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Letter to the editor

Is endoscopic ultrasound-assisted cholecystogastrostomy sufficient to resolve malignant distal biliary obstruction from pancreatic cancer?

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Dear Editor:

First and foremost, we would like to congratulate Dr. Pinto et al. on their presentation of a Colombian case in which their technical success was evident throughout a surgery that required a high level of experience in endoscopic ultrasound and was performed remarkably well (1).

Endoscopic retrograde cholangiopancreatography (ERCP) is currently the standard treatment for jaundice caused by distal malignant biliary obstruction in patients with advanced disease or for palliative purposes (2, 3). In cases in which ERCP is not feasible or unsuccessful, without access to the papilla, endoscopic ultrasound-guided (EUS-guided) biliary drainage is considered an effective alternative treatment (3-5). EUS-guided choledoduodenostomy is the endoscopic technique preferred by many authors when biliary obstruction is distal, while hepaticogastrostomy is preferred in cases of proximal biliary obstruction or when there is no access through the duodenum (3, 4).

In cases in which ERCP is unsuccessful and EUS-guided biliary drainage is not possible, a transhepatic biliary drainage (percutaneous drainage) may be more efficient and safer. Most tertiary care centers offer interventional radiology services and, in terms of frequency, transparietohepatic biliary drainage is more common, considering that there may be more familiarity with the technique, which is highly relevant since it could reduce the risks associated with the procedure.

The experience of transparietohepatic biliary drainage in bile duct obstruction was detailed in a recently published study conducted in two universities of a Latin American country. With a sample of more than 500 patients, most cases were caused by malignant biliary obstruction; catheter patency was equal to or greater than 6 months in more than 70.4% of these cases, while complications (hemobilia and infection) occurred in 12.2 % of the cases (6).

In cases of biliary obstruction, gallbladder drainage may have a residual impact on the bile load in the main bile duct, especially as one of the functions of spiral valves of Heister in the cystic duct is to prevent retrograde bile flow from the common bile duct to the gallbladder (7). In the cases referred to in the article prepared by Dr. Pinto et al., gallbladder drainage was performed in one case after attempting hepaticogastrostomy. After puncturing and drawing the biliary tree, it was concluded that drainage could not be carried out through this route (8). In the other cases discussed, EUS-guided

gallbladder drainage was performed in the context of acute cholecystitis and did not occur specifically due to biliary obstruction (9-13).

To date, only one retrospective study is known. It included 12 patients with malignant biliary obstruction who had their gallbladders drained using EUS-guided gallbladder drainage. In that study, this technique was used as a rescue therapy in an attempt to drain the bile duct in individuals in whom EUS-guided biliary drainage was not possible or refused percutaneous drainage because they wanted to avoid the external drainage tube. Technical success was reported in 100% of patients and functional success in 91% (functional success was defined as a reduction of more than 50% of total bilirubin in the 2-week follow-up); nevertheless, complications occurred in 16.9% (14).

Although the gallbladder is a large and often more convenient target for puncturing and draining, the goal of effectively draining the bile duct in malignant biliary obstructions may not always be achieved.

In this situation, in which enlarged gallbladder and cystic duct were evident, it may be of interest to pass a Fogarty catheter through the cystogastrostomy as a complement to biliary drainage to occlude it. Then, a contrast agent should be injected to perform a transcystic cholangiogram, followed by the passing of a guidewire to the bile duct, and finally using this gastrocystic communication to drain the bile duct with a double pigtail biliary stent. Another plausible option could be the passage of a conventional endoscope through cystogastrostomy, advance a guidewire directly to the choledochus, and drain the bile duct with a double-tail pig stent.

In endoscopic interventionism, it is necessary to be very clear about the objectives and the target to be used for the approach. On the one hand, in cases of cholecystitis, a hydropic gallbladder that causes symptoms in patients who are not surgical candidates or patients who reject percutaneous drainage, EUS-guided gallbladder drainage should be attempted; but if the clinical problem is biliary obstruction, the target should be the bile duct (either EUS-guided or transparietohepatic) in the first place. On the other hand, in cases with duodenal obstruction, in which the duodenoscope fails to overcome duodenal stenosis (as described in this case), an attempt should be made to resolve gastric outflow obstruction using duodenal stenting or EUS-guided gastrojejunostomy to completely alleviate the patient's clinical problems.

In conclusion, EUS-guided cystogastrostomy is an excellent option in the context of acute cholecystitis or symptomatic hydropic gallbladder in patients who are not surgical candidates, whereas the benefits of biliary drainage using a cystogastrostomy may be limited.

In cases of distal malignant biliary obstruction in which ERCP or EUS-guided biliary drainage are not feasible, a transparietohepatic biliary drainage could be more effective and safer. However, in cases where transparietohepatic biliary drainage is not feasible or refused, EUS-guided gallbladder drainage could be offered as a compassionate rescue method.

REFERENCES

1. Pinto R, Solano J, Cabrera LF, Benito E. Colecistogastrostomía guiada por ultrasonido endoscópico en un paciente con cáncer pancreático: primer caso en Colombia (con video). Rev Colomb Gastroenterol. 2020;35(4):527-532. https://doi.org/10.22516/25007440.400
2. Forero EA, Galasso D, Bories E, Giovannini M. Derivaciones biliopancreáticas guiadas por ultrasonido endoscópico: descripción de caso y revisión de la literatura. Rev Colomb Gastroenterol. 2013;28(4):339-351.
3. Minaga K, Takenaka M, Yamao K, Kamata K, Omoto S, Nakai A, Yamazaki T, Okamoto A, Ishikawa R, Yoshikawa T, Chiba Y, Watanabe T, Kudo M. Clinical utility of treatment method conversion during single-session endoscopic ultrasound-guided biliary drainage. World J Gastroenterol. 2020;26(9):947-959. https://doi.org/10.3748/wjg.v26.i9.947
4. Perez-Miranda M, de la Serna C, Diez-Redondo P, Vila JJ. Endosonography-guided cholangiopancreatography as a salvage drainage procedure for obstructed biliary and pancreatic ducts. World J Gastrointest Endosc. 2010;2(6):212-22. https://doi.org/10.4253/wjge.v2.i6.212
5. de Benito Sanz M, Nájera-Muñoz R, de la Serna-Higuera C, Fuentes-Valenzuela E, Fanjul I, Chavarría C, García-Alonso FJ, Sanchez-Ocana R, Carbajo AY, Bazaga S, Perez-Miranda M. Lumen apposing metal stents versus tubular self-expandable metal stents for endoscopic ultrasound-guided choledochoduodenostomy in malignant biliary obstruction. Surg Endosc. 2020. https://doi.org/10.1007/s00464-020-08179-y
6. Muñoz R, Salazar G, Velásquez J, Prasca M, Lander B. Drenaje biliar transparietohepático: Experiencia en el hospital universitario y centro médico de Caracas. Rev Colomb Radiol. 2018;29(3):4957-62.

7. Dasgupta D, Stringer MD. Cystic duct and Heister's "valves". Clin Anat. 2005;18(2):81-7. https://doi.org/10.1002/ca.20118
8. Itoi T, Binmoeller K, Itokawa F, Umeda J, Tanaka R. Endoscopic ultrasonography-guided cholecystogastrostomy using a lumen-apposing metal stent as an alternative to extrahepatic bile duct drainage in pancreatic cancer with duodenal invasion. Dig Endosc. 2013;25 Suppl 2:137-41. https://doi.org/10.1111/den.12084
9. Itoi T, Coelho-Prabhu N, Baron TH. Endoscopic gallbladder drainage for management of acute cholecystitis. Gastrointest Endosc. 2010;71(6):1038-45. https://doi.org/10.1016/j.gie.2010.01.026
10. Itoi T, Isayama H, Sofuni A, Itokawa F, Kurihara T, Tsuchiya T, Tsuji S, Ishii K, Ikeuchi N, Tanaka R, Umeda J, Moriyasu F, Kawakami H. Stent selection and tips on placement technique of EUS-guided biliary drainage: transduodenal and transgastric stenting. J Hepatobiliary Pancreat Sci. 2011;18(5):664-72. https://doi.org/10.1007/s00534-011-0410-9
11. Jang JW, Lee SS, Park DH, Seo DW, Lee SK, Kim MH. Feasibility and safety of EUS-guided transgastric/transduodenal gallbladder drainage with single-step placement of a modified covered self-expandable metal stent in patients unsuitable for cholecystectomy. Gastrointest Endosc. 2011;74(1):176-81. https://doi.org/10.1016/j.gie.2011.03.1120
12. Súbtil JC, Betes M, Muñoz-Navas M. Gallbladder drainage guided by endoscopic ultrasound. World J Gastrointest Endosc. 2010;2(6):203-9. https://doi.org/10.4253/wjge.v2.i6.203
13. Widmer J, Alvarez P, Gaidhane M, Paddu N, Umrania H, Sharaiha R, Kahaleh M. Endoscopic ultrasonography-guided cholecystogastrostomy in patients with unresectable pancreatic cancer using anti-migratory metal stents: a new approach. Dig Endosc. 2014;26(4):599-602. https://doi.org/10.1111/den.12163
14. Imai H, Kitano M, Omoto S, Kadosaka K, Kamata K, Miyata T, Yamao K, Sakamoto H, Harwani Y, Kudo M. EUS-guided gallbladder drainage for rescue treatment of malignant distal biliary obstruction after unsuccessful ERCP. Gastrointest Endosc. 2016;84(1):147-51. https://doi.org/10.1016/j.gie.2015.12.024

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Reply to Letter to the Editor Endoscopic ultrasonography-guided cholecystogastrostomy in a patient with pancreatic cancer: the first case in Colombia

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The treatment of choice for biliary obstruction of neoplastic origin is endoscopic retrograde cholangiopancreatography (ERCP), even though it may fail in 5-10% of cases due to anatomical alterations of the ampulla of Vater, intradiverticular papilla, neoplastic infiltration into the duodenum with stenosis, or altered anatomy. Usually, in these cases, the second choice is to perform a percutaneous transhepatic biliary drainage (PTBD); however, this procedure is associated with a high rate of complications (up to 33%), including bleeding, infections, catheter displacement, and bile leakeage, which have a significant impact on the patient's quality of life (1-3).

Recently, endoscopic ultrasound-guided biliary drainage (EUS-DB) has emerged as an alternative to PTBD, with a high technical and clinical success rate, low risk of complications, and better quality of life for the patient. There are two techniques: choledochoduodenostomy (EUS-CDS) and hepaticogastrostomy (EUS-HGS) (4, 5).

EUS-DB was first described by Giovannini *et al.*in 2001 (6) and since then, many studies have been published showing high rates of technical and clinical success (95% and 97%, respectively), as well as a low risk of complications (1, 4).

The development of dedicated devices, such as *lumen-apposing metal stents* (LAMS) and others such as Giobor®, has displaced the use of *self-expandable metal stents* (SSMS) and plastic stents, which increased the risks of complications such as biliary leakage, stent migration, and pneumoperitoneum; therefore, this procedure can be carried out with greater safety and lower risks (3, 7, 8).

Biliary stenosis of neoplastic origin implies a poor short-term prognosis because most patients receive their diagnosis in an advanced stage of the disease. This limits treatment with curative intent and leads to the initiation of a palliative approach that seeks to improve the patients' quality of life, taking into account that the signs and symptoms they suffer (such as jaundice, pruritus, and bowel obstruction) can significantly deteriorate their overall health status (7, 9, 10).

The main intervention carried out around the world in these cases is biliary drainage with *stent* placement in the common bile duct by means of ERCP. This method has a percentage of technical failure in cases in which neoplastic infiltration into the papilla does not allow cannulation and, therefore, biliary drainage, leading to the need to perform procedures such as PTBD, which is associated with a higher percentage of morbidity (1, 2, 10).

PTBD is the most common biliary drainage procedure in cases of malignant biliary disease and duodenal disease with subsequent obstruction of the biliary tree, which prevents the technical success of ERCP; it is also useful in elderly patients, with multi-

ple comorbidities and unresectable cancer with a limited life expectancy.

Even so, percutaneous access to the biliary tree has a percentage of comorbidity that must be considered due to the need for constant care of the bile drain, as it requires constant washing and replacement, in addition to the discomfort of carrying it permanently, which implies the risk of involuntary removal that could cause sepsis, bleeding and, consequently, infection of the insertion site, altering the quality of life in an attempt to improve it (1).

Regarding surgery, biliary drainage by hepaticojejunostomy, hepaticoduodenostomy, and choledochoduodenostomy, among others, play an important role in cases in which percutaneous drainage of the biliary tree is not possible. Unfortunately, the surgical approach, whether open or laparoscopic, in this group of patients with a high frailty index does not offer the best outcomes since it has high rates of morbidity related to anastomotic leak, organ or space infection, and perioperative mortality (1, 2, 9).

Over the last decade, the development of endoscopic ultrasonography (EUS) has provided an alternative for biliary drainage and decompression in cases of failed ERCP, and has demonstrated certain advantages over PTBD, such as the possibility of performing it during the same intervention when ERCP is not possible, as well as less pain and infection (2, 9).

The clinical success of biliary drainage by EUS-CDS has been exposed in multiple series with the use of different stents and devices, to the point of being proposed as the first-line option (2). Initially, EUS-CDS was performed using plastic stents, obtaining clinical success demonstrated in several studies, such as that of Hara et al., who reported a technical and clinical success of 94% and 100%, respectively, but with a percentage of stent occlusion at 163 days of 66.7% (7).

On the other hand, the risk of bile leakage and cholangitis implied a significant morbidity rate, which led to the use of metal stents to perform EUS-CDS (7). Thus, studies such as the one by Gupta et al., in which the incidence of cholangitis in patients treated with plastic stents and patients treated with metal stents was compared, have found a much higher incidence in the group treated with plastic stents, with a similar incidence of bile leakage (7). However, over time, the most dangerous complication of using coated metal stents was found to be stent migration from the puncture site, since it leaves a major defect open (7).

Finally, EUS-CDS with LAMS (Hot Axios) was introduced (3); it was first used for cases of pancreatic pseudocyst drainage before being adopted for biliary drainage. In particular, the drainage device used for this procedure is characterized by having a short length and the shape of a "dumbbell" with wide flanges, which allows it to be anchored through non-adherent structures, explaining its antimigration capacity and the lower risk of bile leakage (7). Another important and very novel property is the inclusion of an electrocautery-enhanced delivery system and stent release, which eliminates over-the-wire exchanges of instruments, thus reducing the number of complications (7, 10).

The first multicenter study to report the experience with cases of EUS-CDS with anti-migratory stent (Hot Axios) was conducted by Tsuchiya et al., who demonstrated a technical and clinical success of 100 % and 95 %, respectively. However, 5 of the 19 patients included in the study had stent blockage within the next 184 days and anticipated the need for further EUS-CDS (7).

With what has been reviewed in the literature, on the one hand, it can be concluded that the performance of EUS-CDS has an approximate percentage of adverse events of 16%, mainly constituted by infection, pneumoperitoneum, bile leakage, bleeding, abdominal pain, perforation, and stent migration; the most common complication is pneumoperitoneum, which is treated conservatively with a good prognosis for the patient (4, 8). On the other hand, the use of Doppler is convenient for the endoscopist when ruling out the presence of vascular stricture and avoiding complications (5). However, there are reports of cases such as that of Mangas-Sanjuan et al., in which they expose a case of accidental puncture of the portal vein at the time of performing an EUS-CDS, a complication that they were able to resolve by the same route, controlling the bleeding and achieving clinical and technical success for biliary drainage (5, 8).

REFERENCES

1. El Chafic AH, Shah JN, Hamerski C, Binmoeller KF, Irani S, James TW, Baron TH, Nieto J, Romero RV, Evans JA, Kahaleh M. EUS-Guided Choledochoduodenostomy for Distal Malignant Biliary Obstruction Using Electrocautery-Enhanced Lumen-Apposing Metal Stents: First US, Multicenter Experience. Dig Dis Sci. 2019;64(11):3321-3327. https://doi.org/10.1007/s10620-019-05688-2
2. Han SY, Kim SO, So H, Shin E, Kim DU, Park DH. EUS-guided biliary drainage versus ERCP for first-line palliation of malignant distal biliary obstruction: A systematic review and meta-analysis. Sci Rep. 2019;9(1):16551. https://doi.org/10.1038/s41598-019-52993-x
3. Lesmana CRA, Gani RA, Hasan I, Sulaiman AS, Ho KY, Dhir V, Lesmana LA. Palliative Endoscopic

Ultrasound Biliary Drainage for Advanced Malignant Biliary Obstruction: Should It Replace the Percutaneous Approach? Case Rep Gastroenterol. 2019;13(3):385-397. https://doi.org/10.1159/000502835
4. Leung Ki EL, Napoleon B. Endoscopic ultrasound-guided biliary drainage: A change in paradigm? World J Gastrointest Endosc. 2019;11(5):345-353. https://doi.org/10.4253/wjge.v11.i5.345
5. Mangas-Sanjuan C, Bozhychko M, Martinez J, Compañy L, Ruiz F, Casellas JA, Aparicio JR. Endoscopic management of accidental portal vein puncture during endoscopic ultrasound-guided choledochoduodenostomy. Endoscopy. 2020;52(2):E47-E48. https://doi.org/10.1055/a-0991-7763
6. Giovannini M, Moutardier V, Pesenti C, Bories E, Lelong B, Delpero JR. Endoscopic ultrasound-guided bilioduodenal anastomosis: a new technique for biliary drainage. Endoscopy. 2001 Oct;33(10):898-900. https://doi.org/10.1055/s-2001-17324
7. Mora Soler AM, Álvarez Delgado A, Piñero Pérez MC, Velasco-Guardado A, Marcos Prieto H, Rodríguez Pérez A. Endoscopic ultrasound-guided choledochoduodenostomy after a failed or impossible ERCP. Rev Esp Enferm Dig. 2018;110(5):299-305. https://doi.org/10.17235/reed.2018.5040/2017
8. Ogura T, Higuchi K. Technical tips of endoscopic ultrasound-guided choledochoduodenostomy. World J Gastroenterol. 2015;21(3):820-8. https://doi.org/10.3748/wjg.v21.i3.820
9. Teoh AYB, Dhir V, Kida M, Yasuda I, Jin ZD, Seo DW, Almadi M, Ang TL, Hara K, Hilmi I, Itoi T, Lakhtakia S, Matsuda K, Pausawasdi N, Puri R, Tang RS, Wang HP, Yang AM, Hawes R, Varadarajulu S, Yasuda K, Ho LKY. Consensus guidelines on the optimal management in interventional EUS procedures: results from the Asian EUS group RAND/UCLA expert panel. Gut. 2018;67(7):1209-1228. https://doi.org/10.1136/gutjnl-2017-314341
10. Wong YJ, Teh JGX, Khor C, Tan DMY. Endoscopic ultrasound-guided choledochoduodenostomy and duodenal stenting for combined malignant biliary and duodenal obstruction. Endoscopy. 2019;51(12):E394-E395. https://doi.org/10.1055/a-0929-4927