GASTRIC ATRESIA*

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In the newborn a complete occlusion of the pyloric outlet of the stomach is an extremely rare event. Very early vomiting occurs due to an absolute stoppage, but the vomitus contains no bile as found in stenosis or atresia below the ampulla of Vater. Respiratory troubles occur very quickly from breathing the overflowing stomach contents. The cause of stomach obstruction may be different. Pyloric spasm in the newborn is rare. Cystic masses in the gastric wall have been described.

Case Report

This case reports an intrinsic occlusion due to a membrane. The premature female infant, weighing 2,500 g., vomited mucus fluid on the second day after birth and later vomited her feeds; there was no bile, but meconium was passed. On admission at the age of 6 days her weight was 1,900 g. A flat plane radiograph of the abdomen showed gas in the stomach, but none in the duodenum or the remainder of the small bowel (Fig. 1).

Despite the fact that the absence of gas in the rest of the abdomen is also typical of an atresia, operation was performed on the supposition of a pyloric spasm. We even found a very slight hypertrophy of the pyloric bulge and slit following Weber-Ramstedt. But post-operatively the child continued vomiting and another radiograph showed there was no gas in the bowel. Three days later a further laparotomy had to be performed. The stomach was opened from a gastrotomy in the antral area. It was impossible to probe the pyloric channel because of a complete obstruction due to a solid membrane between antrum and pyloric channel (Fig. 2). After perforating the membrane and dilating the opening, a tube was inserted into the duodenum (Fig. 3). The passage was then free, the child could be fed through the tube and bowel movements were satisfactory. A further radiograph taken two weeks after the operation showed the opaque medium passing the pylorus beside the tube.

A short time later the child began vomiting again and the fluid residues in the stomach increased. It was decided at this third operation to perform a gastrojejunostomy. Postoperatively the passage through the anastomosis slowly began to work (Fig. 4). Nevertheless, the course was a dramatic one because of disturbances of electrolytic balance as well as troubles from respiratory and circulatory systems. For a long time the child did not gain weight and only recently has there been a constant increase in weight.

Discussion

In the literature we have found only 10 cases of children operated upon in the first 12 days of life for a complete gastric occlusion. Bennett (1937), Touroff and Sussman (1940), and Fell (1951) found, as we did, the cause in a prepyloric diaphragm. Burnett and Halpert (1947) and Brown and Hertzler (1959) in other cases observed connective tissue up to 1 cm. in length in the pyloric area, completely occluding the pyloric channel. A very interesting paper was given by Metz, Householder and DePree (1941). They found two membranes at a distance of 6 cm. with a tumour palpable through the abdominal wall, containing gastric juice. From the 10 cases dealt with, five had been operated on successfully and re-examination showed free passage and a normal gastric function.

The cause of gastric atresia is almost unknown. In the foetal stage the stomach is at first a hollow organ. Until now no solid stage has been found, as is observed with the rest of the bowel in the fifth to tenth week of foetal life. Therefore an insufficient recanalization of solid stage as supposed in duodenal atresia cannot be the cause of gastric atresia. Touroff and Sussman believe that a fusion of the mucous membrane folds during the development of the pyloric bulges leads to the diaphragmatic occlusion.

In complete gastric obstruction indication for operation is clear. Pyloric spasm in the newborn rarely indicates complete absence of gas in the bowel; generally speaking, absence of gas in the bowel and vomitus without bile indicate a complete occlusion above the ampulla of Vater, either a membrane or atresia. Confusion with pyloric spasm is sometimes made and is described for instance by Bennett (1937).

The question remains as to what to do in atresia of the pyloric outlet of the stomach. An operative excision of a membrane by gastrotomy leads to

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FIG. 1.—Antero-posterior radiograph, showing gaseous distension limited to the stomach.

FIG. 2.—Diagram of the stomach with the intrinsic obstruction.

FIG. 3.—After opening the stomach in the antral area and perforating the membrane a tube was inserted into the duodenum.

FIG. 4.—Radiograph taken two weeks after performing the gastro-enterostomy, showing satisfactory passage of the opaque medium into the small bowel.
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technical difficulties due to the considerable hypo-

plasia of the duodenum beyond the membrane. 

During excision damage to the wall may occur. 

To prevent this one can fill up the duodenum with 
sodium solution, so that the membrane will bulge 
slightly into the stomach. It is possible now to 
resect the central part and slit the border radially. 

Brown and Hertzler (1959) reported on two children 
with connective tissue 0.6 cm. in length in the 
pyloric channel, found by a longitudinal incision of 
the pylorus. They opened the blind-ending 
sacks of mucous membrane and performed an 
anastomosis over a tube and finally closed the 
incision laterally.

We found quite different features in another case 
with a very small opening in the membrane. A 
5-week-old child presented with a postpyloric 
membrane and we performed the excision without 
difficulty by gastrotomy. Unlike the child with 
complete occlusion, a great deal of air and fluid 
ran through the small opening; the duodenum 
and the distal bowel werefunctioning and therefore 
were of nearly normal calibre. This enlargement 
of calibre beyond the membrane considerably 
facilitates the excision and makes it fairly safe.

The perforation we tried seems questionable and 
cannot be more than a temporary help. Neverthe-
less, the perforation worked as a congenital opening, 
and led to improved bowel function facilitating the 
gastroenterostomy. There will not always be such 
good results as in the case of Benson and Coury 
(1951), who performed a gastroenterostomy after 
perforation and later found a free pyloric passage 
with closed anastomosis.

Because of the well-known disadvantages and 
dangers of a gastrojejunostomy, the decision to 
perform one is taken reluctantly. Three of the 
10 children with gastroenterostomy died a few days 
after operation. One of these had a suture leakage 
and pneumonia and two others suffered from ileus, 
the exact cause for which was not known (Holladay 
1946; Salzberg and Collins, 1960).

Possibly the complicated conditions of a gastro-
jejunostomy have been the cause of our child not 
progressing over a month. Until now there have 
been few reports of gastroenterostomy in the new-
born, but the poor results in adults seem to prohibit 
it use in the newborn. What remains is pylorus 
resection or gastroduodenostomy, neither of which 
are particularly successful in the newborn infant.

It is another question, whether we should use it in 
our case as a secondary step with removal of the 
gastroenterostomy after enlargement of the duo-
denum and small bowel and recovery by the child.

In this way it would perhaps be possible to achieve 
somewhat normal conditions. On the other hand, 
such an intervention would not be simple or without 
risk in view of the fact that the child's abdomen has 
already been operated on three times.

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