

Endoscopic retrograde cholangiopancreatography and endoscopic sphincterotomy in the management of suspected gallstone pancreatitis

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Summary

An approach to suspected gallstone pancreatitis based on endoscopic retrograde cholangiopancreatography (ERCP) and endoscopic sphincterotomy (ES) was adopted in 1976 and was followed in 29 patients. ERCP became the routine method of early biliary tract assessment when gallstone pancreatitis was suspected on clinical and biochemical grounds, and further management was based on ERCP findings. If calculi were detected in the common bile duct (13 cases) ES was performed; when calculi were confined to the gallbladder (12 cases) cholecystectomy was advised; and if no calculi were detected on ERCP (4 cases) investigations were continued. ERCP proved to be a reliable guide to management, while ES provided safe and effective symptomatic relief when choledocholithiasis was present, and prevented recurrence of pancreatitis even when the gallbladder remained *in situ*.

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Endoscopic sphincterotomy (ES) has proved to be an effective and safe alternative to surgical management of choledocholithiasis.¹ Indications for the procedure have widened to include the management of calculi in the common bile duct (CBD) complicated by severe acute pancreatitis.²⁻⁵ In 1976 a uniform approach to the management of patients with suspected gallstone pancreatitis was adopted by the Department of Surgery at the Provincial Hospital, Port Elizabeth. Endoscopic retrograde cholangiopancreatography (ERCP), being the best method available for the detection of CBD calculi, became an integral part of biliary tract assessment in these patients. When CBD calculi were detected ES was performed in order to avoid the technical difficulties associated with their surgical removal in the presence of severe acute pancreatitis.

The management of patients in whom the diagnosis was suspected on clinical and biochemical grounds is reviewed in this report. In this category of patients the designation 'suspected gallstone pancreatitis' is preferred in view of the well-known observation that a significant proportion of these patients have no gross evidence of acute pancreatitis at early surgery.⁶⁻⁹ Patients in whom gallstone pancreatitis was discovered at diagnostic laparotomy for an acute abdomen were excluded from this study, and are reviewed in a separate communication.¹⁰

The purpose of this report is threefold: firstly, to describe a simplified approach to the management of patients with suspected gallstone pancreatitis based on ERCP findings; secondly, to test the reliability of ERCP in the early biliary tract assessment of these patients; and thirdly, to record the results of ES in patients with CBD calculi.

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Patients and methods

The indications for and results of ERCP and ES performed by one endoscopist (S.v.d.S.) in patients with suspected gallstone pancreatitis since 1976 are reviewed. The diagnosis was suspected in patients presenting with acute abdominal pain unrelated to alcohol, clinical features compatible with acute pancreatitis, and a serum amylase value above 1000 U/l (Phadebas method). These patients were routinely investigated by ERCP to establish the presence (or absence) of gallstones and to determine their exact anatomical site. After presentation or referral ERCP was scheduled for the first available session (sessions were held twice-weekly). When the illness was severe and life-threatening urgent ERCP was arranged.

Further management of these patients was based on the ERCP findings: patients with calculi demonstrable in the CBD underwent ES at the conclusion of the procedure; patients with gallstones confined to the gallbladder on ERCP were advised to undergo cholecystectomy; and patients in whom no gallstones were detectable on ERCP were placed in the 'undetermined' aetiological group and underwent continued investigations to establish a diagnosis and exclude the presence of gallstones that might have been overlooked on ERCP.

Technique

A standard ERCP technique was followed, using an Olympus JF-B3 or JF-IT side-viewing duodenoscope. Overfilling of the pancreatic duct was avoided. After demonstration of CBD calculi, ES was carried out using a Classen-Demling sphincterotome and an Olympus PSD diathermy power unit. A pre-cut was made if required for the deep placement of the diathermy electrode within the CBD. In accordance with departmental practice no attempt at endoscopic removal of calculi was made.¹¹ Reliance was placed on free biliary drainage and on the spontaneous passage of calculi from the CBD. In most cases no special precautions were taken after ES apart from the standard clinical observations for complications such as haemorrhage, acute cholangitis and pancreatitis. Patients with evidence of acute cholangitis were treated with an appropriate antibiotic. A nasobiliary drain was inserted in selected patients with large calculi or with evidence of cholangitis to prevent impaction of calculi at the sphincterotomy site, and normal saline was infused down the catheter at a rate of 4 - 5 ml/h for 3 - 5 days.

Further management

Patients with an intact gallbladder at the time of ES were managed selectively. Elective cholecystectomy was advised if they were relatively young and fit, while an expectant attitude was adopted if they were frail and elderly.

Patients were followed up by personal interviews or contact through the referring physician until December 1988 (or earlier death). Special emphasis was placed on the presence or absence of recurrent pancreatobiliary symptoms. The passage of CBD calculi following ES was not routinely confirmed

radiologically, but cholangiography was routinely performed during subsequent cholecystectomy and ERCP was performed if biliary symptoms recurred.

Results

During the 12-year period 1976 - 1988, 31 patients (21 women, 10 men) with suspected gallstone pancreatitis were encountered. The mean age was 64 years (range 26 - 89 years). In the majority of patients the illness was mild to moderately severe and settled rapidly; 4 patients, however, had severe and life-threatening illness, and 2 of the 4 had evidence of cholangitis (rigors, a temperature of more than 38°C, and clinically apparent jaundice).

ERCP

ERCP was successfully carried out in 29 patients. The 2 remaining patients did not undergo ERCP and were not included in this study; 1 patient refused the investigation, while the other presented at a time when an experienced endoscopist was not available.

ES was carried out in 13 patients who were shown to have CBD calculi on ERCP, and 12 patients in whom calculi were confined to the gallbladder on ERCP were advised to undergo cholecystectomy. This was performed electively in 9 cases, while cholecystectomy alone was performed in 1 very frail and elderly patient. Two patients refused cholecystectomy.

No calculi were demonstrable on ERCP in 4 patients. Repeated investigations, which included ultrasound examination, subsequently failed to show evidence of calculi in this undetermined aetiological group, indicating a true negative result on ERCP.

An analysis of the reliability of ERCP in the early biliary tract assessment of 29 patients with suspected gallstone pancreatitis is summarised in Table I. Imaging of the CBD was regarded as unsatisfactory in 2 patients (7%); in 1 case a calculus was suggested but the cholangiograms were of sub-optimal quality, and in another no CBD calculi were detected, but operative cholangiography performed during cholecystectomy subsequently revealed a small calculus. The gallbladder was intact in 24 patients, 5 having previously had a cholecystectomy. The gallbladder failed to fill in 2 patients (8%); in 1 case subsequent cholecystography also showed non-filling, suggesting a gallbladder lesion, and the other ES was performed as soon as CBD calculi were detected and filling of the gallbladder was not attempted. The analysis suggests an accuracy of ERCP in excess of 92%.

ES

ES was carried out successfully in all 13 patients with CBD calculi. There were no complications and no deaths. Sympto-

matic patients all experienced rapid relief of symptoms; improvement was particularly striking in 4 patients with severe, life-threatening pancreatitis caused by CBD calculi. Four patients with intact gallbladders were treated expectantly, while 3 patients underwent elective cholecystectomy.

Two patients who underwent ES have been lost to follow-up, while the remaining 11 have been followed up for periods ranging from 1 to 12 years (mean 3 years). Two patients died of other causes during this period. No recurrence of pancreatitis has occurred in any patient, including the 4 in whom the gallbladder remained *in situ*. One patient developed an attack of biliary colic after ES, but surgery was withheld owing to severe chronic obstructive airways disease, of which she died 3 years later. Patients who underwent follow-up cholangiography after ES (operative cholangiography during cholecystectomy in 3 patients, and ERCP in 2) did not have residual CBD stones.

Discussion

The management of acute pancreatitis caused by gallstones remains controversial. Until comparatively recently the controversy centred around the timing of surgical intervention, with a sharp dividing line between surgeons advocating biliary surgery within 72 hours of admission (or 'urgent' biliary surgery)¹²⁻¹⁴ and those advocating non-operative initial management and definitive biliary surgery after the 5th day of admission (or 'early' biliary surgery).¹⁵⁻¹⁷ Because many have found that urgent biliary surgery is accompanied by increased morbidity and mortality,¹⁵⁻¹⁸ this approach has not gained general acceptance.

The controversy has gained a fresh perspective with the introduction of ERCP and ES as an alternative to surgery in the management of patients with acute gallstone pancreatitis. The present study, which was commenced in 1976, was mainly concerned with ERCP as a method of biliary tract assessment in patients with suspected gallstone pancreatitis, and with the safety and efficacy of ES in patients found to have CBD calculi. It did not involve any controlled comparison with surgery. Such a study was undertaken more recently by Neoptolemos *et al.*,¹⁹ who carried out a controlled trial of urgent ERCP and ES versus conventional treatment (i.e. non-operative initial management and early definitive biliary surgery). They showed that morbidity was lower and hospital stay shorter with urgent ERCP and ES compared with conventional management.

Although it has been shown that the endoscopic approach has certain advantages over definitive biliary surgery in patients with gallstone pancreatitis, several aspects of the endoscopic approach require clarification, e.g. the method of selection of patients in whom ERCP would be desirable, the timing of the endoscopic intervention, the need for the extraction of CBD calculi after successful ES, and the potential role of ES in patients with calculi confined to the gallbladder. These issues

TABLE I. RESULTS OF EARLY BILIARY TRACT ASSESSMENT BY ERCP IN PATIENTS WITH SUSPECTED GALLSTONE PANCREATITIS

Structure assessed	Patients investigated	Technically unsatisfactory	True-positive results	True-negative results	False-positive results	False-negative results	Accuracy (%)
CBD	29	1*	12†	15	0	1	93
Gallbladder	24‡	2	20†	4	0	0	92

* Presence of calculus suggested, but ERCP of suboptimal quality.

† Presence of calculi on ERCP unequivocal.

‡ 5 patients had had a cholecystectomy previously.

will be discussed briefly in the light of the experience gained with this series of cases.

The routine application of ERCP as a method of early biliary tract assessment has greatly simplified the management of patients with suspected gallstone pancreatitis. By this method patients were divided into their appropriate treatment groups with a high degree of precision, viz. patients with CBD calculi, who were managed by ES; patients with calculi confined to the gallbladder, who were advised to undergo a cholecystectomy; and patients without detectable gallstones, who did not require any biliary intervention.

Non-invasive investigations such as ultrasonography, radio-nuclide scanning, and biliary contrast radiography were also used, but unlike ERCP they did not play a decisive role in management because they were unreliable in detecting CBD calculi.²⁰⁻²² Neoptolemos *et al.*²³ found an admission serum bilirubin value of more than 40 mmol/l a good predictor of persisting CBD calculi and a valuable aid in deciding whether to undertake ERCP. A review of the results in the present series, however, showed this correlation to be too unreliable to be helpful; 5 of the 13 patients with choledocholithiasis had serum bilirubin levels below 40 mmol/l.

The policy adopted with regard to timing of endoscopic intervention in this series was based on a knowledge of the natural history of the disease. Since gallstone pancreatitis is known to settle down spontaneously after an acute attack in the majority of cases, there is generally no need for urgent intervention. Biliary tract assessment by means of ERCP was therefore scheduled for the first available session. More urgent endoscopic intervention was reserved for severely ill patients whose condition was not settling. In most of these cases persistent CBD calculi were demonstrated, and ES was performed with striking symptomatic improvement. The good results obtained in this series suggest that the timing of the endoscopic intervention was satisfactory.

It is generally accepted that an attempt should be made to extract calculi after ES for CBD calculi. The author has not followed this practice, but has rather relied on establishing free biliary drainage and on the spontaneous passage of calculi from the CBD after successful ES.¹¹ A policy of non-extraction has also been followed in patients with suspected gallstone pancreatitis managed by ES in the present series, and is supported by follow-up observations; recurrent biliary symptoms occurred only in 1 patient in whom the gallbladder remained *in situ*; pancreatitis has not recurred in any patient; and no residual CBD calculi were detected in 5 patients who underwent follow-up cholangiography. While the extraction of calculi after ES is an attractive concept, the actual benefit to the patient remains to be established by a controlled study.

There has been a striking absence of recurrent pancreatitis after ES, even in patients with an intact gallbladder who have been managed expectantly. The protective effect of ES against recurrent gallstone pancreatitis even in the presence of a gallbladder containing stones suggests a potential role for ES even when ERCP shows that the gallstones are confined to the gallbladder. Such a step could be considered in patients who are unfit for surgery or refuse cholecystectomy.

The accurate localisation of biliary calculi on ERCP permitted a more conservative approach to suspected gallstone pancreatitis. CBD calculi could be managed safely and effectively by ES, thus avoiding a potentially difficult and unsatisfactory CBD exploration. Furthermore, frail and elderly

patients with an intact gallbladder could be managed expectantly after ES, with a low risk of recurrent pancreatobiliary problems.

In conclusion, an approach based on ERCP and ES greatly simplified the management of suspected gallstone pancreatitis. ERCP is an accurate method of early biliary tract assessment, and a reliable guide to further management. ES without basket extraction provides safe and effective symptomatic relief in patients with CBD calculi, and prevents recurrence of pancreatitis even when the gallbladder remains intact.

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