

# PANCREATIC CYSTS—SURGICAL TREATMENT ESPECIALLY BY THE USE OF INTERNAL DRAINAGE

WITH A REPORT ON SIX CASES\*

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THE SURGICAL TREATMENT of pancreatic cysts presents an interesting problem in spite of their infrequency. In recent years an increasing number of cases treated by internal drainage have been reported. In 1948, Griessmann<sup>19</sup> made a summary of 31 cases of pancreatic cysts primarily treated by internal drainage, this being the largest number reported up to that date. When our thesis was submitted to Athens University in March, 1951, it reported 79 such cases, and when published (March, 1952) it reviewed 26 more, *i.e.*, a total of 105 cases, including our six cases (see accompanying table). It is our hope, therefore, that the present paper will offer enough evidence to convince surgeons still looking at internal drainage with some circumspection.

Surgical treatment is undoubtedly indicated in every case of proved or suspected pancreatic cyst. Conservative management may result either in death of the patient due to cachexia, or to spontaneous rupture of the cyst into the free peritoneal cavity. Occasionally pancreatic cysts perforate and drain into neighboring hollow viscera. This "spontaneous" internal drainage might be considered a desirable solution, although it happens very rarely. Such a case was quite recently observed in the Hellenic Red Cross Hospital.

Of the three major surgical procedures (total excision, external and internal drainage of cysts), the first is still considered the ideal method. Unfortunately it is feasible in approximately 25 per cent of the cases due to technical difficulties. This is especially true in cases of pseudocysts firmly adherent to the surrounding structures or possessing a thin and friable wall, while small cysts located in the tail of the gland or thin pedicled cysts can be completely enucleated. Careful investigation of anatomical relationships should be made before any attempt to resect the cyst wall, as the usual mortality of 10 per cent may reach 55 per cent when the attempt at excision is abandoned during the operation. Neoplastic cysts constitute an urgent indication for excision where technically possible, because of the danger of malignant degeneration.

In some cases of large cysts of the body and tail of the pancreas accompanied by excessive inflammatory reaction, or in recurrent cysts, partial pancreatectomy of the tail or body may be indicated.

External drainage is still regarded by many surgeons as the safest procedure because of its simplicity, short duration and low mortality (4 to 6 per cent). It can be executed with a rubber drain, and mostly by marsupialization of the cyst wall to the parietal peritoneum. The use of this procedure must be limited because of persist-

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ent pancreatic fistulae and repeated recurrence of the cysts, commonly reported as being the result of external drainage. Pseudocysts presenting a wall, irresectable or unsuitable for anastomosis, can be externally drained, but once a permanent pancreatic fistula has developed, a second operation, *i.e.*, implantation of the sinus tract into a corresponding part of the gastro-intestinal tube, appears inevitable.

In order to avoid these difficult secondary operations as well as the above mentioned complications, primary internal drainage has been introduced. Far from being extremely enthusiastic about this method, which undoubtedly needs more time to be evaluated, we nevertheless believe that it soon will be accepted by most surgeons as the operation of choice. By draining the cyst into the digestive tract, fluids, electrolytes and enzymes contained in the cystic cavity are reabsorbed, and the skin excoriation of external drainage is obviated. With this procedure, very good results have been reported, including reports on patients who have been followed for three to ten years.

Pancreatic cysts can be anastomosed to different hollow viscera, such as the stomach, the jejunum, the gallbladder and the duodenum.

In spite of serious criticism, cystogastrostomy is an extremely valuable method. Most pseudocysts of the pancreas are retrogastric in position. This explains why cystogastrostomy to date has been the most frequently applied method among internal drainage procedures. Brandenburg, Maddock and Schweitzer<sup>5</sup> reviewed 24 such cases. Our table reviews 50 cases of primary cystogastrostomy.

This procedure is simple, especially when approach to the cyst is made transgastrostomically, *i.e.*, through a transverse incision in the anterior gastric wall, first described by Jurasz<sup>30</sup> in 1931. In 29 out of the 50 cases mentioned, including four of our own, the transgastric route was used. When a pseu-

docyst is intimately bound by adhesions to the posterior gastric wall, transgastric drainage can be established through a simple opening of the area adherent to the stomach, without performing a two-layer anastomosis. The stoma constructed should be large enough, at least 4 to 5 cm. in length, to insure adequate drainage, especially in cases of pseudocysts where the lack of an epithelial lining favors premature closure of the stoma. At present there is no definite explanation of the functioning of such an anastomosis. Some surgeons believe this is a purely mechanical matter. Without sharing this theory, we nevertheless suggest, for at least the first postoperative days, keeping the patient in a prone position in order to facilitate drainage and prevent reflux of the gastric contents into the cyst. In fact, this complication represents the most serious theoretical objection to cystogastrostomy, but has been verified, as far as we know, in only one case. This was one of our patients (Case 2) in whom a recurrent pseudocyst was first anastomosed to the pyloric antrum after an unsuccessful marsupialization six months previously. Roentgenogram examination proved definite reflux of barium into the residuum of the cyst a few weeks after the anastomosis. In poor condition, the patient was finally re-operated upon at the Hellenic Red Cross Hospital. After detachment of the cystic residuum from the stomach, closure of the stoma at the antrum was performed, and finally the cyst was anastomosed to a defunctionalized Roux-Y jejunum loop.

Many surgeons have found no reflux of barium during postoperative radiological examination. However, it seems likely to us that in some cases, at least during the first postoperative weeks, and especially when the anastomosis is made to the antrum, a small quantity of gastric contents may enter the cyst. Nevertheless, the case mentioned above was the only one in which regurgitation was definitely demonstrated, both by

TABLE I.—Cases of Primary Internal Drainage Reported Up to December, 1951.

Transplantations of pancreatic fistulae into hollow viscera are not included. In some cases internal drainage was performed for cystic residuum left from previous operations.

Author (The name in parenthesis states the surgeon)	Year of Report	No. of Cases	Procedure—Cystogastrostomy	Result
Jedlicka (Jedlicka).....	1923	1	Dissection of the cyst, anastomosis of its fundus to poster. gastric wall, external drainage of the remaining cystic sac.	Good
Jurasz (Jurasz).....	1931	2	Transgastric approach.	Good
Vecchi (Gold).....	1935	1	Anterior anastomosis.	Good
Hara.....	1936	1	Transgastric approach.	Good
Reported by Brocq- Aboulker (David)...	1936	1	Jedlicka's technic.	Good
Kafka (Kafka).....	1939	1	Posterior anastomosis.	Died on the 9th p. o. day. Hemorrhage from erosion of a vessel.
Orator.....	1939	1	Cystogastrostomy.	Good
Erdely.....	1941	1	Transgastric approach.	Good
Hortolomei.....	1941	1	Transgastric approach.	Good
Maske.....	1941	1	Transgastric approach.	Good
Reported by Brunschwig (Phemister)	1942	1	Transgastric approach, anastomosis to the lesser curvature.	Recurrence of the cyst.
Henrich (Henrich).....	1942	1	Anastomosis to pyloric region, dissection of stomach above the cystogastrostomy, gastroenterostomy of the major part of the stomach.	Good
Rössing (König).....	1942	1	Posterior anastomosis.	Good
Altshuler.....	1942	1	Transgastric approach.	Developed pernicious anemia, not definitely attributable to cystogastrostomy.
Selman.....	1942	1	Cystogastrostomy.	
Mahadevan.....	1943	1	Posterior anastomosis.	Good
Siem (Jüngling).....	1944	1	Transgastric approach.	Good
Dos Santos.....	1944	1	Transgastric approach.	
Aldis.....	1946	1	Cystogastrostomy.	Cured
Hanke.....	1947	1	Anastomosis to pyloric antrum.	Good
Kunc (Kunc).....	1947	3	Transgastric approach. In one of cases there were two cysts explored, one of which was simultaneously anastomosed to duodenum.	Good
Mahadevan.....	1947	1	Posterior anastomosis.	Good
Zehrer (Zehrer).....	1948	1	Transgastric approach.	Good
Chodoff (Chodoff).....	1948	1	Anastomosis to greater curvature, in the pyloric region.	Good
Poer-Stephenson.....	1949	1	Posterior anastomosis, 28 months post external drainage.	Good
Haberer (Haberer).....	1949	1	Posterior anastomosis.	Good
Steden (Steden).....	1949	1	Posterior anastomosis.	Improvement
Ramb (Ramb).....	1949	1	Anterior anastomosis to the pyloric antrum.	Good
Franke (Franke).....	1949	1	Transgastric approach.	Died on the 5th p. o. day. Hemorrhage from re-inflammation of the pancreas.
Franke.....	1949	1	Transgastric approach.	Good
Paul (Paul).....	1949	1	Transgastric approach.	Good
Sehmisch (Sehmisch)...	1949	1	Anterior anastomosis.	Good
Wojciechowski.....	1949	4	Transgastric approach.	Good
(Karajanopoulos).....	1949	1	Anastomosis to the pyloric antrum, 6 months post marsupialization.	Recurrence of the cyst
Makkas (Makkas).....	1949	1	Transgastric approach.	Good
Manos (Manos).....	1949	1	Transgastric approach (anastomosis to the pyloric antrum).	Good
Markus.....	1950	1	Transgastric approach.	Good
Maxeiners.....	1950	1	Anastomosis to the greater curvature.	Developed bleeding peptic ulcer at the site of anastomosis.
Brandenburg-Maddock- Schweitzer	1951	2	Transgastric approach.	Good
Zschau.....	1951	1	Transgastric approach.	Good
(Sapkas).....	1951	1	Transgastric approach.	Good
(Makkas).....	1951	1	Transgastric approach (Anastomosis to the pyloric antrum).	Good
Kuhne.....	1951	1	There were two cysts; one of the head, anastomosed to pyloric antrum and one of the tail, anastomosed to the stomach's fundus.	Good

roentgenogram and by clinical examination. Recurrence of the cyst due to inadequate drainage was reported only in one case operated on by Plemister (Brunschwig), where a portion of the cystic cavity did not

ations which seriously aggravated the patient's general condition. It is, however, noteworthy that during the second operation, the anastomosed cyst was found almost completely obliterated.

TABLE II.—*Cystojejunostomy.*

Hahn (Henle).....	1927	1	Cystojejunostomy with additional jejunojejunostomy, 9 months post-marsupialization.	Good
Krasnoselsky (Dzanelidze).....	1936	2	Cystojejunostomy with additional jejunojejunostomy.	Good
Blinow.....	1938	1		Good
Kafka.....	1940	1	Cystojejunostomy with additional jejunojejunostomy, post ext. drainage.	Good
Chesterman (Chesterman).....	1943	1	Simple cystojejunostomy.	Good
Adams-Nishijima (Adams).....	1946	2	Cystojejunostomy with additional jejunojejunostomy.	Good
König (König).....	1946	1	Cystojejunostomy, Roux-Y technic.	Good
Griessmann (Griessmann).....	1947	2	One simple cystojejunostomy and one on the Roux-Y technic.	Good
Migliaccio-Laurelli.....	1948	1	Cystojejunostomy, Roux-Y technic.	Good
Gurwitz-Hurwitz.....	1948	1	Cystojejunostomy, Roux-Y technic.	Good
Poer-Stephenson.....	1949	1	Antero colic cystojejunostomy, post repeated external drainage.	Good
Ramb (Ramb).....	1949	1	Simple cystojejunostomy.	Died on the 15th day. Pulmonary embolism.
Schrank (Schrank).....	1949	1	Simple cystojejunostomy.	Clinically cured. On p. o. X-ray examination barium reflux into cyst.
Meyer-Sheridan-Murphy.....	1949	2	Simple cystojejunostomy.	Both died. One from fecal fistula, the other from sup-puration of the cyst, peritonitis.
Hempel.....	1949	1	Antecolic cystojejunostomy with additional jejunojejunostomy.	Reoperated for ileus caused by filling of blind loops. Pan-creatic cyst found completely eliminated.
Landanyi.....	1949	1		Good
Laqua.....	1950	1		Good
Markus.....	1950	1		Good
Orth.....	1950	1		Good
Kourias (Kourias).....	1950	1	Cystojejunostomy (Roux-Y technic) 16 months post cystogastrostomy	Good
Poer-Whitaker.....	1951	1	Cystojejunostomy, Roux-Y technic.	Good
DeBakey.....		3		In one case cyst recurred from premature closure of stoma.
Rosi.....	1951	2	Cystojejunostomy, Roux-Y technic.	Good
Johnston.....		2	Cystojejunostomy with additional jejunojejunostomy(?).	
Reported by Brunschwig.....		1		Recurrence of the cyst.

drain. No further complications, such as pernicious anemia (as in Altshuler's case<sup>3</sup>) or leakage of the suture line due to enzymatic activity, have been proven or even reported as a result of the abnormal physiology established in the stomach through cystogastrostomy. A bleeding peptic ulcer developed at the site of anastomosis to complicate the case reported by the Max-einers.<sup>42</sup> This necessitated two more oper-

Fatal results were reported in only two cases (Kafka,<sup>31</sup> Franke<sup>17</sup>), the first from severe hemorrhage due to erosion of a vein of the cystic wall, and the second as a result of hemorrhage caused by reinflam-mation of the pancreas due to surgical manipulation. Both complications can derive from any procedure concerning pan-creatic cysts, especially marsupialization. Thus theoretical objections raised by many

authors to cystogastrostomy were confirmed only by five actual failures out of 50 cases. On 33 of the 45 successful cases, more or less long and satisfactory follow-up results

subsequent re-infection or activation of the cyst enzymes.

Cystojejunostomy is also a more physiological procedure in so far as it drains the

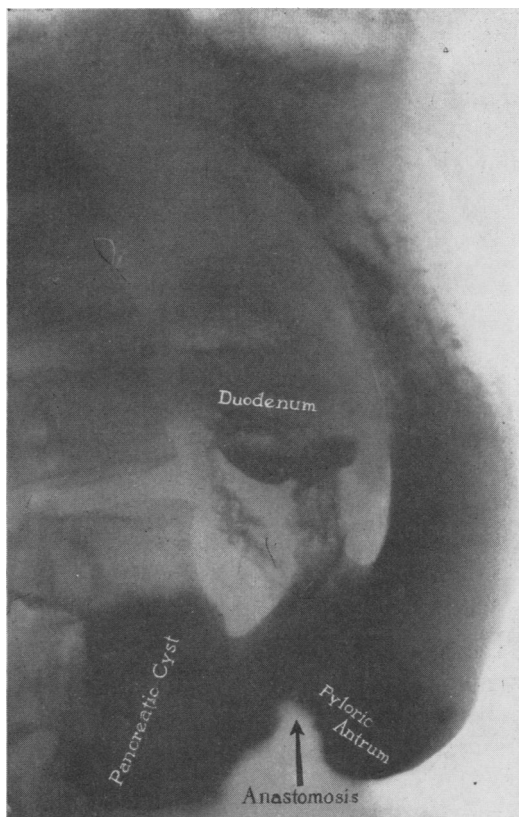


FIG. 1.—Roentgenogram taken 8 months after cystogastrostomy in Case 2. Cystic residuum remains filled with barium, entering through the stoma at the antrum, 24 hours following administration of meal.

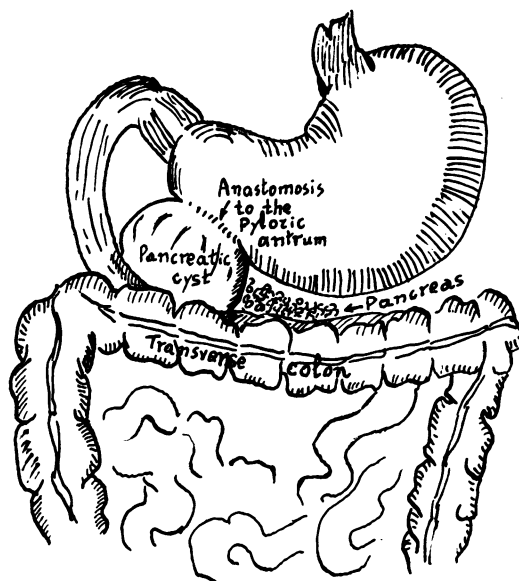


FIG. 2.—Sketch of the findings at operation in Case No. 2. The cystic residuum attached to the pyloric antrum, with a stoma 7 cm. in length.

external pancreatic juice into the intestine, where it is normally secreted. Anastomosis of the jejunal loop to the cyst can be achieved either according to the principles of a common gastro-enterostomy or by adding a jejunojejunal anastomosis to the foot of the cystojejunostomy. When the Roux-Y technic is applied, the distal end of the loop is usually brought through an opening of the transverse mesocolon and attached to the cyst by an end-to-side or side-to-side anastomosis. In eight out of 33 cystojejunostomy cases which we were able to review in the literature up to December, 1951, a Roux-Y anastomosis was successfully performed; in nine other cases, an additional jejunojejunal anastomosis was made; in 12 others, a simple loop was probably used.

Insufficient information is given about the technic used in the remaining cases. According to the general rules of internal

were reported. In one case (Poer) a patient was observed for a period of nine years, while Erdely's patient was found in excellent health ten years after the operation. The latter represents the longest follow-up period after internal drainage procedures.

Cystojejunostomy, although technically more difficult, has attained increasing popularity during the last years. Specifically, surgeons seem to be attracted by the Roux-Y technic which may prevent intestinal contents from entering the cyst with

drainage, the stoma constructed has to be large enough to avoid premature closure. Two layers of interrupted silk sutures are commonly used at the anastomosis. Some surgeons point out the risk involved in the use of uninterrupted suture which particularly exposes the anastomosis to the digestive action of trypsin. This complication probably caused leakage of the suture line in the fatal case reported by Meyer, *et al.*,<sup>43</sup>

those in which the Roux-Y technic was applied. In some of the latter, an astonishingly quick recovery was reported, even when the case was complicated due to previous operation. We believe, therefore, that the Roux-Y anastomosis represents the most satisfactory method of internal drainage.

Cystocholecystostomy, with or without ligation of the ductus cysticus, is not rec-

TABLE III.—*Cystocholecystostomy.*

Walzel (Walzel).....	1927	1	Cystocholecystostomy with ligation of ductus cysticus.	Good
Neuffer (Neuffer).....	1932	1	Cystocholecystostomy without ligation of d. c.	Recurrence of cyst 8 months p. o., from premature closure of stoma, rupture of cyst death.
Gold (Neuffer).....	1934	1	Cystocholecystostomy without ligation of d. c.	Good
Achmatowicz (Achmatowicz)	1937	1	Cystocholecystostomy without ligation of d. c.	Good
Meyer (Meyer).....	1939	3	Cystocholecystostomy without ligation of d. c.	Good
Carter-Slattery.....	1947	1	Anastomosis to accidental opening of common duct, post ext. drainage.	Good
Meyer-Sheridan-Murphy	1949	3	Cystocholecystostomy.	1. Died on 30th day of cerebral hemorrhage. Autopsy proved inadequate drainage of cyst 2. Cured. 3. Improvement.

where a fecal fistula developed on the tenth postoperative day. In another case reported by the same authors, death occurred as a result of peritonitis due to reflux of intestinal contents into the cyst, with subsequent suppuration of the latter. In both cases simple cystojejunostomy was performed. Re-inflammation of the pancreas was never reported following cystojejunostomy. A case was reported by Schrank<sup>55</sup> in which roentgenograms taken five weeks after operation showed definite reflux of barium from a jejunal loop into the cystic residuum, although the patient did well clinically. Brunschwig<sup>8</sup> and DeBakey<sup>13</sup> reported on recurrent cysts, the first because of partial elimination of a multilocular cyst through the initial cystojejunostomy, the second on account of premature closure of the stoma.

In the remaining cases very good results were obtained, even after nine years of follow-up examination, and especially

commended. In 11 cases reported up to now (see accompanying table), rather poor results were obtained with this procedure, in spite of the theoretical consideration that the absorbent capacity of the gallbladder would add to the internal drainage of the cyst. The value of cystocholecystostomy has not merited the lengthy discussions of the procedure which have appeared in the literature. Having no personal experience, we believe that the ductus cysticus should not be ligated, for the main idea is to drain the cyst internally, supplementary drainage through absorption being rather doubtful. In certain cases where anatomical relationships might strongly suggest such a procedure, the method could give good results if the gallbladder possessed a firm, healthy wall and the cyst contents were serous in character.

Of the various anastomoses between pancreatic cysts and the digestive tract, cystoduodenostomy is undoubtedly the most

physiological on theoretical grounds, but due to the rather rare location of pancreatic cysts in the head of the gland, it is not frequently performed. Some surgeons may disapprove of this method because of an unsatisfactory experience with cystogastros-

months' duration, located especially in the left hypochondrium. There was no vomiting or fever, but a little before admission a considerable loss of weight and feeling of weakness were noticed. A tender, fluctuating mass was palpable in the left hypochondrium. Roentgenogram examination showed a mass displacing the stomach anteriorly.

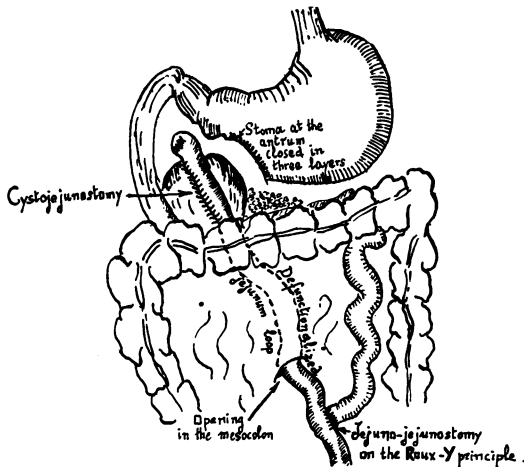


FIG. 3.—Sketch showing the cystojejunos-  
tomy on the Roux-Y principle performed in Case 2,  
after detachment of the cyst from the pyloric  
antrum.

tomy, which is similar to cystoduodenostomy as far as operative conditions are concerned. Nevertheless, the operation is simple, particularly when carried out by the transduodenal route, and it is recommended whenever possible. In eight out of ten reported cases of cystoduodenostomy, excellent results were obtained, not one of the usually anticipated complications being encountered. Mueller's patient died of cancer of the rectum seven years after the cystoduodenostomy. Autopsy verified the complete elimination of the anastomosed cyst. In Kerschner's<sup>32</sup> case autopsy showed the cyst considerably diminished and a patent anastomosis seven weeks following the operation; the patient had died of pulmonary tuberculosis.

#### CASE REPORTS

**Case 1.**—A white female, age 39, was admitted to the Hellenic Red Cross Hospital on April 5, 1949, complaining of abdominal pain of ten

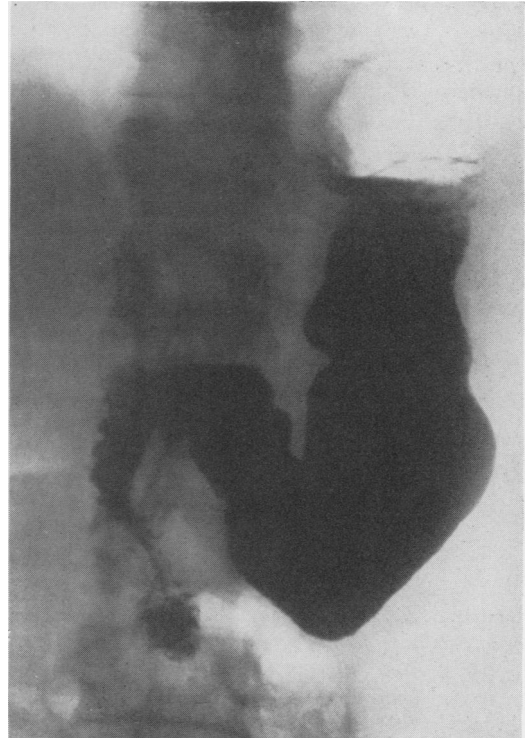


FIG. 4.—Roentgenogram taken four weeks post-  
operationem in Case 2: Normal.

Diastase in urine amounted to 64 Wohlgemut units. Preoperative diagnosis: Pancreatic cyst. On operation (April 28, 1949) a large retroperitoneal mass firmly adherent to the posterior gastric wall was explored. It was then decided to perform a cystogastrostomy, though the initial idea was to use a defunctionalized Roux-Y jejunal loop. Cystogastrostomy was performed transgastrically, some interrupted catgut sutures being placed around the stoma which was 4 to 5 cm. large. Pancreatic enzymes were found in the cystic contents. Pathological examination of its wall showed a retention cyst.

The postoperative course was uneventful. The patient was kept in a prone position for the first few days, taking no food or oral fluids, and was discharged on the 19th postoperative day in very good condition. Two weeks after operation roent-

genogram examination showed no filling of the cyst through the cystogastrostomy. She remained asymptomatic for 3 years, during which she steadily regained weight and strength.

Case 2.—A white male, age 42, was admitted to the Hellenic Red Cross Hospital on December 20, 1949. About 16 months before admission, following a previous history of probable acute pancreatitis, the patient was operated upon in another hospital. A large pseudocyst of the head of the pancreas was then discovered which was marsupialized. Drainage continued for 6 months until

performed in two layers with interrupted silk sutures. The end-to-side jejunojejunal anastomosis was constructed about 25 cm. from the duodenojejunal flexure (Fig. 3).

The patient had an uneventful convalescence and was discharged on the 23rd day in good condition except for a persistent anemia which had existed preoperatively. Roentgenogram examination a month later did not reveal any irregularity (Fig. 4). He was followed for a period of two years, during which he gradually recovered and remained asymptomatic. Recently he has been

TABLE IV.—*Cystoduodenostomy.*

Ombredanne (Ombredanne)	1911	1	Cystoduodenostomy.	Died on the 11th day. Peritonitis.
Kerschner (Kerschner)	1929	1	Transduodenal approach. Additional gastroenterostomy.	Died on the 7th p. o. week of pulmonary TBC. On autopsy cyst was found nearly eliminated.
Kerschner (Kerschner)	1935	1	Transduodenal approach.	Good
Josa	1936	1	Anastomosis to 1st part of duodenum.	Good
Vuori (Vuori)	1936	1	Cystoduodenostomy post ext.-drainage and cystogastrostomy(?).	Good
Siegmund	1938	1	Transduodenal approach.	Good
Dobay	1939	1	Transduodenal approach.	Good
Kunc (Kunc)	1947	1	Transduodenal approach. One of the two cysts explored was transgastrically anastomosed to stomach.	Good
Müller (Müller)	1948	1	Cystoduodenostomy in two layers.	Good On autopsy, 7 years p. o. cyst was found eliminated.
Lorizio	1950	1	Cystoduodenostomy.	

a second operation was performed, also at another hospital. At that time a large cystic residuum was found and anastomosed to the pyloric antrum. Shortly after the second operation he began to complain of continuous epigastric pain, discomfort and fever, and noticed a considerable loss of weight. Roentgenograms taken on the third and eighth month after the second operation verified definite reflux of barium into a cystic residuum which was as large as an orange; the cyst remained filled with barium 24 hours after administration of the meal (Fig. 1). This necessitated a third operation, which was performed 9 months after the second one in the Hellenic Red Cross Hospital on December 24, 1949. The cystic residuum was found attached to the pyloric antrum by an anastomosis 7 cm. in length (Fig. 2). The cyst was detached from the antrum and the stoma closed in three layers. A Roux-Y anastomosis was then performed, during which a defunctionalized segment of jejunum 18 cm. in length was brought through an opening in the mesocolon and anastomosed side-to-side to the cystic residuum. The cystojejunostomy was 8 cm. in diameter and was

suffering from a chronic urinary infection unrelated to the cystojejunostomy.

Case 3.—A 69-year-old white female was admitted to the Hellenic Red Cross Hospital on December 20, 1950, complaining of continuous mild pain in the left hypochondrium, accompanied by nausea, vomiting, and loss of weight of 2 months' duration. A tender firm mass, the size of a child's head, was palpable in the left hypochondrium; roentgenography showed a defect in the greater curvature of the stomach with displacement of its posterior wall to the right. Urinary diastase was increased (128 Wohlgemut units). A preoperative diagnosis of probable pancreatic cyst was made and on December 23, 1950, at laparotomy, a large cyst originating from the tail of the pancreas was found. As the cystic wall was neither resectable or suitable for anastomosis, marsupialization was performed. Pathological examination showed a retention cyst. The cyst continued to drain for 3 weeks, then stopped and the patient was discharged. Three months later, due to premature closure of the sinus tract, the cyst recurred and



the patient did very poorly. Unfortunately we have no additional information on this patient.

**Case 4.**—A 45-year-old white female was admitted to the Hellenic Red Cross Hospital on January 15, 1951, with a history of probable acute pancreatitis of a 2 months' duration. She was then complaining of epigastric pain, fever, anorexia and loss of weight. A tender firm mass was palpable in the left hypochondrium. Roentgenography showed a defect in the greater curvature of the stomach, anteriorly displaced by an extrinsic mass. Urinary diastase amounted to 64 Wohlgemut units. A preoperative diagnosis of pancreatic cyst was made, and on operation (January 18, 1951) cystogastrostomy of a cyst originating from the tail of the pancreas was performed in the same way as in Case 1. Pathological examination proved a pseudocyst. For the first 2 weeks there was an increase in the patient's temperature accompanied by epigastric discomfort, probably due to inadequate drainage. She was kept deliberately in a prone position and underwent intensive antibiotic therapy, after which she recovered and was discharged in good condition on the 24th postoperative day. The patient has since remained asymptomatic.

**Case 5.**—A 44-year-old white female with a previous history of severe cholelithiasis was admitted to the Hellenic Red Cross Hospital on March 7, 1951. She complained of discomfort in the left hypochondrium, nausea and occasional vomiting. Roentgenogram examination showed a defect in the right part of the greater curvature with downward displacement of the transverse colon. A firm, tender mass as large as a child's head could be felt in the epigastrium. The mass was thought to be a pancreatic cyst and the patient was operated upon on March 24, 1951. Exploration revealed a cystic mass displacing the posterior wall of the distal half of the stomach towards the anterior gastric wall so that the pyloric region appeared completely distended over the cyst. On account of the bitter experience in Case 2 with cystogastrostomy in the pyloric area, the surgeon considered performing a cystojejunostomy on the Roux-Y principle, but the intimate relationships between the cyst and the stomach were so favorable that it was finally decided to perform a typical transgastric cystogastrostomy. Pathological examination of the cystic wall showed a pseudocyst. The postoperative course was uneventful and roentgen study 2 weeks after operation showed no filling of the cyst with barium. The patient was followed for a year, during which time she recovered completely.

**Case 6.**—A 30-year-old white male was admitted to the Evangelismos Hospital in April, 1949.\*

His history was of severe acute pancreatitis 4 months previously, after which he experienced anorexia, feeling of weakness, slight abdominal distention and low fever. There was probably a second episode of pancreatitis 2 weeks before admission. The patient had already lost 30 kgs. of weight. The preoperative diagnosis was pseudocyst of the pancreas and on operation (April 28, 1949) a pseudocyst of the head of the pancreas was explored and transgastrically anastomosed to the pyloric antrum. The patient made an uneventful recovery. A roentgenogram taken 3 weeks after the operation showed no filling of the cyst through the cystogastrostomy. He has remained completely asymptomatic now for a period of 3 years.

#### SUMMARY

The surgical treatment of pancreatic cysts with special reference to internal drainage has been discussed.

Total excision of the cyst remains the ideal procedure to be performed whenever possible.

External drainage should be limited to cases of pseudocysts which cannot be excised or which have a wall unsuitable for anastomosis.

Of the various types of internal drainage, cystogastrostomy is the simplest, especially when the approach is made transgastrically. This procedure has been strongly criticized. However, only a very few actual failures have been reported.

Cystojejunostomy with the use of the Roux-Y technic has gained increasing popularity, and this procedure has given excellent results to date.

In one of our cases, the Roux-Y technic was successfully used to repair the complete failure of a previous cystogastrostomy performed post marsupialization. This case appears to be unique.

Four more cases of successful transgastric cystogastrostomy have been presented.

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\* Dr. A. Manos, Director of the II Surgical Department of this Hospital, has kindly allowed us to report on this case.

These patients have been followed for periods ranging from one to three years.

Internal drainage is, in our view, the procedure of choice. The 105 cases collected in this paper lend considerable statistical support to its use.

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