

Percutaneous biliary drainage in biliary obstruction

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Abstract

Klatskin tumor is a term traditionally given to a hilar cholangiocarcinoma (CCA), occurring at the bifurcation of the common hepatic duct. Typically, these tumors are small, poorly differentiated, exhibit aggressive biological behaviour, and tend to obstruct the intrahepatic bile ducts. Etiology of cholangiocarcinomas is not clear, however damages of the biliary ducts, acute and chronic cholecystitis have higher predisposition for malignity. Diagnosis with ultrasound (USG), computed tomography (CT), magnetic resonance imaging (MRI), and magnetic retro-cholangio-pancreatography (MRCP) have an irreplaceable role in its diagnosis in addition to endoscopic-retro-cholangio-pancreatography (ERCP). The aim of this study is the application of biliary ducts' percutaneous drainage in the most complicated and terminal stages of the disease.

Keywords: biliary ducts, Klatskin tumor, PTDB, punction.

Introduction

Klatskin or biliary cholangiocarcinoma are slow-growing tumors are most often found in the portal hilus and choledoc, in cystic duct and ampulla of Vater segment. However, such tumor can also involve the common hepatic duct as well as the intrahepatic ducts. An evident clinical sign is a jaundice without pain. It is the most common symptom faced when this tumor is present, even if it is small in size and only partially obstructs the biliary ducts. Cholangiocarcinoma can be localized in the periphery of biliary tree, seen as a solid mass. When the obstacle is in the level of hepatic hilus, there is an enlargement of intrahepatic biliary ducts but there is no sign of a choledoc enlargement (1). Two thirds of cases with cholangiocarcinoma are patients aged >65 years, increased by ten times in patients older than 80 years. The incidence is similar in both males and females.

Diagnosis

Ultrasound imaging: Klatskin tumor is presented as mass in biliary ducts with/or indirect finding of dilatation of biliary ducts and presence of heterogeneous echo structure. (hyperechogenicity in 79% of cases, hypoechogenicity in 19% of cases and heterogeneous echogenicity in 2% of cases) (2).

CT/MRI – in CT imaging Klatskin tumor is presented as dilatation of intrahepatic bile ducts. Tumor mass in some cases cannot be seen, however presence of dilatation of bile ducts, lymph nodes, necrotic zones or metastases can be detected. MRI and MRCP with 3D reconstruction are superior to CT in identification of localization of tumor, also for identification of stenosis of biliary ducts. MRI and MRCP is imaging gold standard in diagnosis of cholangiocarcinomas.

Differential diagnosis of cholangiocarcinoma includes consideration of hepatoma (1), as well as the inflammatory pseudo-tumors of gallbladder that often cannot be differentiated with imaging methods (3).

Treatment and prognosis: biliary duct stenting

with ERCP, radical tumor removal, liver transplantation and biliary drainage with PTCB are the methods of choice in the treatment of Klatskin tumors.

Cases presentation

First case - female patient aged 55 years, treated 14 days prior with cholecystectomy (verified histopathology of CCA), with worsening clinical appearance, progressive increase of jaundice and with high bilirubin values (>25mg/dl) and high levels of CA19-9 tumor marker. In USG and MDCT of abdomen, there is a heterogeneous enhancing mass with aggressive appearance and noted necrotic changes with extension from fifth liver segment and involving biliary duct bifurcation; a marked biliary dilatation is noticed. MRI-MRCP shows a heterogeneous mass with marked narrowing of biliary ducts and extension to fifth hepatic segment in the level of intrahepatic biliary bifurcation. Due to worsening of jaundice and clinical condition, the patient is referred for percutaneous transhepatic biliary drainage (PTBD) and possible stent placement.

Based on the USG, a draining catheter is placed and bile drainage is achieved. Bile drainage goes on for two weeks and after the improvement of the situation, ERCP stent placement is carried out and chemotherapy treatment is further applied.

Second case - male patient aged 69 years, with short history of illness, and diagnosed with Klatskin tumor through imaging evaluation (USG, MDCT, MRI-MRCP); with advanced jaundice and severe clinical condition, high values of bilirubin (>40mg/dl), and high level of CA19-9. Biochemistry values are inconclusive regarding the diagnosis of causes of biliary obstruction; however, the diagnosis is achieved through radiologic evaluation (Figure 1). Patient is diagnosed with a heterogeneous mass in the level of bifurcation of intrahepatic bile ducts of right lobe. The mass has typical imaging character-

istics for Klatskin tumor. Four more masses distributed in other liver segments are noted with metastases characteristics. Imaging modalities (US, CT and MRI) on Figure 1 and Figure 2 suggest the Klatskin tumor. ERCP is recommended for verification of images' findings and subsequent stent placement; however ERCP is not performed due to severe clinical condition of the patient. As an inoperable case, with primary tumor, presence of liver metastases and regional lymph nodes enlargement, PTDB and PTC with stenting is recommended.

After a transhepatic puncture in right lobe, and the visualization of dilated intrahepatic biliary tree (Figure 2), a drainage of ~200 ml of bile takes place. The procedure is planned in two phases: first

one consists in the drainage of bile and the second one in the stent placement, three weeks later. The reason of this two-phase procedure planning is the connective tissue development in the place of puncture, in order to avoid possible peritonitis and also improve jaundice and clinical condition (4). The result is drainage of bile and inflammatory changes withdrawal while using wide-specter antibiotics.

Due to manipulations with draining catheter and segmental drainage of obstructed bile ducts, contamination of bile ducts with blood is noticed, and it is decided not to leave a draining catheter.

Patient was treated with some wide-specter antibiotics and antipyretics.

Figure 1. CT and MRI

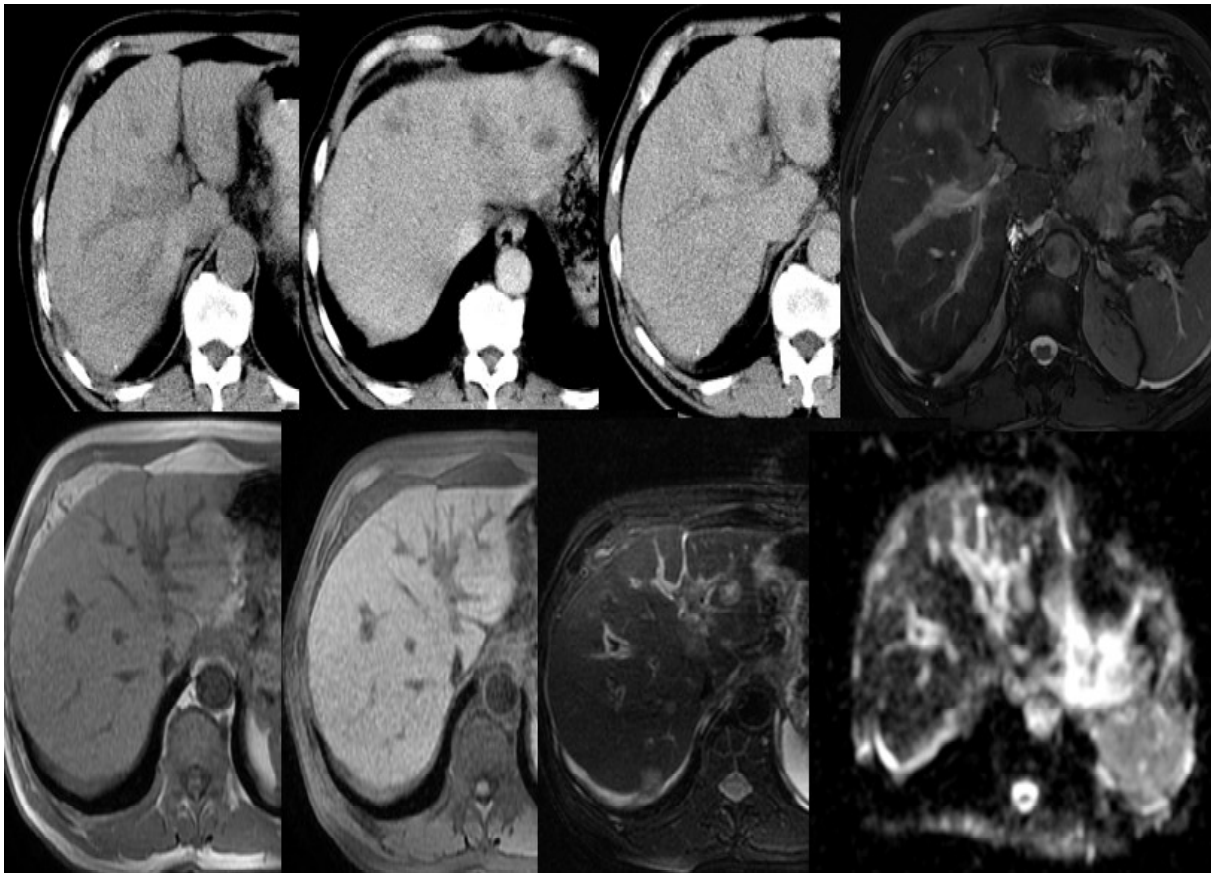
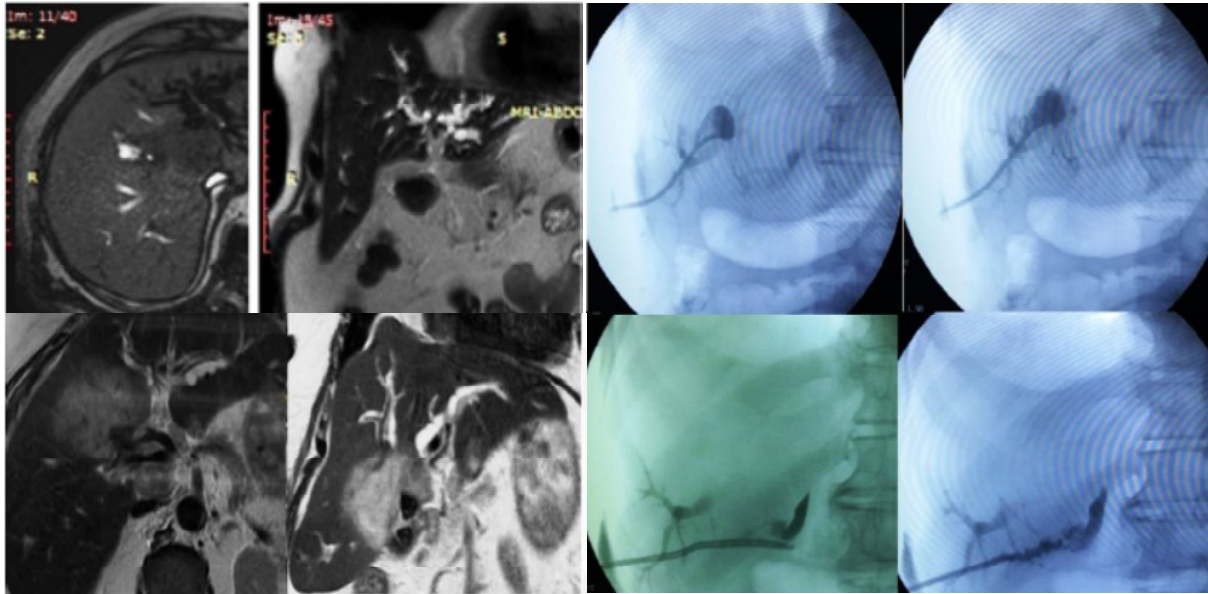


Figure 2. MRI, PTC and PTCB



Discussion

Primary and secondary malign obstruction of biliary ducts and gallbladder, usually have a fast progressive clinical picture. Clinical signs of obstructive jaundice include advanced hepatic tumors, tumors and metastases of the pancreas head or gastrointestinal tract, all infiltrating biliary ducts.

In the two above-mentioned cases, primary tumors of biliary tree were presented. The first patient was histopathology verified, while the second one had a fast progressive clinical picture and was inoperable due to local and peripheral metastases.

Patients with obstruction of bile tumors often are asymptomatic, or the symptoms are non-specific even when the disease is in the advanced stages. Therefore, when diagnosed most of the patients are inoperable and have poor prognosis, and life expectancy from 3 to 16 month for CCA (4).

The surgical extirpation was not an option in our patients. The first patient had had a prior operation, with fast progression of the disease in the post-operation period (post cholecystectomy) and diagnosed with CCA, while the second patient was diagnosed in an advanced stage of CCA.

Different approaches were applied to treat these

clinical challenges, such as: endoscopic intervention, surgical intervention, chemotherapy, radiotherapy, brachytherapy, including PTC/PTDB, proposed in a multidisciplinary approach (4), to achieve a better prognosis and improved life quality.

Choosing the right treatment modality for biliary tree and gallbladder obstruction, primarily depends on clinical and images findings in the time of diagnosis (4). In inoperable patients, choosing the percutaneous or endoscopic approach primarily depends on the localization and extent of the lesions.

The percutaneous approach is considered as a treatment of choice in patients with inoperable malign tumor with obstruction of bile duct (Klatskin tumor) (4,5).

The percutaneous transhepatic biliary drainage (PTBD) and stent placement have shown to be beneficial in achieving bile duct drainage and improving the liver function (4), allowing patients to undergo safely chemotherapy treatment, having in mind that chemotherapy is contraindicated in patient with liver function damage.

The first patient was successfully treated with PTBD placement, in which tumor had infiltrated biliary ducts at the bifurcation level; the treatment

had a very good response. However, the second patient had been successfully treated only during the procedure, since it was impossible to place a permanent draining catheter because of the blood-bile contamination.

PTBD is one of the most difficult procedures carried out by an interventional radiologist. Contraindications for PTBD and stent placement are relatively few, including severe coagulopathies or ascites (4).

Reported rate of successful percutaneous transhepatic cholangiograms/PTBD is 90-95% (4). Similarly, reported post procedural mortality rate is 0.7 to 8.6% (4,6,7). Reported complications related to such a procedure are: hemorrhage, acute sepsis and pleural ruptures related to catheter placement. However, later complications are reported, such as: pericatheter bile leakage, catheter misplacement, catheter blockage with or without cholangitis, and the tumor spreading along the catheter (8-10).

In the first patient, there were reported no complications, however, in the second one the placement of the draining catheter was not allowed due to

blood-bile contamination and possible cholangitis. In CCA patients, tumor topographic distribution has an important prognostic value. In western countries, around 60-70% of cases with CCA have been reported as hilar CCA (Klatskin tumor) (4). These patients have a poorer prognosis than patients with CCA tumor located in periphery (4). It is obvious that symptoms of obstructive jaundice significantly influence the patients' quality of life. In the first patient, with a successful PTBD, there were 450ml of evacuated bile during the procedure in the first 48 hours, which improved his clinical condition, while in the second patient, there were only of 150-200ml of evacuated bile during the procedure in the first 48 hours, and post-procedure cholangitis ended with a poor prognosis (exitus letalis in the first 48 hours).

As a conclusion, PTBD is a treatment applied in patients in terminal phases of disease, when all other treatments, such as biliary duct stenting or surgery procedures, are exhausted, since it is a successful procedure that improves patient's quality of life and life expectancy altogether.

Conflicts of interest: None declared.

References

- Gjokutaj A, Hoxhaj A, Çeliku A, Enesi E, Kaçi M. Bazat e ekografisë klinike-diagnostike. Tirana: ASD, 2006 [in Albanian]. ISBN 99943-781-7-1.
- Yeung EY, McCarthy P, Gompertz RH, Benjamin IS, Gibson RN, Dawson P. The ultrasonographic appearances of hilar cholangiocarcinoma (Klatskin tumours). *Br J Radiol* 1988; 61:991-5.
- Knowlton JQ, Taylor AJ, Reichelderfer M, Stang J. Imaging of biliary tract inflammation: an update. *Am J Roentgenol* 2008;190:984-92.
- Rroji A, Enesi E, Bilaj F, Celiku E, Tukaj F, Gega B, et al. Percutaneous plastic stent placement in malignant biliary obstruction. *Alban Med J* 2014;3:118-26.
- Khan SA, Davidson BR, Goldin R, Pereira SP, Rosenberg WM, Taylor-Robinson SD, et al. British Society of Gastroenterology: Guidelines for the diagnosis and treatment of cholangiocarcinoma: consensus document. *Gut* 2002;51:VII-9.
- Gunther RW, Schild H, Thelen M. Percutaneous transhepatic biliary drainage: experience with 311 procedures. *Cardiovasc Intervent Radiol* 1988;11:65-71.
- Weber A, Gaa J, Rosca B, Born P, Neu B, Schmid RM, et al. Complications of percutaneous transhepatic biliary drainage in patients with dilated and nondilated intrahepatic bile ducts. *Eur J Radiol* 2009;72:412-7.
- Chapman WC, Sharp KW, Weaver F, Sawyers JL. Tumor seeding from percutaneous biliary catheters. *Ann Surg* 1989;209:708-13.
- Mueller PR, Van Sonnenberg E, Ferrucci JT Jr. Percutaneous biliary drainage: technical and catheter-related problems in 200 procedures. *Am J Roentgenol* 1982;138:17-23.
- Audisio RA, Morosi C, Bozzetti F, Cozzi G, Bellomi M, Pisani P, et al. The outcome of cholangitis after percutaneous biliary drainage in neoplastic jaundice. *HPB Surg* 1993;6:287-93.