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Management of common bile-duct stones and associated gallbladder stones: surgical aspects

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For many years, open exploration of the common bile duct has been the treatment of choice for patients with common bile-duct stones. During recent decades endoscopic sphincterotomy has gained wide acceptance as an effective and less invasive alternative. After sphincterotomy, subsequent (laparoscopic) cholecystectomy is warranted in patients with gallbladder stones. This chapter will discuss whether sphincterotomy should be performed prior to, during or after cholecystectomy, and will also address the question of whether single-stage treatment by laparoscopic cholecystectomy and laparoscopic bile-duct exploration is in fact preferable. The rate of recurrent choledocholithiasis after endoscopic biliary sphincterotomy can reach more than 20%. This review focuses on the risk factors – delayed bile-duct clearance and bactobilia – that may lead to recurrent primary bile-duct stone formation. Underlying altered bile composition (relative phospholipid deficiency) should be recognised in a subgroup of patients. Identification of these risk factors may significantly affect treatment policy.

Key words: choledocholithiasis; laparoscopic cholecystectomy; endoscopic sphincterotomy; common bile-duct exploration; ursodeoxycholic acid; MDR3 protein.

Up to 15% of patients with gallbladder stones exhibit concomitant stones in the common bile duct (CBD).[1] Symptoms caused by CBD stones consist of colic or may result from complications such as jaundice, cholangitis or pancreatitis.

In case of symptomatic CBD stones, decompression of the common bile duct and removal of ductal stones is warranted. Decompression may be achieved by endoscopic methods such as endoscopic sphincterotomy, papillary dilatation, nasobiliary drainage,

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or biliary stenting. Whether these different modalities represent a permanent solution remains a subject of discussion. For a long time it has been matter of debate whether removal of CBD stones should be followed by cholecystectomy to prevent recurrent symptoms. Only recently, prospective randomised trials have suggested benefit of planned subsequent cholecystectomy. But in which individual patients should we be more aggressive, and in which situation is an expectant policy preferable? And if we decide that a specific patient will in the end need surgery, why not try to treat that patient in one procedure by cholecystectomy and surgical stone removal? Should we perform that procedure laparoscopically? Should we then, avoiding 'unnecessary' preoperative drainage procedures, perform standard intraoperative cholangiography, and proceed to bile-duct exploration if stones are present? Or have the skills of today's gastroenterologists developed to such a high level that endoscopic sphincterotomy is standard first-choice therapy for CBD stones? And if so, should a patient with combined cholecystocholedocholithiasis undergo both endoscopic sphincterotomy and laparoscopic cholecystectomy, and should we concentrate on the sequence and timing of both procedures?

INTERVENTIONAL TREATMENT OPTIONS FOR CBD STONES

Open cholecystectomy and CBD exploration

Long before the introduction of endoscopic treatment measures for CBD stones, the first surgical CBD exploration was reported in 1889 by a Swiss surgeon, Ludwig Courvoisier, who removed a gallstone via an incision in the CBD.[2] For many years, open cholecystectomy and exploration of the common bile duct has been standard treatment of patients with combined cholecystocholedocholithiasis. Morbidity and mortality of this procedure were low, the percentage of retained stones only 1–3%, and during long-term follow-up revisional surgery was necessary in about 10% of the patients.[3–6] But nowadays surgical experience with the procedure has decreased dramatically, and open exploration of the common bile duct is reserved for patients in whom less invasive treatment options are unsuccessful.

Open cholecystectomy and CBD exploration versus endoscopic sphincterotomy

In the early 1970s, endoscopic sphincterotomy (ES) was introduced as a treatment modality for common bile-duct stones.[7,8] During the following decades, ES gained wide acceptance as a good, less invasive, highly effective alternative for the treatment of biliary obstruction due to gallstones. However, in patients with residual stones in the gallbladder, subsequent cholecystectomy was considered necessary. In a prospective randomised trial it was demonstrated that ES before (open) cholecystectomy did not lead to earlier recovery or less postoperative morbidity as compared to primary open cholecystectomy combined with common bile-duct exploration.[5] Thus it was concluded that routine preoperative ES was not recommended. Why subject these patients to ERCP with its morbidity and mortality if surgery is to be performed anyway?

On the other hand, patients who were considered unfit for surgery because of old age or severe co-morbidity were managed expectantly more and more often after ES. After all, the 'pseudo-obstruction' caused by stones at the level of the ampulla of Vater had been eliminated. And in large retrospective series it appeared that only 10% of these expectantly managed patients presented after ES with their gallbladder in situ,