Letter to the Editor

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From Laparoscopic Cholecystectomy to Liver Transplantation: When the Gallbladder Becomes the Pandora's Box

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Dear Editor,

Bile duct injuries (BDI) tend to be more complex in laparoscopic than in open cholecystectomy procedures, and frequently involve young adults with benign pathologies. The ultimate consequence may be a liver transplantation (LT), making this situation one of the most rare transplant indications. Fatal post-transplant outcome is extreme infrequently reported. Aim of this study is to report on our single-case experience and to review the literature concerning lethal outcome after LT for major BDI following cholecystectomy.

A 36-year old obese caucasian woman underwent a laparoscopic cholecystectomy for symptomatic cholelithiasis at an outside institution. Intraoperatively, she sustained an E4 BDI in conjunction with total transection of the right hepatic artery. The surgeon converted to an open laparotomy, examined the site, placed two drains, and immediately transferred the patient to our center for further evaluation and treatment. At relaparotomy, a dearterialized right liver as well as 7 bile duct orifices was found; a right hemihepatectomy and a Roux-en-Y drainage of 4 left-sided bile ducts were performed. The post-operative course was complicated by bile leaks requiring

re-operation and relapsing episodes of cholangitis and intra-hepatic bilomas, requiring re-submissions of the patient and conservative treatment with intravenous antibiotics and percutaneous drainage procedures, respectively. She subsequently developed severe endocarditis leading to cardiac mitral and aortic valves' insufficiency (grade III and II, respectively) demanding mechanical replacement of them. The patient developed secondary biliary cirrhosis, was listed to Eurotransplant with a Model for End-Stage Liver Disease score of 39, and underwent LT 19 months after the laparoscopic cholecystectomy. Histology of the explanted liver showed 50% parenchymal necrosis, chronic cholestasis and cirrhosis. On post-transplant day 5, she developed cardiogenic shock associated with pericardial tamponade that despite adequate surgical drainage progressed to multi-organ failure and death 2 days later.

The two most frequent complications of hepatobiliary surgery that may ultimately require LT are: 1) lesions of the bile duct leading to recurrent cholangitis, chronic cholestasis, and secondary biliary cirrhosis, and 2) hilar vascular lesions (almost always arterial) associated with fulminant hepatic failure. Up to date there have been very few publications about LT as a treatment option following major BDI. To the best of our knowledge, 4 deaths post-LT after major BDI during laparoscopic cholecystectomy are reported in the literature (1-3) (Table 1). The indications for LT in these 4 cases were fulminant hepatic failure (n=2) (2) and secondary biliary cirrhosis (n=2) (1, 3) and the deaths occurred 6 days, 1 month, 7 and 18 months post-operatively, respectively. Five additional fatal outcomes after LT for secondary biliary cirrhosis after major BDI during open cholecystectomy were reported in the literature

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Table 1. Review of the literature cases with fatal post-LT outcome following major BDI during cholecystectomy. *N*: Number of cases; LC: laparoscopic cholecystectomy; OC: open cholecystectomy; FHF: fulminant hepatic failure; SBC: secondary biliary cirrhosis

Author	PubYear	N*	Type of surgery	LT Indication	Outcome
Nordin et al.	2002	1	LC	SBC	7 month [†]
Fernandez et al.	2004	2	LC	FHF	6 days [†]
				FHF	1 month [†]
De Santibanes et al.	2008	4	LC	SBC	18 months [†]
			OC	SBC	7 days [†]
			OC	SBC	1 month [†]
			OC	SBC	7 months [†]
Loinaz et al.	2001	1	OC	SBC	8 months [†]
Thomson et al.	2007	1	OC	SBC	† after 3 LTs
Present case	2009	1	LC	SBC	7 days [†]

(3-5). Four patients died at 7 days, 1 month, 7 and 8 months post-LT, respectively (3-4). The fifth patient died after 2 subsequent transplants for hepatic artery thrombosis unrelated to the initial injury sustained during cholecystectomy (5).

This indeed displeasing analysis of the overall 10 cases shows, that despite the very few post-transplant fatal outcomes reported in the literature, this is a real scenario representing one of the most dreaded outcomes of a seemingly simple procedure such as cholecystectomy.

Conflict of interest

The authors of the present manuscript have no conflict of interest and no funding to declare.

Authorship

All authors confirm that they have met the criteria for authorship as established by the International Committee of Medical Journal Editors.

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