Case Report

Access this article online
Website: www.afrjpaedsurg.org
DOI: 10.4103/0189-6725.78935
Quick Response Code:

Acute spontaneous gastric perforation in neonates: A report of three cases

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ABSTRACT

Gastric perforation in neonates is a rare, serious and life-threatening problem. The precise aetiology is obscure in most cases. By virtue of its high mortality rate, it requires prompt recognition and surgical intervention. We report three cases of neonatal gastric perforation managed by early resuscitation and primary repair.

Key words: Gastric perforation, neonates, pneumoperitoneum

INTRODUCTION

Neonatal gastric perforation is an unusual surgical emergency. The high mortality rate reflects to a certain extent the precariousness of the neonatal period, but the process evolves so rapidly that prompt diagnosis is necessary if improved survival rates are to be achieved.

Many theories have been proposed for the pathogenesis of gastric perforation, but the aetiology is still unknown. Here, we present three cases of neonatal gastric perforation treated in our hospital in last 5 years.

CASE REPORTS

Case 1

A 3-day-old full term baby, weighing 2605 g, was admitted with history of abdominal distention. Examination revealed a lethargic newborn with marked abdominal distention. Bowel sounds were absent. Abdominal X-ray revealed huge free intraperitoneal air [Figure 1]. The provisional diagnosis was perforative peritonitis. On exploration, after opening the lesser sac there was a 2 cm × 1.5 cm perforation seen on the posterior wall along the greater curvature, with inflammatory exudates all over the abdominal cavity [Figure 2]. Primary repair was done in two layers and abdomen was closed. A drain was left in place [Figure 3]. Postoperative period was uneventful



Figure 1: X-ray showing pneumoperitoneum

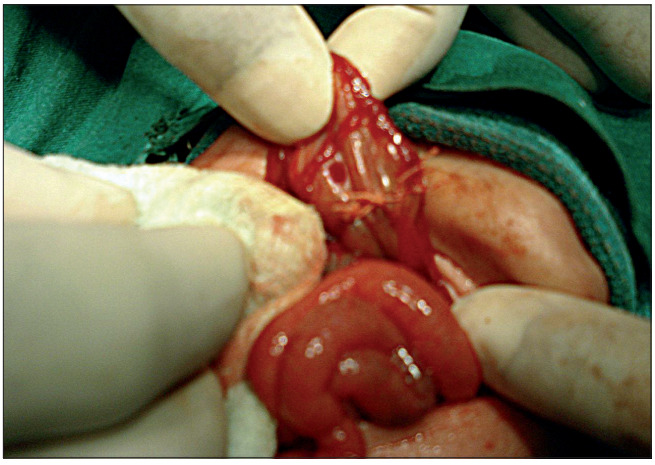


Figure 2: Perforation over posterior wall of stomach

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and baby was discharged on 12th postoperative day. Histopathology of the margin of perforation area revealed nonspecific inflammation.

Case 2

A 2-day-old premature girl with 33 weeks gestational age, weighing 2105 g at birth, was admitted. She had abdominal distension, respiratory distress, cyanosis and hypoxaemia; assisted ventilation was applied. We performed an abdominal radiograph which confirmed the presence of massive pneumoperitoneum. Laparotomy revealed 2 cm × 2 cm gastric perforation located over the anterior wall of stomach along the greater curvature of the stomach, with extensive necrosis of the rims [Figure 4]. Primary repair was done in two layers and abdomen was closed. A drain was left in place [Figure 5]. The baby expired 14 hours after operation. Histopathology of the margins revealed acute nonspecific inflammation. Cause of death was prematurity with septicaemia.

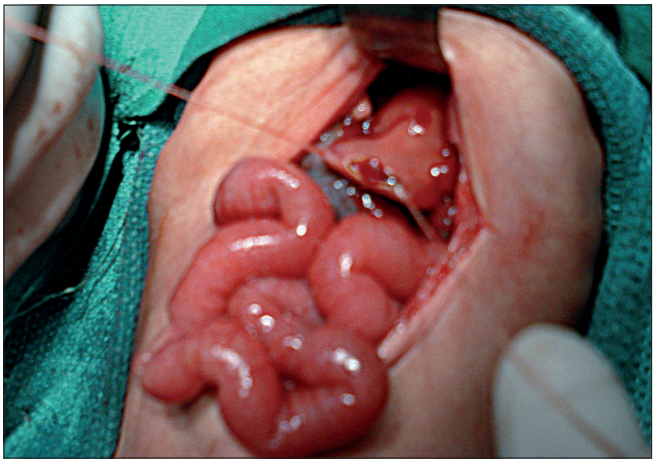


Figure 3: Primary repair of posterior gastric wall perforation

Case 3

A 2-day-old full term boy, weighing 3105 g, was admitted with history of abdominal distention, fever and rapid shallow breathing. Examination revealed abdominal distention with signs of dehydration. On abdominal X-ray, there was free intraperitoneal air. On exploratory laparotomy, there was 1 cm × 1 cm perforation seen on the posterior wall along the greater curvature. Primary repair was done in two layers and abdomen was closed. A drain was left in place. Baby expired 6 hours after surgery. Histopathology of the margin of perforation area revealed nonspecific inflammation. The cause of death was septicaemia with respiratory failure secondary to peritonitis.

DISCUSSION

Gastric perforation in the newborn infant was first described by Siebold in 1825.[1] Three mechanisms have been proposed for stomach perforation: traumatic, ischaemic, and spontaneous. Most of the gastric perforations are due to iatrogenic trauma[2] by vigorous nasogastric or orogastric tube placement. Perforation is usually along the greater curvature and appears as a puncture wound or a short laceration. Traumatic gastric perforation may develop during the course of positive pressure ventilation.[3] The mechanism of ischaemic perforation has been difficult to elucidate because these cases of perforation are associated with conditions of severe physiological stress, such as extreme prematurity, sepsis and neonatal asphyxia. Ischaemic gastric perforations have been noted in conjunction with necrotising enterocolitis. Because gastric stress ulcers have been reported in a variety of critically ill infants, it has been proposed that these perforations result from the transmural necrosis of such ulcers.[2,3]

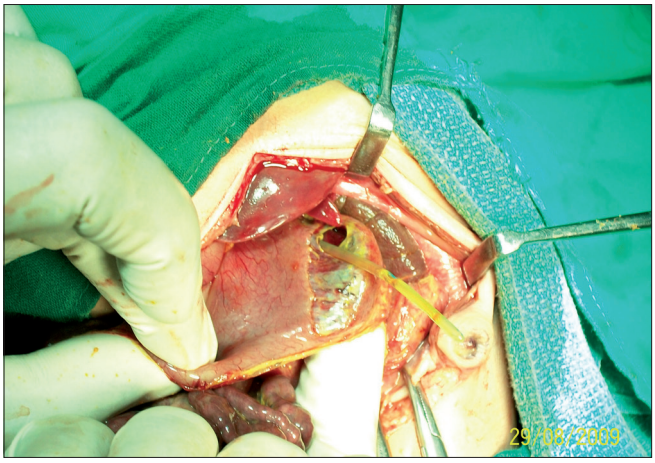


Figure 4: Perforation over anterior wall of stomach

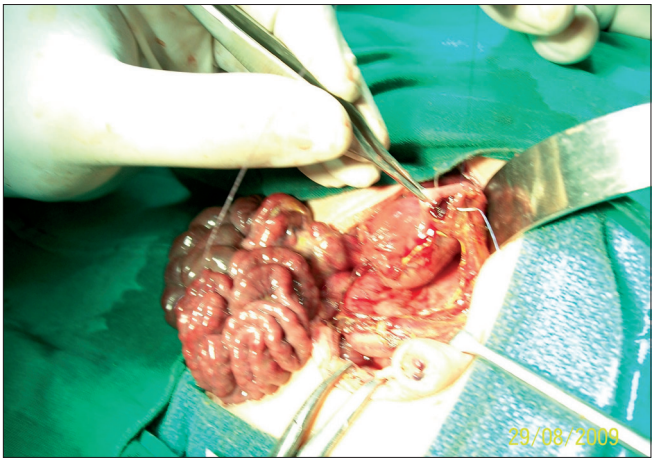


Figure 5: Primary repair of anterior gastric wall perforation

Spontaneous gastric perforations have been reported in otherwise healthy infants, usually within the first week of life, particularly in between the first 2 and 7 days of life.[4] One hypothesis is that spontaneous perforations are due to the congenital defects in the muscular wall of the stomach.[5] Anatomical defects of the gastric muscular wall have been suggested to potentiate perforation of the stomach among neonates, especially in prematurity. The circular muscle layer of the newborn stomach normally contains several gaps, most prominently in the fundus, near the greater curvature. These gaps are more common in premature infants. Gastroduodenal perforation has been associated with postnatal steroid therapy.[6]

The most common radiographic finding of gastric perforation is pneumoperitoneum which was seen in our cases. Because of the large size and proximal nature of perforation, these infants may have rapidly progressive pneumoperitoneum with associated cardiopulmonary compromise.

Surgical repair of most perforation consists of debridement and two layer closure of stomach. Significant gastric resection should be avoided but cases are reported. Postoperative vigorous supportive therapy coupled with the use of broad spectrum antibiotics administered intravenously is necessary. In very sick infants, short-term external peritoneal drainage may be required, followed by formal surgical repair of the perforation once the infant's condition is stabilised. Persistence of free air or continued acidosis and evidence of peritonitis may mandate surgical exploration.[7]

Due to the associated problems of sepsis and respiratory failure often found in premature infants, mortality rates of gastric perforation are high, ranging from 45% to 58%.[8] For better outcome, interval between the onset of symptoms and start of definitive therapy should be minimised.

ACKNOWLEDGEMENT

We thank Dr. H.R. Tata, Professor and Head, Department of Surgery, Krishna Institute of Medical Sciences, Deemed University, Karad, for advice and permitting this publication.

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Cite this article as: Kshirsagar AY, Vasisth GO, Ahire MD, Kanojiya RK, Sulhyan SR. Acute spontaneous gastric perforation in neonates: A report of three cases. Afr J Paediatr Surg 2011;8:79-81.

Source of Support: Nil, **Conflict of Interest:** None declared.