

Imaging Clue in Biliary Cyst in Liver

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Hepatic lesions with a multilocular cystic appearance are frequently encountered in routine practices. This imaging pattern covers a wide spectrum of common and uncommon diseases. A cystic lesion is a well-defined lesion with predominant near-water attenuation (0–30 HU) or signal intensity that exhibits negligible enhancement at dynamic imaging. The internal septa refer to the partitions or membranes that divide the lesion into multiple compartments. Septa may vary in thickness, uniformity, extent of enhancement, and mural nodularity.

Cystic Lesions Associated with The Ductal Plate Malformation

1. Biliary Hamartomas (Von Meyenburg complex)

- Small lesion composed of dilated bile ducts and interspersed fibrous or hyalinized stroma
- Ductal plate malformation of the smaller, more peripheral interlobular bile ducts
- Markedly hyperintense on T2WI
- Solid, absent, and rim enhancement have been reported
- Differential diagnosis; metastases, microabscesses, Caroli's disease
- Features that suggest hamartoma over metastases- small size (most hamartomas are less than 1 cm), thin rim enhancement with no centripetal progression, high fluid content

2. Hepatic cyst

- Thought to arise from cystic dilatation of Meyenberg complexes
- Simple cysts are lined by cuboidal epithelium, surrounded by a thin fibrous stroma, and contain serous fluid
- On MR uncomplicated cysts are homogeneously T1 hypointense and T2 hyperintense
- Cysts complicated by hemorrhage or infection may have variable T1 and T2 signal intensity and thickened walls

3. Polycystic liver disease

- Attributed to cystic dilatation of the Meyenberg complexes
- Vary from less than 1 cm to greater than 10 cm
- Usually are round but may be polygonal or irregular
- No communication with each other or biliary tree
- Low T1 and high T2 signal intensity and no contrast enhancement
- Intracystic hemorrhage may result in cysts of varying signal intensity including T1 hyperintensity, fluid-fluid levels, or thickened walls

4. Caroli's disease

- Multifocal segmental dilatation of the large intrahepatic bile duct retaining their communication with the biliary tract
- Typically manifests as saccular or fusiform cystic dilatation of the intrahepatic bile ducts often containing calculi or sludge
- Fibrovascular bundles with strong contrast enhancement within dilated cystic intrahepatic ducts (central dot sign)
- Complications are due to bile stagnation leading to cholangitis, stone formation and liver abscess
- Cholangiocarcinomas have been reported with a prevalence of 7%

Neoplastic lesion**1. Biliary cystadenoma and cystadenocarcinoma**

- 85% of cases appear in the intrahepatic bile duct; the others occur within the extrahepatic biliary tract or gallbladder
- Occur predominantly in middle-aged women and may potentially transform into cystadenocarcinomas
- A Highly cellular mesenchymal tissue that resembles the ovarian stroma occurs in over 80% of cases
- Large, solitary, multilocular cystic lesion with well-circumscribed smooth margins and internal septa
- Calcification may be seen within the wall and the septa in a minority of cases
- Large polypoid, papillary excrescences in the wall usually indicate malignant transformation

2. Metastases

- Cystic metastasis; predominantly composed of large intratumoral areas of liquid attenuation with negligible contrast enhancement
- They are formed through (a) necrosis of hypervascular metastases secondary to rapid growth beyond the vascular supply (eg. neuroendocrine tumor, melanoma, GIST); (b) abundant mucin production by acinar structure and glandular tissue from mucinous adenocarcinoma
- The enhancing septa in a metastatic cystic lesion tend to have an irregular thickness
- The inner surfaces are typically ragged, serrated, and ill-defined with multiple mural nodules
- Well-documented representative example is the cystic change in metastatic GIST after treatment with imatinib mesylate

Differential Diagnosis**Pyogenic abscess**

- The most common cause-biliary tract infection
- E.coli is the most frequently identified organism
- Diabetes is present in up to half of patients
- Unilocular or multiseptate
- Hyperintense on T2WI
- Cluster sign; grouping of multiple abscesses that may then coalesce into a single larger abscess, suggestive of pyogenic abscess
- Perilesional edema; sinusoidal congestion due to adjacent inflammation
- Marked arterial enhancement that persists on delayed imaging

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