Imaging hepatobiliary and pancreatic system by ERCP
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Introduction
The development of fibroptic endoscopes which are designed specifically for duodenal observation and cannulation of the ampulla of vater with pancreatocholangiography has provided a new approach to the evaluation of duodenal, pancreatic, and biliary disorders. Many reports attest to the effectiveness of these new instruments in visualizing duodenal pathology. In this paper we will report our experience with cannulation of the ampulla of vater and cholangiopancreatography in 201 consecutive patients with symptoms suggestive of pancreatobiliary diseases.

Methods
The VIDEO fibroptic duodenoscope manufactured by pentax was used in the series. Premedication with inj. pethedine HCL 40-60 mg IN is given just before the procedure. Pharyngeal anaesthesia with 10% Xylocaine spray is given immediately before duodenoscopy. In prone position of the patient, the fibroscope is inserted into the duodenum. The ampulla is brought into the field, and the orifice is identified. If hyperperistalsis or spasm of the sphincter of oddi are cannulated, additional IN anticholinergics medication may be required. After insertion of the cannula into the ampulla of vater, under fluoroscopic control 60% iomeron is injected until the pancreatic duct or biliary tree is visualized. If only one system is visualized, the catheter is repositioned and a second injection is made. Generally 1 to 3 ml of iomeron is required to visualize the pancreatic duct adequately, while 10-30 ml is usually needed for optimum radiographic visualization of the biliary tree. After injection radiographs are taken.

Results
A total of 201 patients with suspected pancreatic or biliary disease were evaluated by cannulation of the ampulla of vater with pancreatocholangiography, pancreatic pathology was suspected in 37 patients and the pancreatic duct was successfully visualized in 30 cases (81%). By contrast, the biliary tract was successfully visualised in 119 cases (85%) of 139 patients with suspected biliary pathology. A satisfactory cannulation was obtained in 174 (86%) of 201 patients and is defined as adequate radiographic visualization of the clinically desired ductal system. For presentation of the data the 174 patients were divided into groups depending on the results on the radiographic evaluation of the pancreas and/or biliary tract (Table -1).

Table-1: ERCP in 174 Cases

<table>
<thead>
<tr>
<th>Normal</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatolithiasis</td>
<td>4</td>
</tr>
<tr>
<td>Peripapillary ca.</td>
<td>40</td>
</tr>
<tr>
<td>Post Operative Stricture</td>
<td>3</td>
</tr>
<tr>
<td>Common duct stone</td>
<td>37</td>
</tr>
<tr>
<td>Choledochal cyst</td>
<td>4</td>
</tr>
<tr>
<td>Cholangio ca.</td>
<td>32</td>
</tr>
<tr>
<td>Pancreatic pseudocyst</td>
<td>2</td>
</tr>
<tr>
<td>Chr. Pancreatitis</td>
<td>16</td>
</tr>
<tr>
<td>External biliary fistula</td>
<td>6</td>
</tr>
<tr>
<td>Obs. at porta</td>
<td>16</td>
</tr>
<tr>
<td>Papillary stenosis</td>
<td>2</td>
</tr>
</tbody>
</table>

Normal cholangiopancreatography
Twelve patients had a normal ERCP (Fig-1). The normal pancreatic duct is smooth and tapering and is visualized from head to tail with only scanty branch ducts in the head and tail of the pancreas. In the absence of obstruction, the contrast media in the pancreatic duct is flushed into the duodenum.

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within 20-30 sec. The mean maximum diameter of the pancreatic duct was around 3-4 mm in the head region of pancreas. The normal cholangiogram reveals an unobstructed common duct with smooth to tapering intrahepatic bile ducts. Frequently the cystic duct and gall-bladder can be seen. The mean maximum diameter of the common bile duct was 8-9 mm.

Ca-head of pancreas  Biliary leakage

Hepatolithiasis  Biliary leakage

Choledochal cyst  Bile duct injury

Cholangiocarcinoma  Bile duct injury

Periampullary Carcinoma
Forty cases of periampullary carcinoma have been diagnosed by ERCP. In cases have been confirmed by operation, 10 cases were managed by endoprosthesis and 20 cases have been lost to follow up.

Choledocholithiasis
Choledocholithiasis was diagnosed in 37 patients. This has been confirmed by surgery in 30 cases and by endoscopic stone extraction in 22 cases, stone in the intrahepatic biliary tree was also seen in four patients.

Cholangiocarcinoma
Thirty two cases of cholangiocarcinoma have been diagnosed by ERCP. In cholangiocarcinoma irregular stenosis or obstruction is readily seen by this method. In most cases the proximal bile duct and intrahepatic bile ducts are dilated and the contrast media clears very slowly from the biliary tree.

Obstruction at portahepatis
Sixteen cases of biliary obstruction at portahepatis was due to carcinoma of the Gall Bladder. In all these cases ultrasonographic findings was in favour of Gall Bladder mass. Six cases have been verified at surgery, remaining ten cases was beyond the scope of surgery.

Chronic pancreatitis
In 16 patients, stenosis and marked deformity of the main pancreatic duct was noted. These patients had well documented chronic pancreatitis confirmed by pancreatic calcification.

Miscellaneous lesions
Four cases of choledochoal cyst was diagnosed by ERCP. In 6 patients with post-operative complications ERCP helped to localize the nature and site of injury. In 27 cases ERCP findings was inconclusive and for which PTC was done.

Discussion
With the development of fiber-duodenoscopes specifically designed for duodenal observations and cannulation, the use of this procedure for the evaluation of pancreatic and biliary disorders has become a reality. With experience, cannulation of the ampulla of vater with pancreatogram is easily performed in practically all cases and has proved to be useful in the evaluation of a variety of pancreatic abnormalities. As with any test, false-positive and false-negative interpretations might be expected. The 12 "Normal ERCPrepresent the main source of false-negative exams. All patient in the group
have had an extensive evaluation which included USG, Endoscopy, X-ray, Serum enzymes, test of liver and pancreatic function. They are currently being followed. To date no patient in this group has developed objective evidence of organic diseases. A longer follow-up period will help to resolve the question of false-negative ERCP.

Cannulation of the ampulla at vater with cholangiography can be performed in almost all cases. It has been most useful in the diagnose of common duct stone, carcinoma of bile duct, periampullary carcinoma and other lesion infiltrating the biliary tree 4. The correct diagnosis of common duct stone was made in 37 cases, cholangiocarcinoma in 32 cases and periampullary carcinoma in 40 cases. Cholangiography was also helpful in the diagnosis of choledochal cyst, and different types of post-operative complications. Transhepatic cholangiogram was performed in 27 cases where ERCP findings were inconclusive. Our data suggest that ERCP is the single most important test in the diagnosis of biliary tract pathology. The application of pancreatogram to the evaluation of suspected chronic pancreatitis is less controversial. The severity and extent of ductal deformity can be evaluated and the cases of ductal stone should be easily recognized.

We have experienced no significant complication from ampullary cannulation with ERCP. Although serum amylase determinations were obtained on all patients who experienced pain, only one case of mild post ERCP pancreatitis was recognized. Both pancreatitis and cholangitis have been described after ERCP and must be anticipated, but careful attention to depth of cannula insertion, force of injection, and amount of contrast media injected should minimize any unwanted effects 5.

In conclusion, our data would indicate that cannulation of the ampulla of vater is a safe, diagnostic tool that may add significant new information in the evaluations of patients with pancreatic and biliary diseases.

References