

Neonatal Gastric Perforation with Recovery

By

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In spite of its comparative frequency, spontaneous gastric perforation in the newborn is rarely recognized in due time. The condition had been described in 1825 [18] but successful correction has been reported on in 1950 only [9] and all in all 6 cases were successfully operated upon till 1959 [10]. Before 1961, of 78 neonatal cases only 14 survived. Of the 143 cases reported until 1964 [6], surgical repair had been performed in 97 patients, in 39 with success; in 46 cases the perforation was revealed post mortem.

REPORT OF A CASE

The male baby was born with 4200 g after uneventful pregnancy and normal delivery. The newborn had cleft lip, upper jaw and palate, and had to be fed through a gastric tube. The baby was referred to our hospital on the fourth postnatal day because of frequent vomiting and grave abdominal distension suggestive of duodenal atresia. At admission, the patient was greyish-pale and inertly whimpering; the abdomen, especially the epigastric region, was markedly distended

and oedematous. The umbilical stump was dry and normal. The abdomen was free on palpation, the epigastrium was tender, no intestinal contours were visible. Meconium was excreted and rectal examination revealed normal conditions. The abdominal wall seemed to contain air and gave a decidedly tympanitic percussion note. The liver was enlarged; the spleen was not palpable. The red count was 5,400,000; haemoglobin 14.2 g per 100 ml; white count 16,000. Urine analysis gave a negative result; the temperature was 38.7°C. X-rays showed clear lung fields and a normal heart. The gas shadows in the abdomen excluded the possibility of duodenal atresia. Passage of water soluble contrast material was unhindered. A wide accumulation of free air above a fluid level was seen below the left diaphragm.

The finding obviously represented a pocket of trapped peritoneal air; perforation being thus evident, immediate surgical intervention was done. On opening the abdomen a circumscribed baby-fist sized cavity filled with air and some serous-purulent exudate was seen. The base was constituted by the anterior surface of the stomach;

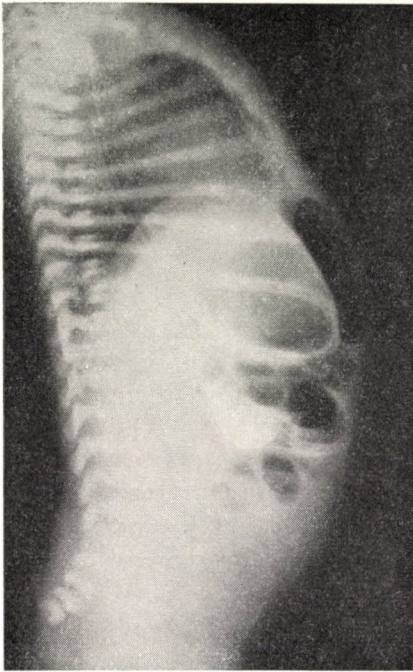


FIG. 1. X-ray showing free air in abdomen, with fluid level in the recess

the omentum adhered to the lesser curvature. A slight amount of fibrous coating was encountered in this area. The perforation having been circumscribed and covered by omentum, we refrained from separating the adhesion and detaching the omentum, and contented ourselves with drainage of the cavity. Neomycin-sensitive *Proteus* was cultured from the exudate. Neomycin was administered both parenterally and locally, and the baby was fed intravenously during five days. The gastric contents were sucked off through a tube. When on the fifth postoperative day the roentgenogram revealed no pathological sign, oral feeding was started. The gastric tube was removed on the 8th

day; the abdominal wound healed by the 12th day. Recovery was smooth and the baby was discharged three weeks after admission.

DISCUSSION

Opinions are divided as regards the aetiology of neonatal gastric perforation. It is, according to certain authors, preceded by gastric ulceration in about 50 per cent of the cases [20], a phenomenon that may be due to the temporary high acidity of newborn infants. The gastric juice is neutral immediately after birth, but five hours later its pH decreases to 3.0 [1]. On the second day it is similar to that of adults but diminishes thereafter, reaches a minimum at the end of the second week of life, to rise then once more to adult values by the end of the first year [12]. Gastric rupture may, according to numerous authors, be due to acute dilatation of the stomach caused by an obstruction of the distal intestinal segment or by hyperventilation at artificial breathing; perforation may also be caused by excessive pressure to which the stomach is exposed in cases of difficult labour [4, 8, 13, 14, 17]. Introduction of a gastric tube has also been followed by rupture of the stomach [10, 20]. A number of authors attribute the development of gastric ulcers to anoxia during delivery [3, 11], while others point to intracranial haemorrhage [19, 20], to a congenital deficiency of the gastric muscles, to high gastric acidity and direct or indirect

trauma as the most probable aetiological factors [10]. In one case gastric rupture was associated with congenital muscular deficiency and accompanied by intracranial haemorrhage [19]. Congenital defect of the gastric wall has also been observed and accused to be the exclusive cause of gastric rupture [5]. It has been suggested [7], on the other hand, that the gastric muscles are deficient in the new-born so that the point of maximum deficiency determines the site of perforation induced by some other factor.

The clinical picture is more uniform, although the symptoms are frequently indistinct and become pronounced too late, i.e. with the development of diffuse peritonitis. Abdominal distension, emesis and cyanosis have been observed by most authors [10, 13, 16, 20]. Oedema of the abdominal wall and subcutaneous emphysema [11] (as observed in the present case), grave haematemesis and melaena [20] have been described. Free air, possibly with a fluid level at the bottom of the recess, visualized by X-rays is an infallible sign of gastro-intestinal perforation which, however, is not always apparent in the X-ray picture.

The only effective treatment is immediate surgical intervention. The

possibility of multiple perforation has to be borne in mind. Of the 137 cases mentioned [6], 13 were multiple ruptures. The prognosis is not promising. In a survey of 62 cases of gastric perforation in infancy, 26 were operated upon within 12 hours after the perforation, and 36 later. The number of survivors was 11 in the first, 9 in the second group [15]. Prognosis is greatly influenced also by premature birth and the concomitant anomalies. About 22 per cent of neonatal gastric ruptures occur among prematures [2]; in other statistics the incidence amounted to about 40 per cent [6].

Although it seems difficult to explain neonatal gastric perforation solely by mechanical factors, the repeated introduction of a gastric tube may have contributed to the rupture in the present case. Employment of sterile synthetic gastric tubes is therefore advisable.

SUMMARY

Aetiology, symptoms and treatment of neonatal gastric perforation are briefly discussed in connection with a case of successful surgical repair.

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