

Gallstone pancreatitis – who really needs an ERCP?

Michael F Byrne MA MD (Cantab) MRCP FRCPC

Gallstones are the leading cause of acute pancreatitis (AP) in developed countries, accounting for up to 50% of cases. Although advances have been made, there is still a significant mortality associated with AP in the range of 2% to 10%, with rates as high as 25% found in the presence of infected pancreatic necrosis (1,2). However, the majority of patients with acute gallstone (biliary) pancreatitis (ABP) have a mild attack and recover uneventfully. A gallstone etiology is suggested by an early rise in the bilirubin, serum transaminases or both, or by findings of ductal stones or ductal dilation on imaging. The role and timing of endoscopic retrograde cholangiopancreatography (ERCP) in the management of gallstone pancreatitis has been a subject of much debate over the past few years.

There is a growing consensus among gastroenterologists that ERCP should be reserved principally, if not solely, for patients in whom therapeutic intervention is likely, because the procedure carries a morbidity of 5% to 10% and a mortality of 0.1% to 0.5%. ERCP shares the risks associated with all endoscopic techniques, as well as having complications particular to this procedure. Risks specific to instrumentation of the pancreaticobiliary system include pancreatitis, cholangitis, bleeding and retroduodenal perforation.

Several studies in the laparoscopic age have investigated the use of preoperative criteria, such as liver function tests, ultrasound findings and features and severity of pancreatitis and cholangitis to predict the likelihood of common bile duct (CBD) stones. The results vary somewhat among studies but overall have been fairly disappointing (3,4). Use of these and other criteria to 'drive' the use of preoperative ERCP results in a high percentage of negative studies. One must always consider that, at the time of initial management of the gallstone pancreatitis patient, there are several options we can consider for detecting and subsequently removing any bile duct stones – preoperative ERCP, magnetic resonance cholangiopancreatography (MRCP), endoscopic ultrasound (EUS), laparoscopic cholecystectomy with intraoperative cholangiography followed by bile duct exploration (laparoscopic or open), or post-operative ERCP and stone extraction.

So, what about the role of early 'preoperative' ERCP in ABP? There are four much quoted prospective randomized trials that have evaluated the role of early ERCP in patients with suspected or confirmed ABP (5-8). The United Kingdom and

Hong Kong studies (5,6) essentially concluded that patients with severe gallstone pancreatitis benefit from early ERCP and sphincterotomy with a reduction in morbidity and mortality. The study from Germany (7) suggested that early ERCP does not benefit patients with ABP without obstructive jaundice or biliary sepsis. In fact, the early ERCP group in this study had a higher incidence of respiratory failure and more severe complications. Finally, a Polish study (8) concluded that all patients with ABP, irrespective of the severity of disease, would benefit from early ERCP.

These are the hard data from which we have to draw a set of recommendations. Most experts in the field conclude from the current body of evidence that early ERCP is most certainly to be encouraged in the setting of one or more of the following: severe ABP, dilation of the CBD on imaging, jaundice, cholangitis

or persistently abnormal and rising liver enzymes (9). In addition, one should also perform urgent ERCP when there is clinical deterioration or in patients with initial mild prognostic signs who fail to improve after 48 h. Early ERCP has been shown to reduce the length of hospital stay in patients with severe ABP. However, in the majority of patients with ABP, preoperative ERCP is not indicated (10). Gallstones causing pancreatitis tend to be small and typically pass spontaneously. A useful statistic to highlight is that ERCP will detect CBD stones in less than 20% of patients with ABP 48 h to 72 h after the onset of an attack. In fact, the offending stone has often passed out of the bile duct by the time the patient has actually presented clinically with pancreatitis.

So, what if one does not follow these recommendations closely, but rather performs ERCP in any patient with ABP, even those with mild disease or those with no jaundice or cholangitis? Are we potentially doing harm? This nonselective policy is undoubtedly practiced by some endoscopists. For the patient who is not fit to have a cholecystectomy, endoscopic sphincterotomy (ES) performed during ERCP is, as discussed below, an intervention that seems to protect the patient against future attacks. However, because most patients with mild features and resolving liver numbers will settle without intervention, exposing this group to the known risks of ERCP and ES is difficult to support. It really is not clear from the literature whether ERCP in this group of patients significantly increases their morbidity, but I like to heed the advice that the



Dr Michael F Byrne

Division of Gastroenterology, Vancouver General Hospital, University of British Columbia, Vancouver, British Columbia

Correspondence: Dr Michael F Byrne, Division of Gastroenterology, Vancouver General Hospital, University of British Columbia,

100-2647 Willow Street, Vancouver, British Columbia V5Z 3P1. Telephone 604-875-5640, fax 604-875-5373, e-mail michael.byrne@vch.ca

patient who least needs an ERCP is the one most at risk of a complication.

It is beyond the scope of the present article to go into any detail about the actual techniques in biliary stone removal during ERCP. However, I think it is worth briefly mentioning that there is a body of evidence to support the placement of a small calibre pancreatic stent if bile duct access is achieved by a pre-cut sphincterotomy (11). A pre-cut is clearly only ever considered when bile duct access is deemed critical and when standard cannulation techniques have failed. Removing a biliary stone in a patient with ABP is all very well, but if ampullary edema from a pre-cut occludes the pancreatic orifice, one may well worsen the situation, even if only temporarily. Although using the 0.018 guidewire for the 3F stent can be a nuisance, the endoscopist and the patient will likely reap the benefit of the extra few minutes to place this stent. Many of these small stents fall out within a few days – as is desired. One therefore may not always even have to remove these stents endoscopically seven to 10 days later (as is my practice) if the stent is no longer visible on fluoroscopy or plain film.

In the past few years, emergence of newer imaging techniques, such as MRCP and EUS, has thankfully allowed us to move ERCP toward being a mainly therapeutic procedure and has limited the number of unnecessary, purely diagnostic ERCPs. Imaging of the biliary tree and pancreas by MRCP is constantly improving. Indeed, MRCP provides images with sensitivity and specificity approaching those obtained by ERCP (12). That said, MRCP results are suboptimal in the detection of small ductal stones, especially those impacted at the ampulla, and in nondilated ducts. However, technical refinements in magnetic resonance technology are likely to address these concerns in the near future. Because MRCP is a safe, noninvasive test, it is hoped that its use will limit the number of unnecessary diagnostic ERCPs. However, MRCP is limited at present by its high cost and limited availability in many centres. Using MRCP routinely to determine the need for therapeutic ERCP is neither practical nor cost-effective at present. What is needed is a reliable indicator of the need for likely endoscopic intervention, a simple test or clinical index that confirms or strongly predicts the presence of choledocholithiasis. EUS is a great tool in the right hands for detecting even small ductal stones or sludge, and has a diagnostic accuracy of over 96% for choledocholithiasis (13,14). EUS carries an inconsequential risk of pancreatitis and could be regarded as the imaging modality of choice in patients with low or moderate probability of CBD stones. Obviously, our patients with severe ABP or evidence of jaundice or cholangitis clearly seem to benefit from early ERCP but EUS or MRCP could certainly help to stratify those more 'borderline' patients into risk groups that would benefit most from preoperative ERCP.

There is debate about whether recurrent biliary complications are more common in patients who do not have elective cholecystectomy after management of CBD stones by sphincterotomy and duct clearance during ERCP (15). This is an option increasingly used in poor surgical candidates. Some studies suggest that an intact gallbladder, with or without gallstones, is a risk factor for recurrent bile duct stones and that cholecystectomy should be performed electively to prevent this and other biliary complications (16). However, other studies conclude that elective cholecystectomy after ES does not significantly reduce the incidence of recurrent biliary

complications (17). Based on the latter data, it is the practice of some centres to adopt a 'wait-and-see' policy after ES for bile duct stones, regardless of age or fitness for surgery. Several retrospective studies have described a relatively low incidence (5% to 12%) of biliary complications or symptoms in patients who do not have routine cholecystectomy after endoscopic bile duct stone clearance. However, other studies, some of them randomized and prospective, do not support this opinion. Yi (18) found a recurrence rate of biliary symptoms of over 20% in noncholecystectomy patients. Recurrence rates were even higher in a recent study from the Netherlands (15) in which 120 patients were randomly allocated following ES and extraction of bile duct stones into two treatment groups: 'wait-and-see' or laparoscopic cholecystectomy. This study found that 47% of expectantly managed patients developed at least one 'recurrent biliary event' during two-year follow-up, and that 37% of these patients needed cholecystectomy. The authors determined that the absolute risk reduction for future events of laparoscopic cholecystectomy was 45%. Interestingly, and somewhat surprisingly, they also found that in the 'wait-and-see' group, younger patients tended to develop recurrent biliary symptoms more frequently than elderly ones. So, what should we be asking of our patients and surgeons? From existing studies, the decision whether to perform subsequent cholecystectomy would appear to be somewhat subjective. It has been postulated that surgeons are more likely to suggest surgery than gastroenterologists, who may favour a conservative approach. Certainly, laparoscopic cholecystectomy is the 'gold standard' for treating cholelithiasis and has been shown to be safe. The previous practice of open cholecystectomy with cholangiography and choledochotomy has been superseded by a practice of 'selective' preoperative ERCP before laparoscopic cholecystectomy or, in skilled surgical hands, a single-stage laparoscopic procedure with cholecystectomy and laparoscopic bile duct exploration. However, not all surgeons have the necessary training for an interest in performing laparoscopic bile duct stone extraction.

I agree that a 'wait-and-see' policy is often the most appropriate practice for poor surgical candidates, and I generally perform a biliary sphincterotomy in this group, but one needs to keep in mind the relatively high symptom recurrence rate. In patients with mild gallstone pancreatitis, ideally one should arrange for cholecystectomy as soon as the patient has recovered (usually within five to seven days), and ideally during the same hospital admission. We have all dealt with the patient who has had another attack of gallstone pancreatitis while waiting two months for surgery, so do try and expedite the surgery if at all possible. The surgeons at my institution generally provide an expedited service which undoubtedly reduces our incidence of 'interim' pancreatitis. In patients who have had a severe gallstone pancreatitis, most surgeons will tell you that it is preferable to delay surgery until the inflammation has subsided (perhaps three to four weeks) and the procedure is then technically easier.

In conclusion, I will rephrase the question posed at the beginning of this article. Should ERCP be performed in all patients with ABP? We have to say that the answer to this question is a firm 'no'. As gastroenterologists, we are often requested or even 'told' by our colleagues that their patient 'needs' an ERCP because she has gallstone pancreatitis. If you want to give your colleague an evidence-based answer as to why you may or may not wish to proceed with ERCP, there are several

sources of reliable data and plenty of so-called 'expert' opinions to back you up. I follow the findings of the more recent literature supporting early ERCP with stone extraction and biliary decompression in patients with evidence of progressive biliary obstruction (jaundice or cholangitis) or in cases of predicted severe biliary pancreatitis (three or more Ranson criteria). Many patients have mild biliary pancreatitis without such features and they usually settle without intervention – there is no justification for doing 'routine' preoperative ERCP in this group. Most of these patients will pass their stones spontaneously. Patients should have cholecystectomy as soon as possible after the attack of pancreatitis has subsided. On the rare occasion when subsequent cholecystectomy is deemed unsafe because, for instance, the patient is old and frail, ES should be performed even in the absence of choledocholithiasis, because ES in these patients may be protective against recurrent gallstone pancreatitis.

REFERENCES

1. Baron TH, Morgan DE. Acute necrotizing pancreatitis. *N Engl J Med* 1999;340:1412-7. (Erratum in 1990;341:460).
2. Mitchell RM, Byrne MF, Baillie J. Pancreatitis. *Lancet* 2003;361:1447-55.
3. Prat F, Meduri B, Ducot B, Chiche R, Salimbeni-Bartolini R, Pelletier G. Prediction of common bile duct stones by noninvasive tests. *Ann Surg* 1999;229:362-8.
4. Abboud PA, Malet PF, Berlin JA, et al. Predictors of common bile duct stones prior to cholecystectomy: A meta-analysis. *Gastrointest Endosc* 1996;44:450-5.
5. Neoptolemos JP, Carr-Locke DL, London NJ, Bailey IA, James D, Fossard DP. Controlled trial of urgent endoscopic retrograde cholangiopancreatography and endoscopic sphincterotomy versus conservative treatment for acute pancreatitis due to gallstones. *Lancet* 1988;2:979-83.
6. Fan ST, Lai EC, Mok FP, Lo CM, Zheng SS, Wong J. Early treatment of acute biliary pancreatitis by endoscopic papillotomy. *N Engl J Med* 1993;328:228-32.
7. Folsch UR, Nitsche R, Ludtke R, Hilgers RA, Creutzfeldt W. Early ERCP and papillotomy compared with conservative treatment for acute biliary pancreatitis. The German Study Group on Acute Biliary Pancreatitis. *N Engl J Med* 1997;336:237-42.
8. Nowak A, Marek TA, Nowakowska-Dulawa E, Rybicka J, Kaczor R. Biliary pancreatitis needs endoscopic retrograde cholangiopancreatography with endoscopic sphincterotomy for cure. *Endoscopy* 1998;30:A256-9.
9. Carr-Locke DL. Biliary pancreatitis. *Can J Gastroenterol* 2003;17:205-8.
10. Howden JK, Baillie J. Preoperative versus postoperative endoscopic retrograde cholangiopancreatography in mild to moderate pancreatitis: A prospective randomized trial. *Gastrointest Endosc* 2001;53:834-6.
11. Rashdan A, Fogel EL, McHenry L Jr, Sherman S, Temkit M, Lehman GA. Improved stent characteristics for prophylaxis of post-ERCP pancreatitis. *Clin Gastroenterol Hepatol* 2004;2:322-9.
12. Varghese JC, Liddell RP, Farrell MA, Murray FE, Osborne DH, Lee MJ. Diagnostic accuracy of magnetic resonance cholangiopancreatography and ultrasound compared with direct cholangiography in the detection of choledocholithiasis. *Clin Radiol* 2000;55:25-35. (Erratum in 2000;55:657).
13. de Ledinghen V, Leceesne R, Raymond JM, et al. Diagnosis of choledocholithiasis: EUS or magnetic resonance cholangiography? A prospective controlled study. *Gastrointest Endosc* 1999;49:26-31.
14. Byrne MF, Jowell PS. Gastrointestinal imaging: Endoscopic ultrasound. *Gastroenterology* 2002;122:1631-48.
15. Boerma D, Rauws EA, Keulemans YC, et al. Wait-and-see policy or laparoscopic cholecystectomy after endoscopic sphincterotomy for bile-duct stones: A randomised trial. *Lancet* 2002;360:761-5.
16. Targarona EM, Ayuso RM, Bordas JM, et al. Randomised trial of endoscopic sphincterotomy with gallbladder left in situ versus open surgery for common bile duct calculi in high-risk patients. *Lancet* 1996;347:926-9.
17. Lai KH, Lin LF, Lo GH, et al. Does cholecystectomy after endoscopic sphincterotomy prevent the recurrence of biliary complications? *Gastrointest Endosc* 1999;49:483-7.
18. Yi SY. Recurrence of biliary symptoms after endoscopic sphincterotomy for choledocholithiasis in patients with gall bladder stones. *J Gastroenterol Hepatol* 2000;15:661-4.




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