

Long-Term Biliary Endoprosthesis Leading to Giant Stentolith Formation

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Abstract: *Stentolith formation is a rare but significant complication resulting from long-term retention of biliary stents. Despite widespread use of biliary stenting, there is limited data in the literature regarding cases where stents have been left in situ for extended durations. A case Report of a 50-year-old male who underwent biliary stenting post-endoscopic stone removal. Although initially symptom-free, he was lost to follow-up. 7 years later, he presented with recurrent cholangitis and right upper quadrant pain. Imaging revealed a retained plastic stent encased in a large biliary stone (stentolith) within the proximal bile duct. Due to the stone's size and stent migration, surgical exploration was done. This case highlights a preventable complication due to long-term stent retention, which remains a significant issue in resource-limited settings. Enhanced patient education, thorough documentation, and consistent follow-up are critical to preventing such outcomes.*

Keywords: common bile duct stone, endoscopy ercp, forgotten biliary stent, recurrent cholangitis, stentolith, surgical abdominal exploration

1. Introduction

Endoscopic retrograde cholangiopancreatography (ERCP) with biliary stenting is widely utilized for the management of biliary obstructions, including those caused by choledocholithiasis, benign strictures, and malignancies. Plastic biliary stents are typically intended for temporary decompression and are recommended to be removed or exchanged within 12 to 16 weeks to prevent stent-related complications [1,2]. Failure to retrieve plastic stents within the appropriate timeframe may result in serious complications such as cholangitis, stent occlusion, migration, and stone formation around the stent, known as stentolithiasis [3,4]. Forgotten biliary stents are a recognized problem, especially in resource-limited settings where follow-up care may be inconsistent. Patients often become asymptomatic after the initial intervention and may not return for scheduled stent removal, leading to severe delayed presentations [5]. The long-term presence of a plastic biliary stent can promote bile stasis and infection, facilitating the deposition of biliary sludge and subsequent stone formation around the stent. Elderly patients, in particular, are at increased risk of forgetting stents, which has been attributed to inadequate follow-up and poor health literacy. In this report, we present the case of a 50-year-old male with a forgotten biliary plastic stent retained for seven years, resulting in a large stentolith and recurrent episodes of cholangitis. This case underscores the importance of structured follow-up, patient education, and thorough documentation to prevent stent-related complications.

2. Case Presentation

A 50-year-old male presented to the outpatient department with complaints of recurrent episodes of fever, right upper quadrant abdominal pain, and jaundice for the past six months. His medical history was significant for endoscopic removal of common bile duct (CBD) stones with plastic biliary stent placement seven years prior.

The patient became asymptomatic after the initial procedure and did not return for scheduled follow-up or stent removal. Physical examination revealed right hypochondrial tenderness without guarding or rigidity. Laboratory investigations showed elevated liver enzymes, total bilirubin of 4.3 mg/dL, and leukocytosis. An abdominal ultrasound revealed intrahepatic biliary dilatation and an echogenic linear structure in the proximal CBD with posterior acoustic shadowing. Subsequent magnetic resonance cholangiopancreatography (MRCP) demonstrated a retained plastic biliary stent located proximally in the CBD with a large stone cast enveloping it consistent with a stentolith. Endoscopic attempts to extract the stent and stone failed due to proximal migration and encrustation. Given the failure of endoscopic intervention, the patient was taken up for open surgical exploration. Intraoperatively, a densely encrusted stentolith was identified in the proximal CBD. The stent and stone were successfully extracted through a choledochotomy (Figure 1). A T-tube was placed postoperatively for bile drainage.



Figure 1: Multiple impacted stones with Forgotten biliary Stent

The patient's postoperative course was uneventful. Liver function parameters normalized over the following weeks. He was discharged on postoperative day seven and counseled extensively on the importance of follow-up.

3. Discussion

Plastic biliary stents are commonly employed for temporary biliary drainage, especially following endoscopic clearance of bile duct stones. However, their use is associated with time-sensitive follow-up, as stents are prone to occlusion, migration, and infection if not removed or replaced within 12-16 weeks [1,2]. In the presented case, the patient had a plastic stent that remained in situ for seven years, ultimately resulting in the formation of a large stentolith—a rare but serious complication. Stentolith formation occurs due to bile stasis, bacterial colonization, and the deposition of bile pigments and cholesterol around the indwelling stent [3,4]. Retained stents can become niduses for stone formation, especially when compounded by poor follow-up practices and limited patient awareness. Reports from developing countries highlight the

frequency of such complications, often due to inadequate documentation, lack of automated recall systems, and poor patient compliance [5]. Previous studies have demonstrated that forgotten biliary stents not only increase morbidity but also escalate healthcare costs due to the need for more invasive procedures like percutaneous or surgical retrieval. In this case, the proximal migration and encrustation of the stent rendered endoscopic retrieval unsuccessful, necessitating open surgical intervention. This aligns with findings by Kumar et al., who noted that long-term indwelling stents often result in severe complications that are not amenable to endoscopic management [2]. The elderly population has been identified as particularly vulnerable to stent-related complications due to cognitive decline and challenges with medical adherence. While our patient was middle-aged, the lack of structured follow-up and patient education contributed significantly to the delay in diagnosis and treatment. This case reinforces the critical need for systems-based strategies, including electronic health reminders, better patient counseling, and comprehensive discharge documentation to ensure timely stent removal. Additionally, physicians should

emphasize the temporary nature of plastic stents and provide written instructions to both patients and primary care providers.

4. Conclusions

This case underscores the critical need for comprehensive patient education, reliable follow-up mechanisms, and meticulous documentation to prevent complications associated with long-term retained biliary stents. In resource-constrained settings, raising awareness about the potential risks of prolonged stent indwelling is essential to reduce preventable morbidity. Patients undergoing ERCP with CBD stenting should be clearly informed about the presence of the stent, the recommended timeline for removal, and the risks associated with delayed extraction. Strategies such as providing appointment cards, using SMS reminders, and proactively contacting patients who miss follow-up appointments can significantly improve adherence. Additionally, including stent removal recommendations in both English and the patient's native language in the ERCP report may enhance compliance and promote timely intervention.

Implementing such measures can help minimize stent-related complications and improve overall patient outcomes.

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