

CASE REPORT

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Overcoming tight perihilar malignant biliary obstructions during percutaneous biliary intervention in Nigerian patients: case reports

Hammed A. Ninalowo¹, Peter T. Adenigba^{1*}  and Aderemi O. Oluyemi²

Abstract

Background A major challenge of either endoscopic or percutaneous approach to placing palliative biliary stents is the difficulty in traversing tight perihilar malignant obstructions. This can be overcome with a rendezvous approach (combined endoscopic retrograde cholangiopancreatography (ERCP)/percutaneous approach) or may require initial placement of an external drain and reattempting later. Interventional radiology for biliary obstruction is still in infant days in our locality. Herein, we describe two cases of perihilar malignant biliary obstruction (MBO) managed at a private facility in Lagos, Nigeria, in which we had to come up with a creative approach to crossing these tight junctions in the absence of ERCP facilities. This was done by securing percutaneous retrograde access into the common bile duct and combining it with the initially unsuccessful anterograde approach. In both cases, this combined percutaneous anterograde/retrograde approach resulted in successful traversal of the malignant obstruction and placement of internal biliary stents.

Case presentation We present the case of two elderly patients with tight malignant biliary obstruction (MBO), one from a suspected cholangiocarcinoma and the other from hepatic metastatic colorectal carcinoma. Both patients had successful traversal of the obstruction via a combined percutaneous anterograde/retrograde approach and biliary stenting.

Conclusions Our case reports demonstrate an unusual approach that should assist interventional radiologists in resource-limited setting who seek for a viable option to those presently available for traversing perihilar MBOs in the percutaneous placement of internal stents.

Keywords Malignant biliary obstruction, Percutaneous biliary stents, ERCP, Case report, Nigeria

Background

Malignant biliary obstruction (MBO) most commonly results from pancreatic adenocarcinoma and cholangiocarcinoma (CCAs) [1]. According to their anatomical location, CCAs are classified as intrahepatic, perihilar and distal CCA [2]. As less than a third of patients present

with surgically resectable tumors, palliative stenting remains the most viable management option for many cases [3, 4]. Endoscopic intervention via endoscopic retrograde cholangiopancreatography (ERCP) is said to be the mainstay for palliation of these MBO patients. However, a percutaneous approach is preferred in individuals with advanced perihilar MBO because of superior technical success rates for biliary drainage, and comparable adverse events and 30-day mortality rates with ERCP [5].

A major challenge of either endoscopic or percutaneous approach is the difficulty in traversing tight perihilar obstructions caused by perihilar MBOs. This can be overcome with a rendezvous approach (combined ERCP/

*Correspondence:

Peter T. Adenigba
adenigbataiwo@gmail.com

¹ IRDOC Interventional Radiology Consulting Limited, Euracare Multispecialty Hospital, Victoria Island, Lagos State, Nigeria

² ReMay Consultancy and Medical Services, Ikeja, Lagos State, Nigeria

percutaneous approach) or may require initial placement of an external drain and reattempt at a later date (usually after 1 week or later) [6, 7]. Only recently have the expertise and technical support for regular performance of both endoscopic and percutaneous biliary interventions become available in Nigeria [8–10].

Attempts at carrying out percutaneous interventions for perihilar MBOs in our locality have been met with similar obstacles as described above. In this report, we describe two such cases managed at a private facility in Lagos, Nigeria, in which a born-of-necessity percutaneous retrograde access into the common bile duct (CBD) was used to cross tight perihilar MBOs caused by CCA and metastatic colorectal carcinoma, in combination with the conventional anterograde approach (born-of-necessity as there was no capacity for ERCP within reach). In both cases, this combined percutaneous anterograde/retrograde approach resulted in successful traversal of the obstruction and placement of internal biliary stents.

Case presentation

Case 1

A 65-year-old man with no significant past medical history presented with jaundice of approximately 2-month duration with associated abdominal distention and weight loss. He was worked up with contrast-enhanced abdominal computed tomography (CT) scan which showed evidence of obstruction of the biliary ducts just below the level of the hilum with concern for CCA. Large-volume ascites were also detected. Notably, ERCP is certainly preferred to percutaneous approach in patients with ascites; however, it was not readily available.

After informed consent was obtained, he was prepared for and had abdominal paracentesis with drainage of approximately 5 L of bilious appearing ascites following the placement of 8-Fr drain (Cook Medical, Bloomington, USA). Next, local anesthesia was given, and under real-time ultrasound guidance, a 21-G AccuStick™ needle (Boston Scientific Corp, Massachusetts, USA) was advanced toward a peripheral bile duct in the left hepatic lobe. Contrast was gently hand-injected to opacify the dilated left-sided biliary ducts. Following the advancement of an 0.018-inch Nitrex™ guidewire (Medtronic, Heerlen, The Netherlands), an AccuStick™ set was advanced. An 0.035-inch Amplatz Super Stiff™ wire (Boston Scientific Corp) was then advanced into the central biliary duct. The AccuStick™ set was exchanged for a 6-Fr sheath (Terumo, Elkton, USA). Despite multiple attempts, the obstruction in the perihilar region could not be crossed from the anterograde approach. Typically, in such cases, our protocol is to place an external drain and return 2

weeks later to reattempt traversal of the obstruction; however, the presence of ascites would have presented certain challenges with pericatheter drainage around an external drain (which is a well-known problem of biliary drainage in the presence of peritoneal fluid).

At this time, careful real-time ultrasound of the right upper quadrant was performed and the distal CBD was identified. A 22-G needle (Cook Medical) was used to access the distal CBD from a percutaneous approach, and contrast was injected (Fig. 1). Following confirmation of the needle location, an 0.018-inch Nitrex™ wire was advanced from the retrograde approach and used to cross the obstruction and subsequently gain access into the intrahepatic biliary tree. Following successful advancement of this wire, a snare system (Merit Medical) was placed through the 6-Fr sheath from the anterograde approach and the 0.018-inch wire was successfully captured (Fig. 2) creating through and through access. The 0.018-inch wire was clamped outside of the body, and a 4-Fr Kumpe catheter (Cook Medical) was advanced over the captured wire and through the region of obstruction. A tandem 0.018-inch wire was then advanced alongside into the duodenum (Fig. 3). The stiff 0.035-inch wire was advanced (Fig. 4), brush biopsy sample was obtained, and subsequently, an 8 mm × 40 mm Protégé self-expanding biliary stent (Medtronic, Plymouth, USA) was deployed across the obstruction. Due to unsatisfactory flow, a second 8 mm × 27 mm express balloon-expandable biliary stent (Boston Scientific Corp) was deployed in the

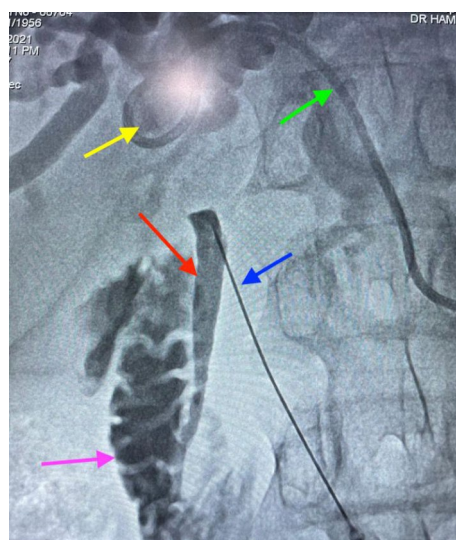


Fig. 1 Intra-procedure fluoroscopic images showing anterograde cholangiogram with pigtail catheter (yellow arrow) in the central biliary tree from a left hepatic approach (green arrow). A 22-G needle (blue arrow) was used to target the distal common bile duct (red arrow), with opacification and contrast egress into the duodenum (purple arrow)

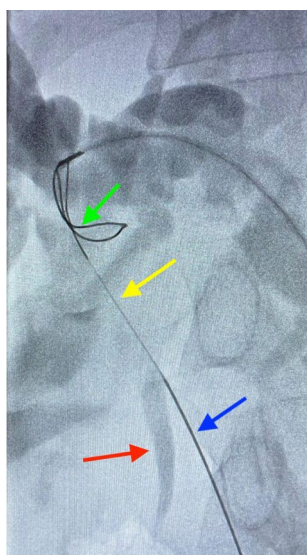


Fig. 2 Fluoroscopic image showing 22-G needle in the common bile duct (Blue arrow), 0.018-inch wire (yellow arrow) inserted through 22-G needle and advanced through the obstruction. 0.018-inch wire captured by a snare (green arrow) from the antegrade approach, and opacified distal common bile duct (red arrow)

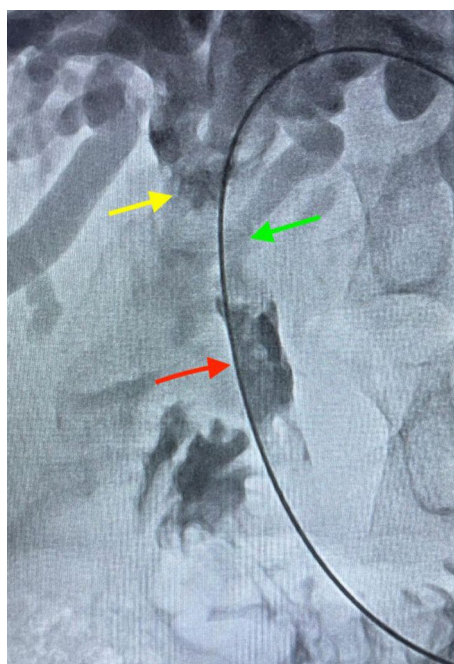


Fig. 4 Fluoroscopic image after successful crossing, showing a 0.035-inch wire traversing the region of obstruction (green arrow) and spanning the central biliary tree (yellow arrow) to the distal common bile duct (red arrow)

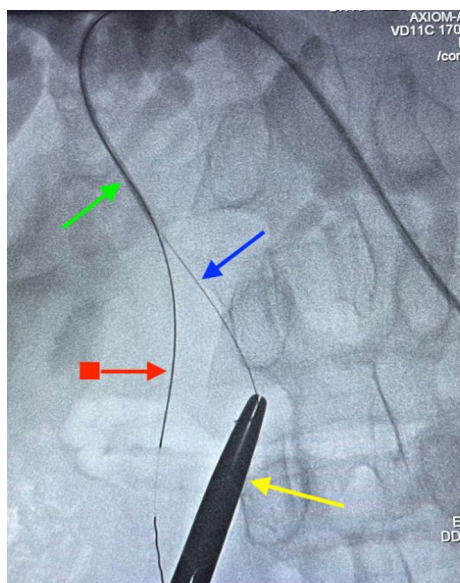


Fig. 3 Fluoroscopic image showing a clamp (yellow arrow) holding a retrogradely inserted wire outside the skin. A 4-Fr catheter (green arrow) was inserted over the captured wire (blue arrow), and a tandem 0.018-inch wire (red arrow) was inserted through the same 4-Fr catheter to gain distal access

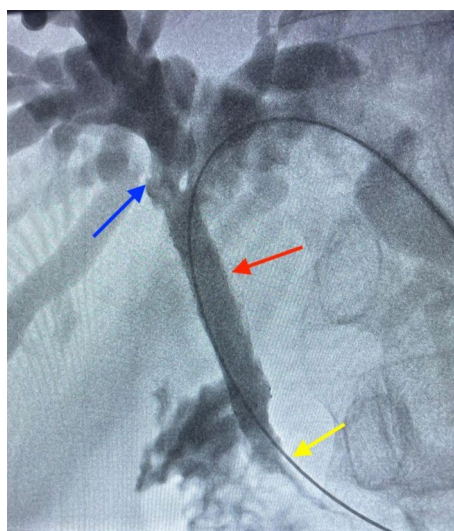


Fig. 5 Completion cholangiogram showing a metallic stent (red arrow) bridging the proximal central ducts (blue arrow) to the distal common bile duct (yellow arrow)

proximal portion. Contrast was injected to confirm position, and this time, the flow was as expected (Fig. 5). Gelfoam® (Pfizer Inc.) was injected through the tract to

achieve hemostasis, and the antegrade tract and sheath were removed.

The 8-Fr ascites drain was left in overnight and removed the next day. Follow-up at 2 weeks and 3 months

post-procedure showed that the patient made significant clinical improvement evidenced by complete resolution of ascites and improved liver function. At 6 months, however, he re-presented with recurrence of jaundice and passage of dark urine and admitted significant anorexia with weight loss. Abdominal CT images revealed extensive soft tissue tumor surrounding the stent in the region of the hepatic hilum with soft tissue encasement around the portal vein. Massive dilatation of the intrahepatic bile duct and small ascites were also noted. He underwent percutaneous transhepatic restenting and was discharged in stable condition.

Case 2

A 75-year-old man with history of colorectal cancer with metastasis to the liver presented with mild jaundice and hyperbilirubinemia. He was evaluated for possibility of biliary stenting to achieve decrease in bilirubin, which may in turn lead to the commencement of chemotherapy. Contrast-enhanced abdominal CT revealed evidence of hepatic metastasis with hypo-enhancing masses within segments 4B and 6. There was diffuse intrahepatic biliary ductal dilatation with transition point in the hilar region due to extrinsic compression from multiple metastatic lesions.

He initially had a right external biliary drain placed following an unsuccessful attempt at traversing the tight obstruction via the standard antegrade approach. Two weeks later, he returned for repeat attempt to cross the obstruction and place an internal stent; however, all efforts to cross the hilar obstruction, including attempts made from a new left hepatic biliary access, again failed. Attention was then shifted to the CBD. Under ultrasound guidance, the mid-segment of the CBD was punctured from a percutaneous approach using a 21 G Chiba biopsy needle (Cook Medical), and contrast was slowly hand-injected to opacify the non-dilated distal two-thirds of the CBD across the sphincter of Oddi into the duodenum. An 0.018-inch Nitrex™ wire was advanced, and the needle was exchanged for the stiffened dilator from a 4-Fr micro-puncture co-axial introducer (Merit Medical, Utah, USA), with which the obstruction in the CBD was eventually crossed. Subsequently a 6-Fr 6–10 mm snare system (Merit Medical) was advanced through the left biliary access to snare the 0.018-inch wire, and the front end was brought out through the sheath, creating through and through access. Next, an angled catheter was advanced over the 0.018-inch wire across the obstruction into the CBD. The 0.018-inch wire was exchanged for a glide wire, and the catheter was advanced further past the sphincter of Oddi into the duodenum. A stiff 0.035-inch wire was advanced, and the catheter was removed. Finally, an 8 mm×27 mm self-expandable biliary stent

was deployed extending from the left hepatic duct to the CBD. Contrast was injected to confirm position, and flow was satisfactory. Gelfoam® was injected into the left tract to achieve hemostasis, and the sheath was removed. The existing right external biliary drain was replaced with a new 8-Fr external biliary drain (Cook Medical) and initially connected to a gravity drainage bag. The drain was later capped and subsequently removed. Following drain removal, the patient had persistent leakage of bile from the previous site of the right-sided drain. Access was gained through the prior stent, and an internal–external drain was placed. The drain was injected with contrast, which flowed promptly into the CBD. However, this patient's performance status continued to worsen over the next month, and he eventually passed on 4 weeks after stent placement.

Discussion

Generally, distal extrahepatic obstruction is best approached with ERCP, while the proximal perihilar obstruction is preferably managed percutaneously, as stenting of biliary hilar obstruction is considered a complex endoscopic procedure [5]. It is being advocated that the technically feasible route that gives the best clinical outcome should be adopted. Therefore, the experience of the experts or centers performing the procedure can inform the choice of either ERCP or percutaneous transhepatic biliary drainage. However, for patients with markedly elevated bilirubin, cholangitis, extensive stenosis, failed ERCP, or altered biliary anatomy from surgery, percutaneous approach is the proposed route [11].

In a resource-limited country like Nigeria, where expertise for either method only became available recently at a few centers, the experience of the operator becomes even more significant in deciding the modality of treatment [8–10]. Percutaneous biliary drainage with metallic stent placement has been carried out successfully on patients with MBO affecting different anatomical levels, at a private center in Lagos, Nigeria, by an interventional radiologist [9]. Most importantly, we have shown that we can mimic the results of ERCP in most patients without the need for external drainage, as we have achieved primary biliary stenting in >90% of our patients [9]. Some of these procedures are not without challenges, such as inability to traverse tight biliary obstructions, thus necessitating placement of external biliary drain and later reattempting to internalize the stent. Internalizing a stent in the setting of palliation for MBO is preferred to placing an external drain, which is inconvenient and impairs quality of life, in addition to leading to loss of bile salts and dehydration [4, 11]. The inflammation in the biliary system is much less when the system is allowed to decompress through external drainage over a period of time, with

success rates of crossing previously difficult lesions >70% on reattempt. Placement of external drain or reattempt of the procedures also confers unnecessary financial burden on patients who often pay out of pocket for treatment in Nigeria.

The two cases described above detailed an ingenious technique adopted in overcoming these challenges. This method entails gaining access percutaneously into the CBD, distal to the obstruction, getting a wire across into the proximal duct, and snaring the wire. It is very practicable; however, it does require mastery of ultrasound anatomy to both gain access into a decompressed CBD and avoid traversal of important structures in this region, such as the hepatic or gastroduodenal arteries. To our knowledge, this is the first report of such biliary intervention. Similar combined retrograde and anterograde approach has been adopted with success in recanalization of chronic vascular occlusion of the lower extremity vessels [12]. We therefore solicit that interventional radiologists, especially in low-resource countries with limited access to ERCP, consider an attempt at this technique prior to relegating patients to long-term external drainage.

Conclusions

The percutaneous combined anterograde–retrograde technique described in this report is worth exploring in patients who have perihilar MBO that is difficult to traverse or who are being managed in centers where ERCP is not readily available. Compared to long-term external biliary drainage, this unusual approach is less expensive and more convenient for the patient and appears to be equally effective.

Abbreviations

CBD	Common bile duct
CCA	Cholangiocarcinoma
CT	Computed tomography
ERCP	Endoscopic retrograde cholangiopancreatography
MBO	Malignant biliary obstruction

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Not applicable.

Author contributions

HN conceived and designed the study. PA is a major contributor to all parts of the paper. HN and AO contributed to the writing process and provided critical feedback, playing a key role in enhancing the report's overall quality. All authors contributed to the writing and review of the manuscript and approved of the final version for submission.

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Competing interests

The authors declare no competing interests.

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