

case report

Percutaneous Y-shape reconstructive biliary stenting in Klatskin cholangiocarcinoma through a single left-sided entry

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Percutaneous Y-shape reconstructive biliary stenting in the Klatskin tumor is typically performed through bilateral biliary access. Single access from a right-side biliary entry is the more commonly used side for biliary access in general. We present a successful Y-shaped biliary stent reconstruction through a single left-side biliary approach. Unilateral single access Y-shaped biliary stenting can be technically challenging; when performed through a left biliary approach, an additional technical challenge may arise due to the unusual combination of Y-shaped biliary stent reconstruction and the single left-side biliary approach. We concluded that percutaneous Y-shaped biliary reconstruction through a left-sided unilateral approach is a technically feasible, less invasive interventional approach in managing Klatskin tumor.

SIMILAR CASES PUBLISHED: None.

Klatskin tumor (KT), which is also called hilar cholangiocarcinoma, is a type of cholangiocarcinoma that characteristically occurs at the confluence of the right and left hepatic bile ducts. This type of cholangiocarcinoma usually does not present until it is in advanced stages. Thus, due to its late and aggressive presentation, KT carries a poor prognosis, especially those with unresectable tumors, with a median survival of less than one year.¹ Available management modalities for patients suffering from KT vary widely. For many years, the surgical approach offered the only curative management of KT.² In patients who present at an early stage of their disease, complete resection of the tumor often provides the best outcomes for long-term survival. However, due to the silent nature of KT, early detection is rare and most patients receive palliative treatment.³

As most KT patients have a late presentation and often suffer from accompanying co-morbidities and old age, there is a need for a less invasive management approach. Endoscopic retrograde cholangiopancreatography with endoscopic stenting technique offers a less invasive approach to the management of KT; however, its role is limited due to a high drainage failure rate, high mortality, and minimal palliation effects.⁴ Another minimally invasive approach to KT management is the percutaneous transhepatic biliary drainage, which is superior to endoscopic biliary drainage in overall technical and therapeutic success rates.⁵ There are two well-recognized percutaneous transhepatic approaches for reconstructing biliary hepatic confluence in KT: T- and Y-shaped stenting.⁶ Other than the bilateral percutaneous access in the Y-configuration stenting, there are no reports of any important difference in the technical or clinical outcomes between the two techniques.⁷

The second access site required in Y-configuration biliary stent reconstruction adds another layer of complexity because of the increased risks of post-procedural complications. For example, the risk of major complications of percutaneous biliary drainage, such as hemorrhage and localized infection or abscess formation,⁸⁻¹⁰ is theoretically doubled due to the additional access site. In this case report, we present a case of percutaneous Y-configuration reconstructive biliary stenting in Klatskin cholangiocarcinoma through a single left-sided entry.

CASE

A 63-year-old woman was referred to our interventional radiology service for a follow-up consultation regarding persisting jaundice following the insertion of a left biliary drain one week earlier. She was previously diagnosed with metastatic KT confirmed on CT and magnetic resonance cholangiopancreatography. We decided to perform reconstructive biliary stenting with the T-configuration using the already existing left biliary drain. Approval of the institutional research ethics committee was obtained (HAPO-06-B-001/ECM#2021-4804), (Date 10/3/2021).

After explaining the procedure and obtaining the patient's informed consent, the left percutaneous drain was accessed under full aseptic conditions, with local anesthetics (10 mL of lidocaine 1%), and IV sedoanalgesia (1 mg midazolam, and 50 mcg fentanyl). Multiple attempts using a hydrophilic guidewire and short angled catheter were made to pass the guidewire from the left to the right hepatic duct for the T-shape reconstruction, but those attempts were unsuccessful (**Figure 1**). Therefore, the decision was made to abandon the T-configuration stenting and proceed with Y-configuration stenting by placing the first limb from the left side and placing the second limb through a new right-side access. The guidewire was passed into the common bile duct then into the duodenum, followed by the placement of a self-expandable stent (8x80 mm, EV3 Protégé Everflex), which was post-dilated by an 8x60 mm balloon (**Figure 2**). The guidewire was kept in the duodenum as a safety wire (**Figure 3**). Just before performing the new right-side puncture to complete the Y-configuration, a last try to cross to the right hepatic duct through the stent struts was attempted and was successful. Pre-dilatation of the stent using a 4x40 mm balloon was done. Then, a balloon-expandable stent (10x37mm, Express LD, Boston Scientific) was used to assure accurate deployment (**Figure 3**). The final image showed a successful Y-shape reconstruction of the biliary ducts (**Figure 4**). There were no complications, and the patient recovered uneventfully. Jaundice continued

to improve, and a one-month follow-up revealed complete resolution of jaundice. Following the one-month visit, the patient was lost to follow-up as she returned to her home country with no further news about her condition.

DISCUSSION

Hilar cholangiocarcinoma is a form of malignant biliary cancer that mostly presents in the 6th decade of life and carries a poor prognosis. Advanced stage hilar cholangiocarcinoma poses a clinical challenge for interventional management. Although typical techniques require bilateral entries to complete a Y-shape stent reconstruction of the biliary tree, the case presented in this report shows that a Y-configuration stent placement through a single unilateral approach from the left side is technically feasible.

Percutaneous biliary stenting using a Y-configuration stent placement is a valid palliative management option for patients suffering from advanced Klatskin tumor. For example, a retrospective study showed that the rate of successful internal drainage was achieved in 90% of cases.¹¹ Nevertheless, the main technical drawback of Y-configuration stenting is the need for bilateral percutaneous transhepatic access to complete the stent-in-stent deployment.

The literature is scarce when it comes to applying the unilateral approach in the construction of Y-shaped stents. Anselmetti et al showed that Y-shape reconstruction using a single right-sided percutaneous biliary approach was a safe and feasible method of managing inoperable hilar cholangiocarcinoma.⁶ Although our case was performed through a single left-sided percutaneous biliary approach, the decision was predetermined as our patient had an already existing left-sided biliary drain placed during a previous procedure for biliary decompression. Nevertheless, the literature shows that a left-sided percutaneous approach is associated with better postoperative quality of life.¹²

A limitation of this study is the loss of longer follow-up beyond one month. In conclusion, obstructive hilar cholangiocarcinoma may pose a clinical challenge for interventional management. This report showed that the construction of Y-shaped stents through a single left-sided percutaneous biliary approach for palliative management of KT is a technically feasible and less invasive option compared with bilateral Y-reconstruction. A trial of Y-shaped construction through a single access site can be recommended in cases where technical difficulties prevent the placement of T-shaped stents, as this approach is less invasive when compared with bilateral access.



Figure 1. Initial cholangiogram showing the hilar obstruction, with failed attempts to cross from the left to the right hepatic ducts.



Figure 2. Placement of the first limb of the Y-stenting reconstruction through the left access, with post-placement dilatation using 8×60mm balloon.



Figure 3. Placement of balloon-expandable stent in the right hepatic duct, through the struts of the first stents from the left-side access.



Figure 4. The final image after completing the Y-shape stents for biliary reconstruction.

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