously repaired ileal segment remained patent and intact. The jejunal lesion resembled type II jejunal atresia, with complete luminal obstruction and a fibrous connection between the blind ends. Segmental resection of the affected jejunal segment was performed followed by primary end-to-end jejunojejunal anastomosis. The postoperative recovery was uneventful, and the patient tolerated feeds well with successful discharge (**Figure 2**).

DISCUSSION

Jejunoileal atresia is generally believed to be due to intrauterine vascular compromise of the developing midgut. Impaired blood supply results in ischemia and necrosis of the

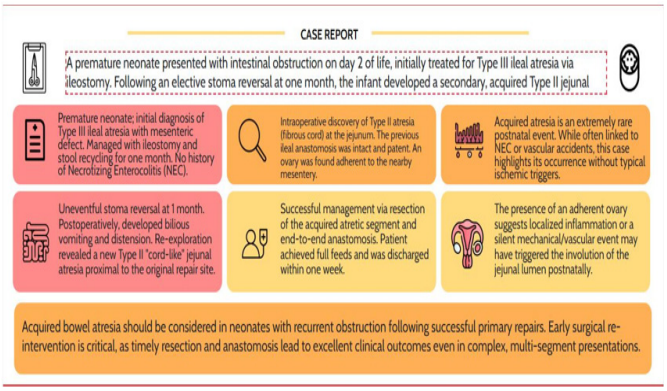

Figure 2. Timeline and key clinical events in acquired jejunal atresia after ileal atresia repair

This schematic provides a detailed schedule of events from neonatal presentation with type III ileal atresia, the management process through ileostomy and stool recycling, subsequent stoma reversal, and postoperative recurrence of obstruction. Later, re-exploration showed a new type II jejunal atresia proximal to the previous repair site, which was successfully treated with segmental resection and primary anastomosis, leading to full recovery.

intestinal segment, and reabsorption causing bowel lumen discontinuity. This mechanism is in contrast to duodenal atresia, which occurs when embryologic recanalization fails, not vascular disruption.[3] Jejunoileal atresia is further divided into four types according to anatomical attributes. Type I presents as an intraluminal membrane with preserved bowel continuity. Type II involves two blind ends joined by a fibrous cord that is without any mesenteric defect. Type III is defined by complete separation of bowel segments with a mesenteric defect, and type IIIb, the other form labelled as the "apple-peel" variant, has widespread mesenteric loss with distal bowel supplied by a single artery. Type IV comprises several atretic segments, characteristically appearing as a "string of sausages".[3] The usual surgical approach is resection of the dilated proximal portion, primary end-to-end anastomosis, and taper maneuvers to correct for luminal discrepancy. In cases of significant bowel diameter mismatch or questionable bowel viability, staged repair or temporary stoma formation may be necessary. However, advances in neonatal intensive care and surgical practices have led to drastically improved outcomes and in the majority of centers the survival rate is >90%.[3] Acquired intestinal atresia occurs in incredibly uncommon and isolated cases, in marked contrast to congenital forms. Han et al.[4] reported the case of acquired intestinal atresia in the wake of previous abdominal surgical procedures, indicating that subsequent interventions might have affected its pathogenesis. The mechanism proposed is that postoperative adhesions lead to localized vascular compromise with resultant ischemia, subsequent fibrosis, and ultimately destruction of the intestinal lumen.[4] Unlike congenital jejunal atresia, our patient developed a new proximal jejunal atresia after successful management of type III ileal atresia and subsequent stoma reversal. The intact distal anastomosis and previously normal proximal bowel strongly supported an acquired rather than congenital origin. Similar postoperative acquired intestinal atresia has been rarely described in literature, particularly following repeated abdominal interventions. Han et al.[4] reported acquired intestinal atresia secondary to postoperative adhesions causing vascular compromise and ischemic fibrosis. Our findings support a similar mechanism, where repeated laparotomy, mesenteric handling, and postoperative adhesions may have contributed to localized ischemia and subsequent atresia formation. Necrotizing enterocolitis

(NEC) is another well established etiologic mechanism of gastrointestinal injury in neonates, primarily in preterm infants. Intestinal wall erosion and its subsequent fibrosis and stricture formation occurs after severe and progressive period of healing during NEC, possibly presenting intestinal obstruction later in the healing process.[5] In our case, as our candidate postpartum infant with prematurity, NEC may provide an intellectual basis, but clinical or radiologic features were missing and intraoperative finding of discrete atretic segment, rather than stricture, limited the possibility for NEC as a theoretical explanation. Earlier abdominal surgery, including previous operative manipulation of the abdomen, is also a recognized risk factor for adhesive small bowel obstruction in children. Abdominal surgery is a further risk factor for childhood adhesion, leading to adhesive small bowel obstruction (ASBO). The peritoneal surgical interventions which occur can result in adhesion development and may also be a source of adhesion that has an effect both in distorting bowel loops, mobility and mesenteric blood supply. The possibility of adhesion generation and therefore, bowel obstruction is further facilitated by repeat abdominal surgery.[6] Here, the laparotomy path of previous ileostomy formation, followed by subsequent reversal of the stoma, may have formed adhesion-induced vascular compromise, therefore the new atretic segment was formed. One incidental intraoperative finding seen in our patient was adhesion of the left ovary to the mesentery around a fibrous band that joins together the segments of atresia. However, the ovary remained as normal as possible; the absence of signs of vascular compromise strongly suggests that it was not the main cause of the atresia. Likewise, though a family history of cystic fibrosis was mentioned, the lack of clinical features such as meconium ileus or inspissated intestinal contents only made this association less likely.

CONCLUSION

The existence of acquired intestinal atresia represents an exceptionally rare phenomenon; consequently, the evidence base is limited to sporadic accounts and definitive findings on its pathogenesis are difficult. This case presents a smaller study in the limited literature on postoperative acquired intestinal atresia and the potential role of it for recurrent intestinal obstruction in infants.

ETHICAL DECLARATIONS

Informed Consent

Informed consent was obtained from the legal guardians of the pediatric patient described in this report. Where developmentally appropriate, assent was also sought from the child.

Peer Review Process

This report underwent external peer review.

Conflict of Interest

The authors declare no conflicts of interest.

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Author Contributions

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