

## A case of worsening jaundice in a critically ill patient

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A 58-year-old male was admitted to the hospital with right upper quadrant (RUQ) pain and fever of four days duration. On admission, patient was febrile and hypotensive with RUQ tenderness. Lab work showed leukocytosis, abnormal liver function test (LFTs) (see table) and *Escherichia coli* bacteremia. His initial imaging showed emphysematous cholecystitis and mildly dilated common bile duct (CBD) and underwent emergent percutaneous cholecystostomy. An ERCP was performed due to concerns of potential concomitant cholangitis which demonstrated a normal intra and extrahepatic biliary system with no filling defects (Fig. 1a) and a plastic biliary stent was placed successfully. Subsequently, the patient underwent open cholecystectomy on the next day and was complicated by intra operative bleeding likely secondary to disseminated intravascular coagulation requiring massive transfusion and continuous use of three vasopressors. Post-operatively, the patient's LFTs increased abruptly suggestive of shock liver and then improved gradually (see table). His hepatitis serologies and immunoglobulin levels were unremarkable.

His postoperative course was complicated by dry gangrene involving both the feet and hand and underwent bilateral below knee amputation.

Roughly 4 weeks after the initial ERCP, the patient began redeveloping conjugated hyperbilirubinemia (see table). An abdominal computerized tomography scan with contrast did not show any evidence of fluid collection in the gall bladder fossa, hepatic necrosis, infarction, or atrophy. Hepatobiliary scan revealed minimal activity in the small intestine at the end of 4 hours despite the presence of CBD stent and was suggestive of partial CBD obstruction (Fig. 2).

### *What is the etiology of jaundice in our patient?*

A second ERCP was performed and revealed a functioning biliary stent in place and was removed. The cholangiogram revealed a stricture of the common hepatic duct with opacification of the right hepatic duct system only. There was no evidence of biliary leak. An occlusion cholangiogram using an above injection balloon showed complete non filling of the left hepatic duct and under filling of the right hepatic duct along with multiple irregular strictures, dilatation and beading of the intrahepatic bile ducts (Fig. 1b). The brush

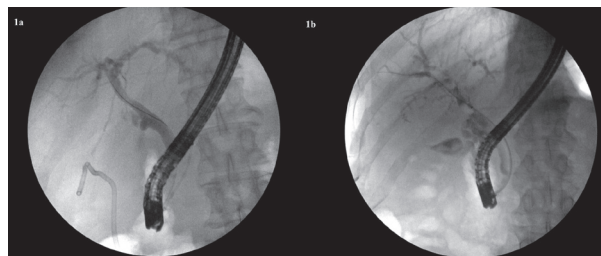


Figure 1. — a, b.

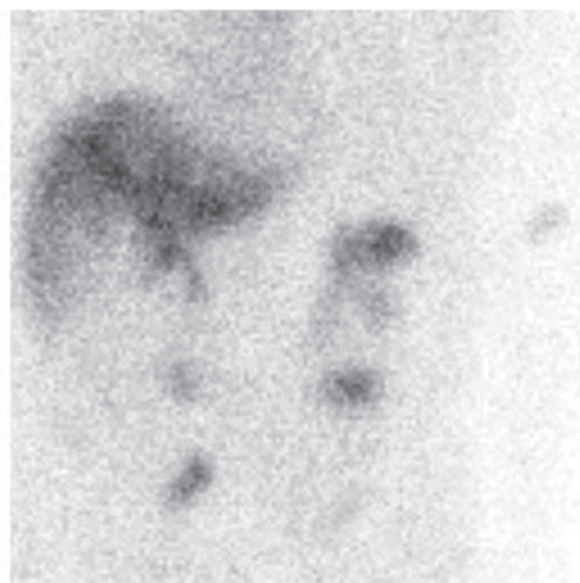


Figure 2.

cytology results of the stricture were benign. A longer plastic biliary stent was placed in the dominant stricture successfully. Coincidentally the stomach was also noted to have diffuse flame-shaped large clean base ulcers suggestive of ischemic etiology.

These biliary findings likely represent ischemic injury of the biliary tract that can develop in a critically ill patient likely due to shock/hypoperfusion, sepsis, high dose vasopressor therapy and mechanical ventilation.

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Submission date: 30/11/2016  
Acceptance date: 27/12/2016

*Acta Gastro-Enterologica Belgica*, Vol. LXXX, July-September 2017

Table 1.

	AST (U/L)	ALT (U/L)	Total Bilirubin mg/dL	Direct Bilirubin mg/dL	LDH (U/L)	Alkaline Phosphatase (U/L)
At admission	260	140	5.2	4.6	640	130
Post 1 <sup>st</sup> ERCP	90	37	1.9	1.2	226	36
POD#1	1690	554	4.9	2.9	1822	71
POD#3	3144	1036	12.9	7.3	3756	127
POD#18	52	25	2.8	1.4	271	328
POD#34	82	78	11.4	7.0	222	861
Post 2 <sup>nd</sup> ERCP (POD #35)	41	11	7.1	3.8	218	511
At discharge (POD #80)	12	10	3.0	1.4	122	265

The condition is rare but it can be fatal with a grave prognosis. Our patient's LFT's improved gradually (see table) and the patient was discharged.