



FIG. 8. Ultrasound study performed in course of a positive Morphine Prostigmin Test. The pancreatic duct (arrow) which is normally barely visible has dilated to 3 times its prestimulation diameter.

result in serum enzyme elevations in normal people. We make no claim to the specificity of the Morphine Prostigmin Test as a diagnostic agent in pancreatic disease. It has however, in the absence of other information, been of value in the management of these difficult situations.^{7,15,16} Experience may indicate that serum lipase elevations may be more reliable than amylase measurement.¹⁵ I have found reversion to normal in a limited number of tests done after surgery.

Serum enzyme elevation, duct dilatation, and increased ductal pressure argue eloquently that an obstructive process plays a role in certain forms of recurrent pancreatitis and that it is in this type of disease that sphincteroplasty may be effective. Further experience with this and similar tests may help us select those patients who will benefit from drainage operations, and save those who will not benefit from unnecessary surgery.

DISCUSSION

DR. ROBB H. RUTLEDGE (Fort Worth, Texas): Dr. Nardi has shown us that transduodenal sphincteroplasty, accompanied by a sphincteroplasty of the pancreatic duct, is a successful operation for acute recurrent pancreatitis. We are indebted to both him and Dr. Bartlett for their original report, back in 1960, and now for this long-term follow-up. Even with the help of ERCP examinations, it is difficult to pick out the patients who will benefit from this surgery.

I rely heavily on the clinical history, and routinely use the morphine prostigmine test. A positive test, coupled with a strong clinical history, is quite helpful. A negative test, or a positive test unsupported by other evidence, is not as reliable.

(Slide) My technique of sphincteroplasty is very similar to Dr. Nardi's. I continue the sphincteroplasty just beyond the color change of the

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mucosa of the duodenum and the bile duct, because this is the margin of the superior choledochal sphincter. Then I use a No. 5 plastic feeding tube to calibrate the pancreatic duct. If the tube passes easily, I tend to leave the pancreatic duct alone. If there is a stenosis, I do an ampullary septectomy. Calibration of the pancreatic duct is a very important part of every sphincteroplasty.

(Slide) Although I have been very pleased with transduodenal sphincteroplasty and ampullary septectomy for acute recurrent pancreatitis, I have actually used sphincteroplasty more often as a primary drainage procedure, to prevent some of these postcholecystectomy problems. At the original operation, I routinely measure the width of the bile duct before any manipulation is done, then do the operative cholangiogram, remove the gallbladder, and frequently calibrate the ampulla through the cystic duct stump, to select those patients who will benefit from a sphincteroplasty or a choledochoduodenostomy. (Slide) Using this ap-

proach, I have done a drainage procedure on 12% of my benign biliary operations. Although most of my primary sphincteroplasties have been for stone problems, one third have been for what I thought was ampullary stenosis or acute recurrent pancreatitis. Twenty per cent of these had a coexisting stenosis of the pancreatic duct requiring a septectomy. Fifty per cent of my secondary sphincteroplasties have been for ampullary stenosis and 35% of these have also had an ampullary septectomy.

(Slide) There have been two operative deaths, one an 87-year-old man with a proven myocardial infarction, the other a 70-year-old woman with pancreatitis.

I have been very pleased with transduodenal sphincteroplasty, both as a primary procedure to prevent subsequent biliary problems, and also as an operation for acute recurrent pancreatitis, without any chronic changes, as Dr. Nardi has discussed.

I would like to ask him two questions. First, do you do an ampullary septectomy on your patients if the pancreatic duct seems normal? I am sure some of the times it must be. Second, how often do you do a primary sphincteroplasty, and do you think selecting some of these patients originally would avoid the type of operation that you are doing on these patients as a secondary procedure?

DR. KENNETH WARREN (Boston, Massachusetts): Sphincteroplasty and sphincterotomy have had a long and controversial history in the treatment of chronic pancreatitis and acute recurrent pancreatitis. As Dr. Nardi pointed out, the excellent results reported by Mulholland and Doubilet could not be reproduced by other surgeons.

In 1953, I pointed out the importance of calibrating, dilating, and, upon occasion, intubating the duct of Wirsung, in the hope of increasing the benefits of sphincterotomy. We, at that time, were doing a sphincterotomy on the common bile duct at 11:00, and a sphincterotomy on the duct of Wirsung at 5:00. Good results were achieved in 65% of patients when direct attack upon the ostia of the duct of Wirsung was made, compared to 50% good results in sphincterotomy alone. I think the important part of this experience is that the longer we followed these patients, the poorer the results were.

I agree with Dr. Nardi that sphincteroplasty, either on the common duct, or especially on the ostia of the duct of Wirsung, will be beneficial in those patients with acute or chronic pancreatitis only if there is outflow obstruction from the pancreas.

Because of the tendency of the sphincterotomy, or septectomy to develop recurrent fibrosis, I frequently intubate the duct of Wirsung with a No. 5 or No. 6 ureteral catheter. That ureteral catheter may be brought to the outside by a stab wound through the duodenum, or it may be shortened and left within the lumen of the duodenum, where it can be retrieved in 3 or 4 months by the endoscopist. But despite the changes in this technique, which we often describe as improvements of technique, I have been very discouraged by the long-term results of sphincterotomy and sphincteroplasty or septectomy in the treatment of this disease. Dr. Nardi's figures, on the other hand, indicate the long-term results are good, once they get by a period of 5 years.

It is to be hoped that Dr. Nardi's attempt to identify the factors which will rationalize the selection of patients suitable for sphincteroplasty will be successful. I applaud his efforts in this regard.

DR. WILLIAM P. LONGMIRE, JR. (Los Angeles, California): The long-term, careful evaluation of this sizable group of patients provides certain objective diagnostic criteria that are so badly needed in the selection of patients for this operation.

The authors have emphasized in their paper the diagnostic limitations and the vexations encountered in their 25 years' experience. For example, only 50% of the 85 patients operated upon obtained a good long-term result, although their criteria of a good result—that is, complete relief of symptoms—is a most severe yardstick.

In enumerating the factors associated with poor long-term results—that is, previous surgery, alcohol and narcotic use, and diarrhea—they have listed clinical features that so many of these patients who are possible candidates for this operation present that they have immediately narrowed the potential surgical group significantly. Sixty-six per cent of their patients obtained a successful short-term outcome, but over a fourth of these failed in the long-term follow-up, an all-too-familiar experience to many of us who have operated upon these patients.

In the analysis of their long experience, the authors have further defined the value of the morphine prostigmine test, known to most of us as the Nardi test. Reproduction of pain has no diagnostic value; only an elevation of the serum amylase alone should be considered. A negative test is a good predictor of failure. Combining the results of the Nardi test with other clinical features increased the predictive value. For example, a positive test and no previous surgery gave an 80% chance for a good result. Whether such would hold true in the practice of the average surgeon, as well as in their tertiary referral center, might be questioned.

If their theory of pancreatic outlet obstruction as the basic pathology is correct—and I believe that it is—a transampullary septectomy would seem to be an important component of the operative technique. I was surprised to find in the review that Dr. William Traverso made of the UCLA cases of chronic pancreatitis a few years ago that 12 of our patients treated by sphincterotomy alone had obtained a good to excellent result. In my mind, there is little doubt that, in the properly selected patient, the operation is of benefit. The authors' concept that sphincterotomy can only be successful in cases without pancreatic disease may well explain some of the past failures of the operation.

On the other hand, the 50% failure rate probably is not only accounted for by patients with advanced parenchymal and duct disease, or by technical failure, as they have suggested; but I would also ask the authors if some of these failures may not be accounted for by patients with what we must today label "functional complaints" who have been submitted to operation.

The analysis of their experience, and the predictive combinations that they have presented, together with further refinements of diagnostic procedures, such as the one they have alluded to of combining ultrasound studies with the Nardi test, are important steps in helping us delineate those patients who will benefit from an operation, which is in itself not entirely free of potential serious complications, from those patients who had best be left alone.

DR. FRANK G. MOODY (Houston, Texas): When I went to Salt Lake City, I realized that there was an opportunity to study a population that did not smoke and did not drink. If you are going to study the pancreas, I think you have to get those two variables out of the picture, as has been so nicely alluded to by Dr. Nardi as being risk factors. I therefore decided that I would pursue an approach to the patient with postcholecystectomy pain, the thinking being that over a period of time, with very careful study, I might define some of the diseases of the papilla of Vater.

(Slide) Now, we talk about sphincteroplasty, but it is likely, if, indeed, the results are due to the transampullary septectomy, that cutting the sphincter really has nothing to do with it. It is just a way to get to the transampullary septum, that thin veil of tissue that lies between the bile duct and the duct of Wirsung. This might provide an explanation for why sphincteroplasty alone has not worked, because one has not corrected the problem, which is outflow obstruction to the opening of the duct of Wirsung.

We have operated on 93 patients, doing sphincteroplasty as it has been done previously, and removing the transampullary septum. You can help yourself in this operation by wearing a head lamp and 4-power loupes. And if one does do this procedure, one should set aside enough time to thoroughly identify the anatomy of not only the major but also the minor papilla.

(Slide) These are our results. I would like to have you focus on the overall results, although you might want to look at the findings. I have classified the papilla according to the amount of inflammation, either in the papilla itself or in the septum, the dysfunction patients being those without any gross distortion of the anatomy of the papilla. And you will notice, in these 83 patients followed from 1 to 10 years, that only a third of them were completely relieved of their pain. Another third were relieved of their need for a narcotic analgesic—and I remind you that all of these patients were medical drug addicts, if you will; they were all on pretty strong medicines at the time I took care of them. And then another third—a little less than a third—failed.

But more importantly, and surprisingly, the patients with prior sphincteroplasty were the ones that got the best results with excision of the septum—and that surprised me. The bad results were in patients

who I felt had papillary cholesterosis. We only confirmed this in two patients histologically. The other patients, however, had a very inflamed papilla, with obvious submucosal deposits of lipid.

So I would also submit to the thesis that you should identify these patients very carefully. They, indeed, are rare. One should avoid the patient that has chronic pancreatitis, or who is an alcoholic.

I would ask Dr. Nardi if he has done the real test to measure whether, in fact, the symptoms are from outflow obstruction to the duct of Wirsung; and that is a provocative secretin test.

DR. JOHN M. HOWARD (Toledo, Ohio): In the group of patients with pancreatitis who do not have gallstone disease, the man-to-woman ratio of those patients who have gross evidence of pancreatitis, microscopic evidence of pancreatitis, or radiologic evidence of pancreatitis, continuing, recurrent, or chronic disease—the man-to-woman ratio is about 3-to-1 or 4-to-1. Of interest in Dr. Warsaw's Group 1, who did not have chronic pancreatitis, and in Dr. Nardi's series, the man-to-woman ratio has been reversed. In Dr. Warsaw's Group 1, the ratio was three women to one man, and in Dr. Nardi's, four women to one man.

I think, in my experience, the crucial test of whether I have helped the patient who did not have definite evidence of disease at operation is to say to the patient a year or two later: "I am so relieved that you have gotten a good result, because I was not sure at operation as to whether or not I had helped you." If you tell them that, in my experience, the neurotic patient may then have recurrent disease.

DR. GEORGE L. NARDI (Closing discussion): To answer Dr. Rutledge's question, yes, I almost always do the septectomy because, in a certain number of cases, if you do not do it, and they have trouble afterwards, you wish you had.

I do not think it would make any difference in your cases whether you did it or not. I do not think it is a prophylactic measure, because I do not think it is going to stop progression of so-called recurrent, chronic pancreatitis.

Dr. Warren, I do not know anyone who has done more sphincteroplasties than you have. I apologize if I did not credit you for your earlier emphasis on the duct of Wirsung. I think your suggestion of stenting is a good one. I sometimes have trouble doing this. Before they go home, a little bile comes trickling out the stent, and I have trouble keeping it in the right place. I may not know how to fasten it properly.

I do think your suggestion is also valuable from a prophylactic point of view, perhaps preventing postoperative pancreatitis, secondary to edema around that orifice.

Dr. Longmire, you have long been a leader in this field, and I appreciate your careful critique and studied analysis. I can not deny that some of these patients may well, indeed, have a profound emotional overlay, and I do not know how I can eliminate or treat it. As a matter of fact, at one time I had several psychiatric consultations, and in most of these consultations the psychiatric reply was that the patient was suffering from no overt psychiatric disease.

Dr. Moody, cutting the sphincter alone may be effective in some cases. I think we are going to find out, because I think our endoscopic medical colleagues are going to be doing a lot of papillotomies.

I have avoided operating on both papillae, the reason being that, of the four deaths, two had double papillotomies, and I think, that unless you have a pancreas divisum, that little duct of Santorini up above might be a good escape hatch for pancreatic juice if you do not have a stent in the main duct and if you get edema at the pancreatic duct orifice.

There was no difference in our series in the patients who had had their gallbladders removed, those with so-called postcholecystectomy syndrome, and those that did not; and there was no difference whether the gallbladder which I removed was called normal by the pathologist or chronically inflamed. I do not know if that is a reflection on me or the pathologist.

Dr. Howard, not only do I tell the patients that I am not sure the operation is going to do them any good postoperatively, but I tell them that preoperatively, and I never offer them more than a 50/50 chance for a successful outcome.