

—Original Article—

VALUE AND INDICATION OF ENDOSCOPIC PANCREATO-CHOLANGIOGRAPHY

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Summary

Endoscopical EPCG has been performed on 123 patients. In 44% of these cases, a clear and well-contrasted visualization of the bile ducts and the pancreatic duct could be reached during a single examination; in 20% only the bile duct and in 24% only the pancreatic duct could be revealed. Retrograde cannulation was unsuccessful in 12% of the cases. In 7 patients, neoplastic lesions were detected (1 carcinoma of the bile duct, 4 carcinomas of the head and 2 of the corpus of the pancreas), none of which had been diagnosed by another method.

We have been disappointed by the EPCG concerning the recognition of malignant lesions in an early stage. In our material all except one case were inoperable.

In our opinion, the most important indication for EPCG is the differentiation between different types of cholestatic jaundice. Here, the EPCG is superior to all known methods. Further experiments must be awaited to judge the value of the EPCG for the diagnosis of chronic pancreatitis.

Up to some years ago it was not possible to visualize the pancreatic duct by X-ray before an operation. In the same way, the radiological examination of the biliary tract depended on the sufficient excretion of the contrast medium by the liver. For differential diagnosis of obstructive jaundice, only percutaneous and peritoneoscopic cholangiography could be used, and these two methods always involve a risk for the patients (12). These diagnostic gaps have been filled by endoscopic pancreato-cholangiography (EPCG) in the last few years. In addition, this method allows a direct view of the papilla of Vater and the ability to take guided biopsy in cases of suspected alterations of the papilla.

To reveal the biliary tract radiologically via the duodenum by cannulation and retrograde injection of contrast medium, there are two possibilities:

1. via the papilla of Vater
2. in cases with choledochoduodenostomy
via choledochoduodenostoma

The radiological visualization of the pancreatic duct is possible only via the papilla.

Before EPCG in principle we demand an X-ray examination of the upper

Key words: *Endoscopic pancreatocholangiography (EPCG), Indications and contraindications, Differentiation between normal and pathological findings, Diameter of the pancreas duct, Percentage of positive fillings, Lesions of the biliary tract, Lesions of the pancreas, Carcinoma of the papilla, Pancreas cancer.*

gastrointestinal tract and an intravenous cholangiography in anicteric patients. A detailed description of the technical procedure and premedication of the patients shall not be given in this paper. We use the method described by OI (10,11), OGOSHI (9), KASUGAI (7,8) and others (1,3,13).

The purpose of this communication is to explain indications and contraindications of this method and to demonstrate our results.

I. INDICATIONS AND CONTRAINDICATIONS

In our opinion, EPCG, bringing little discomfort to the patient, should be used for investigating the circumstances listed in **table I**:

Table I Indications for EPCG

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- | | |
|----|---|
| 1. | Endoscopic cholangiography |
| a) | Clinical suspicion of obstructive jaundice |
| b) | Recurrence of cholangitis with or without previous operation on the biliary system |
| c) | Suspicion of occlusion on the papilla of Vater |
| d) | Jaundice of unknown origin |
| e) | Choledochoduodenostomy or papillotomy with recurrency or persistence of pains or jaundice |
| f) | Cystic duct occlusion syndrome |
| 2. | Endoscopic pancreatography |
| a) | Suspicion of pancreas tumour |
| b) | Suspicion of chronic pancreatitis |
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EPCG is indicated in the differential diagnosis of obstructive jaundice, especially in differentiating between intra- and extrahepatic cholestasis. This method is superior to the usual procedures with regard to accuracy, risk, and amount of information gained. In the differentiation between chronic pancreatitis and carcinoma of the pancreas there are still great difficulties. In our opinion, it is not possible to distinguish the two diseases by pancreatography on the basis of our present experience. Contraindications for EPCG are rare, although the procedure should never be performed in acute pancreatitis, and acute cholecystitis. Duodenal stenosis and elevated titres of Australia antigen count as relative contraindications.

II. DIFFERENTIATION BETWEEN NORMAL AND PATHOLOGICAL FINDINGS

Besides local alterations such as stones, obstructions of the duct, fistulas, and circumscribed disconnection of the contrast medium, the width of the duct systems must be especially noted. On the strength of our examinations, a common bile duct diameter greater than 1.5 cm is to be regarded as pathological. It is much more difficult to determine the normal width of the pancreatic duct.

Table II shows the maximal diameters of the pancreatic duct in the head, body and tail of the pancreas as they have been determined in different studies. All measurements were performed with the patients lying in the supine position.

Our results and those of CLASSEN (2) and his coworkers show greater pancreatic duct diameters than those reported by Japanese authors (7) and by COTTON (4) in England.

Table II. Diameter (mm) of the main pancreas duct in patients without pancreatic diseases

Authors	head	body	tail
OGOSHI et al.	3.1±0.6	2.9±0.6	2.0±0.4
KASUGAI et al.	3.5±0.9	2.7±0.6	1.7±0.5
OI et al.	3.6	2.7	1.6
COTTON	3.7±0.8	2.7±0.5	—
CLASSEN	4.8	3.4	2.3
SEIFERT et al.	4.8±1.2	3.75±0.75	2.7±1.3

According to our experiences, it seems that pathological alterations of the biliary tract such as concrements in the common bile duct or the obstruction of the cystic duct, have influence on the diameter of the pancreatic duct.

Table III. Diameter (mm) of the main pancreas duct in patients with and without bile duct lesion (without pancreatic diseases)

		head	body	tail
Lesions of the bile ducts	without	4,0	3,5	2,7
	with	5,3	3,8	3,0

The pancreatic duct of patients with diseases of the biliary tract had a greater diameter than that of normal patients.

III. RESULTS

Up to now we have performed EPCG in 123 patients. In 44% of the cases, a clear and well-contrasted visualization of the biliary tracts and the pancreatic duct could be obtained. In 20% only the biliary tracts and in 24% only the pancreatic duct could be revealed. In 12% it was impossible to fill the duct systems. Most of the failures were due to lack of experience at the beginning of our studies. In principle, one should attempt to fill both duct systems. This is possible in many cases by cannulation of the papilla in different directions.

We believe that the failure to fill both duct systems does not justify the conclusion of a stenosis of the papilla. This diagnosis may only be confirmed if the width of the choledochus is greater than 15 mm and an obstruction is radiologically present.

1. Lesions of the biliary tract

Concrements were the most frequent pathological findings revealed by endoscopic cholangiography (12 cases with choledocholithiasis, 8 cases with cholelithiasis and 3 patients with concrements in the gallbladder and common bile duct).

In a female, obstruction of the common bile duct near the liver hilus was detected by EPCG. The finding was confirmed by transcutaneous cholangiography.

Operation revealed an inoperable carcinoma of the bile duct. A stenosis caused

Fig. 1: Carcinoma of the common bile duct near the liver hilus: abruption of the common bile duct. Pancreatic duct is normal (EPCG)

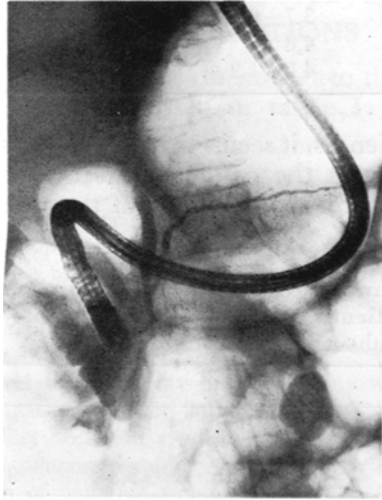
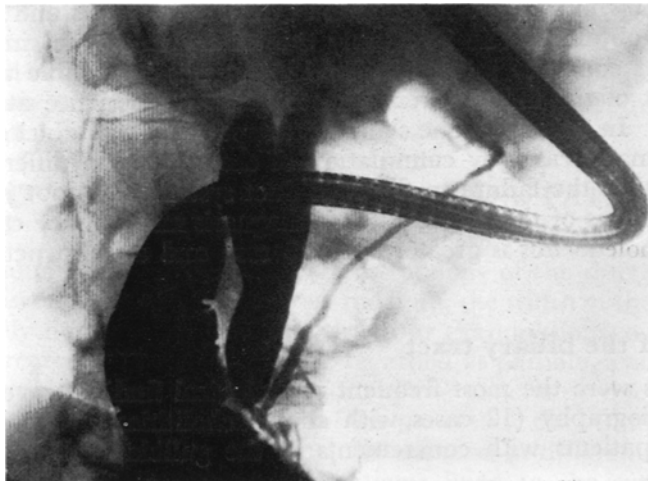


Fig. 2: Inflammatory stenosis: circumscribed narrowing of the common bile duct near the papilla with dilatation in the upper part. Pancreatic duct is normal (diagnosis was confirmed by operation).



by inflammation, which we have seen only after cholecystectomy, is characterized by circumscribed narrowing of the bile duct over a short distance.

2. Lesions of the pancreas

Dilatations, narrowings and obstructions of the main pancreatic duct, its side branches and the fine pancreatic ducts were the most frequent pathological findings in endoscopic pancreatography. These alterations were interpreted by KASUGAI and others as signs of chronic pancreatitis.

We have so far been unable to decide if these alterations really correspond to chronic pancreatitis. Examinations of pancreatic function by the Pancreozymin-Sekretin-test have been performed in only a few cases. No correlation between endoscopic-radiological and functional results were found.

In our opinion, reports in the literature do not allow one to relate such endoscopic alterations to chronic pancreatitis (6, 8, 10, 11, 13, 14).

To prove this, further studies are necessary, which should include both results of animal experiments and comparative studies in humans during operation or at autopsy.

Up to now we have diagnosed 4 carcinomas of the papilla, 4 carcinomas of the pancreatic head and two of the pancreatic corpus region by duodenoscopy and EPCG. We will not discuss the problem of carcinomas of the papilla in detail, but we wish to point out that all of these cases were recognized by duodenoscopy-2 of the 4 papilla carcinomas were verified bioptically before operation. A cannulation and visualization of the duct system by retrograde filling was possible only in one case.

Fig. 3: Carcinoma of the papilla of Vater: irregular filling defect with narrowing in the lower common bile duct and dilatation of the bile duct in the upper part (diagnosis was confirmed by operation).

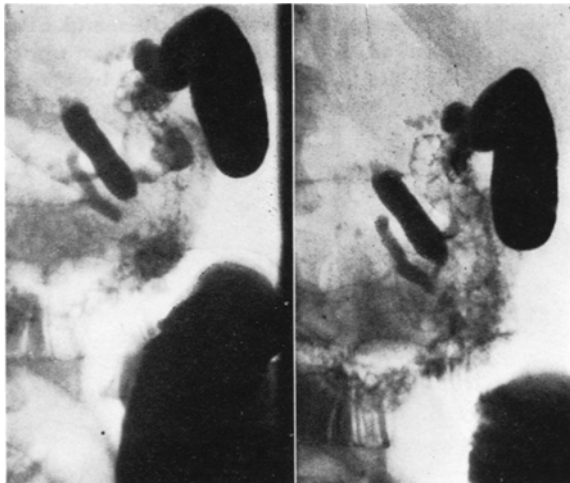


Four carcinomas of the head and two carcinomas of the corpus region were diagnosed by EPCG (Table IV). In the 2 cases of corpus carcinoma, the mentioned obstructions of the duct could be proven. In 3 out of 4 cases of carcinoma located in the head region, visualization of the pancreatic duct was impossible. Only in one case, in which only part of the region around the papilla was attacked, could a retrograde filling of the pancreatic duct be performed.

Table IV Pathological findings by EPCG in cases with Pancreas cancer n=6

Diagnosis	pancreas duct		not filled	common bile duct		
	pathol.	normal		pathol.	normal	not filled
Pancreas body Ca	+					
Pancreas body Ca	+					
Pancreas head Ca	+			+		
Pancreas head Ca			+	+		
Pancreas head Ca			+	+		
Pancreas head Ca (Papilla couldn't be cannulated)			+			+

Fig. 4 Pancreas head cancer: filling of the pancreatic duct and its branches in a short distance with abruption. Visualization of the common bile duct until the junction of the cystic duct with abruption there. Gallbladder is visualized (diagnosis confirmed by operation). Prone position.



According to our experience with carcinomas of the pancreatic head region, in most cases only alterations of the common bile duct can be shown, and filling of the pancreatic duct is usually impossible.

The operative findings in 6 cases of pancreatic carcinomas were disappointing -only one could be resected, while the remaining 5 cases were inoperable.

DISCUSSION

Thus far our experiences show that in nearly 90% of the cases either the biliary tract, the pancreatic duct, or both can be visualized by EPCG. This demonstrates that EPCG is a practical method to reveal alterations of the pancreas and of the biliary tract. Without doubt, the EPCG is the safer method, compared with percutaneous transhepatic cholangiography or peritoneoscopic cholangiography. Furthermore, EPCG, seems to replace the explorative laparotomy in many cases (8, 10, 11, 14).

As we and other authors (2,8) know, malignant tumors of the pancreas or of the biliary tract can so far be recognized only in an advanced stage in which an operation has little chance of being successful.

It cannot yet be decided whether endoscopic pancreatography is a step forward in the diagnostic efforts for chronic pancreatitis. Different investigators have reported variabilities and abnormalities of the pancreatograms. These observations, however, should be confirmed by great series of operation or autopsy specimens or by experimental investigations.

For the differential diagnosis of obstructive jaundice EPCG has a great advantage compared with previous methods (1,3,8,10,13,14). It permits the recognition of concrements in the biliary tract of jaundiced patients, who can then undergo immediate surgery.

Furthermore, it is now possible to differentiate between primary and secondary biliary cirrhosis of the liver.

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