The von Meyenburg Complexes

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Background: Biliary duct hamartomas (the von Meyenburg complexes) is a rare malformation of the hepatic ductal plates usually discovered incidentally during surgery or autopsy.
Case presentation: We present the case of a 66 year-old man who presented symptoms suggestive of a biliary colic. Following an open surgical biopsy from the liver, the sample obtained underwent classic Hematoxylin-Eosin, as well as histochemical and immunohistochemical stains, which allowed establishing the diagnosis of biliary duct hamartoma, using macro- and microscopical criteria (well-defined, subcapsular hepatic lesions and no nuclear atypia).
Conclusion: The recognition of this particular lesion is important due to its macroscopic and microscopic resemblance to multiple liver metastases and other types of multicentric subcapsular hepatic lesions. The mandatory technique in order to diagnose this rare type of hepato-biliary lesion remains the histopathological examination.

Keywords: von Meyenburg complexes, hamartoma, multifocal hepatic lesions

Introduction

Bile duct hamartoma is a benign hepatic lesion usually discovered incidentally during surgery or autopsy. Histologically, it consists of groups of bile ducts, of which some are dilated in a cyst-like manner, arranged within a dense, fibrous stroma. The incidence of this lesion is age-dependent, ranging between 1% in children and 5–6% in adults. Although bile duct hamartoma has no clinical significance significance, as it is discovered incidentally in asymptomatic patients, it is important to recognize it because the malignant transformation was observed in 11 cases and the association with cholangiocarcinoma have also been reported [1].

Since von Meyenburg complexes are small lesions, it is difficult to detect them using classic radiologic and ultrasound examinations, computed tomography and even magnetic resonance imaging [2,3,4].

Case presentation

We present the case of a 66 year-old man, who was admitted to the Surgery Department of the "Gheorghe Marinescu" Municipal Hospital from Târnăveni, Romania, with symptoms suggestive of biliary colic.

Following clinical and paraclinical examinations, the diagnosis of chronic cholelithiasis without associated comorbidities was established. The therapeutic approach decided upon was laparoscopic cholecystectomy. Abdominal intraoperative exploration revealed multiple nodular, elastic, grey-brownish subcapsular hepatic lesions, similar to multiple hepatic metastases.

The biopsy was directed to the Pathology Department.

Macroscopic examination revealed a 10 × 6 mm empty multilocular cystic cavity on the cross section surface.

The cystic cavity had a smooth, regular internal surface. After formalin fixation, sampling, paraffin inclusion and sectioning, we assessed the microscopic features of the lesion in both standard Hematoxylin-Eosin and Alcian blue-PAS stains. The hepatic fragment displayed a subcapsular lesion located within and next to the portal areas, consisting of groups of both normal-sized bile ducts, some of which were branched and angulated, and cystically dilated bile ducts. All bile ducts were lined to simple columnar epithelium, focally flattened, without nuclear atypia (Figure 1).

The luminal content of the bile ducts was amorphous, slightly eosinophilic, and negative to the Alcian blue-PAS stain. The stroma between these ducts was dense, rich in collagen fibers, and was continued by the stroma of adjacent portal areas. A reduced quantity of interstitial Alcian blue-positive mucin was also present (Figure 3).

The rest of the hepatic parenchyma's architecture was preserved and did not display any alterations of pathological significance.

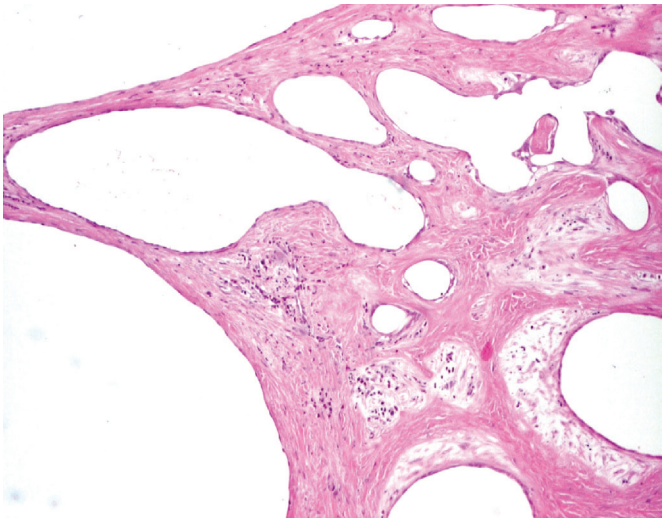

Fig. 1. Groups of bile ducts, some cystically dilated, within a fibrous stroma (H&E stain, 200x magnification)

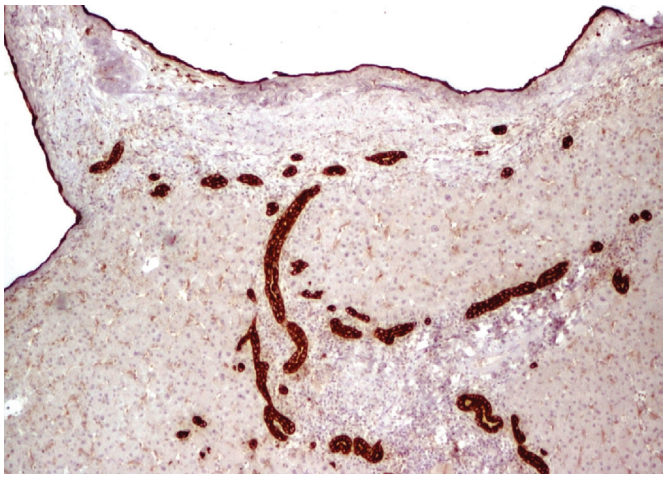

Fig. 2. Lining epithelium of the ducts, stained with Cytokeratin 7, 200x magnification

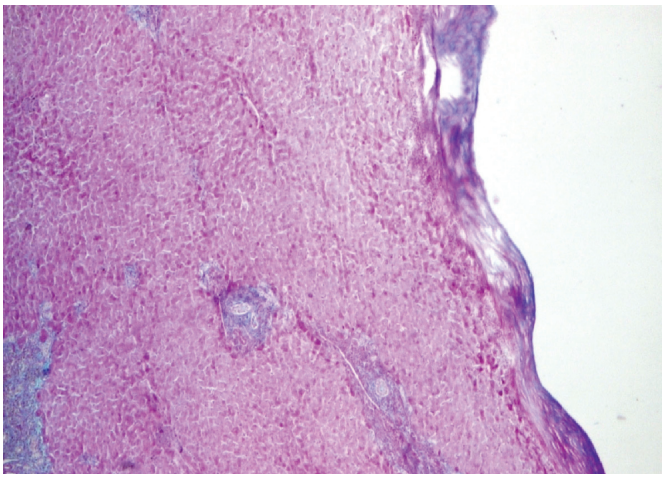

Fig. 3. Areas of the stroma containing Alcian blue-positive mucin (Alcian blue-PAS stain, 200x magnification)

Immunohistochemistry techniques were performed at the Pathology Laboratory of the County Emergency Clinical Hospital from Tîrgu Mureş, Romania, in order to establish the nature of the lining epithelium (Figure 2).

Four–five micron thick sections were obtained from selected paraffin blocks and mounted on silanized slides. Following deparaffination and rehydration, endogenous peroxidase blocking and antigen retrieval following the heat-induced epitope retrieval method (using Dako EnVision FLEX Target Retrieval Solution, High pH) were performed. We used Clone OV-TL 12/30 anti-cytokeratin 7 antibody (Dako) for the immunohistochemical reaction and 3,3'-Diaminobenzidine tetrahydrochloride for staining.

Hematoxylin was used for nuclear counterstaining, and all sections were assessed using positive and negative control slides.

The postoperative evolution of the patient was favorable, and hepatic function tests remained within physiological limits.

Discussion

Von Meyenburg complexes are thought to be malformations of the ductal plates due to defects in embryological involution [5,6]. They appear within normal liver tissue, but may also be associated with Caroli syndrome, congenital liver fibrosis or autosomal dominant polycystic kidney disease [5]. Proposed pathogenetic mechanisms include ischemia, inflammation and genetic anomalies, since approximately 97% of the patients with polycystic kidney disease also present bile duct hamartomas.

The prevalence of von Meyenburg complexes is comprised between 0.9% and 5.6% in autopsies [7]. The main clinical significance of these lesions is yielded by their misdiagnosis as multiple hepatic metastases [8].

The majority of the patients are asymptomatic and the values of their hepatic function tests are within normal limits. Malignant transformation of the von Meyenburg complexes might occur, although they are generally regarded as benign lesions [1,3].

At gross examination bile duct hamartomas appear as white-grayish nodules, located under the capsule of the liver, that usually have a diameter between 1 and 10 mm [8].

Microscopically, they generally consist of groups of bile ducts, some of them being cystically dilated, lined with a simple columnar epithelium. The stroma between these ducts is dense and rich in collagen fibers [3]. In rare cases small quantities of Alcian blue-positive acid mucin may be present, a feature confirmed in our case with the Alcian blue-PAS stain.

Immunohistochemically, the linning epithelial cells are positive for cytokeratin 7, a fact that demonstrates the biliary origin of these structures.

The differential diagnosis of the bile duct hamartoma should include multiple hepatic metastases, and other multifocally lesions such as hepatic abscesses, granulomatous inflammations (miliary tuberculosis) [9], biliary cystadenoma, bile duct adenoma, reactive bile duct proliferation, hemangioma and even cholangiocarcinoma.

Conclusion

This case reveals the importance of the correct diagnosis of the bile duct hamartoma, due to imagistic and macroscopic resemblance with multiple hepatic metastases and other types of subcapsular hepatic multicentric lesions.

Recognizing these hamartomas prevents an erroneous presumptive diagnosis of hepatic metastases. Since bile duct hamartoma is difficult to evidentiate through imagistic methods, histopathological examination remains the mandatory technique in order to diagnose these rare hepatic lesions.

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