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Isolated Segmental Sigmoid Structure after Necrotizing Enterocolitis: A Rare Localization of the Stricture Out of the Late Complication

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Abstract: ***In one-third of newborns with necrotizing enterocolitis (NEC) can take place intestinal stricture as a late complication. Contrast enema studies are routinely carried out prior to stoma closure following NEC. The locations of strictures are often in ascending colon/hepatic flexure, transverse colon/splenic flexure and descending colon together with sigmoid or multiple colonic areas. The stricture is less common in small bowel segments than those of the large bowels. This report describes a isolated segmental sigmoid colon stricture after NEC of which was 5 mm in diameter and 5 cm in length of a male infant who was born via cesarean section at 38 weeks of gestation with weighing 2140 grams. We firstly found and described this complication as a solitary stricture in the sigmoid colon for the first time. We believe that due to early diagnosis and treatment, the stricture did not compose of in the previous segments and strictly limited to this region only. However, it is a dilemma whether more or fewer practitioners cannot escape from this fate or not.***

Keywords: Necrotizing enterocolitis; complication; stricture; sigmoid colon

1. Introduction

In the neonatal period, the most common gastrointestinal emergency requiring surgery is necrotising enterocolitis (NEC). Clinical presentations of NEC are characterized by vomiting, feeding intolerance, abdominal distension, bloody stools, cardio-respiratory deterioration, and severe hemodynamic instability [1]. In one-third of newborns with necrotizing enterocolitis (NEC) can take place intestinal stricture as a late complication [2]. Stricture areas in the intestine in the post-NEC period are often in ascending colon/hepatic flexure, transverse colon/splenic flexure and descending colon together with sigmoid or multiple colonic areas. The stricture is less common in small bowel segments than those of the large bowels [3]. After medical therapy and proximal diverting enterostomy, the late strictures in the sigmoid colon segment is very rare in the NEC patients although the stricture occurs most commonly in the left colon [4,5]. We herein aimed to report a newborn with an isolated sigmoid colon stricture after NEC.

2. Case Description

This report describes a sigmoid colon stricture after NEC of which was 5 mm in diameter and 5 cm in length of a male infant who was born via cesarean section at 38 weeks of gestation with weighing 2140 grams. He had intrauterine growth restriction. Apgar scores of the patient were 6 and 8 at 1 and 5 minutes of life, respectively. He had apnea shortly after birth, and resuscitation was provided in the delivery room. He was transported to the neonatal intensive care unit (NICU) and given positive pressure ventilation (PPV) by bag mask. His glucose blood level was 33 mg/dl. 10% dextrose was given to him at 2 ml/ kg, immediately. Hemoglobin level of him was 6,9 g/dl. The erythrocyte suspension was given at 10 ml/kg. Although the patient had respiratory distress, his oxygen saturation was normal. He was started on empiric IV ampicillin and gentamicin. Antibiotics were discontinued after 72 hours and result of negative blood culture. His hemoglobin level was increased to 10 g / dl after two cycles of erythrocyte suspension were given. After the general condition of the patient improved, he began to be fed with breast milk. After the next five days, he had intermittent feeding intolerance with bilious emesis and abdominal distension. And then, abdominal distention with tenderness, hematochezia, and abdominal wall discoloration subsequently occurred in the patient. Supine radiograph of the abdomen of the patient showed that the bowels were markedly dilated with gas thus had an air-fluid level and there was weakly a sign of pneumonitis intestinalis (Figure 1).

Figure 1: Supine radiograph of the abdomen of the patient showing that the bowels. Markedly dilate bowel segments with air-fluid levels and weakly a sign of pneumonitis intestinalis

He was started on antibiotics including meropenem and metronidazole. He underwent emergency surgery and was found to have an extensive semi-gangrenous bowel with hemorrhage between end of the transverse and the distal sigmoid colon. There was no perforation in the bowels. We performed to the patient a Mikulicz double barrel enterostomy with the middle of the sigmoid colon. The peritoneal fluid culture was positive for Enterobacter spp. while blood culture was negative. According to culture result, meropenem was continued as antimicrobial therapy. In the histopathological examination in the resected segment, there was transmural necrosis with focal areas of marked transmural inflammation. He completed a 10-day course of IV antibiotics. When ostomy started to work, the enteral feed was resumed with breastfeeding on day 2 postoperatively. He discharged on a postoperative day 15.

Prolapsus occurred in the distal barrel after on the fifth postoperative day. We found that the patient had the sigmoidal stricture on the contrast examination of the distal colon in the first month, postoperatively. This segment with the stricture in nearly all sigmoid colon having 5 mm in diameter and 5 cm in length was resected during the procedure of colostomy closure (Figure 2). Rectal and transverse colon biopsies were also performed at the same operation. Histopathologically, there were ganglion cells in both specimens. He had no additional complications.

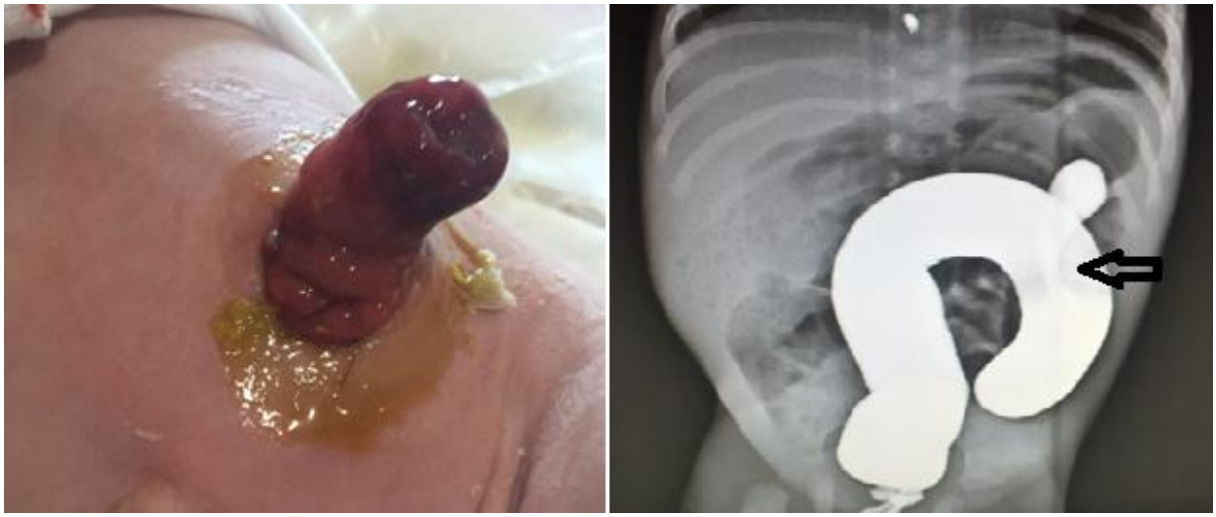

Figure 2: Prolapsus of the distal ostomy. The black arrow shows the sigmoid colon with the stricture (contrast examination)

3. Discussion

The incidence of the intestinal stricture occurring after NEC as a late complication varies from 10% to 35% for medically and surgically managed patients [6]. Since infants with strictures who have been managed or underwent peritoneal drainage for NEC could enable to go through with feeding intolerance and evidence of partial bowel obstruction, some practitioners have previously applied routine contrast studies before beginning to feed in these patients treated medically [7]. This application, however, is not widely practiced, as most authors reported a very low applicable examination of this theory many years ago [8,9]. As in described previous practices, we have not been in a hurry to implement the contrasted colon examination of the patient by this rule. However, after abdominal distention with tenderness, hematochezia, and abdominal wall discoloration subsequently occurred in our patient; supine radiograph of the abdomen of the patient instead of the contrast study was examined. The radiograph showed the markedly dilated bowels with an air-fluid level and weakly a sign of pneumonitis intestinalis. He underwent emergency surgery and was found to have a semi-gangrenous bowel segment in which was as described in the case presentation.

A stricture due to NEC taking place usually in watershed areas where the vascular flow is interrupted brings about ischemia. The majority of post-NEC strictures occur where is in colonic (80%) and left-sided as well as small bowel. Multiple strictures may be present at the rate of 15% percentage. Interestingly, we detected an isolated stricture covering the nearly all segment of the sigmoid colon during the closure of colostomy except for intestinal parts forming the usual stricture area reported in the literature [2-10].

4. Conclusions

In the previous studies, colonic strictures regarding NEC were detected in the left colon where were in varying segments between the transverse and sigmoid colon. We firstly found and described this complication as a solitary stricture in the sigmoid colon for the first time. We believe that due to early diagnosis and treatment, the stricture did not compose of in the more proximal segments and strictly limited to this region only. That is, even though the more proximal colonic segments are not affected, the sigmoid colon blood flow with the same disturbed flow of blood remains inadequate. Early intervention in the patient would likely allow less necrotic segments to develop and fewer segments to be resected. However, it is a dilemma whether more or fewer practitioners cannot escape from this fate or not.

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