Common Bile Duct Stones – Update 2006

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Definition, Epidemiology and Clinical Course

There are no obvious changes in epidemiology of common bile duct stones (CBDS). As less invasive treatment options for CBDS are now well established, even older patients with significant comorbidities and pediatric patients who present with symptomatic cholecystolithiasis and CBDS are reported to be treated with increasing success [3, 25, 34]. In contrast, some prospective data suggest that in selected patients older than 80 years of age an expectant attitude can be justified, because symptoms are rare (below 15%) and in over one third of patients spontaneous passages of calculi were observed [4, 25].

Diagnosis of Common Bile Duct Stones

The ongoing unsolved crucial issue in diagnosis and treatment of CBDS is whether one should favour a high rate of negative examinations or a higher rate of retained stones. The benefit or harm of either strategy short and long term remains to be settled. Further studies [1, 32] underlined that cholangitis, dilated common bile duct with evidence of stones by ultrasound, elevated conjugated bilirubin, and less likely elevated asparate transaminase were predictive as individual factors and jointly excellent indicators (positive predictive value 99%) for CBDS. No new predictive factors for CBDS have been described in the literature and the 1997 statement is still valid for the identification of high-, medium- and low-risk groups for CBDS.

No new diagnostic tools have been established, but some of the existing diagnostic tools have been improved. Conventional percutaneous ultrasound continues to be useful, but still serves just as a screening tool. Intravenous cholangiography is of very limited value and the routine use of intravenous cholangiography cannot be advocated [14, 21]. Besides the technical advances, for example in evaluation of living related liver transplantation (“all-in-one” CT), CT continues to play a major role in routine diagnosis and management of CBDS [16]. Intraoperative ultrasound has a high accuracy (above 95%), but requires sufficient expertise and normally has its place only in centres performing one-stage procedures either by an open approach or by laparoscopy [2, 28].

Endoscopic ultrasound is an excellent diagnostic tool for CBDS with a sensitivity of more than 95% and a specificity of more than 90%, but is an invasive procedure and no controlled trials were published in the last 5 years, indicating that there is no widespread acceptance of endoscopic ultrasound in diagnosis of CBDS in general practice [24, 30]. The technology of magnetic resonance cholangiopancreatography (MRCP) is evolving rapidly and is increasingly gaining acceptance. Sensitivities and specificities for diagnosis of CBDS are reported to be 97 and 95%, respectively. Furthermore, there are data available showing that differentiated use of short and long-sequence MRI and half-Fourier acquired single-shot turbo spin echo (HASTE) vs rapid acquisition with relaxation enhancement (RARE) can increase diagnostic accuracy and decrease costs [6, 7, 13, 19, 20, 27, 36]. Currently, MRC(P), whenever available, should be the standard diagnostic test for patients with medium or high risk for CBDS. Endoscopic retrograde cholangiopancreatography (ERCP) provides an accuracy of at least more than 90% but owing to its invasiveness and complication rate ERCP is only indicated for confirming diagnosis of CBDS and whenever there is an intention to treat CBDS by endoscopic papillotomy (EPT) and stone extraction in the same session, or when magnetic resonance cholangiography (MRC) or endoscopic ultrasound are not available. Alternatively, CBDS are diagnosed by intraoperative cholangiography, whenever preoperative diagnosis is uncertain, or when there is an intention to treat CBDS intraoperatively [2, 21, 28].

Operative vs Conservative (Interventional) Treatment

According to published (external) evidence there is no option which can be identified as a “gold standard”. Endoscopic stone extraction via endoscopic retrograde cholangiography/papillotomy, laparoscopic transcystic or laparoscopic common bile duct revision, and open duct exploration are applied. All three treatment options can be very effective and safe in experienced hands; however, all three treatment principles have their specific disadvantages [5]. Results of three randomized controlled trials comparing therapeutic splitting with one-stage procedures including laparoscopic common bile duct exploration (LCBDE) are available. Depending on the study design, some arguments in favour of laparoscopic bile duct revision [5, 26, 29] can be derived from these studies. Furthermore, in some published series, single-stage procedures including LCBDE are safe and effective, and can result in shorter hospital stay and less frequent procedures, although a clear advantage could not be shown [8, 23]. However, preoperative ERCP and clearance of the common bile duct followed by laparoscopic cholecystectomy is the most frequently applied technique, at least in surveys in Scotland (96.2%) and Germany (94.2%) [12, 17].

CBDS following cholecystectomy should be primarily treated by endoscopy. In the absence of cholangitis, indication for “routine” cholecystectomy after en-

doscopic duct clearance can be individualized in high-risk patients. In order to potentially reduce long-term complications of endoscopic sphincterotomy, endoscopic dilatation for stone clearance showed similar clearance rates, less bleeding, and preservation of sphincter function in controlled trials [15, 22, 33].

Choice of Surgical Approach and Procedure

If single-stage procedures are performed or operative bile duct exploration is otherwise indicated, there is no clear recommendation whether to perform open or laparoscopic common bile duct revision. LCBDE has possible advantages concerning hospital stay and postoperative pain, while being equally safe in experienced hands. Concerning technical aspects of LCBDE, descriptions of various techniques exist. Especially, concerning closure of the common bile duct over T-tubes, an endoprothesis, or no drainage at all, no recommendations can be given [9, 10, 35].

General Comments

In general, it remains uncertain what are the exclusively best diagnostic and therapeutic strategies for CBDS. Personal expertise and experience of the surgical, medical, and radiology team and costs or socioeconomics still seem to be dominating factors in general practice. Nevertheless the currently existing diagnostic tools have a high accuracy and the existing treatment options are effective concerning clearance of CBDS, while usually being safe.

In patients who have a medium risk for the presence of CBDS they are best diagnosed by MRC. Although there has been a continuous trend in the last decade from large incisions towards “closed-cavity” treatment options, up to now, only a minority of surgeons prefer the LCBDE. Most frequently, the also minimally invasive treatment option of combining laparoscopy and conventional interventional endoscopy is applied. Possible reasons are that laparoscopic bile duct surgery requires demanding technical skills, has a longer learning curve, and new methods of adequate training in advanced endoscopic surgery still have to be developed, evaluated, and introduced in general practice [11, 31]. Additionally specialization is already high and increasing, and for example, ERCP and EPT are rather performed by physicians and percutaneous transhepatic cholangiography with drainage by interventional radiologists and not by surgeons. Therefore, an interdisciplinary team approach is usually necessary and overall success may depend on the strength of the team. Training and continuous education should be intensified, especially in academic institutions. Surgeons should be preferably trained in academic institutions which are independent.

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