RESULTS OF TREATMENT OF CARCINOMA OF PANCREAS*

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IN A RECENT publication, Dr. Thomas Orr[2] has reported the results of treatment of carcinoma of the pancreas and has pointed out that additional final results should be reported, so that the treatment of this disease can be more adequately evaluated.

This present report is limited to a discussion of the results of treatment of 37 patients† known to have carcinoma arising in the head of the pancreas. In order to focus sharply on one facet of the problem, patients who had carcinoma arising from the ampulla or from the duodenum, and those who had pancreatic carcinoma of the islet cell or adenocystic varieties, have not been considered. No patient has been included unless an exact pathologic diagnosis of tissue removed from the pancreas could be made under the microscope. All patients have been followed.

It is fortunate that carcinoma of the head of the pancreas is a relatively uncommon lesion. It has been estimated that one or two patients per thousand general hospital admissions suffer from this disease, but the authors believe it to be less common than that. As has been so well pointed out by Cattell and Warren[1] and others, one of the traditional fallacies is the teaching that the pathognomonic symptom is painless jaundice. Indeed, the seemingly increasing incidence of infectious hepatitis and that of homologous serum jaundice further deemphasize pancreatic cancer as the chief cause of painless jaundice. All with experience in treating this condition are impressed by the frequency of severe pain as a primary symptom. The pain is generally in the upper abdomen, with radiation to the back. It is often similar to that experienced in peptic ulcer; it may also occur in attacks resembling the paroxysms of pancreatitis. In our experience, unhappily, this has led to erroneous diagnosis and to resultant delay in the proper treatment of the disease.

When both pain and jaundice occur and when the laboratory tests indicate clearly that the jaundice is the result of obstruction of the extrahepatic biliary tract, the indication for surgical therapy is clear, even though the correct diagnosis may not have been made before operation. Often enough, however, the laboratory procedures, including barium studies of the upper gastrointestinal tract, are of no aid in making a diagnosis until the disease is far advanced.

There were ten patients who underwent exploratory laparotomy and biopsy only; 16 patients had a palliative procedure performed which, in every instance, was some form of biliary tract shunt for the relief of the biliary obstruction. In 11 patients, pancreaticoduodenectomy was carried out. In each of the 37 cases, an exact pathologic diagnosis was made, although this was

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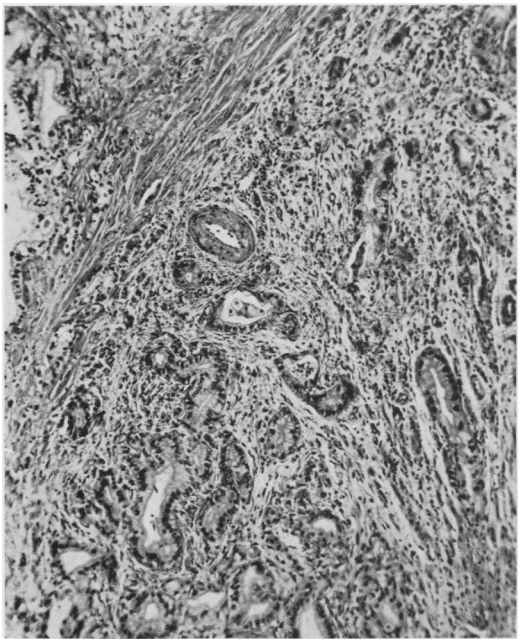

FIG. 1. Photomicrograph of adenocarcinoma of head of pancreas ($\times$ 87). This patient is living and well 16 months after pancreaticoduodenectomy.

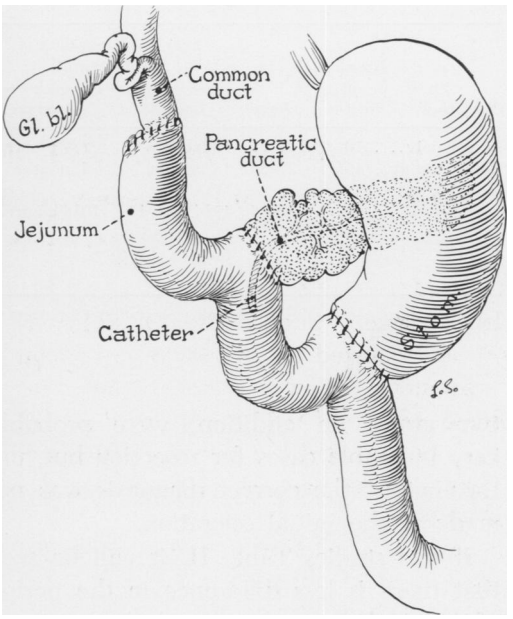

FIG. 2. Diagram of reconstruction of gastrointestinal tract following pancreaticoduodenectomy.

sometimes from a biopsy, sometimes from the operative specimen, or sometimes at postmortem examination. In all of the cases here reported, the lesion was adenocarcinoma of the pancreas of the duct cell variety, as illustrated in Figure 1.

In reporting the results of surgical therapy, it has been traditional to report five-year cures, or survival times commencing from the date of operation. It has seemed to us that this is probably an incorrect and unrealistic method of reporting results. What is really the crux of the matter is to discover whether or not a given therapeutic procedure has influenced the course of a disease. In order to do this one should start the period of evaluation with the onset of the disease; obviously, a long-term result in disease of short preoperative duration may be of no more value to the patient than a short-term result in longstanding disease if the two total periods are of comparable length.

In Table I it will be noted that the traditional method of evaluating procedures has been employed. As would be expected, those for whom nothing could be done survived the shortest period. When the surgeon found it possible to perform a palliative shunt, the patients lived twice as long after operation, and those patients undergoing resection of the pancreas appeared to achieve the longest period of survival. There is only one living patient, the one from whom the neoplasm shown in Figure 1 was removed 16 months ago, and who is in good health at the time of this report. It might be argued that better results could be expected in the resection group because this procedure would be reserved for the most favorable cases. In the group of patients reported here, however, this has not been a factor, because some of the surgeons of our group do not undertake the extensive resection procedure. Others of the patients in the pallia-

TABLE I

Operation	Number of Patients	Ages	Survival (from date of operation) Longest	Average
Biopsy only....	10	44–71	10 months	2½ months
Biliary shunt..	16	27–78	13 months	5 months
Pancreaticoduodenectomy...	11	38–75	18½ months (1 patient living at 16 months)	10½ months*

*Immediate postoperative mortality excluded (3 patients).

TABLE II

Operation	Number of Patients	Ages	Survival (from onset of symptoms) Longest	Average
Biopsy only....	10	44–71	14 months	6½ months
Biliary shunt..	16	27–78	29 months	11½ months
Pancreaticoduodenectomy...	11	38–75	23½ months (1 patient living at 20 months)	14 months*

*Immediate postoperative mortality not included (3 patients).

tive group, in addition, were probably very favorable cases for resection but, unfortunately, the correct diagnosis was not made at the initial operation.

If one studies Table II, it will be seen that there is less difference in the period of survival from the onset of symptoms, whether palliative procedure or resection was carried out. On the average, patients judged suitable for either type of procedure survived the onset of symptoms by only 12 to 14 months. This would suggest that the type of operative procedure had not influenced the course of the disease. Although the onset of symptoms does not necessarily mark the initial appearance of the neoplasm, there is not at present a better means available for gauging the start of the disease. It seems to us, from the evidence in Table II, that carcinoma of the head of the pancreas usually takes one of two courses, the one associated with relative absence of symptoms until distant metastases have occurred resulting in a brief illness, and the other associated with the production of pain and/or jaundice in a somewhat more gradual manner, resulting in disease of a more prolonged nature.

Since the introduction of pancreaticoduodenectomy by Whipple, Parsons and Mullins,[4] and its subsequent modification by Trimble, Parsons and Sherman[3] and others, the operative mortality for this extensive procedure has been gradually brought down. Cattell[1] reports a mortality of 12.7 per cent, not significantly higher than the mortality reported for palliative shunts. Since this is so, and since the survival time is at least equivalent to that of palliative procedures, we believe that it is entirely justifiable to continue to perform pancreaticoduodenectomy in suitable cases. Sooner or later patients will be encountered in whom the lesion is actually confined to the specimen removed at operation and, in this way, actual cures will be obtained.

All who have dealt with this disease have been impressed with the difficulty of making an accurate diagnosis, even at the operating table. In carcinoma of the pancreas, it is likely that only the advanced unfavorable neoplasms will permit a successful biopsy. We favor the following procedure. Biopsy is first taken from the head of the pancreas. If this shows no tumor, the duodenum is opened and a biopsy taken from the ampullary area. If this, too, is unsuccessful, and if there are no evidences of distant metastases, resection is undertaken. It is realized that an occasional resection will be carried out for benign disease of the pancreas, but we believe that this risk is justifiable in the attempt to cure patients who have cancer. Following removal of the head of the pancreas and duodenum, a variety of methods for re-establishing the continuity of the alimentary tract is available. The authors prefer the method illus-

trated in Figure 2, a one-stage procedure which employs the common duct rather than the gallbladder. These principles were first advocated by Trimble.[3]

SUMMARY

A review of 37 proven cases of carcinoma of the head of the pancreas has been presented. This small number does not justify the drawing of conclusions. It is of interest that only one of these patients is living, 16 months after pancreaticoduodenectomy. These results are in accord with those reported by others. Despite the gloomy outlook, it is fair to say that carcinoma of the pancreas must be attacked if it is to be cured. The gradual lowering of operative mortality associated with pancreaticoduodenectomy ranks this as at least as favorable a palliative procedure as the various biliary tract shunts. The authors believe that it is worthwhile to continue the radical attack on favorable lesions in the hope that eventual cures will be obtained.

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DISCUSSION.—DR. RICHARD B. CATTELL, Boston, Mass.: I should like to express my admiration of the courage of Drs. Stafford, Trimble and Classen in limiting their report to the most unfavorable group of lesions in the pancreatoduodenal area. They could make their results appear much more favorable than those they have presented by including the patients with carcinoma of the ampulla of Vater. What they have shown us by this large experience with carcinoma of the head of the pancreas is that surgical excision by pancreatoduodenal resection is usually followed by early recurrence and death.

I would like to comment briefly on certain steps that have been utilized by surgeons interested in this problem in an attempt to improve the results. I believe these steps are necessary in order to arrive at a proper understanding of what can be accomplished and yet, based on the experience that Dr. Stafford has just presented, I think there is very little possibility of increasing the salvage rate in cases of carcinoma of the pancreas by more extensive surgery. For example, taking out the portal vein or the superior mesentery vein because of involvement by adenocarcinoma is, I think, doomed to failure. Dr. Stafford reported that a positive biopsy was usually obtained before proceeding with resection. We have come to the point of view that if a positive biopsy can be readily obtained in carcinoma of the pancreas, the lesion is probably inoperable because of extension. This is not true if needle biopsy is utilized.

The high recurrence rate of this type of carcinoma—adenocarcinoma of the duct—may be due to a number of factors, and probably one of the important ones in partial pancreatectomy is the dislodgement and floating of tumor cells in the ductal system of the pancreatic remnant. If, in carrying out pancreatoduodenal resection, the surgeon crosses a line of malignant infiltration, we think those patients may die earlier than if they do not have a resection, because carcinomatosis is likely to develop earlier, and this may be indicated by having carcinoma grow out of the drainage duct.

These remarks support our belief that pancreatoduodenal resection should be limited to those patients with favorable lesions without extension beyond the head of the pancreas. In recent years we have considered 25 per cent of cases of carcinoma of the head of the pancreas to be suitable for resection.

One thing that has been demonstrated by Dr. Trimble's group in Baltimore is that this operation can be done with a reasonably low mortality in selected cases. In our own experience this has been 14 per cent. I would like to call attention, in the presence of Dr. Stone, in view of his acceptable comments on super-radical surgery, to the fact that pancreatoduodenal resection can be done for these serious lesions, leaving a reason-