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Conceptual Paper

Bile leaks: Insights Gained from an Unusual Complication

Edgar Vargas-Flores[1]*, Juan Carlos Quintana-Cortez[1] and Jose Luis Beristain-Hernandez[2]

[1]Department of General Surgery, Hospital General de Zona 5 IMSS, Nogales, Sonora, Mexico

[2]Department of General Surgery, Hospital de Especialidades, Centro Medico Nacional La Raza, Mexico city, Mexico

***Corresponding Author:** Edgar Vargas-Flores, Department of General Surgery, Hospital General de Zona 5 IMSS, Nogales, Sonora, Mexico.

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Laparoscopic cholecystectomy is currently the procedure of choice for symptomatic gallstones in the chronic as well as in the acute setting [1]. One of the most fearsome complications for the surgeon is the management of bile leaks following this procedure. However, successful drainage of a bile leak is critical. If drainage is inadequate, sepsis and biliary peritonitis may develop and this remains a clear indication for immediate surgical intervention. High morbidity and mortality follow these complications especially when treatment is delayed.

Minor post-operative leaks (less than 300 ml/day) can be treated with drainage alone usually trough a percutaneously placed catheter (if no drain was left in place intraoperatively). Low output drainage can be observed and should resolve within 5 to 7 days. If the catheter drainage fails to resolve within this period, or if the patient has high output drainage (> 300 ml/day), an ERCP should be performed. Three possibilities exist, (a) duct of Luschka leak (injury to a supravesicular duct in the gallbladder bed) that can be treated by sphincterotomy, (b) cystic duct stump leak that can be treated with a transpapillary stent with or without sphincterotomy, or (c) suspected common bile duct injury. In the latter case, a percutaneous transhepatic cholangiogram should be performed to further delineate the anatomy of the proximal biliary three and to plan subsequent repair. Minor common bile duct injuries (less than 50% duct circumference) may also benefit from the use of endoscopic techniques. Bile drainage should always be controlled and repair major common bile duct injuries must be undertaken by an experienced hepatobiliary surgeon as this has been shown to optimize long-term outcomes after repair [2].

ERCP has both a diagnostic and therapeutic role [3]. It allows identification of both the site of the leak as well as any residual stones within the bile duct that may be contributing to it. Such stones can be removed reducing the pressure gradient between the bile duct and the duodenum created by contraction of the sphincter of Oddi [3-5]. An endoscopic sphincterotomy encourages the flow of bile into the duodenum thus diminishing the bile leak and allowing the site to heal [6]. Indeed, this, in effect, can save the patient from undergoing a laparotomy with the aim of finding and closing the leak.

A number of techniques have been proposed including endoscopic sphincterotomy alone, nasobiliary tube drainage and internal biliary-duodenal stents [3,4,5-7].

ERCP and stenting also plays an important role as an adjunct to biliary leak, accelerating recovery. However, although the use of ERCP has undoubtedly been a major advance, it does have potential drawbacks. The plastic stents inserted into the CBD need removal after 6 weeks, exposing the patient to a second ERCP, a second hospital visit and potential complications following an endoscopic procedure [8].

Overall morbidity, mortality and hospital stay post laparoscopic cholecystectomy were similar both before and after introduction of a minimally invasive management protocol. It is not surprising that these were similar in view of the relatively small numbers and the pathophysiology of bile leaks since patients with biliary peritonitis often take several days to get recover from the episode of peritonitis.

However, the minimally invasive approach with laparoscopic drainage bile peritonitis is preferable. The change in the management of bile leaks and the avoidance of laparotomy has a major impact on the patient's perception of the significance of the complication. Furthermore, longer-term problems such as intra-abdominal adhesions and incisional hernias may be reduced.

A structured stepwise approach to the management of uncommon complications such as bile leaks is really important for the general surgeon. In order to run such a protocol there must be the resources and skills available to provide ERCP and laparoscopic surgery. If this is not available, it is perfectly possible and recommended to transfer the patient to centers where minimally invasive expertise is routinely available.

Bile leak remains an unusual problem in our practice. Nevertheless, every surgeon should bear in mind that a difficult cholecystectomy (especially those performed in acute settings) may be prone to develop post-operative bile leaks. Whether if it is due to an unidentified bile duct injury or an inadequate surgical technique. Proper intra-operative surgical bed drainage placement should always be considered in this scenario, since this cheap and easy maneuver can be actually life saving (while avoiding biliary peritonitis) and at the same time can also be used as a clinical monitor to plan the next steps in the management if the patient develops this post-operative complication.

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