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# Management of common bile duct stones in the era of laparoscopic cholecystectomy

An Essay  
submitted for partial fulfillment of master degree  
in general surgery

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## Summary:

The incidence of the CBD stones in patients having gallstones varies between 8 and 20%.<sup>1</sup> CBD stones are usually accompanied by gallbladder stones, but in about 5% of cases the gallbladder is empty.<sup>2</sup>

Common bile duct stones (Choledocholithiasis) may appear in one of the following five ways: without symptoms, biliary colic, jaundice, pancreatitis and cholangitis. The classic triad of fever with chills, jaundice and pain leads to the suspicion of choledocholithiasis and when associated with known cholelithiasis, the diagnosis is certain. Total bilirubin, Alkaline Phosphatase and liver function tests are elevated and the common bile duct diameter is more than 8 mm on sonography.<sup>1</sup>

High values (more than or equal to the double of the normal value) of serum glutamic oxalacetic transaminase (SGOT), alkaline phosphatase (ALP) and conjugated bilirubin with dilated duct (>8mm) are all diagnostic factors of common bile duct lithiasis.<sup>3</sup>

Radiological preoperative evaluation includes ultrasonography which is the most commonly used modality, and has a sensitivity of 55 to 91%.<sup>4</sup> Computed tomography is very useful in diagnosing choledocholithiasis and has a sensitivity of about 95.5%.<sup>4</sup> Magnetic resonance cholangio-pancreatography is an accurate, non-invasive modality and has been recommended as the preoperative procedure of choice in detection of choledocholithiasis with a sensitivity of 81-100%.<sup>5</sup> Endoscopic ultrasound is a useful tool and has a sensitivity of 88-97%.<sup>6</sup> Endoscopic retrograde cholangiopancreatography has been the gold standard for preoperative diagnosis of choledocholithiasis. It has the advantage of providing a therapeutic option when a stone is identified. Successful cholangiography by an experienced endoscopist is achieved in greater than 90% of patients.<sup>7</sup>

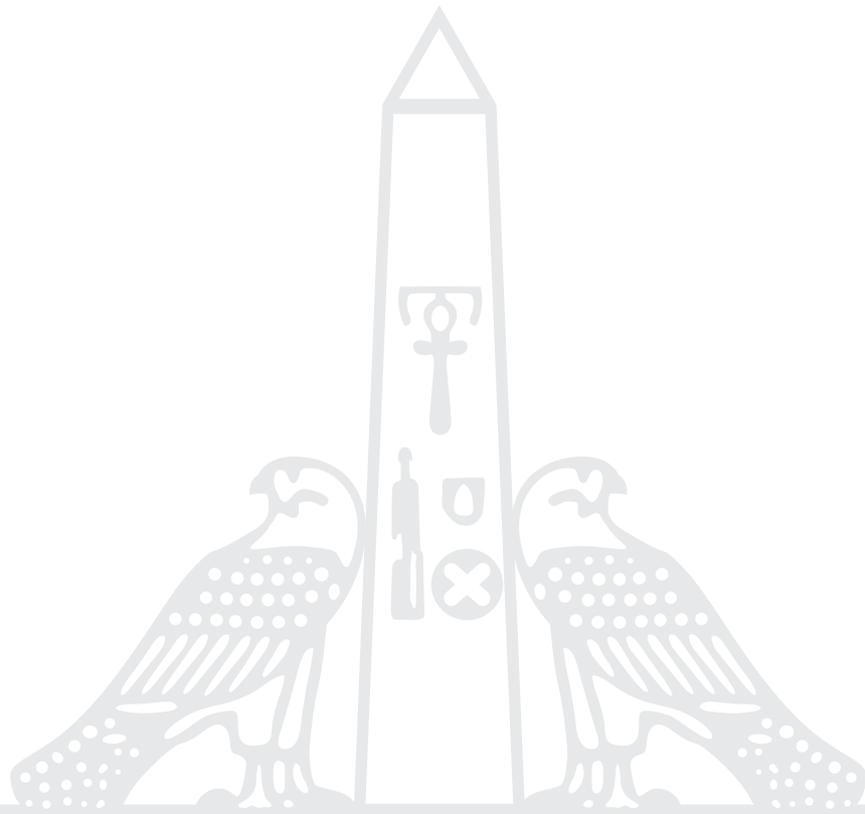
Intraoperative evaluation is done through intraoperative cholangiography, the dynamic fluoroscopic imaging of which is considered as the technique of choice and gives a sensitivity of 98%.<sup>8</sup> Intraoperative ultrasonography can satisfactorily demonstrate stones with a sensitivity of 96%.<sup>8</sup> Choledochoscopy has two types: the rigid Berci-Shore choledochoscope, which can be used in open surgery. The second type is flexible choledochoscope, which can be used in open or laparoscopic surgery and gives a therapeutic option.<sup>9</sup>

Postoperative evaluation can be conducted by endoscopic retrograde cholangiopancreatography which can be used for bile duct clearance when stones are detected intraoperatively.<sup>6</sup>

The treatment options are: pre, intra or postoperative endoscopic retrograde cholangiopancreatography which has a success rate of more than 90% and a complication rate of about 5-10%.<sup>6</sup> Open choledochotomy remains an important option for managing stones that are unsuitable for removal by other options, although it is superseded by the minimally invasive techniques.<sup>10</sup> Laparoscopic common bile duct exploration includes transcystic or transductal procedures and has a success rate of more than 90% and a complication rate of about 9.5%.<sup>11</sup> Lithotripsy which means fragmentation of common bile duct stones, can be done using mechanical, electrohydraulic or laser devices via ERCP or percutaneous access or via extracorporeal shock-wave lithotripsy. The limitations are its availability, experience, and complications.<sup>12</sup> Chemical dissolution therapy is a non-effective option with high complication rate, and has been abandoned as a line of management of common bile duct stones, but may be resorted to as a last option for risky patients, who are unsuitable for other treatment options.<sup>10</sup>

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