PANCREATODUODENECTOMY: A "CURATIVE" OPERATION FOR MALIGNANT NEOPLASMS IN THE PANCREATODUODENAL REGION

REPORT OF THREE OVER-FIVE-YEAR SURVIVORS*

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THE ARBITRARY CRITERION for cure in reporting results of therapeutic effort for malignant neoplastic disease is five-year survival without evidence of persistent, recurrent, or metastatic disease. As more experience in the handling of patients with cancer is accumulated, the five-year survival period is becoming to be regarded more as simply a measure for survival and not necessarily a criterion for definitive cure, although for certain forms of malignant disease such periods of survival free from disease are gratifying indeed from every standpoint.

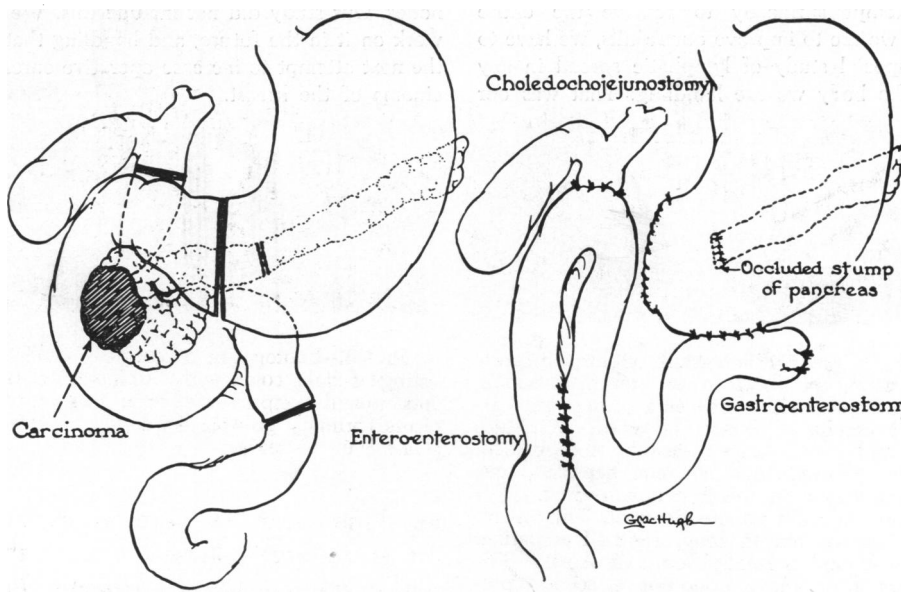

FIG. 1.—Schematic representation of pancreatoduodenectomy (author's technic). The neck of the pancreas is not implanted into the jejunum. This procedure was carried out in the patients described in the text, except that in the third patient the gallbladder was also anastomosed to the jejunum, as well as the common bile duct.

In general, patients with malignant neoplasms arising in the pancreatoduodenal region succumb in the course of several months following the onset of symptoms. Short-circuiting operations to relieve jaundice may prolong life, but even this has been questioned and the palliative effects of

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these operations has been ascribed to relief of symptoms due to obstructive jaundice. Survival for periods longer than five years

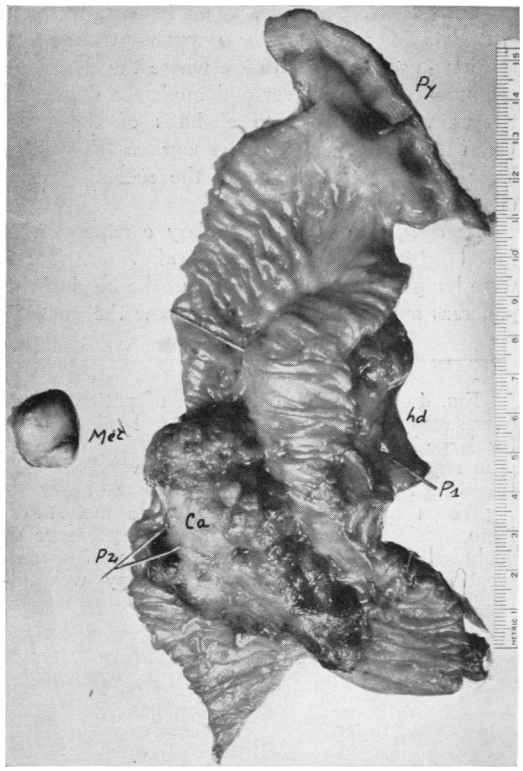


FIG. 2.—(Case 1) Photograph of surgical specimen consisting of (Py) lower end of stomach; entire duodenum with (Ca) large fungating carcinoma of papilla of Vater; (hd) head of (Met) pancreas and (Met) large metastatic node present at junction of cystic and common hepatic ducts. (P_2) metal probe in lower common duct; (P_1) metal probe in main pancreatic duct. This operation was carried out in May, 1943. The patient remains well and normally active in April, 1952. Two years after above operation a second procedure was carried out, right colectomy, for a second primary carcinoma in the ascending colon (see Fig. 3).

free from evidences of active disease and in good general condition with full pursuit of usual physical activities, it would seem, can be ascribed to surgical efforts in the case of malignant epithelial neoplasms arising in the pancreatoduodenal region, since the natural course of neoplasms arising in this region is rather rapid.

Pancreatoduodenectomy for cancer of the ampulla of Vater and for cancer of the head of the pancreas was introduced in 1935[5] and 1937[1] respectively, and since that time increasing numbers of such operations have been performed until at present the procedures are generally regarded as more or less standard. Prolonged survivals follow-

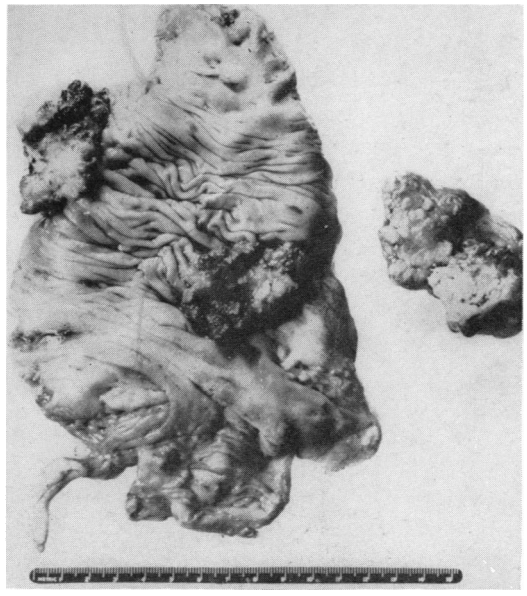
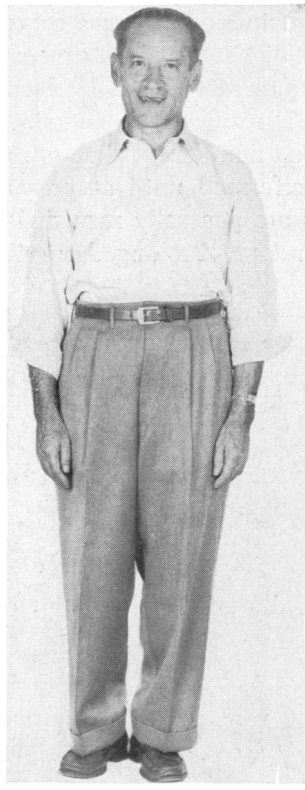


FIG. 3.—Photograph of surgical specimen consisting of right colon with carcinoma in ascending portion and lymph node metastases. This is the second primary growth developing in this patient (Case 1 in the text).

ing these operations have not yet been recorded in large numbers, and for this reason a group of three patients—from the writer's personal series now living and well eight and one-half, seven and over five years following pancreatoduodenectomy are presented. They are patients who have been previously cited in connection with other reports,[2, 3] but not previously as an over-five-year survival group from this operation. They are presented for the purpose of demonstrating that pancreatoduodenectomy is no longer an "experimental" procedure, or one to envisage palliation, but a proce-



dure that can afford patients an opportunity for more than five-year survival (Fig. 1).

CASE REPORTS

Case 1.—N. G., male, age 55 years, was admitted in May, 1943. There was a previous admission in another institution where the dyspeptic symptoms, enlarged liver and moderate degree of icterus were ascribed to cirrhosis of the liver. Upon this admission roentgenograms showed a large papillomatous lesion in the second portion of the duodenum.

At operation a large papillary carcinoma was found arising from the papilla of Vater. There were lymph node metastases about the head of the pancreas and the node situated below the junction

FIG. 4.—(Case 1) Photograph of patient taken over seven years following pancreatoduodenectomy for large carcinoma of papilla of Vater with regional lymph node metastases and over five years following right colectomy for carcinoma of ascending colon and regional lymph node metastases. Note satisfactory nutritional status in presence of occluded external pancreatic secretion. No pancreatin or other substitutional therapy was administered.

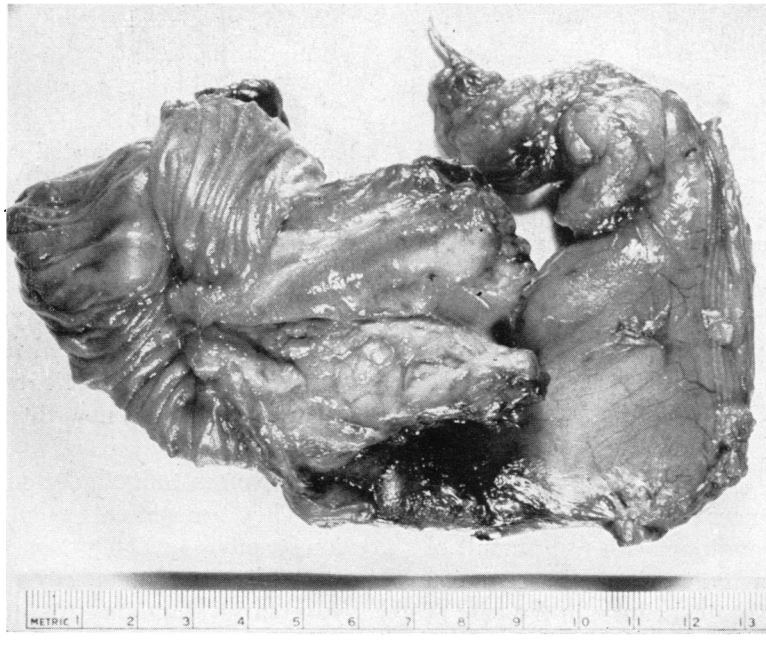


FIG. 5.—(Case 2) Photograph of surgical specimen consisting of head of pancreas, lower end of stomach and entire duodenum. The head of the pancreas has been split to expose carcinoma arising from near the termination of the main pancreatic duct (duct cell carcinoma of head of pancreas). The patient is well and normally active over seven years following operation.

of cystic duct and common hepatic duct was enlarged, globular and firm, obviously involved by metastases. A radical pancreatoduodenectomy was performed (Fig. 2). The neck of the pancreas was not implanted into the jejunum but tied off securely. Histologic study revealed carcinoma of the papilla of Vater with metastases to the nodes about the head of the pancreas and to the node high in the porta hepatis where the cystic duct joins the common hepatic duct to form the common bile duct. Convalescence was uneventful.

In November, 1945, a second laparotomy was performed by the writer for a palpable mass in the mid-right lateral abdomen, and upon clinical examination it was thought to be a metastasis from the lesion described above. Instead a second primary was found in the ascending colon with metastases to nodes in the right retroperitoneal space corresponding to the site of the growth in the colon. A right hemicolectomy was performed with ileotransverse colostomy, and right retroperitoneal *en bloc* lymph node excision also carried out.

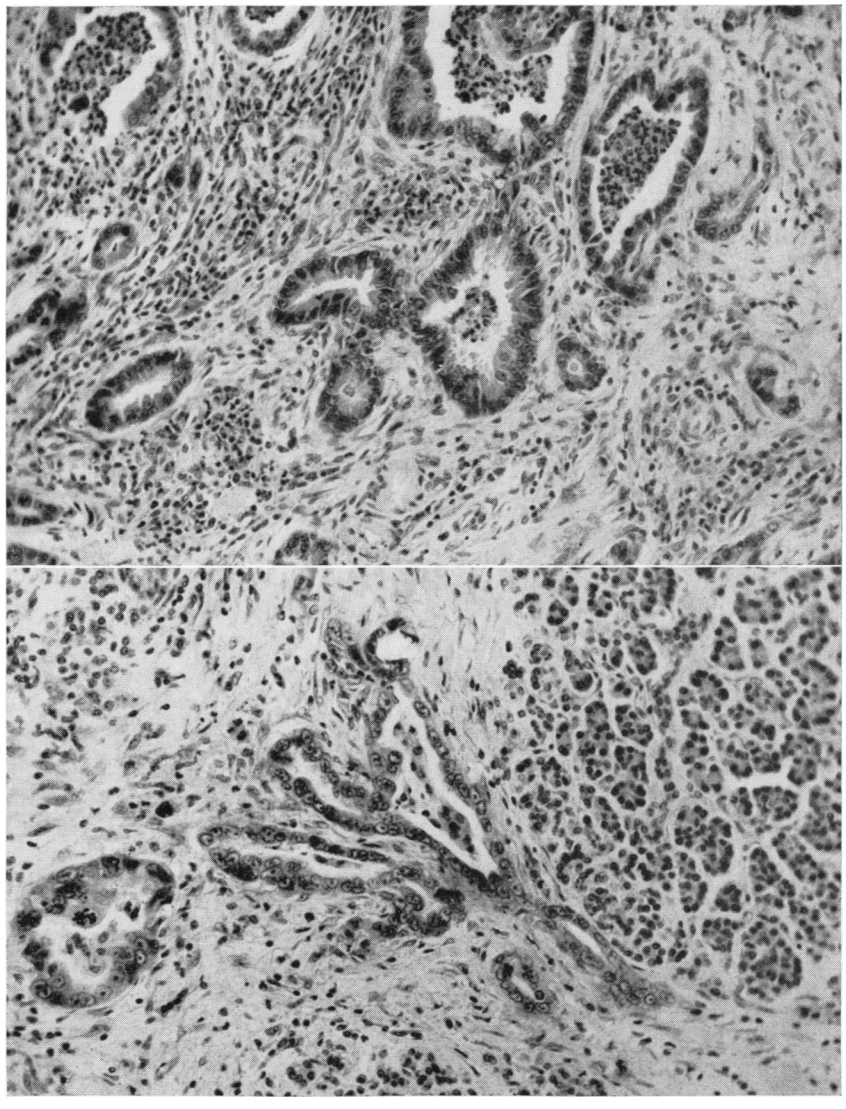


FIG. 6.—(Case 2) Microphotographs of sections from carcinoma of head of pancreas. (A) "malignant ducts" infiltrating peripheral portion of duodenal wall. (B) "malignant ducts" infiltrating interlobular septa of the head of the pancreas.

Convalescence was again uneventful (Fig. 3).

At the first laparotomy in 1943, the liver appeared finely granular and biopsy revealed periportal cirrhosis and vacuolization with enlargement of a number of the hepatic cells. At the second laparotomy the appearance of the liver was improved and biopsy revealed decreased severity of the hepatitis.

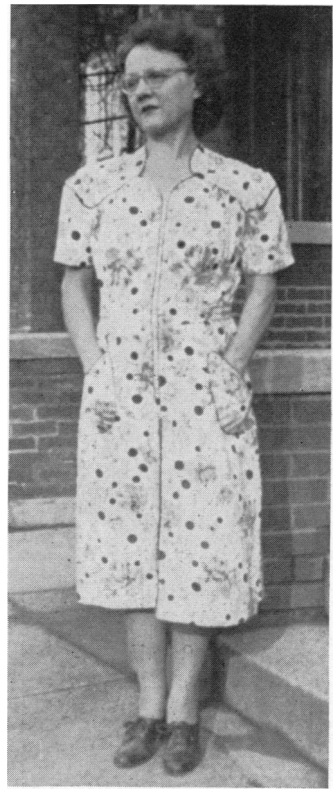


FIG. 7.—(Case 2) Photograph of patient taken seven years after pancreatoduodenectomy for carcinoma of the head of the pancreas. Note satisfactory nutritional status in presence of occluded external pancreatic secretion. No substitutional therapy of any type was received.

Since 1943, with exception of the fall of 1945, the patient has been well. His weight is maintained. He pursues his usual work, that of a bookbinder. There were periods of dyspepsia but these are much less frequent than formerly. There are 3 to 4 stools a day, yellowish brown, somewhat bulky and pasty. To all intents and purposes he is a normal person. At this writing it is 8 years and 7 months since the pancreatoduodenectomy and 6 years since the right hemicolectomy (Fig. 4).

Case 2.—E. R., a female, 42 years of age, was admitted November, 1944, complaining of 15 to 20 pounds loss in weight and mild icterus. The latter was thought to be of only a few weeks' duration. Dyspeptic symptoms were present for some weeks.

At laparotomy a small hard mass in the head of the pancreas was discovered; the common duct was considerably dilated, as was the gallbladder. The hard mass in the head of the pancreas was at the periphery of the latter near the duodenum in the region of the ampulla. A pancreatoduodenectomy was carried out. The pancreatic stump was ligated and not reimplanted into the jejunum. When the gross specimen was bisected and the main pancreatic and common bile ducts opened in their entirety, the mass was observed to be about 0.5 cm. in diameter and situated below and proximal to the terminations of the common bile and main pancreatic ducts as these passed into the duodenal wall (Fig. 5). There was no common channel to form an ampulla of Vater. The papilla of Vater was edematous. From macroscopic appearance the lesion seemed to be situated in the head of the pancreas and quite possibly arising from the termination of the main pancreatic duct. Inasmuch as the great majority of carcinomas of the pancreas arise from the pancreatic ducts, this growth is classified as a carcinoma of the head of the pancreas (duct origin). Histologic sections (Fig. 6) reveal the "malignant ducts" permeating the interlobular septa in the pancreatic parenchyma and streaming toward the duodenal wall in the fibrous tissue between pancreatic parenchyma and duodenal wall.

Convalescence from the operation was essentially uneventful and throughout the years the patient has continued a more or less normal existence. A letter from the patient written after seven years following operation states: "I was feeling wonderful until one year ago when I began to feel tired and had very little energy. . . . About six weeks ago I went to see our doctor and found that I am anemic. I have been taking iron pills daily and get "one shot" a week. . . . At present I feel wonderful. My appetite is very good. I'm always eating and everything I eat agrees with me. My bowel movements are never less than three times a day and sometimes four and six times a day. At present my weight is 136 pounds." (Fig. 7).

Case 3.—C. F., male, 37 years of age, was admitted August, 1946, complaining of epigastric pain of 6 years' duration, nausea and vomiting for one year, "heart burn" for "many years," loss of 20 to 25 pounds in weight during the previous six months. There was no icterus. Fluoroscopic ex-

amination revealed greatly dilated stomach and pylorus and first portion of duodenum with severe grade of stenosis in second portion of the duodenum. At laparotomy performed in September, 1946, a constricting lesion, obviously malignant neoplasm, was found in the second portion of the duodenum, and about the head of the pancreas there was a cluster of markedly enlarged but discrete lymph nodes. At the operating table the lesion was interpreted to be a lymphosarcoma of the duodenum with regional lymph node involvement. A pancreatoduodenectomy was carried out, excising also the cluster of enlarged nodes about the head of the pancreas. Choledocho- and cholecysto-jejunostomies were done to anastomose external biliary to alimentary tracts. The pancreatic stump was not implanted into the jejunum.

Study of the gross specimen revealed a constricting ulcerating neoplastic lesion in the second portion of duodenum just above the papilla of Vater which was not involved but which had become curiously enlarged and edematous (Fig. 8). The microscopic sections revealed the lesion to be a carcinoma and there were metastases in the enlarged nodes. Because of the associated pronounced lymphoid hyperplasia, or reaction, the microscopic diagnosis was lympho-epithelioma (glandular type) of the duodenum.

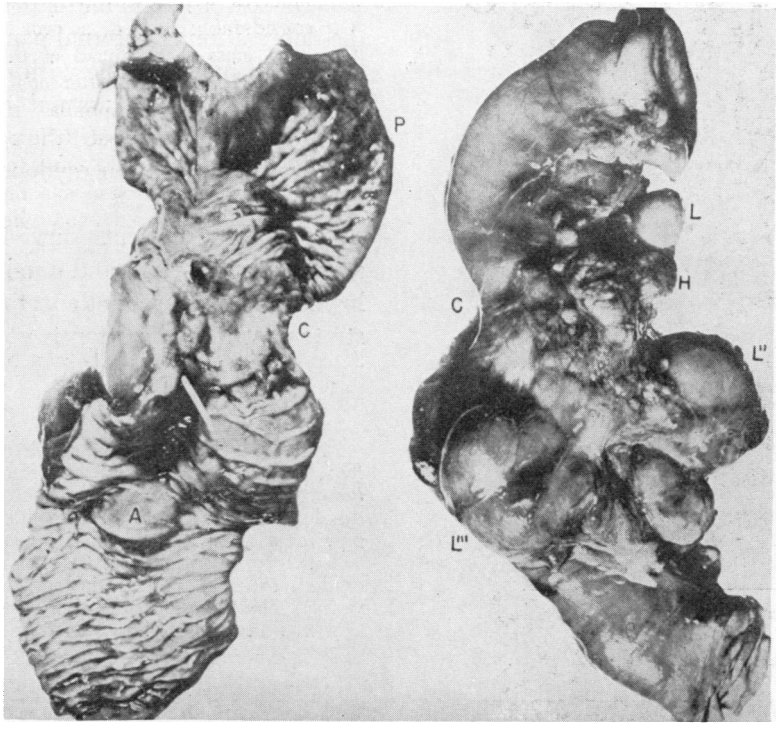


FIG. 8.—(Case 3) Photograph of surgical specimen removed by pancreatoduodenectomy and consisting of entire duodenum, (H) head of pancreas, (P) pyloric end of stomach. In the first segment of the second portion of the duodenum there is an annular carcinoma, (C) which infiltrated the subjacent head of the pancreas to production of (A) marked edema of the papilla of Vater. (L,L,L) peripancreatic enlarged lymph nodes due to marked lymphoid hyperplasia and carcinomatous metastases. Five years and four months after operation the patient is well and engaged in his full time occupation of railroad yard worker. There is no evidence of nutritional disturbance due to occluded external pancreatic secretion.

Convalescence was uneventful and he was discharged on the 17th postoperative day. During a period of 9 months after the operation he had "oily stools" following the ingestion of fatty foods and he had about 4 stools a day; later these were reduced to 2 a day and were not as "oily." In July, 1951, gastroduodenal fluoroscopy was carried out and the altered upper alimentary canal noted. There were many irregular radiolucent objects interpreted as giant mucosal folds. The examination was repeated on September 29, 1951, and similar findings observed. In view of the fact that the

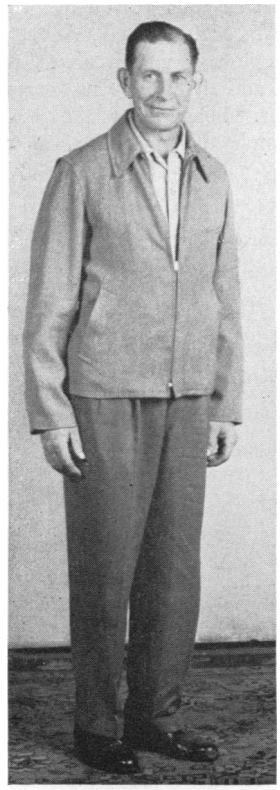


FIG. 9

patient was feeling so well and working as usual, no further study was ordered. (Report by Dr. D. A. Cofrin, resident staff, University of Chicago.)

DISCUSSION

The well being of these patients demonstrates quite emphatically that apart from altered bowel habits and stool consistency, the deprivation of external pancreatic secretion is not incompatible with indefinite survival in essentially normal conditions in man. No special substitution therapy was given and there is no evidence of hepatic dysfunction.

These three patients surviving over five, seven and over eight and one-half years following pancreatoduodenectomy demonstrate that this operation is no longer to be regarded as "experimental" but one which is able to afford the patient a chance for

FIG. 9.—(Case 3) Photograph of patient taken five years and three months after pancreatoduodenectomy for carcinoma of second portion of duodenum that extended into head of pancreas and metastasized to regional lymph nodes. Note satisfactory nutritional status in presence of occluded external pancreatic secretion (over five years). No pancreatin or other substitutional therapy was administered.

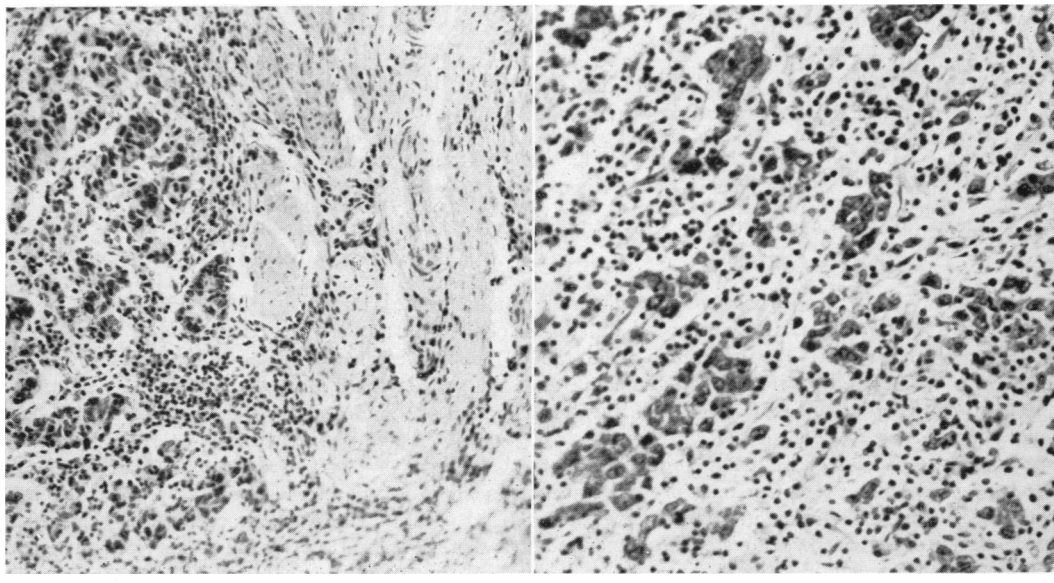


FIG. 10.—(Case 3) (A) Microphotograph of primary lesion, carcinoma duodenum, showing infiltration of duodenal wall. (B) Microphotograph of areas of metastatic carcinoma in one of the several enlarged peri-pancreatic lymph nodes.

"cure" for malignant neoplasms arising in the pancreatoduodenal region. These patients do not present special situations; they are not examples of very minute lesions found only by microscopic examination and fortuitously removed. The histories in each case were fairly typical of pancreatoduodenal neoplasms; at operation there was neoplasm present on macroscopic examination and in two instances there were macroscopically evident regional lymph node metastases. Histologic study confirmed the macroscopic findings.

It is of interest that among these three over-five-year survivors, three different types of malignant neoplasms were found that necessitate pancreatoduodenectomy for their resection, viz., carcinoma of the papilla of Vater, carcinoma of the duodenum and carcinoma of the head of the pancreas. The writer does not subscribe to the view that differentiation should be made in the case of pancreatoduodenal lesions as to which should be excised and which should be short-circuited, *i.e.*, excision for ampullar lesions and short circuiting procedures for neoplasms of the head of the pancreas. Whenever a lesion is resectable it should be removed, as this is the only chance the patient has for "cure." Corroborative evidence for this point of view is afforded by the recent report by Miller and Clagett,[4] who cite another five-year survival following pancreatoduodenectomy for carcinoma of the head of the pancreas.

SUMMARY

Three patients whose malignant neoplasms were so situated (Papilla of Vater, head of pancreas and second portion of duodenum) as to require pancreatoduodenectomy for their excision have survived over eight, and seven years, and five years two months, respectively. In two of these patients there were extensive regional lymph node metastases. These case histories constitute evidence that pancreatoduodenectomy is certainly beyond the "experimental stage" and capable of affording five-year "cures" for malignant neoplasms in the region of the duodenum and head of the pancreas.

Addendum: Since this report was first submitted for publication the family of Patient N. G., Case 1, has reported that pulmonary metastases have developed and that biopsy performed elsewhere suggests they are secondary to the primary cancer of the colon.

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DISCUSSION.—DR. CHARLES GARDNER CHILD, III, New York City: It is indeed a pleasure to congratulate Dr. Brunschwig on introducing a note of enthusiasm insofar as this unhappy group of patients is concerned.

We concur insofar as the papillary tumors—those primarily in the duodenum—are concerned. However, our efforts in the primary pancreatic tumors have been dismal, indeed. Out of 15 such patients—that is, those with primary pancreatic cancer—we have but one five-year survival. Interestingly enough, it was Dr. Foote's opinion that this, too, was a tumor primary in the duct system of the pancreas rather than that of acinar origin.

About two years ago my associates and I believed that we might improve this record, were we able to resect the portal vein. At that time we presented here our preliminary experiments in the monkey with resection of this vessel. Since then we have been able to resect the portal vein in continuity with the head of the pancreas in two patients, by employing a two-stage procedure. The two stages are necessary to permit the severe degree of portal hypertension attending sudden occlusion of the portal vein to subside. During the week or so intervening between the first and sec-