



UPDATE IN RADIOLOGY

Bile duct tumors[☆]



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KEYWORDS

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Abstract Bile duct tumors are benign or malignant lesions which may be associated to risk factors or potentially malignant lesions. They constitute a heterogenous entities group with a different biological behavior and prognosis according to location and growth pattern. We revise the role of the radiologist in order to detect, characterize and stage these tumors, specially the importance of their classification when deciding an appropriate management and treatment.
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PALABRAS CLAVE

Conductos biliares;
Neoplasias biliares;
Colangiocarcinoma;
Estadificación

Tumores de la vía biliar

Resumen Los tumores de la vía biliar son lesiones benignas o malignas que pueden asociarse a factores de riesgo o a lesiones con potencial de malignización. Constituyen un grupo heterogéneo de entidades con diferente comportamiento biológico y pronóstico dependiendo de su localización y del tipo de crecimiento. En este artículo revisamos el papel del radiólogo para detectar, caracterizar y estadificar estos tumores y, sobre todo, la importancia de clasificarlos para planificar el manejo y el tratamiento.
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Introduction

Bile duct tumors originate in the epithelium of any bile duct segments, running from the small intrahepatic ducts to the choledochus,¹ and they are classified into different anatomical-pathological types: benign, premalignant and malignant, or cholangiocarcinoma (CC), of intra- and extrahepatic localization.² The anatomical location and morphological growth type (Fig. 1) allow us to categorize them into several groups with different prognoses requiring

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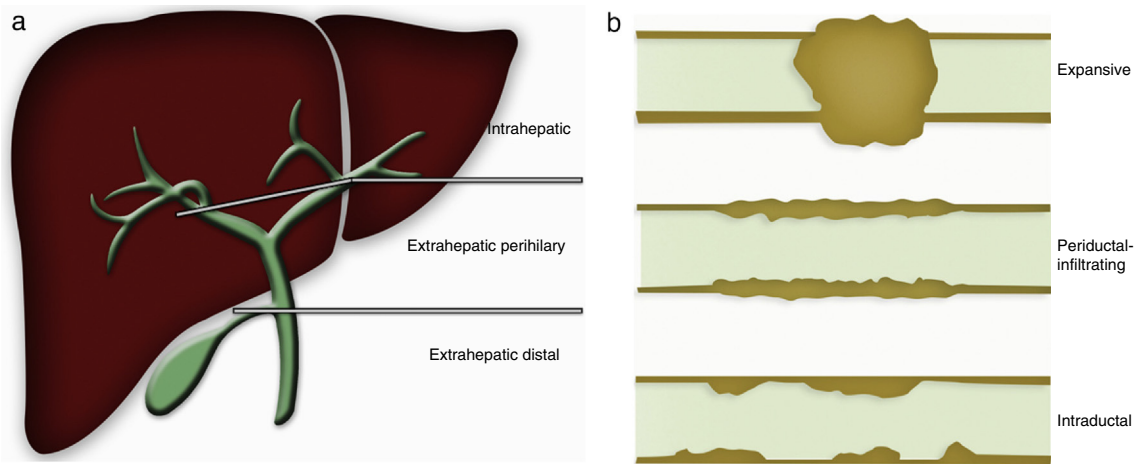


Figure 1 Graph illustrating the classification of bile duct tumors according to anatomical location (a): intrahepatic, perihilar and distal; and according to growth type (b): expansive, periductal-infiltrating and intraductal.

specific therapeutic strategies. The confluence of the secondary bile ducts sets the limit between intrahepatic and extrahepatic tumors, and the cystic duct junction to the common hepatic duct divides extrahepatic tumors into perihilar and distal tumors.²⁻⁴

Based on morphological growth four groups can be categorized: expansive, periductal-infiltrating and intraductal, or mixed if two of them coexist.⁵⁻⁷ Clinical presentation is variable, unspecific and generally late, and biliary obstruction signs are predominant in extrahepatic tumors, pain or weight loss in intrahepatic ones, or they appear as incidental findings in the image modalities.^{5,8} There are no specific tumor markers. CA 19-9 can be high (with a sensitivity of 40–70% and a specificity of 50–80%) as well as CA-125 in malignant tumors, in other tumors or in inflammatory cholangiopathies; so they are useful when assessed along other diagnostic modalities.^{5,9} This is why imaging techniques are essential to detect, characterize and classify these tumors. There is not such a thing as an ideal modality that allows us to make overall assessments so usually several additional image modalities are required.⁵

The radiologist's role in the finding, characterizing and staging of these tumors and above all the importance of categorization for therapy planning and managing is the aim of this article.

Diagnostic modalities

Abdominal ultrasound is the initial test in patients with suspicion of biliary obstruction due to its wide availability. It is very accurate to detect the obstruction and its level of obstruction but limited to detect and characterize the tumor and determine its extension and resectability.^{10,11} There is no evidence of the role that ultrasound contrast plays to detect extrahepatic tumors, although it may be relevant to distinguish them from biliary sludge¹² or for the guided biopsy of hard-to-see lesions. Multiphase multidetector computer tomography (MDCT) has a great spatial resolution and wide coverage, which makes

it an excellent method to detect and stage bile tumors, both in vascular invasion and distant dissemination.^{10,13} When hepatectomy is considered the hepatic volume can be estimated more easily and accurately than with magnetic resonance (MR).¹⁰ MR is considered the best imaging modality to study bile ducts due to its higher contrast resolution. It allows us to obtain biliary anatomical information, the level of obstruction, the type of growth, the dimensions of tumor, the extension and vascular and nodal damage through conventional diffusion-weighted cholangiographic sequences and hepato-biliary contrasts.^{3,9,10,13,14} However, it is inferior to MDCT to detect distant metastasis.⁵ The contribution of positron emission tomography combined with CT (PET-CT) to detect CC is not too significant and even though it may be useful for the detection of metastases^{15,16} its use for staging purposes has not been validated.⁵

The endoscopic retrograde cholangiopancreatography (ERCP) has lost ground to MR to distinguish benign from malignant stenoses^{3,5} but it retains its role in obtaining anatomic-pathological samples and the implantation of palliative biliary prostheses.¹⁷ The percutaneous transhepatic cholangiography (PTHC or PTC) is useful when the endoscopic pathway is not accessible.¹⁰ Endoscopic ultrasound with fine-needle puncture is recommended when other techniques are not conclusive showing a 53% sensibility and a 89% specificity for the diagnosis of extrahepatic CC.¹⁷ It is much more accurate to assess ganglia than MDCT or PET is.¹⁸ Other modalities, such as intraductal ultrasound or transpapillary cholangioscopy, may provide relevant information, the former to detect and stage perihilar CC, and the latter to characterize stenosis, detect villous processes, ulcerated stenoses, intraductal nodules or to take biopsy samples, with a 90% sensibility and specificity for the diagnosis of CC.¹⁷

On occasion, intraoperative laparoscopy or ultrasound may be necessary to determine whether the lesion is irresectable.⁴ The anatomic-pathological sample is essential for diagnosis when resection is not indicated and hence puncture guided by imaging modalities

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