





IMAGING OF ACUTE CHOLANGITIS An Update

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ACUTE CHOLANGITIS (AC)

SYNONYMS

- Ascending cholangitis,
- Bacterial cholangitis,
- Pyogenic cholangitis,
- Obstructive cholangitis.

ACUTE CHOLANGITIS (AC)

DEFINITION: "bacterial infection of the biliary tree"

- Escherichia coli, Klebsiella and Pseudomonas cause most cases of acute cholangitis in Western countries (parasites in the rest of the world)
- Cholangitis are nearly always <u>secondary to biliary tree obstruction</u>. Obstruction may cause intrahepatic ductal dilation with increased pressure and reflux of bacteria.

ACUTE CHOLANGITIS (AC)

PHISIOPATHOLOGY: Cholangitis are nearly always secondary to biliary tree obstruction.

- Obstruction may cause intrahepatic ductal dilation with increased pressure and reflux of bacteria.
- Causes of biliary obstruction (biliary stenosis):
 - -Benign: duct stones,...
 - -Malignant:

DIAGNOSTIC CRITERIA for AC

Proposed Tokio 2018 Guidelines diagnostic criteria:

A. Systemic inflammation

- a.1 Fever and/or shaking chills
- a.2 Laboratory data: evidence of inflammatory response

B. Cholestasis

- b.1 Jaundice
- b.2 Laboratory data: abnormal liver function tests
- C. Imaging
 - c.1 Biliary dilatation
 - c.2 Evidence of the etiology on imaging (stricture, stone, stent, etc...)

Suspected diagnosis: one item in A + one item in either B or C **Definite diagnosis**: one item in A, one item in B and one item in C

IMAGING PERSPECTIVE in AC

- The primary task of imaging is not ONLY to detect signs of cholangitis, but to detect the underlying obstructive lesion.
- Imaging plays a keystone role in diagnosis of cholangitis:
 - helps <u>identify predisposing causes</u>, and
 - demonstrates <u>complications</u>: sepsis, hepatic abscess, portal vein thrombosis, and bile peritonitis.

IMAGING

- Primary obstructive biliary lesion and/or biliary dilatation
- Dilatation of the peribiliary venous plexus and to increased arterial flow
- Local extension of the inflammatory process into the periportal tissues and surrounding liver

IMAGING PERSPECTIVE in AC

IMAGING METHODS



ABDOMINAL US

ABDOMINAL CT

ABDOMINAL MRI and/or MRCP

THE MRI/MRCP SIGNS OF ACUTE CHOLANGITIS

BILIARY SIGNS

DILATATION OF INTRAHEPATIC BILIARY DUCTS

- <u>Distribution</u>: dilation tends to be central or segmental (less likely diffuse).
- <u>Appearance</u>: Concentric and smooth wall thickening with contrast enhancement (gadolinium-enhanced delayed phase fat-suppressed sequences).

☐ INTRALUMINAL FILLING DEFECTS

- Stones, sludge, inflammatory debris, etc...
- Pneumobilia

PERIPORTAL OEDEMA

Increased T2 signal around the portal system



DILATATION OF BILIARY DUCTS



Isolated biliary stone





INTRALUMINAL FILLING DEFECTS



INTRALUMINAL FILLING DEFECTS



Increased T2 signal around the portal system

PERIPORTAL OEDEMA

LIVER PARENCHYMAL SIGNS

PERIPORTAL OEDEMA

- Increased T2 signal around the portal system
- ☐ ALTERED PATTERNS OF SIGNAL PARENCHYMA
 - Distribution: wedge-shaped (most freq), peripheral patchy or peribiliary
- □ HETEROGENEOUS HEPATIC ENHANCEMENT
 - Described as an early sign of severe cholangitis
 - Distribution: wedge-shaped (most freq), peripheral patchy or peribiliary
 - <u>Arterial-phase</u>: "splenization" of the hepatic parenchyma enhancement
 - Late portal-phase

LIVER ABSCESSES

 Low-signal T1 and high-signal T2, which could be heterogeneous if haemorrhage or proteinaceous content is present, with adjacent soft tissue oedema and enhancing peripheral rim on T1WI C+ sequences.



Increased T2 signal around the portal system

PERIPORTAL OEDEMA



Increased parenchymal T2 signal with different patterns distributions

ALTERED PATTERNS OF SIGNAL PARENCHYMA



Diffuse "splenization" of the hepatic parenchyma Gd enhancement

HETEROGENEOUS HEPATIC ENHANCEMENT

□ VASCULAR COMPLICATIONS

Portal vein thrombosis



ACUTE CHOLANGITIS: EXAMPLES





M 49yo Prior cholecystectomy □ Systemic inflamation **Cholestasis** Imaging Biliary signs Dilatation Filling defects Periportal oedema Parenchymal signs Altered signal pattern Heterogeneous (+Gd) Liver abscess







M 55yo Prior biliary-enteric anastomosis □Systemic inflamation **Cholestasis** Imaging Biliary signs Dilatation Filling defects Periportal oedema Parenchymal signs Altered signal pattern Heterogeneous (+Gd) Liver abscess





W 60yo Prior liver transplantation □Systemic inflamation **Cholestasis** Biliary signs Dilatation Filling defects Periportal oedema Parenchymal signs Altered signal pattern Heterogeneous (+Gd) Liver abscess





M 68yo Prior cholecystectomy (aberrant biliary ducy injury) □Systemic inflamation **Cholestasis** Biliary signs Dilatation Filling defects (debris) Periportal oedema Parenchymal signs Altered signal pattern Heterogeneous (+Gd) Liver abscess





W 39yo Prior liver transplantation □Systemic inflamation **Cholestasis** Biliary signs Dilatation Filling defects Periportal oedema Parenchymal signs Altered signal pattern Heterogeneous (+Gd) Liver abscess





W 62yo Prior cholecystectomy □Systemic inflamation **Cholestasis** Biliary signs Dilatation Filling defects Periportal oedema Parenchymal signs Altered signal pattern Heterogeneous (+Gd) Liver abscess





M 82yo □ Systemic inflamation **Cholestasis** Biliary signs Dilatation Filling defects Periportal oedema Parenchymal signs Altered signal pattern Heterogeneous (+Gd) Liver abscess





M 43yo Prior liver transplantation □ Systemic inflamation **Cholestasis** Biliary signs Dilatation Filling defects Periportal oedema Parenchymal signs Altered signal pattern Heterogeneous (+Gd) Liver abscess

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