

A Novel Approach: Trans-Cholecystic PTC and Malignant Biliary Stenting

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Abstract

Background: Percutaneous Biliary Cholangiography (PC) is the first step in a commonly employed technique utilized by interventional radiologist to relieve biliary obstruction via biliary stenting and drainage. A narrow gauge 22 gauge Chiba needle is utilized to gain access into the biliary tree via the right or left hepatic duct, followed by biliary imaging and intervention. Occasionally, access is limited into the biliary tree utilizing traditional methods due to decompression, variant anatomy, or other complications.

Materials and methods: Magnetic Resonance Imaging (MRI), Computed Tomography (CT), and Fluoroscopic images detail a case of a novel trans-cholecystic approach of biliary stenting and drainage in a patient with poor access to traditional methods and poor surgical candidate. Additionally, a full work up of the patient is presented to explain the presenting symptoms. Detailed history, relevant laboratory results, and hospital course are reviewed.

Results: We present a Novel approach of biliary drainage utilizing the cystic duct as the entry point into the central biliary system. To our knowledge, this has not been previously described in literature and confers a tool for interventionalists to gain biliary access on patients who are otherwise poor surgical candidates.

Conclusion: We describe a case report of a novel approach for biliary access for cholangiography and subsequent interventions utilizing a trans-cholecystic approach. Familiarity with this approach can improve clinical outcomes and morbidity for those that are otherwise poor surgical candidates and present a challenge to interventionalists via traditional access methods.

Keywords: Percutaneous intervention; Gall bladder intervention; Malignant biliary stricture; Interventional radiology; Bilirubinemia; PTC

Introduction

Percutaneous Biliary Cholangiography (PC) is a common procedure employed by interventional radiologist after access has been gained into the biliary system. This is traditionally followed by subsequent intervention. Once a popular approach, now has been largely replaced by retrograde canalization of the distal biliary tree (ampulla) utilizing an endoscope. This procedure still serves as an alternative for patients who are not viable candidates for anesthesia or difficult to canalize. Traditional methods gain access to the right hepatic duct via a narrow gauge non-cutting needle (Chiba). Various methodologies apply to gaining access. At our institution, we direct a Chiba needle in the right hepatic lobe angled approximately 45°. The needle is slowly retracted with simultaneous injection of contrast. Puddling of contrast in a tubular structure confirms biliary placement. 0.035" hydrophilic guide wire is placed into the common duct via the right hepatic duct. A biliary drainage catheter is placed, terminating in the duodenum. Confirmation of position is achieved with fluoroscopy and contrast [1].

Occasionally, intrahepatic biliary radicles are decompressed and traditional methods are rendered nonviable to the interventionalist. Transcystic ampullary balloon dilatation has been previously described in general surgery literature in the clinical setting of inadequate lavage of small gallstones and debris during laparoscopic cholecystectomy. To our knowledge, percutaneous trans-cholecystic biliary drainage has not been reported to be a current strategy of percutaneous CBD access and intervention.

Materials and Methods

We detail a case of the first reported trans-cholecystic approach PC and biliary drainage in the clinical setting of choledochlithiasis. Initial

CT revealed a large gallstone impacted in the distal common bile duct (Figure 1). Sonographic images reveal a dilated gallbladder containing multiple gallstones (Figure 2).

MRI MRCP (magnetic resonance cholangiopancreatography) reveals a dilated CBD containing a large stone with possible surrounding debris. Please note the relatively decompressed intrahepatic biliary radicals (Figures 3 and 4).

Fluoroscopic images during trans-cholecystic biliary drainage catheter placement reveals appropriate position, terminating in the duodenum (Figures 5 and 6) [2].

Results

Percutaneous approach cholangiography and biliary intervention has been a commonly utilized approach for patients who have difficult ampullary anatomy rendering canalization difficult or are poor surgical candidates. Interventionists rely on hepatic duct localization and access utilization commonly detailed procedure techniques. When access is compromised by difficult percutaneous localization of the hepatic ducts, this can present a dilemma to Interventional radiologists.

We present a case of a 93 y/o Hispanic female with a pertinent

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Received August 06, 2015; **Accepted** January 07, 2016; **Published** January 20, 2016

Citation: Iqbal M, Gronlie T, Gonda S, Joshi A, Iqbal S (2016) A Novel Approach: Trans-Cholecystic PTC and Malignant Biliary Stenting. J Vasc Med Surg 4: 245. doi:10.4172/2329-6925.1000245

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history of CHF and HTN who presents to the ED with acute onset RUQ abdominal pain. Workup reveals elevated Total bilirubin of 5.8 (nml 0.3-0.9 mg/dL), with the remainder of the liver function panel unremarkable. WBC was also elevated at 20,000(nml 4,500-10,000 wbc/mCL). Physical exam was unremarkable aside from RUQ tenderness. Imaging studies revealed an obstructive stone in the CBD (choledocolithiasis). These findings raised suspicion for cholangitis as a complication. Prior ERCP revealed a failed ERCP related to tortuosity and inaccessible ampulla of vater. Interventional radiologists similarly



Figure 1: Distal common bile duct.

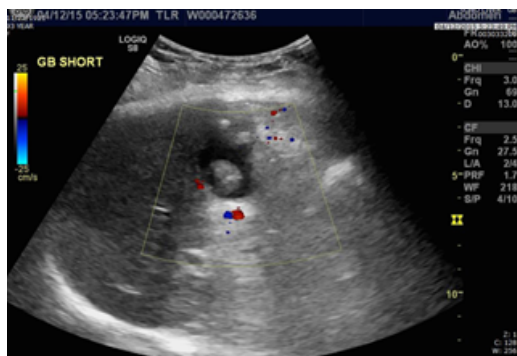


Figure 2: Sonographic images of gall bladder.

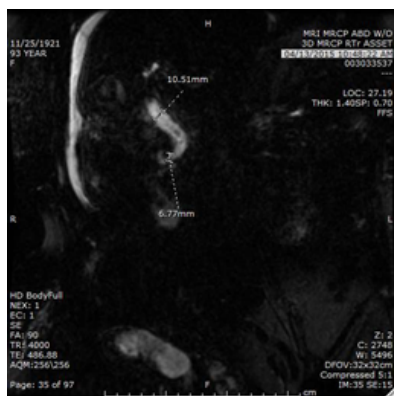


Figure 3: MRI MRCP ABD W/O (3D MRCP RTr Asset).

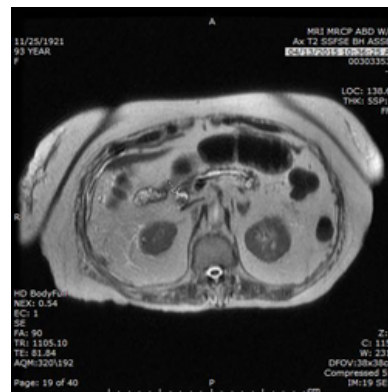


Figure 4: MRI MRCP ABD W/O (Ax T2 SSFSE BH Asset).



Figure 5: Fluoroscopic image during trans-cholecystic biliary drainage.

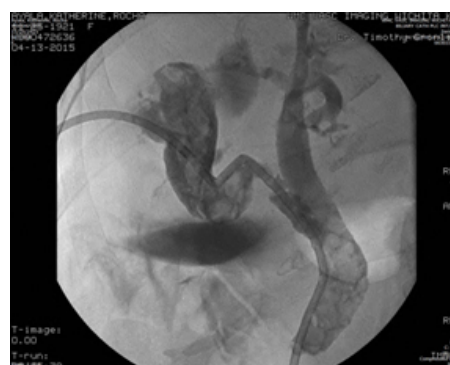


Figure 6: Biliary drainage catheter terminating in the duodenum.

encountered difficulty in access of the hepatic duct utilizing traditional methods. Further deliberation resulted in the access of the CBD via the gallbladder and cystic duct. Access is gained into the Gallbladder with a 22 gauge Chiba needle, similar to a cholecystostomy. A 0.035 inch hydrophilic guidewire was then carefully manipulated through cystic duct into the duodenum. An 8Fr. Biliary catheter was introduced over the guide-wire into the CBD and finally into the duodenum. The catheter was set to external drainage. Patient's total bilirubin decreased with marked improvement in clinical symptoms. The patient was soon discharged in stable condition with likely transition to internal drainage.

Conclusion

We discuss the first reported case of a percutaneous biliary drainage utilizing the gallbladder as the point of entrance, through the cystic duct and into the common bile duct. Percutaneous biliary drainage is a technique generally reserved for difficult endoscopic access. While, intrahepatic biliary radicals can be readily accessed, anatomic variants can limit access, presenting a challenge to the interventionalist. As demonstrated, we propose access into the central biliary system utilizing the gallbladder and thus, the cystic duct. We

believe that this novel trans-cholecystic approach can be a vital tool for the interventionalist presented with a difficult or inaccessible entrance into the biliary system.

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