Ultrasound Guided Pancreatic Ductography

K DAS, R KOCHHAR, S K MEHTA, S SURI
Departments of Radiodiagnosis and Gastroenterology, Postgraduate Institute of Medical Education and Research, Chandigarh 160 012

Abstract
Thirteen patients underwent ultrasound guided percutaneous pancreatic ductography during a one year period. In nine cases the procedure was performed after failure of endoscopic retrograde pancreatography (ERP) and in four patients ERP was not attempted. Under ultrasound guidance a 22 gauge needle was inserted into the pancreatic duct through a vertical transgastric route. After aspiration of 10-15 ml of pancreatic juice, contrast medium was injected into the pancreatic duct. Opacification was successful in 12 (92.3%) patients. No significant complications were encountered. The usefulness of the procedure in our country is highlighted.

Key words: Pancreatography.

Introduction
Evaluation of pancreatic duct morphology is helpful in cases with equivocal diagnosis of chronic pancreatitis and carcinoma. A pancreatogram is also useful for planning the appropriate approach for pancreatic surgery. Although endoscopic retrograde pancreatography (ERP) has become the method of choice, it may fail or prove inadequate in patients with proximal duct obstruction or anatomical variations. Percutaneous opacification of pancreatic duct is an alternative in such cases. We present our initial experience on ultrasound (US) guided percutaneous pancreatography in 13 patients.

Material and Methods
The 13 patients referred for percutaneous pancreatic ductography included cases with chronic pancreatitis (7), peripancreatic carcinoma (4), and carcinoma of pancreas (2). One patient with chronic pancreatitis had a pseudocyst in the head of the pancreas. Nine patients had been subjected to ERP but the pancreatic duct could not be cannulated in them. Four patients with endoscopic features of peripancreatic carcinoma underwent the procedure because at endoscopy, using a side-viewing endoscope, it was felt that the ampullary opening was hidden in the tumor mass, and cannulation was not attempted. These four patients were subjected to endoscopic biopsy, brush cytology and fine needle aspiration cytology, on the basis of which a correct diagnosis was achieved in three patients. In the fourth patient US guided fine needle aspiration established the diagnosis.

The patients were first examined with a 5 MHz sector transducer (IGE RT 3600) after an overnight fast. Anatomical details of the pancreas including its size, shape and echotexture were recorded, besides the pancreatic duct diameter and any echogenic foci in the duct or the parenchyma. A sterile condom was mounted over the transducer after putting K-Y jelly inside it as a conducting gel. After skin disinfection, under constant real-time US guidance, a 10 cm long, 22 gauge needle was inserted in line with the plane of the pancreatic duct at its widest diameter. The entry into the pancreatic duct was confirmed by seeing the echoes of the needle tip and aspiration of pancreatic juice. Ten to fifteen ml of pancreatic juice was aspirated and replaced by 9 to 13 ml of Conray 260. To prevent pancreatitis, overdistension of the pancreatic duct was avoided.

![Fig 1: Pancreatogram demonstrating changes of chronic pancreatitis and evidence of a communicating pseudocyst in the head region.](image)

Spot films were then taken. In one patient with chronic pancreatitis and a pseudocyst, a communication between the cyst and the pancreatic duct was suspected. He was subjected to delayed filming in the left lateral position. In three patients US guided fine needle aspiration cytology was also taken in the same sitting.

Results
The examination was successful in 12 of 13 cases. In one case the pancreatic duct could not be cannulated because the needle tip repeatedly got displaced on touching the posterior wall of the stomach. There were no complications related to the procedure.
The diameter of the pancreatic duct cannulated ranged from 3 to 8 mm. The patient with failed duc
tography had duct diameter of 4 mm in the head region.
All the seven patients with chronic pancreatitis showed
diffuse ductal changes in the form of irregularity,
dilatation and narrowing of the main duct along with
changes in side branches. In one patient a commu-
nicating pseudocyst was demonstrated (Fig 1). Two
patients demonstrated ductal calculi of 2 to 4 mm
size. Four patients with periampullary carcinoma
had regular dilatation of the pancreatic duct and a
mass impression over it (Fig 2). Of the two patients
with pancreatic carcinoma, ducography succeeded in
one and showed a mass impression over the duct in
the region of the head along with slight dilatation of
the proximal duct. Fine needle aspiration cytology
revealed adenocarcinoma in both the patients with
periampullary carcinoma and in one of the patients with
periampullary carcinoma.

Fig 2: Dilated pancreatic duct with mass impression in the area of
head of pancreas denoting a tumour.

Discussion
Although ultrasonography and computed tomography
(CT) are the two commonly employed techniques for
evaluating pancreatic lesions, ERP is the method of
choice for detection of subtle ductal abnormalities.
However ERP may not be technically possible after
a Whipple procedure or partial gastrectomy and in
patients with pancreas divisum, juxta-papillary diverticulum
and duodenal obstruction. Moreover in patients
with complete obstruction of the pancreatic duct in
the head of the pancreas due to a tumour or calculus,
adequate information may not be achieved about the
status of the more proximal duct. Percutaneous opacifi-
cation of the pancreatic duct is a potential alternative
in such cases. This procedure can be performed
under CT guidance, but US guided ductography has
gained more popularity, as it is virtually radiation free
and less time consuming.

Our success rate of 92% compares favourably with
the results of two large series. Nearly all the patients
in these reports have had pancreatic duct diameter of
3 mm or more. Other reports are based on only one
or two cases.

A major handicap of the procedure is the difficulty
in visualizing the pancreatic duct in patients having
bowel gas. This can be obviated by the use of water
or radiolucent agents. Two possible complications,
biliary leak and pancreatitis, need to be taken into
account while performing US guided ductography. Bile
leak can be avoided by using the transgastric instead
of the transhepatic route. The risk of acute pancreatitis
from parenchymal extravasation is reduced if the
injection is performed with low pressure and the amount
of contrast medium injected is less than the amount of
pancreatic juice aspirated.

Thus, US guided pancreatography is a safe and
reliable procedure. It is easily performed in patients
in whom the pancreatic duct is easily identifiable on
US and measures > 3 mm. Since the facilities and
expertise for endoscopic pancreatography are available
at only a few centres, the widespread use of US may
make this procedure more readily available to the
patient at a considerably lesser cost.

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