Diagnostic Papillotomy: Application of Endoscopic Sphincterotomy (EST) to the Diagnosis of Diseases in Cholangio-Pancreatic Tracts

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Abstract
Endoscopic retrograde cholangiopancreatography (ERCP) is now an important examination method for diseases in the cholangio-pancreatic tracts. The diagnostic ability of ERCP for small intrapancreatic lesions is good; however, some cases still undergo pancreatectomy on the suspected diagnosis of carcinoma. In the present study, an attempt was made to improve the diagnostic ability of ERCP by inserting cytodiagnostic brushes and biopsy forceps after performing endoscopic sphincterotomy (EST). Post-EST, it was easy to insert the cytodiagnostic brush and biopsy forceps and, moreover, it was also possible to obtain sufficient tissue for diagnosis. Although EST was originally a technique utilized for the treatment of calculi in the biliary tract, we have extended it for diagnostic purposes. This technique is described here with illustrative case reports.

Key words: Endoscopic sphincterotomy, cytodiagnosis, biopsy.

Introduction
At present, the conclusions from endoscopic retrograde cholangiopancreatographic (ERCP) examination seem to depend solely on the interpretation of the contrast radiographs of the pancreatic and biliary ducts. In spite of several refinements and modifications of techniques, there are still many problems in determining suitability for surgery, especially in cases with insufficient contrast radiogram and those in whom it is difficult to decide whether a lesion is benign or malignant. In such cases, surgery is undertaken only on the basis of a suspected diagnosis of malignancy.

In an attempt to resolve these problems in diagnosing diseases of the cholangio-pancreatic tracts, our initial trials of brush cytodiagnosis of the pancreatic and biliary ducts at the time of ERCP increased the diagnostic accuracy in malignant diseases. However, it was technically very difficult to insert the brush deep inside the intra-pancreatic or biliary tract.

In the present study, endoscopic sphincterotomy (EST) was performed at the time of ERCP and a cytology brush or a biopsy forceps could be inserted easily. The technique proved useful for the diagnosis of malignant diseases in the cholangio-pancreatic tracts.

Method and Instruments
Instruments used for the examination were JF-B3, JF-B4, JF-1, and JF-1T 10. In addition to the conventional use of a cytology brush for pancreatic duct brushing in this study, the biopsy forceps was modified on an experimental basis to an effective length of 180 cm and with a slightly slender mouth 6 mm × 2 mm in size. The length of the EST incision was limited to 5-10 mm, stopping short of the hooding fold; thus, even frequent insertions of the brush and forceps immediately after the incision did not result in any haemorrhage.

Case Reports
Case 1: Carcinoma of ampulla of Vater.
On endoscopic examination of the duodenal papilla, swelling of the intramural portion of the common bile duct (CBD) and papilla was observed. ERCP showed a filling defect at the ampulla (Fig 1A); although erosion was found on biopsy, the biopsy result was negative. A percutaneous transhepatic cholangiography and drain (PTCD) was done to reduce the jaundice (Fig 1B); pancreatic duct brushing performed simultaneously gave a positive result for carcinoma. ERCP was performed again. In the post-papillotomy biopsy and localised brushing, a group I, class V carcinoma of the ampulla of Vater was found. Fig 1C gives a diagrammatic representation of the lesion.

Case 2: Pancreatitis.
A narrow segment of the main pancreatic duct was found in the picture of the pancreatic duct (Fig 2A). Therefore, pancreatic duct brushing and biopsy of the narrowed segment (Fig 2B) was performed after diagnostic papillotomy, and negative result was obtained. However, emaciation of the pancreatic dorsal artery was observed on angiography, suggesting the presence of carcinoma; hence resection of the pancreatic tail was performed on a suspected diagnosis of carcinoma. The resected preparation showed no evidence of carcinoma, thus proving the brush cytodiagnosis and biopsy accurate.

Case 3: Pancreatic cyst.
On ERCP the cyst was observed at the region of transition from pancreatic head to corpus; however, its differentiation from cystic adenocarcinoma was difficult (Fig 3A). Diagnostic papillotomy and biopsy (Fig 3B) were performed and the possibility of carcinoma was excluded. In addition, a biopsy was taken during surgery and the benign nature of the lesion was confirmed. A cystogastrostomy was performed.

Case 4: Pancreatic carcinoma.
Pancreatic tail irregularity was seen in the pancreatic duct image. Since contrast radiography of the duct in the pancreatic tail was not possible, it was difficult to make a definite diagnosis (Fig 4A). However, carcinoma was detected in the pancreatic duct brushing taken after diagnostic papillotomy (Fig 4B).
Fig 1: A. ERCP findings show irregularity of the common bile duct and dilatation of pancreatic duct. B. PTC findings show defect in the ampulla. C. Diagrammatic sketch of the lesion.

Fig 2: A. Stricture at mid pancreatic area. B. Biopsy forceps at the site of lesion. Forceps introduced after diagnostic papillotomy.
Fig 3: A. ERCP showing pancreatic cyst at the transition of pancreatic head to corpus. B. Biopsy forceps after diagnosis papillotomy in the pancreatic cyst area to exclude cystic adenocarcinoma.
Fig 5: ERCP and PTC showing filling defect in the common bile duct and biopsy forceps at the site of lesion after diagnostic papillotomy.

Case 5: Cholangiocarcinoma.

The main observation on ERCP was a filling defect in the upper part of the CBD. However, malignancy was not strongly suspected on angiography and CT scan. No evidence of carcinoma was seen in the biliary tract cytodiagnosis on PTC. However, a biopsy performed after diagnostic papillotomy (Fig 5) proved the presence of a carcinoma.

Discussion

The diagnosis of diseases in the cholango-pancreatic tracts has improved markedly through the introduction of ERCP, and it has recently become possible to detect small pancreatic carcinomas.5-6

While considering the large surgical resection in a case of carcinoma in the cholango-pancreatic tracts, accuracy of presurgical diagnosis is essential. However, currently the diagnosis based solely on contrast radiographic findings has limitations because of frequent poor quality contrast radiograms. Moreover, even when good quality contrast radiogram is obtained, difficulties in detecting extremely small lesions or those at the border area still remain.

Attempts made to obtain improved contrast radiograms in the pancreas5-11 do not appear to have contributed sufficiently. Moreover, there are limitations to diagnosis by angiography, CT, or ultrasonic examinations. It is thus desirable to collect tissues or cells directly from the site of lesion. Therefore, it was
considered worthwhile to insert the cytology brush or biopsy forceps for collecting specimens at the time of ERCP. However, technical factors hinder the insertion of brushes and biopsy forceps. In the present study, by utilizing EST, it was possible to insert brushes and biopsy forceps easily.

The incision of the papilla ideally should be 5-10 mm in length, and the incision was not extended to the hooding fold in most of the cases. Therefore, in our experience, no case developed haemorrhage, which may be observed at the time of EST. With respect to the length of the incision, the risk of haemorrhage increases if it is too long, and cicatricular stenosis ensues if it is too short. These problems should be taken into consideration and elucidated in the future. As regards the direction of the incision, although there is no problem if the incision is applied to the biliary duct, it is still not clear as to what extent the incision on the pancreatic duct may be safe. On the basis of the experience of the present author, it is considered to be almost safe if it is less than 10 mm from the papillary orifice.

As described above, EST is an effective method not only for therapeutic purposes but also for diagnosis. However, the development of better brushes and biopsy forceps for insertion is necessary in the future. The brushes presently available are not easy to use. Although we have devised a biopsy forceps model with an overcoat, it is desirable to make further improvement for easy insertion.

Thus, “diagnostic papillotomy” is a method which could in future be used for the diagnosis of diseases in the cholangiopancreatic tracts. This method is one step toward biopsy under direct visualization in these tracts. The suitability and adaptability of this technique should be further examined.

References