Case Report

Endoscopic Ultrasound-guided Antegrade Stenting in an Occluded Biliary Self-expandable Metal Stent

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ABSTRACT

Endoscopic ultrasound-guided biliary drainage (EUS-BD) is an attractive option for patients who cannot undergo conventional endoscopic retrograde cholangiopancreatography (ERCP) and do not want surgery or percutaneous drainage procedures. We present the use of EUS-antegrade (EUS-AG) insertion of a self-expandable metal stent (SEMS) in a patient with a common hepatic duct cholangiocarcinoma, as well as a huge gastric lipoma, after recurrent biliary obstruction of a prior SEMS inserted via ERCP in the same session as a duodenal stent insertion for gastric outlet obstruction.

Key Words: Biliary drainage, endoscopic ultrasonography, endoscopic ultrasound-guided biliary drainage, self-expandable metal stents, stents

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Endoscopic ultrasound-guided biliary drainage (EUS-BD) is becoming an attractive option for patients who cannot undergo conventional endoscopic retrograde cholangiopancreatography (ERCP) and do not want surgery or percutaneous drainage procedures.[1] EUS-antegrade (EUS-AG) interventions are one of the EUS-BD techniques that are used in cases where access to the papilla is not possible either after surgical interventions or because of obstruction from a neoplastic process. In this case report, we present the use of EUS-AG in a case where there was a self-expandable metal stent (SEMS) inserted but became blocked, and at the same time access to the papilla was prohibited by neoplastic obstruction of the duodenum.

CASE PRESENTATION

A 77-year-old male was referred to our endoscopy unit for the evaluation of abdominal pain and a lesion that was observed in the hilum of the liver on cross-sectional imaging. On esophagogastroduodenoscopy (EGD), he was found to have a large submucosal lesion in the antrum of the stomach. The lesion was occupying the majority of the antrum and had an ulcer. Computerized tomography (CT) demonstrated a large, fat density, submucosal mass measuring 13 × 12 × 5.5 cm. A diagnosis of a large stomach lipoma was made. An EUS was performed that demonstrated a lesion at the level of the hepatic duct; a fine-needle aspiration (FNA) was performed and was proven to be a cholangiocarcinoma. The patient was not a surgical candidate and was started on palliative chemotherapy.

Five months later, the patient presented with jaundice and was found to have biliary obstruction on imaging. An ERCP demonstrated a common hepatic duct stricture approximately 2.5 cm in length with dilatation of the proximal biliary tree (Klatskin tumor type II) [Figure 1]. An uncovered SEMS was inserted and his symptom resolved [Figure 2].

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After 4 months, the patient presented with jaundice and elevated liver enzymes and was found to have stent dysfunction. The second ERCP demonstrated narrowing at the proximal end of the SEMS due to ingrowth. A 7 Fr, 12 cm long plastic biliary stent was inserted with good biliary drainage [Figure 3].

Four months after his second ERCP, he presented with repeated nausea and vomiting, and he was also noted to have jaundice and some itching. On imaging, the plastic stent had migrated distally and the biliary obstruction had recurred. An EGD demonstrated gastric outlet obstruction, with narrowing mainly at the junction of the first and second part of the duodenum that was passed with difficulty even after using a controlled radial expansion balloon. An uncovered 10 cm long metallic duodenal stent was inserted smoothly passing the stenotic area. An EUS-AG drainage procedure was planned for two reasons; (1) reaching the papilla was difficult using a duodenoscope due to the stenosis and (2) a percutaneous drainage procedure was not possible due to a large soft tissue mass in the right hypochondrial area that was thought to be a metastatic deposit.

Initially, the biliary tree was punctured from the left lobe of the liver using a 19-guage FNA needle, and after confirming the correct position of the needle by aspirating bile and injecting contrast a cholangiogram was obtained [Figure 4]. A guidwire was advanced through the needle and through the prior SEMS into the duodenum. A straight catheter was then advanced and then the track was dilated using a 4-mm biliary balloon. The proximal end of the SEMS was also dilated using the same balloon. A 12 cm long uncovered SEMS was placed antegradely and co-axially into the initial SEMS and overlapping both the proximal and distal ends [Figures 5 and 6].

The patient improved in the form of nausea and vomiting, and the jaundice and his itching resolved. He resumed his palliative chemotherapy.

DISCUSSION

The majority of patients who develop malignant biliary obstruction present at a stage when the management is mainly palliative.[1] In such cases, the initial endoprosthesis that should be used is a SEMS because it has a longer duration of patency[2] and is more cost-effective, even in those with a short life-expectancy.[3] In our patient, we had inserted an uncovered SEMS during the initial ERCP because we had mapped the location of the stricture using cross-sectional imaging as well as MRCP and the patient was not a surgical candidate. This initial assessment is important because it decreases the need for repeated procedures and potential morbidity. The use of the uncovered SEMS was chosen as there is no clear added benefit from using a covered or partially covered SEMS.[4] Despite that, the patient developed recurrent biliary obstruction because of ingrowth into the SEMS; we used a plastic stent as a method of achieving biliary drainage.[5]

In cases where conventional biliary drainage cannot be performed, EUS-BD is an attractive option. Furthermore, an EUS-BD would enable the patient to resume his chemotherapy without disruption compared to a surgical drainage procedure. In addition, percutaneous drainage was not an attractive option to the patient due to the external drain that would be required with its associated care of frequent flushing, as well as the multiple procedures that would be required if a percutaneous biliary SEMS would be contemplated.

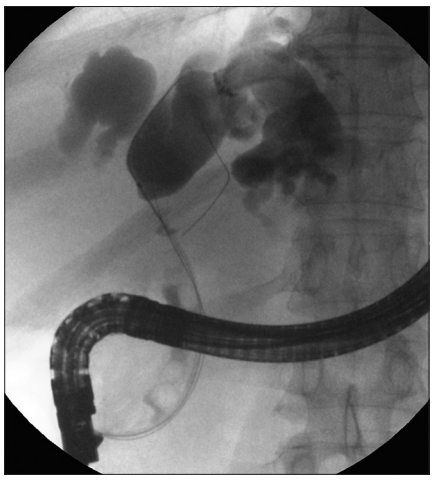

Figure 1: Initial endoscopic retrograde cholangiopancreatography; common hepatic duct stricture with proximal biliary dilatation

Figure 2: Deployment of an uncovered self-expandable metal stent in the biliary system

Figure 3: Insertion of a plastic stent in the blocked self-expandable metal stent

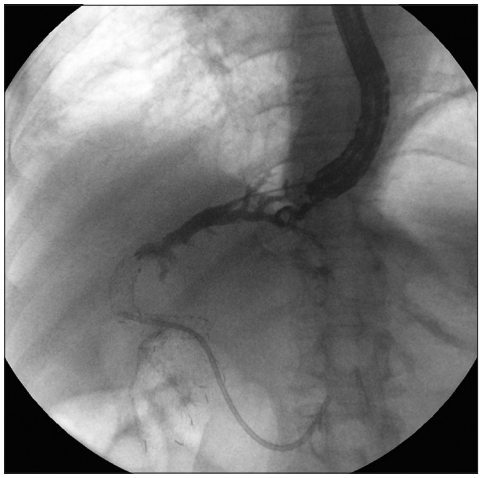

Figure 4: After deployment of a duodenal stent, access into the biliary tree was confirmed with an endoscopic ultrasound cholangiogram through the left lobe of the liver. Note that the plastic stent has migrated distally

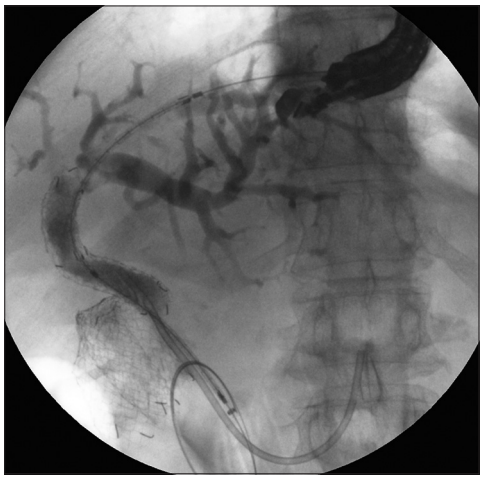

Figure 5: After advancing a wire through the endoscopic ultrasound needle through the papilla and dilation of the track a self-expandable metal stent is inserted co-axially and overlapped both ends of the original stent

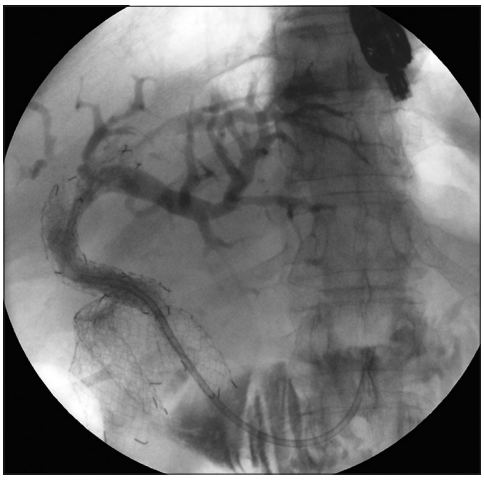

Figure 6: Final image after deployment of the self-expandable metal stent

We chose to perform an EUS-AG stent insertion because it has the advantage of avoiding a non-natural fistula between the gastrointestinal track and the biliary system, as in the case of choledocoduodenostomy or hepaticogastrostomy. A retrograde insertion of an SEMS would be preferable compared to an antegrade insertion when feasible, as it has been shown to have a lower complication rate (13.9% vs. 32%, $P = 0.07$).[6] An EUS- rendezvous technique was not possible in our case due to the duodenal obstruction.

This case demonstrates a few interesting points; patients with malignant biliary obstruction display variable survival periods based on the underlying malignancy and even within the same tumor type. In addition, this case demonstrates the feasibility of the use of EUS-AG even in cases with a prior SEMS in place as well as an attractive option of performing multiple stenting procedures in the same session where the patient had both duodenal stenting as well as the EUS-AG in the same setting under conscious sedation.

EUS-AG does have limitations; it is considered an advanced endoscopic procedure that requires expertise as well as an adequate support system of interventional radiologists as well as surgeons, if and when adverse events occur, and in cases were technical or clinical success is not achieved. Moreover, EUS-AG might be inappropriate in the setting of advanced hilar strictures, and a hepaticogastrostomy might be more appropriate.

The applications of EUS-AG as a revision and primary drainage procedure is relatively new, and the clinical applications are still evolving but can have equivalent

success rates and procedure times compared to ERCP inserted biliary SEMS and potentially a lower incidence of pancreatitis.[7] This procedure was also found to have a higher technical as well as functional success rate in cases with duodenal obstruction where positioning of the duodenoscope into the second part of the duodenum is not possible.[7]

In conclusion, this case demonstrates the applicability and usefulness of EUS-AG in the setting of recurrent biliary obstruction after an initial SEMS insertion.

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Conflicts of interest

There are no conflicts of interest.

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