

Endoscopic balloon dilatation for congenital
membranous stenosis in the jejunum in an infant

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Abstract

INTRODUCTION: As endoscopic equipment and instruments have improved, the indications for endoscopic treatment have also been extended. This report presents an applicable procedure of endoscopic balloon dilatation for an infant patient with congenital membranous stenosis in the jejunum.

METHODS: We used a 9-mm flexible endoscope and a through-the-scope multidiameter balloon catheter in the endoscopic treatment.

RESULTS: Dilatation was performed for dilatation diameters 10, 12, and 15 mm each for 2min. After carrying out balloon dilatation, the endoscope could be smoothly inserted through the opening.

CONCLUSION: In upper jejunal stenosis, endoscopic balloon dilatation was minimally invasive and effective as a treatment modality.

Key words: endoscopic balloon dilatation, congenital jejunal stenosis, membranous stenosis, children

Introduction

Endoscopic treatment is less invasive and also provides a cosmetically better outcome than does a conventional laparotomy [1]. We applied endoscopic balloon dilatation for congenital membranous stenosis in the jejunum. There have been several reports concerning endoscopic treatment for duodenal stenosis [1-6], but to our knowledge, this is the first report describing jejunal stenosis in the English literature.

Case report

A 7-month-old female patient (BW 5,680 g) with gastric dilatation in ultrasonography (US) was admitted to our institute. The patient had a history of intermittent bilious vomiting and poor weight gain since 4 months of age (BW 5,540 g). A plain X-ray and US showed dilatation of the stomach and duodenum, and a contrast study of the upper gastrointestinal tract showed a duodenal dilatation and the to-and-fro movement of contents in the duodenum with stenosis beyond the ligament of Treitz (Fig. 1a, b). Gastro-esophageal reflux was also revealed. Computed tomography showed no compression to the stenosis from outside. The procedure was performed in the operating room, with

the patient under general anesthesia in preparation for proceeding to a laparotomy if complications occurred. A 9-mm flexible endoscope (XQ230, Olympus, Tokyo, Japan) was easily inserted into the jejunum through the ligament of Treitz. Endoscopy revealed significant dilatation of the duodenum and upper jejunum, and using an endoscope the mucosal diaphragm with a pin hole in the jejunum could be seen to "billow" in and out of the proximal jejunum with the intermittent insufflation of air (Fig. 2a). A through-the-scope multidiameter balloon catheter (controlled radial expansion, CRE; Microvasive, Boston Scientific Corporation, Natick, MA) was inserted through the membranous stenosis, and dilatation was performed for dilatation diameters 10 mm, 12 mm, and 15 mm each for 2 minutes (Fig. 2b). The amount of bleeding was small. When the membrane of the stenosis was partially lacerated with dilatation using a balloon catheter measuring 15 mm in diameter, the endoscopic balloon dilatation of the stenosis was completed (Fig. 2c). After carrying out balloon dilatation, the endoscope could be smoothly inserted through the opening (Fig. 2d). There were no complications either during or after the procedure. Oral feeding resumed and the patient was discharged one

day after the treatment. Five months after the procedure, repeat endoscopy demonstrated no stricture of the jejunum, and the patient is currently doing well.

Discussion

As both endoscopic treatment and instrumental techniques improve, endoscopy has thus become a less-invasive and cosmetically beneficial approach [1]. Several studies reported the endoscopic treatment for congenital membranous duodenal stenosis [1-6]. Almost all of these reports described a membranectomy [1-5], which is useful for larger membranes such as the windsocks in the duodenum [1]. The patient presented with recurrent vomiting and therefore underwent surgery after an adequate membranectomy due to narrowing of the descending part of the duodenum over a long distance due to an annular pancreas [4]. The considerable risks or complications associated with this endoscopic treatment include causing an injury to the papilla of Vater [4] and the occurrence of a mural perforation of the duodenum [5]. Van Rijn et al. [6] presented the first case on the use of balloon dilatation to treat children. Asabe et al. [3] used balloon catheter measuring from 12 to 13.5 mm in diameter to achieve

sufficient dilatation of the congenital duodenal stenosis at nine days of age, when the BW was 3,060g. Therefore, we applied a 10 mm balloon catheter at the beginning of the treatment protocol.

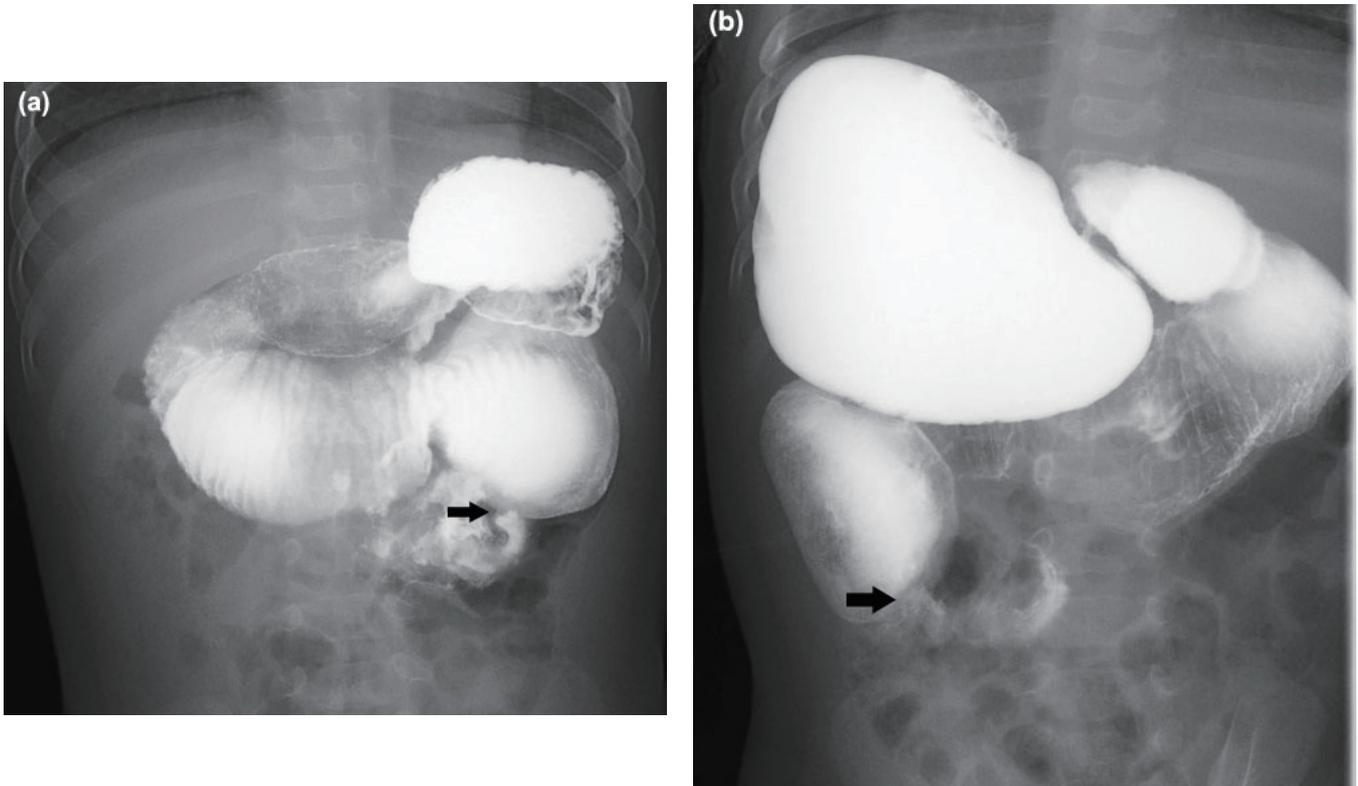
The incidence of jejunoileal atresia and stenosis has been reported to be between 1 in 330 and 0.9 in 10,000 live birth. Stenosis was 7% of them [7]. It is difficult to evaluate small bowel disorders because the small bowel is located quite far from the mouth and anus in adults [8]. In the present case, it was easy to insert through the ligament of Treitz, because we presumed that the duodenum might have been significantly dilated and shorter than that in adults.

In upper jejunal stenosis, endoscopic balloon dilation was more safety because there is no problem as the papilla of Vater. Additionally, a stenosis resembling a pin hole was detected more easily because of the adjacent effect following endoscopy than following a laparotomy. Endoscopic balloon dilation for an infant patient with congenital membranous stenosis in the jejunum was minimally invasive and effective as a treatment modality.

References

1. Nose S, Kubota A, Kawahara H et al (2005) Endoscopic membranectomy with a high-frequency-wave snare/cutter for membranous stenosis in the upper gastrointestinal tract. *J Pediatr Surg* 40(9):1486-1488
2. Okamatsu T, Arai K, Yatsuzuka M et al (1989) Endoscopic membranectomy for congenital duodenal stenosis in an infant. *J Pediatr Surg* 24(4):367-368
3. Asabe K, Oka Y, Hoshino S et al (2008) Modification of the endoscopic management of congenital duodenal stenosis. *Turk J Pediatr* 50(2):182-185
4. Ziegler K, Schier F, Waldschmidt J (1992) Endoscopic laser resection of a duodenal membrane. *J Pediatr Surg* 27(12):1582-1583
5. Kay GA, Lobe TE, Custer MD, et al (1992) Endoscopic laser ablation of obstructiong congenital duodenal webs in the newborn: a case report of limited success with criteria for patient selection. *J Pediatr Surg* 27(3):279-281
6. Van Rijn RR, van Lienden KP, Fortuna TL et al (2006) Membranous duodenal stenosis: initial experience with balloon dilatation in four children. *Eur J Radiol* 59(1):29-32
7. Stollman TH, de Blaauw I, Wijnen MH et al (2009)

- Decreased mortality but increased morbidity in neonates with jejunoileal atresia; a study of 114 cases over a 34-year period. *J Pediatr Surg* 44(1):217-221
8. Sunada K, Yamamoto H, Kita H et al (2005) Clinical outcomes of enteroscopy using the double-balloon method for strictures of the small intestine. *World J Gastroenterol* 11(7):1087-1089

Figure Legends**Fig.1**

A preoperative contrast study showed dilatation of the duodenum with membranous stenosis (arrow) in the jejunum beyond the ligament of Treitz; **a**, with the patient in a supine position or **b**, in a prone position.

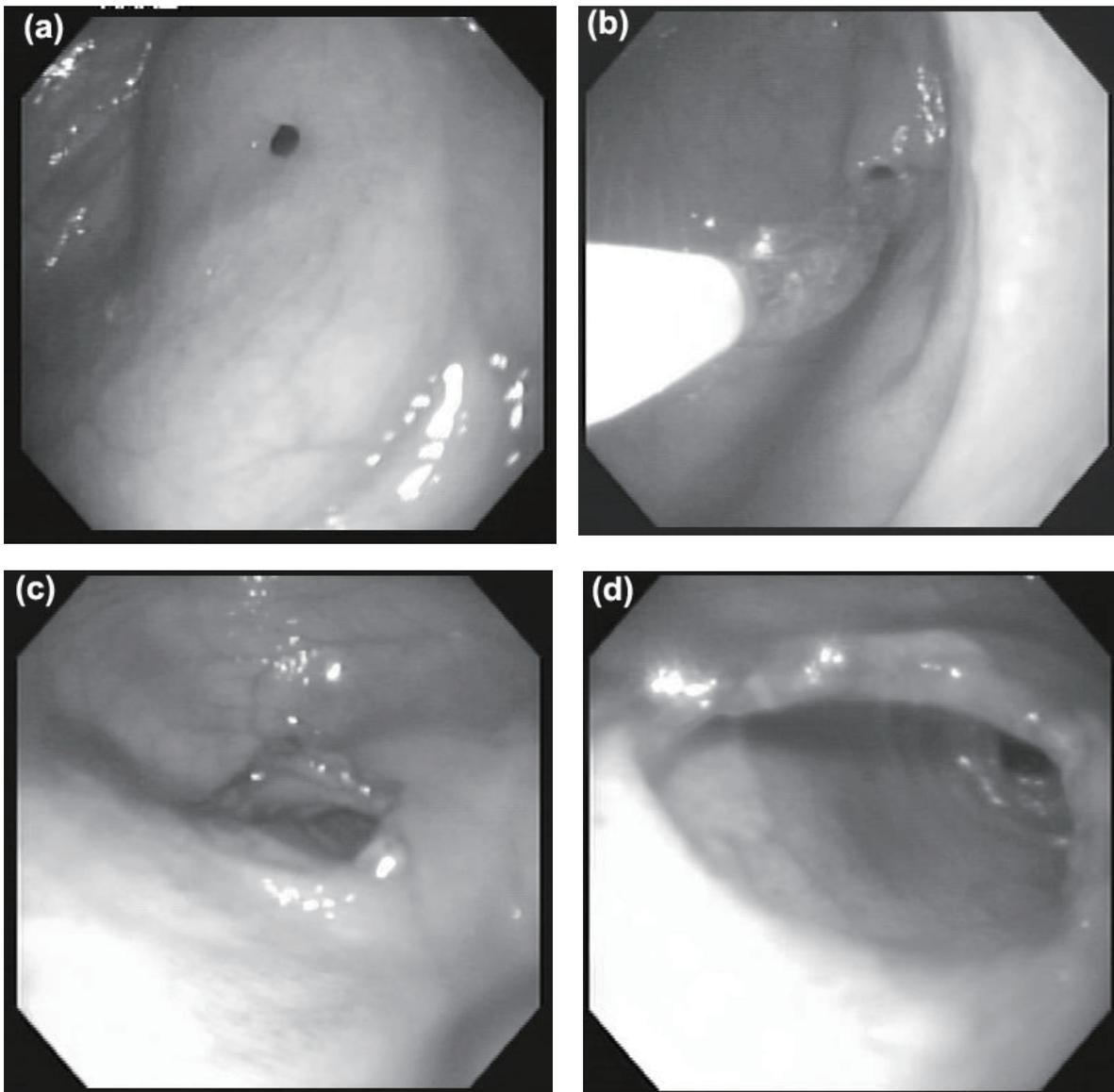


Fig.2

Balloon dilatation for the treatment of membranous stenosis in the jejunum. **a**, The stenotic lesion resembled a pin hole. **b**, A balloon catheter was inserted through the site of stenosis. **c**, Dilatation was performed. **d**, The endoscope was inserted through the opening.