International Journal of Innovative Research in Medical Science (IJIRMS)
Volume 10, Issue 06, June 2025,
https://doi.org/10.23958/ijirms/vol10-i06/2087

Case Report

A Rare Occurrence of Choledochoduodenal Fistula in a Patient with Obstructive Jaundice Secondary to Pancreatic Cancer after Biliary Stent Placement

Dr Nitin Sherkar [1], Dr. Pankaj Takarkhede *[2], Dr Bhupendra Mehra [3], Dr Siddharth Dubhashi [4], Dr Prashant Sawarkar [5]

[1]Associate Professor, Department of General Surgery, AIIMS Nagpur, Nagpur 441108, India.
[2]Senior Resident, Department of General Surgery, AIIMS Nagpur, Nagpur 441108, India.
[3]Professor, Department of General Surgery, AIIMS Nagpur, Nagpur 441108, India.
[4]Professor and Head, Department of General Surgery, AIIMS Nagpur, Nagpur 441108, India.
[5]Additional Professor, Department of General Surgery, AIIMS Nagpur, Nagpur 441108, India.

*Corresponding Author: Dr Pankaj Takarkhede; pankajtakarkhede1990@gmail.com

Received: 22 April 2025; Accepted: 03 June 2025; Published: 07 June 2025

Abstract

Intestinal perforation post biliary stent placement is extremely uncommon and is induced by different factors. Choledochoduodenal fistula (CDF) caused by biliary stent-induced perforation is also rare occurrence. We present a case of obstructive jaundice due to pancreatic cancer with a development of CDF following biliary stent placement and was managed by Whipple's procedure successfully. CDF could have resulted from a bile duct rupture induced by pressure necrosis and inflammation generated by direct contact between the common bile duct and the stent's edge.

Keywords: ***Choledochoduodenal fistula, Biliary Stent, Pancreatic Carcinoma, Obstructive jaundice, Whipple's procedure***

Introduction

Self-expanding metal stents (SEMS) are often used for palliative treatment of patients with unresectable malignant distal biliary blockage because they remain patent for a longer period of time. Covered SEMS was recently designed to limit tumour ingrowth and maintain stent patency [1]. Biliary stent-related intestinal perforations are extremely uncommon and are induced by the different factors like pointed end of a metallic stent, stent migration from biliary duct, or invasion of tumour into the biliary tract. Choledochoduodenal fistula (CDF) caused by metallic biliary stent-induced perforation are also relatively rare. Damage from a self-expandable metallic stent, duodenal ulcer, duodenum carcinoma, bile duct carcinoma can cause CDF [2].

Case Report

51 years old female presented with right upper abdominal pain, yellowish discolouration of eyes and urine and itching for 2 months. Patient underwent ERCP with CBD stenting 1 month before for obstructive jaundice. Post ERCP, abdominal examination was normal, liver function test revealed total bilirubin was 2.73 with direct being 2.40 with normal liver enzymes. Computed Tomography abdomen showed 2.7 x 1.8 cm hypoenhancing lesion in pancreatic head lesion with CBD stent in situ with CDF with migration of stent inside the fistulous tract (figure 1). PET-CT findings suggestive of hypermetabolic pancreatic head lesion with no evidence of active disease elsewhere. Patient underwent Whipple's procedure where intra-operative findings were pancreatic mass with choledochoduodenal fistula with intraluminal migration of CBD stent into fistulous tract (Figure 2) which was excised along with standard Whipple's resection specimen.

Figure 1: CECT Abdomen showed pancreatic head mass with CBD stent in situ with migration of stent inside the fistulous tract.

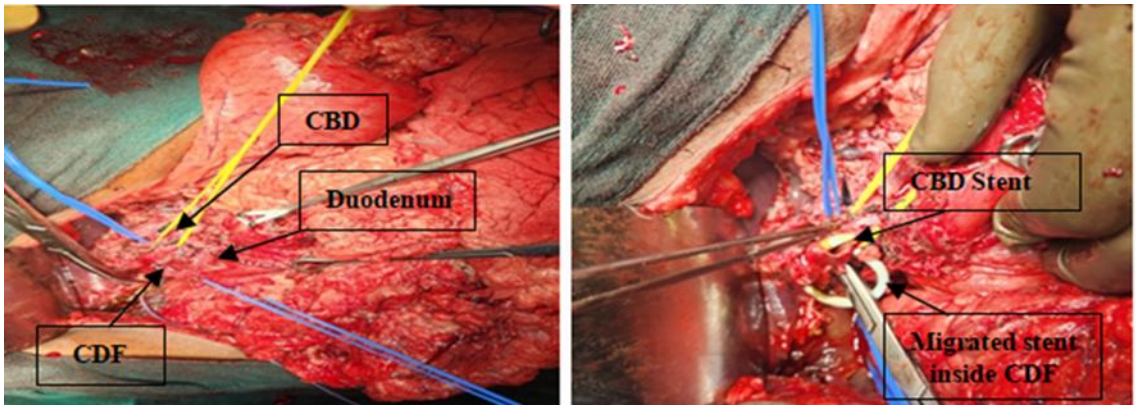

Figure 2: Intra-operative findings: Choledochodeodenal fistula with migrated CBD stent into the CDF.

Discussion

For patients with extrahepatic biliary obstruction, endoscopic biliary stenting is a frequently used drainage procedure. Either plastic or metal stents are used. Plastic stents are used for malignant biliary obstruction in patients with a short life expectancy due to the low patency rate of 3-6 months. Metal stents provide great flexibility, radial expansion force and have a higher patency rate because of larger diameter and are offered in three types: covered, partially covered, and uncovered. For benign biliary strictures covered stents are used, whereas uncovered stents are used for malignant biliary obstruction. However, biliary stenting has been linked to problems such as stent malfunction, stent clogging, stent migration, tumour ingrowth, tumour outgrowth, and cholecystitis. Most migration happens distally, which, on rare occasions, may lead to bowel perforation [3].

Biliary tract fistulas can be classified as spontaneous or post-operative. Gallstones, peptic ulcer, malignancy and trauma all cause spontaneous biliary-enteric fistulas with the chances of cholecystoduodenal fistula is the most common than cholecystocolonic and cholecystogastric fistula. A long history of duodenal ulcer, cholelithiasis, recurrent biliary tract infections, and choledocholithiasis all contribute to the creation of a choledochoduodenal fistula [4].

CDF develops in pancreatic or periampullary carcinoma because of direct pressure of tumour on CBD. Fistulas can also occur as a consequence of metallic stents with underlying cancer. CDF may arise as a result of increased intra-biliary pressure due to obstruction in the distal CBD and duodenal wall erosion by the stent, which may result in duodenal perforation, bleeding, and fistula development. The carcinoma could infiltrate the local tissues, causing necrosis and the creation of fistula [5,6]. CDF developed spontaneously in our patient with pancreatic carcinoma following metallic biliary stent placement without tumour invasion; however, stent migration was found in the well-formed fistula. This migration of the stent into the duodenal via fistulous tract may be related to a direct contact between the wall of the common bile duct and the edge of the stent.

Ryozawa et al. and Lee et al. described the cases of a patient with obstructive jaundice due to lymph node metastasis of rectal cancer and ampulla of vater carcinoma respectively; a CDF without stent migration was discovered after months after placing the metallic stents. Krokidis et al. reported that there was late migration of a covered SEMS through CDF 13 months after stent placement in a case of pancreatic uncinate process malignancy [2,7,8].

Majority of patients of CDF are asymptomatic. However, in symptomatic cases, symptoms of cholelithiasis and choledocholithiasis such as right upper quadrant pain, fever, and jaundice are common [5]. Our patient presented with classical symptoms of obstructive jaundice secondary to pancreatic carcinoma and not because of the development of CDF.

CDF can be diagnosed with ultrasound examination, magnetic resonance imaging, computed tomography, percutaneous transhepatic cholangiography, abdominal X-ray, and barium meal examination [9]. CDF in our patient was identified pre-operatively on CT and intra-operatively during dissection.

The treatment of CDF is based on the cause, severity of the symptoms, and the general condition of the patient. Li et al. proposed treatment of CDF depending on the diameter of fistulous tract, if greater than 1 cm, a transection of CBD was done to prevent the reflux of duodenal juice; biliary drainage for fistula between 0.5 and 1.0 cm, and fistula orifices less than 0.5 cm were treated non-surgically. There was increased incidence of cholangitis in larger fistulas and necessitate surgical intervention. Also, recurring gallstone ileus induced by CDF was considered a definitive indication for surgy [10]. In our case, CDF was removed along with the surgical specimen as a part of Whipple's procedure.

Conclusions

Biliary stents are increasingly being employed in the palliative treatment of patients with malignant biliary obstruction. The development of a choledochodeodenal fistula following biliary stenting is uncommon, and special attention should be made to rare adverse consequences such as migration and spontaneous choledochoduodenal fistula formation.

List of abbreviations

CDF: Choledochoduodenal fistula.
SEMS: Self-expanding metal stents.
ERCP: Endoscopic Retrograde Cholangiopancreatography.
CBD: Common bile duct.
PET-CT: Positron emission tomography–computed tomography.
CECT: Contrast-Enhanced Computed Tomography.

Declarations

Ethics approval and consent to participate

Not applicable

Consent of Publication

Written and Informed Consent was obtained from the patient regarding her data to be shared for scientific research purpose and publicly.

Data Availability

Detail data regarding the patients is available with the authors.

Conflicts of Interest

The authors declares that there is no conflict of interest regarding the publication of this paper.

Funding Statement

Not applicable

Authors' contributions

Author Name	CRediT Author Role in Manuscript
Dr. Nitin Sherkar	Writing – original draft /Conceptualization/ Data curation / Resources
Dr. Pankaj Takarkhede	Writing – original draft /Conceptualization/ Data curation / Resources
Dr. Bhupendra Mehra	Supervision/ Validation /Writing – review & editing/ Project administration
Dr. Siddharth P. Dubhashi	Supervision/ Validation /Writing – review & editing/ Project administration
Dr. Prashant Sawarkar	Data Curation/ Resources

Acknowledgments

None

Supplementary Materials

Not applicable.

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