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Contribution of Bili MRI in the diagnosis of extrahepatic cholangiocarcinoma

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Abstract

Extrahepatic cholangiocarcinomas are malignant tumours that include hilar tumours, known as Klatskin tumours, and tumours arising in the middle and lower two-thirds of the main bile duct (MBD), known as distal cholangiocarcinomas.

The diagnosis of cholangiocarcinoma represents a real challenge, given the difficulty of accessing a cytological diagnosis. A non-contributory cytology may lead to the consideration of certain examinations, particularly MRI, for diagnostic purposes. We report here our experience in a series of 27 patients, followed for extrahepatic cholangiocarcinoma, reviewing the data in the literature.

Keywords: Extrahepatic cholangiocarcinoma; Cholestasis; Bili-MRI; Bismuth, Drainage; Surgery

1. Introduction

Cholangiocarcinoma defines a group of tumors with a poor prognosis arising from the epithelial cells of the bile ducts. They can occur anywhere along the biliary tree. Depending on their location, a distinction is made between intrahepatic cholangiocarcinoma and extrahepatic cholangiocarcinoma; the latter is subdivided into: peri hilar and distal. The diagnosis of cholangiocarcinoma represents a real challenge, given the difficulty of accessing a cytological diagnosis. Pathological diagnosis remains the gold standard. Nevertheless, a non-contributory cytology may lead to the consideration of certain examinations, particularly MRI, for diagnostic purposes.

The aim of our work is to study the contribution of bili-MRI to the diagnosis of extrahepatic cholangiocarcinoma.

2. Materials and methods

This is a monocentric descriptive retrospective study extending over a 02-year period (January 2021-August 2023) collecting 27 cases of extrahepatic cholangiocarcinoma hospitalized in the "Médecine B" Hepato-Gastro-Enterology and Proctology Department of Ibn Sina University Hospital, Rabat.

We studied clinical, biological and radiological data.

3. Results

27 patients were included in our study, mean age 65 years with extremes between 39 and 83 years. There were 16 men (59.2%) and 11 women (40.7%), i.e. a M/F sex ratio of 1.45.

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The circumstances of discovery were dominated by deterioration in general condition, reported in 18 patients (66.6%), jaundice in 16 (59.2%), and angiocholitis in 11 (40.7%). Biologically, total bilirubin levels were increased in all our patients, with a mean of 199 mg/l (range: 31- 443), and mean PAL and GGT values of 772 U/l and 656 U/l respectively. Tumor markers were disturbed, with mean values for ACE and CA 19-9 of 245 ug/l and 1920 U/ml respectively.

Radiologically, ultrasound revealed biliary dilatation in 11 (40.7%) cases.

Bili MRI revealed distal tumours in 6 patients (22.2%), and hilar tumours (also known as Klastkin tumours) in 21 patients (81.4%), including 14 cases (51.8%) classified as bismuth IV (figure 1), 3 cases (11.1%) classified as bismuth III (figure 2) ; bismuth II (figure 3) in 3 patients (11.1%), and bismuth I (figure 4) in one patient (3.7%).

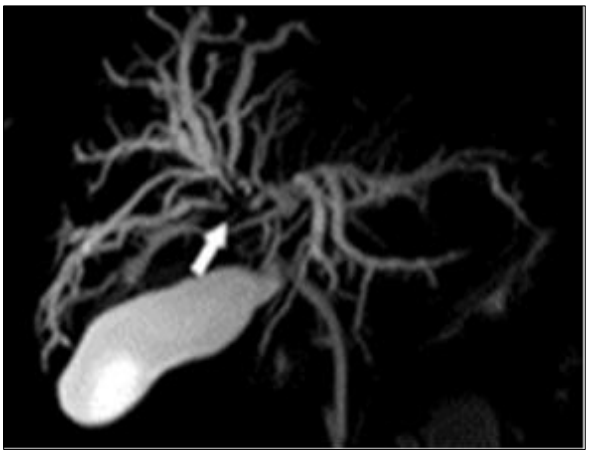

Figure 1 Tumor classified as Bismuth IV

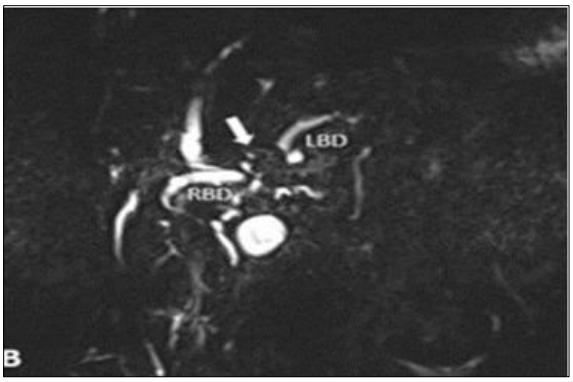

Figure 2 Bismuth III

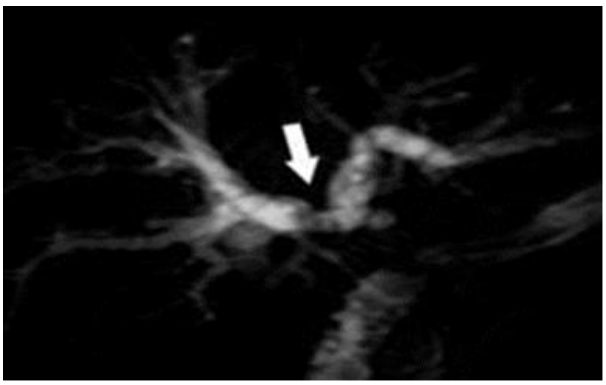

Figure 3 Bismuth II

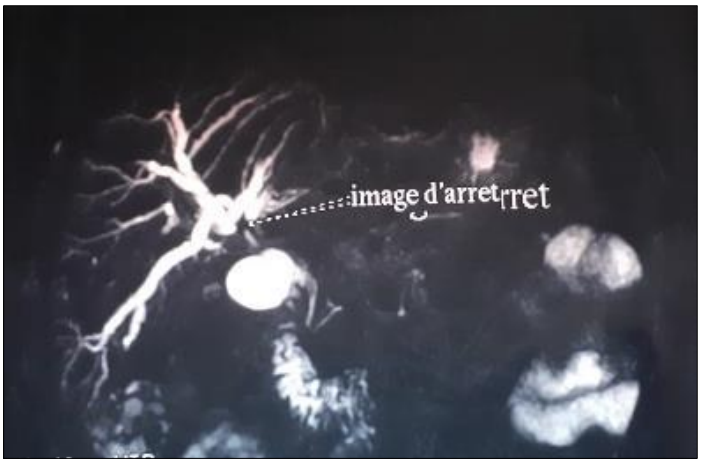

Figure 4 Bismuth I

The process was infiltrative in 25 cases (92.5/%), budding in 2 cases (7.4%), and stenosing in 19 cases (70.3%).

In all our patients, the cholangiocarcinoma presented as an irregular process, enhanced late and progressively after contrast injection, with diffusion restriction, and with different signal intensities: Hypo signal T1 in 19 cases (70.3%), iso signal T1 in 07 cases (25.9%), hyper signal T2 in 14 cases (51.8%), intermediate signal T2 in 11 patients (40.7%), and iso signal T2 in 2 patients (7.4%).

VBIH dilatation was observed in 26 patients (96.2%). As part of the tumor extension study, bili-MRI revealed ascites in 16 patients (59.2%), hilar lymph node extension in 15 (55.5%), including 6 cases (22.4%) with distant lumbo-aortic and coelio-mesenteric adenopathies (22.2%). Liver metastases were noted in 9 patients (33.3%). The process invaded the hepatic artery or its branches in 9 cases (33.3%) and the portal system in 8 cases (29.6%).

The diagnosis of cholangiocarcinoma was confirmed histologically in 11 patients (40.7%).

Only 3 patients (11.1%) underwent surgery: 2 patients underwent resection of the VBP with hepaticojejunal anastomosis on a Y loop, and one patient underwent biliary-digestive bypass.

Treatment was palliative in 24 patients (88.8%), of whom 16 (59.2%) received palliative chemotherapy, while 18 patients (66.6%) underwent endoscopic drainage (16 cases, 59.2%), with metal prosthesis in 9 cases (33.3%) and plastic prosthesis in 7 cases (25.9%), or radiological drainage in 2 patients (7.4%).

In addition, 18 patients died of cachexia and distant metastases.

4. Discussion

Extrahepatic cholangiocarcinomas are malignant tumours that include hilar tumours, known as Klatskin tumours, and tumours arising in the middle and lower two-thirds of the main bile duct (MBD), known as distal cholangiocarcinomas (1,2). The frequency of cholangiocarcinomas varies according to location. Extrahepatic forms account for 80-85% of all cholangiocarcinomas. Klatskin tumors are the most common, accounting for 50-60% of cases.

Various risk factors have been incriminated in the development of these cancers. They are linked to chronic inflammation of the biliary epithelium secondary to bile stagnation (3). The main risk factor described is primary sclerosing cholangitis; the rate of cholangiocarcinoma in this population varies from 9 to 23% (4,5). Other risk factors are rare, and relate to the presence of lithiasis or parasitic biliary obstruction, chronic viral hepatitis C (6) and certain congenital anomalies of the biliopancreatic tree, such as a long bilio-pancreatic duct, bile duct cyst, Caroli disease or aberrant pancreas (7,8). However, the majority of patients with HCC have no particular risk factors.

The clinical presentation of CCH is that of an obstructive VBP syndrome, dominated by the onset of naked jaundice. The jaundice is retentional in nature, with pruritus, discolored stools and dark urine. It is constant and progressive.

Biologically, there is cholestasis of variable significance. Increased Ca19-9 levels are common in this type of cancer; high levels suggest malignant obstruction of the bile ducts, but this marker remains non-specific (9).

Morphological assessment combines ultrasonography, triphasic thoracoabdomino-pelvic computed tomography (TAP CT) and hepatic magnetic resonance imaging (MRI) (10).

Ultrasound is often the initial examination carried out when cholestatic jaundice is first discovered, enabling dilatation of the intra- and/or extra-hepatic bile ducts to be identified.

A three-phase CAT scan locates the level of biliary obstruction, and can sometimes reveal the tumour when it takes the form of a mass. It also assesses the hepatic parenchyma (dysmorphic or not) and its volume, as well as the existence of regional adenopathies. Its decisive role is to enable assessment of arterial and portal vascular damage, notably through reconstruction sequences, which will guide the therapeutic strategy.

Initial bilio-MRI is indicated because it is the best examination for non-invasively obtaining a complete map of the intra- and extra-hepatic bile ducts (7). It enables precise localization of the obstruction (sensitivity greater than 95%), visualization of ductal structures excluded due to stenosis, thus specifying local extension, and can often identify the nature of the obstruction. Bili-MRI reveals the three forms of Klatskin tumors, and enables classification according to the Bismuth-Colrette mode of invasion.

The MRI signal of the lesion is generally iso or hyposignal T1, hypersignal T2 and diffusion, with centripetal tumor enhancement similar to the kinetics of scannographic enhancement (11). MRI has good contrast resolution, enabling us to pinpoint tumour boundaries and infiltration, proximal extension to the biliary tree, liver perfusion disorders, vascular invasion and biliary tree mapping (11).

It plays a key role in infiltrating and endoluminal forms, where the diagnosis is made in the presence of dilatation of the bile ducts upstream of an abrupt arrest image (12).

MRI with fine cholangiographic sequences is the most effective examination for the preoperative assessment of hilar involvement. Its sensitivity is comparable to that of ERCP, used as a reference, in the series by Fulcher et al. (13) where bili-MRI enabled more detailed visualization of the biliary tract than ERCP in 3 out of 4 patients. Yeh et al (14) compared the efficacy of bili-MRI and ERCP in 40 patients with a perihilar malignant obstruction. Bili-MRI was superior to ERCP in determining the extent of tumour lesions.

Surgical cure with healthy resection margins represents the only curative treatment that can counteract the poor prognosis of cholangiocarcinoma. Imaging, in this case MRI, plays a vital role in determining surgical resectability.

5. Conclusion

Because of its safety, high-resolution cholangiographic sequences and diffusion imaging, hepatic MRI provides valuable information for the positive diagnosis, staging and extension work-up of extrahepatic cholangiocarcinoma, Bili-MRI thus plays a key role in the therapeutic decision, determining resectability and the extent of biliary and vascular involvement, peritoneal, lymph node and hepatic invasion, as well as extra-hepatic metastases.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

All authors contributed to the conduct of this work. All authors also declare that they have read and approved the final version of the manuscript.

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