DUPLICATION OF THE STOMACH

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Case Report

FIG. 1.—Radiological appearances of the stomach (antero-posterior view) after a barium meal. The duplication protrudes into the lumen of the stomach at the greater curve.

Pathological Findings. The specimen consisted of a cystic structure shaped like a kettledrum (Fig. 2) and measuring $5 \times 3 \times 3$ cm. It had a thick muscular wall which merged into the muscle layer of the attached oval-shaped portion of true stomach and it was covered exteriorly by peritoneum. At one point on its lower convex border there was a small granulomatous nodule surrounding a minute orifice. Some 2 ml. of slightly mucinous but otherwise watery fluid was 'milked' through this hole by compression. The fluid had a pH of 4.0 and contained pepsin but no free hydrochloric acid. When the specimen was bisected a cavity was seen, approximately 3 cm. in diameter lined by pink, healthy-looking mucous membrane partially folded into small rugae (Fig. 3). There was no communication between the cavity and the overlying stomach.

Microscopic examination of the cystic structure showed that its mucous lining was like that of normal gastric mucosa (Fig. 4), with chief and parietal cells easily identifiable. There were no active erosions or ulcers, but the appearances of the mucosa around the small orifice on the distal border, where there had been adhesion to the transverse colon, were suggestive of healed erosion. There was a well-defined muscularis mucosae beneath the mucous membrane and external to this were a submucous layer of connective tissue and then a thick muscle coat, most of which was covered by peritoneum. In many parts of the cavity wall two muscle coats, an inner circular and an outer longitudinal, were distinguishable; these blended with the muscle coat of the true stomach, thus accounting for the surgical impossibility of removing the cyst by dissection. Auerbach's and Meissner's nerve plexuses appeared to be normal.

The appearances thus conformed to those of so-called 'duplication of stomach'.

Progress. The condition of the baby after operation was uneventful except for some reluctance to take feeds. She was discharged home August 4, when she weighed 11 lb. 12 oz. On January 4, 1956, there was still a little difficulty in feeding but the weight was 17 lb. 4 oz. A further radiological examination revealed no abnormality of the vertebrae, particularly in the cervical and upper dorsal region, but an opacity was seen in the right lung field at the level of the hilum (Fig. 5). It did not pulsate and it caused no oesophageal displacement. Moreover, no calcification was seen in it. The significance of this abnormality is uncertain but it may be a mediastinal cyst of foregut origin. No surgical interference is at present contemplated, but the infant is being kept under close observation.

Discussion

The baby was admitted to hospital because of green, slimy stools and failure to thrive, not because of an abdominal tumour. When the latter was observed clinically it was thought to be either a double stomach or a cyst. The correct diagnosis of duplication of stomach was suggested by radio-

logical examination after a barium meal when the abnormality was seen to be outside the stomach but could yet be invaginated into it.

Duplications are 'spherical or elongated hollow structures which possess a coat of smooth muscle, which are lined by a mucous membrane, and which are intimately attached to some portion of the alimentary tube' (Ladd and Gross, 1941). They are more common in relation to small intestine than to any other part of the alimentary tract, and they are usually observed in childhood but may be found at any age. The lining is alimentary in type but does not necessarily correspond to that at the level at which the duplication is found, e.g., a rectal cyst may have a partial lining of gastric mucosa. In some specimens there are two or even three types of alimentary mucosa. In Ladd and Gross's series of 18 cases of duplication the sites were: base of tongue, in one patient; oesophagus, in three; stomach, in one; duodenum, in one; jejunum, in two; ileum, in seven; caecum, in one; sigmoid, in one; rectum, in one. Their case involving the stomach was in a 6-year-old girl; the lesion was on the greater curve and posterior surface and was almost as large as the stomach.

Duplications may or may not communicate with the lumen of the adjacent hollow viscus. In the case under discussion there appeared to have been ulceration from the duplication into the transverse colon; this, we presume, was a possible cause of melaena.

Signs and symptoms of duplication arise most commonly from mechanical obstruction to part of the normal alimentary tube. Repeated haemorrhage, associated with peptic ulceration, has also been described. The radiological findings are very helpful in diagnosis, while at laparotomy the intimate union of the muscle coat of the duplication with that of the adjacent alimentary tract is important in the recognition of the condition. Mesenteric cysts which may be confused with abdominal duplications can usually be dissected free and are, moreover, thin-walled. In our patient the movement of the abdominal swelling, observed clinically, is attributable to the firm attachment of the duplication to the greater curve of stomach: as the stomach became distended with food, the swelling moved downwards and inwards towards the midline.

Several theories have been advanced to explain the formation of duplications. The most popular is the 'sequestration theory', viz., groups of cells from the primordial intestinal tube become pinched off. In this connexion it is of interest that Lewis and Thyng (1907) frequently found diverticula in various portions of foetal alimentary tract in pigs.

FIG. 2.—Lateral view of the resected specimen. The upper part is covered by a part of the normal stomach wall.

FIG. 3.—The specimen after bisection showing its rugous mucous lining.

FIG. 4.—Section of the wall of the duplication showing a mucous membrane like that of normal body of stomach. Haematoxylin and eosin, $\times 40$.

FIG. 5.—Radiological appearances of the thorax (antero-posterior view) showing the mediastinal opacity.

rabbits, cats, sheep and man. These were seen most often in the ileum but were unrelated to a Meckel's diverticulum and usually regressed.

We have mentioned the radiological finding of an opacity in the chest and have suggested the possibility of it being due to a mediastinal cyst of foregut origin. Fallon, Gordon and Lendrum (1954) have given an excellent account of such cysts which are commonly associated with vertebral anomalies and sometimes with mesenteric cysts and duplications. They emphasize that the association of such mediastinal cysts with anterior spina bifida has not been adequately appreciated and they regard such cysts as the final result of an abnormal extension of the lumen of the foregut produced on its posterior aspect by incomplete separation of the notochord. Consequent interference with anterior fusion of the

vertebrae brings about the vertebral anomalies. Later in embryonic development the cyst tends to move caudally by growth of the intrathoracic viscera.

Summary

A case of duplication of the stomach is described and points of diagnostic value are indicated.

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