CARTA AL EDITOR

Relevant clinical features in the assessment of the performing of intraoperative cholangiography

Aspectos de importancia en la valoración del uso de la colangiografía intraoperatoria

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Dear editors:

Routine use of intraoperative cholangiography (IOC) in patients undergoing a laparoscopic cholecystectomy has been a matter of debate for several years. In this context, we wish to make some comments about the recent publication of Díaz-Osuna et al. in this journal[1]; in this paper, the usefulness of the IOC was evaluated in patients with choledocholithiasis diagnosed with pre-operative imaging study.

1. To date, there are many options in the management of choledocholithiasis, and it is adjusted to patient preference, local expertise, and availability of resources of the center. However, during the initial approach of choledocholithiasis, it is important to evaluate some parameters such as liver function test and others such as common bile duct diameter in abdominal ultrasound; this information was not specified in the paper and that would allow knowing the basic patient demographics of the studied cohort, as well as the influence on the results obtained in the study. The importance of these aspects relies on the impact on therapeutic decision making. In this sense, the American Society for Gastrointestinal Endoscopy (ASGE) has proposed risk criteria for choledocholithiasis[2], although its use has been debated, its high negative predictive value has been demonstrated, allowing to establish the management of this pathology based on risk-benefit. Furthermore, in 2019, the recent update of the ASGE guideline[3], and the European Society of Gastrointestinal Endoscopy guideline for endoscopic management of common bile duct stones, provides practical advice based on level risk for common bile stones. Determining this grade of risk is essential to select, in which patients will benefit most from a more accurate assessment[4] (Fig. 1).
2. Routine use of the IOC is controversial; this role is justified due to the possible reduction of residual stones, as well as the prevention and intraoperative identification of bile duct injury (BDI). However, the available evidence has not been conclusive to support this posture[5]. On the other hand, the limitations of the routine use of IOC, such as an increase in cost and surgical time, increase in post-operative complications, exposure to radiation, the false positives, and, even in some cases, the possible predisposition to BDI, lead to the selective IOC posture (Table 1). The false-positive rate of the IOC for choledocholithiasis is not a minor issue, and it happens by 4-24% of cases[1], due to misinterpretation, inexperience, or even secondary to air bubbles. Particularly, in the paper, the diagnostic performance of the IOC is not specified and only the false positives (6.25%) are

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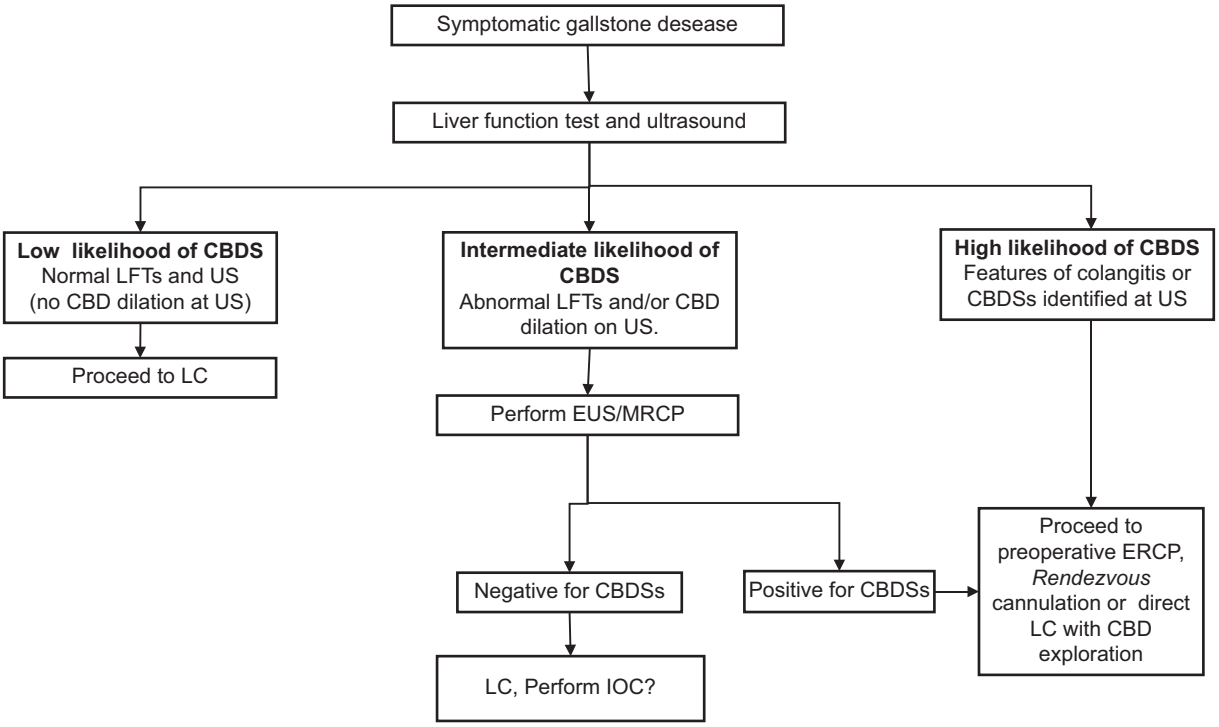

Figure 1. *Diagnostic algorithm for suspected CBDSs. CBD: common bile duct; ERCP: endoscopic retrograde cholangiopancreatography; EUS: endoscopic ultrasonography; IOC: intraoperative cholangiography; LC: laparoscopic cholecystectomy; LFTs: liver function test; MRCP: magnetic resonance cholangiopancreatography; Rendezvous (laparoscopic cholecystectomy and intraoperative ERCP) US: ultrasound. Adapted from endoscopic management of common bile duct stones: ESGE (European Society of Gastrointestinal Endoscopy) guideline 2019[4].*

Table 1. Indications for intraoperative cholangiography during laparoscopic cholecystectomy*

Jaundice or history of jaundice
History of pancreatitis particularly related to gallstone pancreatitis
Elevated liver function tests
Common bile duct larger than 5-7 mm in diameter
A cystic duct larger than 3 mm in diameter
Multiple small gallbladder stones
Unclear anatomy
Common bile duct stones visualized on pre-operative ultrasound
Possible bile duct injury or leak
A short cystic duct

*Indications for intraoperative cholangiography based on SAGES recommendation[5].

mentioned[1]; this is very important when evaluating the usefulness of a diagnostic test.

There are other operative modalities that can be used instead of IOC to evaluate common bile duct anatomy, such as laparoscopic ultrasound, which is an excellent diagnostic tool in choledocholithiasis and when combined with the IOC, the sensitivity and specificity are close to 100%. Furthermore, near-infrared fluorescent cholangiography is a novel emerging technique that is described as safe and feasible to perform during laparoscopic cholecystectomy, although these tools are not always available.

3. Time between endoscopic retrograde cholangiopancreatography (ERCP) and surgery has also been debated, there is the posture of pre-operative ERCP with cholecystectomy in a 2nd time or perform them during the same surgical time in the so-called laparoendoscopic "*Rendezvous*" procedure (laparoscopic cholecystectomy and intraoperative ERCP). Intraoperative ERCP with *Rendezvous* cannulation offers the advantages of being a single-stage procedure and decreasing the risk of post-ERCP pancreatitis[4]. In this regard, in the study by Díaz-Osuna et al., this interval time and the risk conditions for choledocholithiasis before cholecystectomy are omitted since they report that 90.5% of pre-operative ERCP were successful[1].
4. The authors conclude that having a pre-operative imaging study and performing an IOC are associated with lower readmissions secondary to residual stones. However, it is important to mention that patients in Group 4 had 100% readmission, but the management of choledocholithiasis in this group is not specified since according to the

paper, no ERCP or IOC was performed[1]. This could be directly related to the conclusion and not necessarily could be a finding of the study.

We know that the use of IOC and management of choledocholithiasis will continue to be a matter of debate; we would like to congratulate the authors on they are good results obtained and the authenticity of their study. We hope that the comments made in this letter will be useful to validate aspects that allow us to assess the routine or selective use of the IOC.

Conflicts of interest

The authors have no conflicts of interest.

Ethical disclosures

Protection of human and animal subjects. The authors declare that no experiments were performed on humans or animals for this study.

Confidentiality of data. The authors declare that no patient data appear in this article.

Right to privacy and informed consent. The authors declare that no patient data appear in this article.

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