Sump Syndrome: A Rare but Persistent Complication of Choledochoduodenostomy

Introduction

Sump syndrome is a rare and often overlooked long-term complication of biliary–enteric anastomoses, particularly side-to-side choledochoduodenostomy (CDD). This surgical procedure was commonly performed in the pre-endoscopic retrograde cholangiopancreatography (ERCP) era to achieve durable biliary drainage in patients with complicated choledocholithiasis or recurrent cholangitis [1,2].
Following CDD, the distal segment of the common bile duct (CBD) between the anastomosis and the ampulla of Vater may become functionally excluded from biliary flow, forming a poorly drained reservoir prone to bile stasis, debris accumulation, infection, and stone formation, a condition referred to as sump syndrome [1,3]. Because symptoms may occur decades after surgery and imaging findings can be subtle, diagnosis is frequently delayed or missed.

Case Presentation

A 63-year-old woman with end-stage chronic kidney disease due to autosomal polycystic kidney disease on maintenance hemodialysis, and a history of cardiac arrhythmia treated with a permanent pacemaker, was admitted to our institution. Twenty years earlier, she had undergone cholecystectomy combined with a side-to-side choledochoduodenostomy for recurrent episodes of lithiasic ascending cholangitis due to choledocholithiasis. The indication for biliary–enteric diversion at that time was recurrent cholangitis with failure of stone extraction during endoscopic retrograde cholangiopancreatography (ERCP).

The patient presented to the emergency department with right upper quadrant abdominal pain associated with vomiting, anorexia, and fever. On admission, she was in pain, tachycardic with a heart rate of 110 beats per minute, and febrile at 38.3 °C. Abdominal examination revealed tenderness on palpation of the right upper quadrant. The remainder of the physical examination was unremarkable.

Laboratory investigations showed leukocytosis of 12,300 cells/mm³ with neutrophil predominance and mild thrombocytopenia (122,000 cells/mm³). Liver function tests revealed moderately elevated transaminases, with alanine aminotransferase (ALT) at 130 IU/L and aspartate aminotransferase (AST) at 87 IU/L. Alkaline phosphatase (PAL) was elevated at 380 IU/L and gamma-glutamyl transferase (GGT) at 92 IU/L. Total bilirubin levels were within the normal range, and no coagulation abnormalities were detected.

An abdominal computed tomography (CT) scan was performed initially and demonstrated mild dilatation of the intrahepatic bile ducts upstream from the choledochoduodenal

anastomosis, as well as peribiliary cystic dilatations surrounding the right and left hepatic ducts. In addition, the CT scan revealed dilatation of the distal common bile duct containing spontaneously hyperdense material, suggestive of food debris and/or microlithiasis, raising suspicion for sump syndrome.

Further evaluation with magnetic resonance cholangiopancreatography (MRCP) showed marked dilatation of the common bile duct, measuring up to 25 mm in diameter, containing lithiasic material and food debris. An air bubble was identified at the level of the biliary confluence, consistent with a patent duodenal–biliary anastomosis. Associated dilatation of the intrahepatic bile ducts was also noted. Overall, these findings were compatible with a diagnosis of sump syndrome.**Figure 1**

The patient was started on intravenous antibiotic therapy and scheduled for ERCP. Duodenoscopy revealed an orifice distinct from the major papilla. Selective cannulation through this orifice resulted in immediate aerobilia and opacification of the proximal biliary tree, with rapid drainage of contrast material into the duodenal lumen, confirming a patent biliary–enteric communication. In contrast, no opacification of the distal common bile duct through the papilla was observed. Contrast injection demonstrated preferential drainage through the biliary–enteric anastomosis, without visualization of a continuous distal biliary tract toward the papilla. During opacification and extraction maneuvers, multiple filling defects were identified within the distal common bile duct, associated with the evacuation of abundant debris and purulent material.**Figure 2**

Taken together, these fluoroscopic findings were consistent with an excluded distal common bile duct segment acting as a poorly drained reservoir, in the setting of a functional biliary–enteric anastomosis.

Following ERCP and endoscopic sphincterotomy, the patient showed marked clinical improvement and continued antibiotic therapy.

Discussion

Sump syndrome is a rare but clinically significant late complication of side-to-side choledochoduodenostomy. Although CDD was initially considered an effective and relatively safe surgical option, it inherently creates a distal CBD segment excluded from physiological biliary drainage, predisposing patients to long-term complications [1–3].

The latency between surgery and symptom onset can be prolonged, often spanning decades, as illustrated in our patient. Clinical presentation is variable and may include recurrent cholangitis, abdominal pain, pancreatitis, or hepatic abscesses [1,4]. Notably, serum bilirubin levels may remain normal due to preferential drainage through the anastomosis rather than the papilla, potentially delaying diagnosis [3,5].

Imaging plays a pivotal role in diagnosis. While computed tomography may reveal pneumobilia, CBD dilatation, or intraluminal hyperdense material, MRCP is particularly

valuable for delineating postoperative biliary anatomy and identifying a blind-ending distal CBD stump with debris [1,6]. In our case, MRCP was decisive in confirming the diagnosis and guiding endoscopic management.

ERCP remains both the diagnostic and therapeutic gold standard for sump syndrome. Typical fluoroscopic findings include pneumobilia, preferential contrast drainage through the anastomosis, absence of distal papillary drainage, and filling defects within the distal CBD stump [1,3,7]. Endoscopic sphincterotomy with clearance of debris restores effective drainage and is associated with rapid clinical improvement in most cases, avoiding the morbidity of surgical revision [2,5,8].

This case emphasizes that sump syndrome remains relevant in contemporary practice, particularly among patients who underwent biliary surgery in the pre-ERCP era. Awareness of this entity, combined with appropriate use of MRCP and ERCP, is essential for timely diagnosis and effective treatment.

Conclusion

Sump syndrome should be considered in patients presenting with biliary symptoms and a remote history of choledochoduodenostomy. MRCP is a key diagnostic tool, while ERCP with sphincterotomy remains the treatment of choice. Early recognition allows effective minimally invasive management and prevents recurrent biliary complications.

Figure 1 : Magnetic resonance cholangiopancreatography showing a markedly dilated blind-ending distal common bile duct stump (arrow) containing heterogeneous intraluminal debris, consistent with sump syndrome and indirect evidence of a functioning biliary–enteric anastomosis.

Figure 2 : Fluoroscopic ERCP image showing preferential contrast drainage through a patent choledochoduodenostomy (arrow) and filling defects within the excluded distal common bile duct, consistent with sump syndrome.

References (Vancouver style – réelles)

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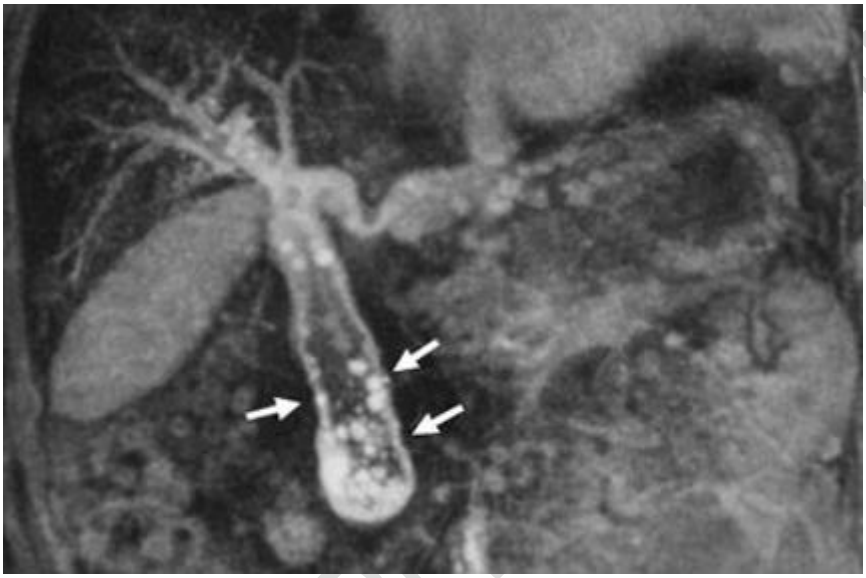
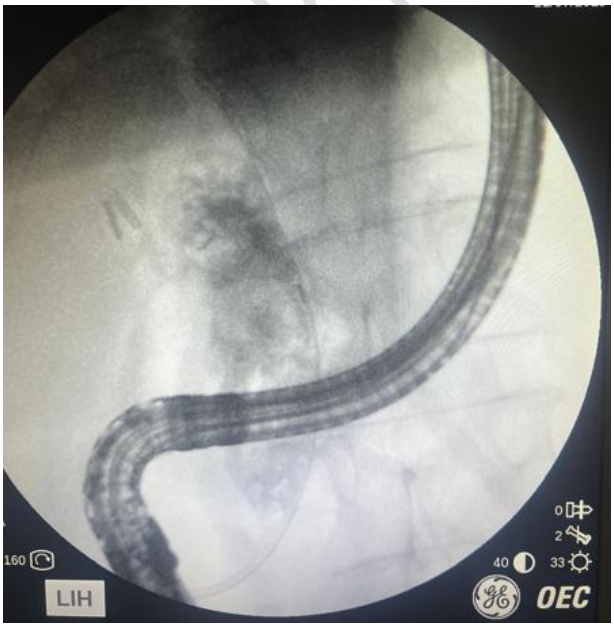


Figure 1



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