duct as early as feasible after the diagnosis has been established offers the optimum opportunity for recovery. Definitive operations for biliary tract disease may be expected to add trauma to the involved pancreas. We believe such procedures are contraindicated. Perhaps this has contributed to the tendency to avoid operation in the past two decades. If an acute fulminating pancreatitis is present when operation is done, little will be accomplished. Preoperative evaluation to determine the extent or degree of the pathologic process in pancreatitis is difficult and unsatisfactory. The persistently high mortality of pancreatitis associated with biliary tract disease, even with modern supportive measures, is indicative of the inadequacies of the current methods of management.

Pertinent to our recommendation that the surgical treatment of pancreatitis associated with biliary tract disease be re-evaluated is the statement of Eugene Opie [8] (1901) on the treatment of acute hemorrhagic and gangrenous pancreatitis: "What has been said concerning the etiology and pathology of acute inflammation of the pancreas demonstrates the futility of medical treatment directed to the palliation of the lesion."

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Discussion

Dr. Warren H. Cole (Chicago): The exact cause of pancreatitis is not known, but it is well known that in many cases the disease is related to biliary tract disease. In Dr. Glenn and Dr. Frey's report they estimate that this relationship may be as high as 60 per cent; I think that corresponds very closely to our experience.

It is rather unique that in 6 per cent of their cases the pancreatitis followed the cholecystectomy, and in 5 per cent it followed some other type of operation. What could be the cause of this? Often the pancreatitis occurs just a few days after an operation (usually celiotomy). Is it trauma, or is it spasm of the sphincter of Oddi which takes place after cholecystectomy? I think it may be either; at least we must keep both in mind.

It is well known that the disease occurs with varying degrees of severity, and of the 221 cases they report 47 were severely ill, and in that group they did not operate; naturally the mortality rate was high in this group.

We do have to emphasize that now and then some of those sick patients will be improved under chemotherapy and supportive therapy and become operable. Operation will usually be urgent if suppurative cholangitis is present.

They also reported that in 150 cases of the less severe type operation was performed. Up to date I have taken a more conservative attitude in acute pancreatitis without jaundice, usually postponing operation until the patient is over the acute phase. If cholecystography reveals gallbladder disease the operation will be an elective cholecystectomy with or without common duct drainage depending upon indications.

In other words, we seldom operate on patients with acute pancreatitis unless there is evidence of common duct obstruction; that, of course, presents a different indication. We know there are many, many cases in which stone will go down the common duct, lodge at the sphincter of Oddi, compress against the pancreatic duct, and block it; under such circumstances it is obvious the patient needs help consisting of removal of the stone. It is well known that in the presence of biliary tract disease removal of the gallbladder and stones in the common duct (if present) will be quite effective in preventing recurrent attacks of pancreatitis.

Dr. Glenn has emphasized the value of common duct decompression in acute pancreatitis; I fully agree it is important when obstruction is definite, but if not I am a bit worried lest the operation may exert too big a load for the patient.

It is very difficult to prove whether this emergency operation is better than the delayed operation. It is hard to say, but their postoperative mortality rate of 8 per cent is quite good, and I think we must look at that result as being possible evidence for a more radical approach than what some of us are practicing.

Dr. Dan W. Elliott (Columbus, Ohio): I would like to tell you about our experience with acute pancreatitis at the University Hospital in Columbus, Ohio.

(Slide) During the past 15 years we have had 339 cases of acute pancreatitis. All of these patients have had an elevated serum amylase, together with typical physical findings. Of this total, 62 per cent had x-ray evidence of gallstones demonstrated either before or just after their acute pancreatitis. By far the most common operation performed in this group of patients was a biliary tract operation, and this operation nearly always included an exploration of the common bile duct.

We have made a practice of deferring operation whenever possible, and have relief upon nonoperative and supportive management for the acute attack. As a result, only one patient in 20 is operated upon during the first week as an emergency, during the acute phase of the illness. In contrast, one patient in four is operated upon electively after suitable preparation during the second and third week, before hospital discharge. We recommend such an elective operation only for demonstrated biliary tract disease.

(Slide) This is our record. There is a 7.2 per cent mortality for the entire series of 339 cases. The operative mortality of 35 per cent for the relatively small number of emergency operations seems strikingly high. However, these patients were operated upon because of a mistaken diagnosis or poor response to treatment. On the other hand, the 1.2 per cent mortality figures seem good for the patients operated upon as electively scheduled cases, in the second or third week of illness. The operation seems as safe at this time as it would be a few weeks or several months later.

In addition we have analyzed our 25 deaths to see if early operation could have improved this record. We found that four of these deaths were accounted for by shock unremitting from hospital admission. In 12 cases there was oliguria, cardiovascular accident, uremia, or some other very severe complicating feature that made these cases very unwelcome surgical candidates. Six patients had an emergency operation, leaving only three in whom an operation was possible but none was performed. Therefore, of the 25 deaths there were only three patients who might have benefited from earlier surgery.

We continue to think that the appropriate biliary operation should be performed electively, after proper preparation, during the patient's initial hospitalization. However, the patient should first be supported through the acute phase of his illness if at all possible. He may then be operated upon quite safely during the second or third week of his hospitalization, when his general condition will be much improved.

Dr. Jonathan E. Rhoads (Philadelphia): I took the position for a number of years back in the early forties that it was not such a sin to operate on these people. We operated on a good many of them and analyzed our statistics, and they seemed to die at just about the same rate as those that were not operated on, so that I was never able to follow the viewpoint that it did a lot of harm.

Convinced finally by other people's statistics that we probably ought not to operate on acute pancreatitis, we then went along for a period of years and analyzed our statistics again, only to find that despite this decision we still operated on a sizable percentage, perhaps as much as 40 per cent, not because we intended to, but because we could not make up our minds about the diagnosis, and we thought we might have a ruptured ulcer or some other lesion that badly needed early exploration.

Like all series in which you select cases for different forms of treatment, you end up with something that you can not draw conclusions from. In other words, if you operate on those patients whose symptoms are so severe as to suggest a ruptured ulcer and do not operate on those in which it is fairly clear that you have no other diagnosis that is tenable but acute pancreatitis, you are apt to get your severe pancreatitises in the first series. I think this is one of the things which have clouded the issue.

I apologize for arriving unprepared, but I really had not known that I was scheduled to discuss this. I think it is fine that the question has been re-opened. I appreciate very much that it has been re-opened so widely, and I think that a number of us will want to go over our statistics afresh and then try to make a new decision without prejudice to those decisions in which we may have participated before as to whether all these cases should be explored or should not.

My own belief is that if you explore them in the acute phase and find acute pancreatitis, you should do a minimum at that time. I have seen some people that went down and out pretty fast from doing a common duct exploration in the case of an acute pancreatitis, and I do think you can get temporary drainage rather adequately with a simple cholecystectomy, admitting that this leaves you with the definitive operation to do later.

DR. HARWELL WILSON (Memphis): I too would like to express my appreciation to Dr. Glenn for this excellent report, and also express our appreciation for his continued interest and his many contributions to the better understanding of biliary tract disease which have been made over a period of years.

Also, I appreciate having had an opportunity to see his manuscript just prior to the meeting, and would like to emphasize briefly two points and to pose two questions.

Dr. Glenn mentioned that acalculous cholecystitis had been found in 24 of 150 patients that had been subjected to operation. I think that this is a tribute to the meticulous care and the great detail with which these patients were observed and studied on Dr. Glenn's service.

With reference to two particular questions, it was mentioned that certain patients following biliary tract surgery developed pancreatitis, and reference was made to the long-limb T-tube being used. I would like to ask Dr. Glenn if he feels that this long-limb T-tube may actually act as a stone in the distal end of the common duct, obstructing the pancreatic duct in certain instances and actually being responsible for acute pancreatitis in certain instances.

Also, in the tables and in the manuscript it is stated that six of 15 patients who died within 13 years after operation for pancreatitis died of cancer. Now, this was more than the number who died from cardiovascular disease, hypertension, and coronary disease, *et cetera*. I would like to ask Dr. Glenn: Were these cancers distributed over the various regions of the body, or were they more frequently found in the pancreas? And if so, is there a relationship between pancreatitis and cancer of the pancreas?

And finally, I think we should heed the warning which Dr. Glenn has given us with reference to avoiding oversimplification of the problem of pancreatitis and biliary tract disease from a study of statistics. I think, however, that all of us have had occasion to operate on patients who we believed had gallbladder disease, and at the time of surgery found what appeared to be a normal gallbladder, and we palpate what feels like a normal gallbladder, but after removing a certain amount of bile, we feel a number of small stones which we had not previously believed to be present.

I think this paper also emphasizes the fact that while gallstones may be silent, they certainly are not innocent, and I personally believe that the information presented this afternoon should cause us to take a more aggressive approach in patients with pancreatitis and with biliary tract disease, to decompress the biliary tract system, avoiding the definitive operation at the time.

DR. CHARLES F. FREY (closing): In answer to Dr. Cole's question about the incidence of jaundice in our patients: it was approximately 50 per cent. It occurred no more frequently in patients with common duct stones than those without common duct stones.

Dr. Cole also inquired as to the nature of acalculous cholecystitis in our patients. All 24 of our patients with acalculous cholecystitis had acute cholecystitis.

Mortality was greater among patients who underwent operation shortly after admission in Dr. Elliott's experience than in those in whom operation was delayed. This was the reverse of our experience. The variation in results between the two series is likely due to a dissimilarity in patients and their management.

Onset of the disease and arrival time at the hospital may have varied between the two groups of patients. The nature of the operative procedure performed in Dr. Elliott's series is not described, nor were his patients limited as ours were to patients with associated biliary disease. Also, as Dr. Rhoads pointed out possibly only the most seriously ill patients came to operation in Dr. Elliott's series.

I think Dr. Rhoads' point about the diagnosis is very important. We believe that in more recent years we have at our disposal much more accurate methods for making the diagnosis of biliary disease and pancreatitis.

Regarding the long-limb T-tube, it is not used routinely at The New York Hospital. However, we have had a death in one of two patients when the long-limb T-tube was employed.

Of the patients who died from cancer following dismissal from the hospital, none of these patients had a carcinoma of the pancreas. The cancers were distributed throughout the body.

In summary, our beliefs about the treatment of pancreatitis are that at present we can make an accurate diagnosis of biliary tract disease. Of the estimated 60 per cent of patients with pancreatitis who have, in addition, biliary tract disease only one in five or one in six can be demonstrated to have a calculus which obstructs the common bile duct, preventing the flow of bile into the duodenum. Anatomical studies by some authors indicate that in as many as 45 per cent of autopsy patients the pancreatic duct enters separately into the duodenum. In our autopsy series the pancreatic duct entered the common duct proximal to the sphincter of Oddi in every instance. We would be reluctant in the face of biliary tract disease and pancreatitis not to decompress the common bile duct.