Obstructing Enterogenous Cyst of the Duodenum Treated by Cystojejunostomy *

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DUPLICATION cysts of the gastro-intestinal tract are rarely encountered by the surgeon. Enterogenous cyst of the duodenum is an even rarer member of this unique family. Gross [8] reports a total of 68 duplications from mouth to anus; only three of which arose from the duodenum. A review of the literature reveals only 19 recorded cases, the last being reported by Broker and Hay [3] in 1955 in a 54-year-old man.

Because of the infrequent occurrence of this lesion, there have been several methods of surgical treatment employed. The manner of treatment has been influenced primarily by the condition of the patient and the pathologic nature of the individual cyst.

Early diagnosis and definitive surgical treatment can be life saving in the obstructed cases, especially when they occur in young children. Even so, the mortality following operation has been reported to be 45 to 50 per cent.[2, 15] The following case illustrates the most frequent complication of enterogenous cyst of the duodenum, and its surgical treatment.

CASE REPORT

On September 22, 1955, D. L., a two-months-old, 7½ pound, white female infant, was admitted to the Pediatric Service of the 4167th USAF Hospital with the chief complaint of persistent vomiting.

Five days after her birth, July 31, 1955, bilateral congenital dislocation of the hips was recognized. This was treated by closed reduction and fixation of the lower extremities in abduction and external rotation by means of a long-leg, bilateral hip spica. Intermittent vomiting began at approximately one month of age. This was attributed to a pyelitis, which was being treated on an outpatient status. When the infection responded to treatment, but the vomiting persisted and became increasingly more severe, she was admitted to the hospital.

Physical examination revealed a thin, dehydrated, malnourished child in a body spica. The anterior fontanel was depressed. The lungs were clear to auscultation. A soft systolic murmur was audible over the precordium. Shortly after admission the body spica was removed, and on abdominal examination a 7 to 8 cm. mass was palpated in the right upper quadrant. The mass was round, firm, and cystic. It was slightly movable, especially in the vertical plane. It was apparently nontender. The liver could be palpated separately from the mass.

A small naso-gastric catheter was passed; a cut-down done, and the child was restored to a near normal state of fluid and electrolytic balance during the next few days. Several attempts at feeding were unsuccessful because of vomiting, so all oral feedings were abandoned. A gastro-intestinal x-ray and a barium enema were suggestive of a large retroperitoneal mass producing extrinsic pressure on, and obstruction of, the duodenum (Fig. 1). The small bowel was displaced to the left (Fig. 1), and the colon was displaced caudad and anteriorly (Fig. 2, A & B). Intravenous pyelograms were negative.

On the sixth hospital day, September 29, 1955, the child was taken to the operating room. A right subcostal incision was made. On opening the peritoneum a large (8 cm.) cystic mass presented, which could be delivered into the wound quite readily (Fig. 3). It was seen to be a large enterogenous cyst of the duodenum arising from the first and second portion. The wall and blood supply of the cyst were identical with that of the duodenum. The duodenum itself was tissue paper thin and stretched over the anterior and superior part of the cyst. The cyst was tense with fluid.

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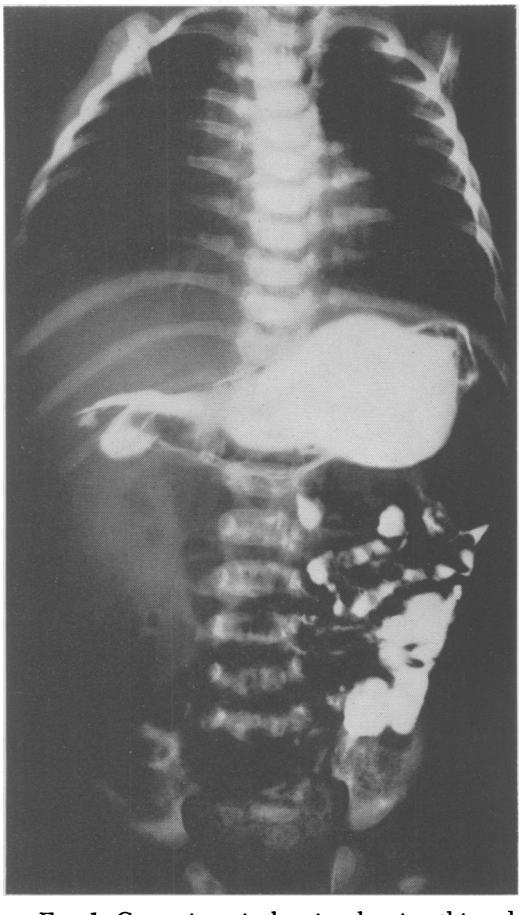

FIG. 1. Gastro-intestinal series showing thinned out, crescent-shaped duodenum. The obstructing, fluid-filled cyst can be faintly seen and is forcing the small bowel to the left.

This was aspirated and seen to be odorless, clear, and mucoid. As the contents of the cyst were removed, the wall became thickened due to muscular contraction (Fig. 4).

Because of the large size of the cyst, its location in the first and second portion of the duodenum, and the child's weakened preoperative condition, resection was out of the question. Therefore, a posterior cystojejunostomy was performed at the most dependent portion of the cyst (Fig. 5).

Postoperatively the child continued to vomit intermittently but with decreasing severity. She was maintained on small, but ever increasing oral feedings, until by the tenth postoperative day she was taking a full formula without further difficulty. She had gained ten ounces before being discharged from the hospital on October 21, 1955.

The child at the time of this writing is approximately seven months old. She is developing

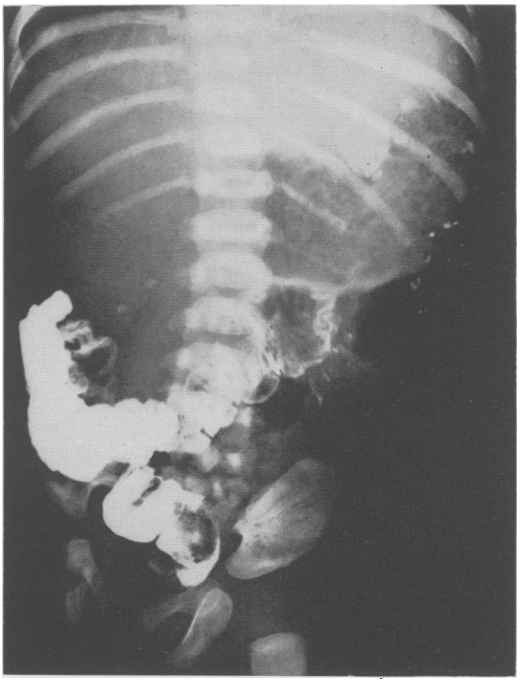

FIG. 2A. Barium enema illustrating displacement of the transverse colon downward.

normally and has no symptoms. A gastro-intestinal x-ray at 6 months of age revealed quick passage of the barium through the duodenum. The cyst was outlined with barium and air, and had apparently shrunk to about half of its former size (Fig. 6).

DISCUSSION

Enteric cysts of the duodenum are most commonly seen during the first year of life.[6] Several theories as to the origin of these cysts exist.[4, 5, 10, 11, 14] However, the most commonly accepted one is that they are developmental and arise as diverticular pockets within the wall of the primordial duodenum.[11] Once established they become an integral part of the duodenum, yet are separated by a mucosal-submucosal layer. Since the lining of the cyst is a secreting mucosal surface, totally isolated, it gradually expands, carrying with it the serosal and muscular layers of the parent duodenum.

The symptoms that are produced have been enumerated by Hicken [9] and are those of chronic duodenal obstruction, partial at

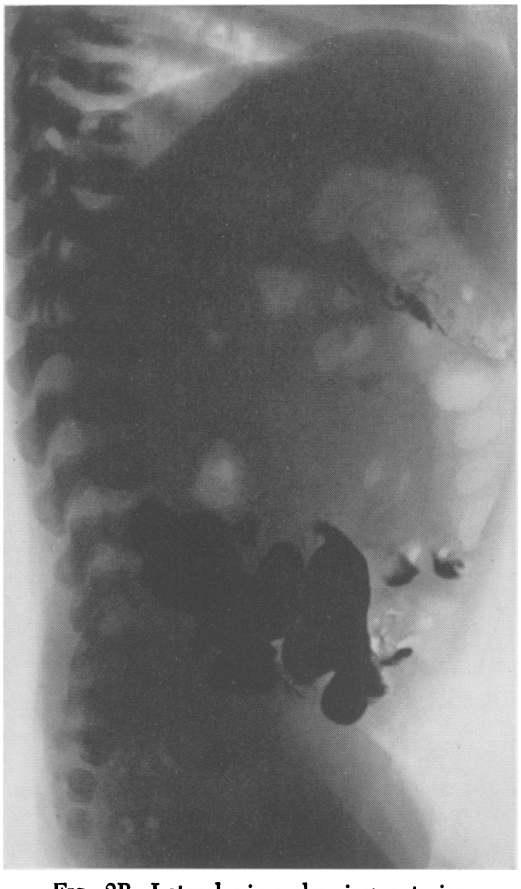

FIG. 2B. Lateral view showing anterior displacement of the colon.

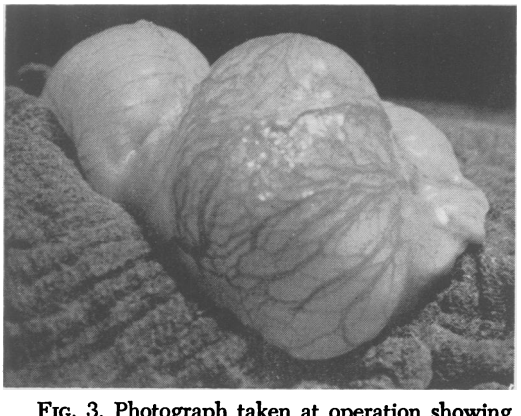

FIG. 3. Photograph taken at operation showing the cyst. The pyloric end of the stomach can be seen above and to the left of the cyst. The transverse colon can be seen to the right.

first and progressing to total obstruction. Because of this, early diagnosis and operation are essential for a successful outcome.

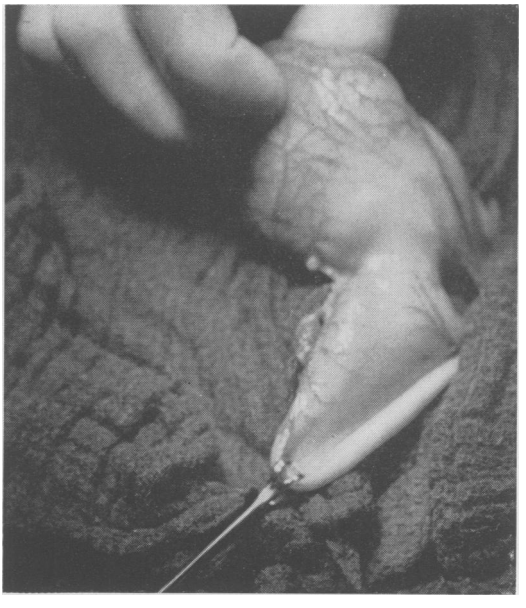

FIG. 4. Photograph taken following aspiration of the contents of the cyst. Note the reduction in size due to the ability of the muscular cyst wall to contract.

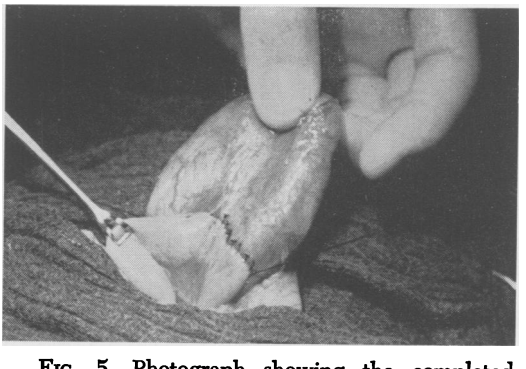

FIG. 5. Photograph showing the completed cystojejunostomy just before the anastomosis was placed in a posterior, retro-colic position.

Several methods of surgical treatment have been suggested: (1) duodenal resection, (2) enucleation, (3) evacuation, (4) marsupialization, (5) gastrojejunostomy, (6) "window operation," and (7) cystojejunostomy and jejunojejunostomy. The most important feature from the standpoint of surgical treatment is the common muscular wall and blood supply found between the cyst and the bowel. This precludes cystectomy in the usual case.

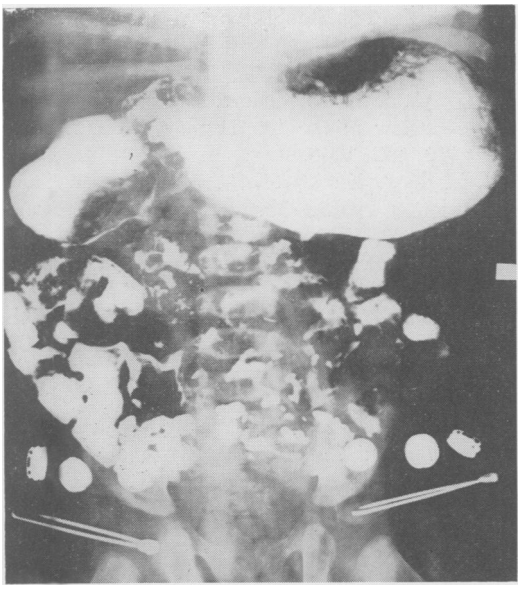

FIG. 6. Follow up gastro-intestinal x-ray done 4½ months postoperatively. The wide duodenum can be seen, and the cyst and cystojejunostomy are visualized with barium and air immediately below.

Duodenal resection along with the cyst is theoretically the best operation. Practically, however, it is seldom possible because the location of the cyst may require re-anastomosis of the common and pancreatic ducts. This is a formidable procedure in a weak, depleted infant. Enucleation is hazardous in a true duplication but works well in cysts of Brunner's glands.[2] Evacuation is merely a temporizing procedure. Marsupialization carries a 100 per cent mortality and is to be condemned.[7]

Gastrojejunostomy has been suggested as a method of treatment.[1, 13] This circumvents the duodenal obstruction but leaves an expanding cyst in situ. Further complications such as necrosis, infection, hemorrhage, and rupture would most certainly ensue.

Gross [8] reports two cases in which he followed the procedure first suggested by Gardner and Hart.[6] A "window" or communication is made in the common wall between the cyst and duodenum. He stresses that the opening should be toward the distal end of the duplication and should be of ample size to prevent accumulation of duodenal contents in the cyst.

Cystojejunostomy with concomitant jejunojejunostomy was first proposed by Shallow *et al.*[16] Although they did not use this method of treatment in their reported case, they suggested it as a feasible plan.

In the present case, cystojejunostomy alone seemed to be the best procedure. The precarious condition of the child precluded any extensive maneuver such as resection. Cutting a window to traverse the common wall between cyst and duodenum would have created a large dependent diverticular sac.

Jejunojejunostomy was considered as a supplementary procedure, but would have lengthened and magnified the operation and was thought to be unnecessary. As far as the writer knows this is the first reported case in which this method of treatment was used. It is fairly simple and quick. It relieves the obstruction and obviates the creation of a large, dependent duodenal diverticulum.

SUMMARY

A duplication cyst of the duodenum in an infant is reported. The method of treatment was posterior cystojejunostomy. The advantages of this procedure are compared to other forms of surgical treatment.

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