Endoscopic ultrasound-guided biliary drainage in malignant
distal obstruction of the common bile duct

Drenaje biliar guiado por ultrasonido
doscopy en obstrucción maligna distal
del conducto biliar común

Endoscopic retrograde cholangiopancreatography (ERCP) is
the criterion standard for biliary and pancreatic drainage.
Ten to fifteen percent of these procedures are reported as
failed due to numerous causes, among which are: ductal
stricture, ampullary fibrosis, giant gallstone, etc.1,2

Alternative bile duct access is transhepatic percutaneous
biliary drainage (THBD) or surgical diversion (SD), both of
which have high morbidity and mortality rates.3

Endoscopic ultrasound (EUS) provides clear, real-time
images of the common bile duct and the main pancreatic
duct, as well as of extraintestinal organs.4,5

There are different bile duct drainage techniques through
EUS in relation to the access route: antegrade or choledochoduodenostomy (CD-EUS) access, whether through
the transduodenal or transgastric routes in distal obstructions;6
transenteric or hepatogastric stent (EUS-HG) in proximal
obstructions;7 and the transpapillary or “rendezvous”
(EUS-RV) access, in which, through endoscopic ultrasound,
a guidewire is advanced in an antegrade manner into the
native ampulla, after which the common bile duct is cannula-
ted with the duodenoscope alongside the guidewire, using
the guidewire in a regular manner once it is retrieved by
means of a metallic loop.8,9 Marsan et al. reported a success
rate of only 57%,10 but Lee et al. described a rate of 94.1%.11

Even though this procedure is considered both ade-
quate and successful, these techniques are not exempt from
complications, among which include: pneumoperitoneum,
biliary peritonitis, stent migration, hemorrhage, and sepsis.12

We describe herein 3 cases at our hospital in which these
techniques were performed as palliative drainage due to
unresectable advanced disease and failed ERCP. The ma-
terials used in all the cases were: a 19 G EchoTip® Ultra (Cook
Medical®) fine needle, a 480-cm long TracerMetro® Direct
Wire Guide (CookMedical®) 0.035” guidewire, an ERCPI 5.5
Fr (Cook Medical) GloTip® catheter, and a 7.5 Fr × 5.5 cm
controlled radial expansion balloon dilator with inflation
diameters of 6.7–8.8 mm (Boston Scientific).

Case 1

A 70-year-old man came to our service due to weight
loss over the past 6 months, liver function tests reflecting
cholestasis, and inability to eat. An abdominal computed
tomography scan revealed a mass at the head of the pan-
creas and liver metastases. The ERCP procedure failed

because tumor infiltration made it impossible to access the
second portion of the duodenum. EUS revealed an unre-
sectable heterogeneous tumor at the head of the pancreas
with a diameter of 40 × 35 mm, a 6-mm dilation of the
common pancreatic duct, and a 14-mm dilation of the extra-
hepatic bile duct. Biliary drainage was carried out with
the choledochoduodenal approach, using a linear echoen-
doscope (Pentax model EG-3870UTK®). The choledochus
was punctured with a fine needle, contrast was injected
to corroborate the site, and the hydrophilic guidewire
was advanced. It was fistulized with a GloTip® catheter
and dilated to 8 mm with the CRE dilator. A fully cov-
ered WallFlex 10 × 40 mm self-expanding metal biliary stent
(Boston Scientific®) was placed, achieving spontaneous bile
outflow. Finally, an uncovered 20 × 90 mm self-expanding
metal intestinal stent was advanced with a Savary-Guilland®
guidewire for intestinal permeability and corroborated
through fluoroscopy (fig. 1). The patient progressed satis-
factorily and was sent home for palliative care due to
unresectable metastatic disease.

Case 2

A 53-year-old woman presented with progressive jaun-
dice, fever and 9-kg weight loss of 8-month progression.
A tomography scan showed a pancreatic tumor with duodenal
infiltration and liver metastases. Cannulation was impos-
sible due to friability and tumor infiltration into the papilla
major, resulting in a failed ERCP. EUS identified a hetero-
geous mass in the pancreas with a diameter of 80 × 80 mm.
Drainage was carried out using the rendezvous technique
(EUS-RV). The linear echoendoscope was introduced into
the duodenal bulb, the proximal bile duct was punctured
with a fine needle and opacified, and the hydrophilic guidewire
was advanced. Through fluoroscopy, the guidewire was
introduced in an antegrade manner in the direction of
the ampulla until reaching the intestinal lumen. The duo-
denoscope was introduced and retrograde cannulation
was carried out adjacent to the guidewire with a sphincter-
tome. Short sphincterotomy (5 mm) was performed and a
WallFlex® 10 × 60 mm covered biliary stent was placed,
achieving spontaneous bile output (fig. 2). The patient was
sent home 24 h later with no signs of complications or bile
duct obstruction.

Case 3

An 84-year-old woman presented with 10-kg weight loss,
jaundice, and intermittent fever of 4-month progression.
She was referred to our service due to severe cholangi-
tis. EUS revealed a heterogeneous pancreatic tumor with
a 40 × 50 mm diameter that invaded the splenoportal conflu-
ence. Choledochoduodenal drainage was performed due to
failed ERCP. The linear echoendoscope was placed in the duode-
nal bulb, revealing intrahepatic and extrahepatic bile duct
dilation of 13 mm in diameter. Fine needle puncture was
performed and the guidewire was advanced. Fistulization
was carried out with a GloTip® catheter and a CRE bal-
loon dilator was dilated to 6 mm. Finally, a double pig-tail
40 mm × 10 Fr plastic biliary stent (CookMedical®) was
advanced. Biliary drainage was technically successful.

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Today, endoscopic ultrasound-guided biliary drainage is an alternative to failed ERCP drainage in patients with malignant distal biliary obstruction. It is considered a second-line technique, but the fact is that not all centers are equipped with endoscopic ultrasound and therefore continue to utilize surgical and/or radiologic drains.

Despite its being a complex procedure, the technical and clinical success rates of biliary drainage through EUS are similar to those of surgical drainage, but with a lower complication rate. Its performance requires careful patient selection, experienced operators, a multidisciplinary team, and the adequate accessories.

**Conflict of interest**

The authors declare that there is no conflict of interest.

**References**


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