Diagnostic imaging methods in the examination of the pancreas, liver and spleen

This article was checked by pedagogue

This article ws checked by pedagogue, but later was changed.

Checked version of the article can be found here (https://www.wikilectures.eu/index.php?title=Diagnostic_imaging_methods_in_the_examination_of_the_pancreas,_liver_and_spleen&oldid=123367).

See also comparation of actual and checked version (https://www.wikilectures.eu/index.php?title=Diagnostic_imaging_methods_in_the_examination_of_the_pancreas,_liver_and_spleen&diff=-&oldid=123367).

Anatomy

- Pancreas
- Spleen
- Liver

Native belly shot

A native abdominal image is rarely useful.

- **Pancreas:** only calcifications are visible in chronic calcifying pancreatitis.
- **Spleen:** contour (size) can be seen.
- **Liver:** the contour (size) can be seen, with ascites the contour is erased.

Fistulography

During fistulography, the fistula is injected with a contrast agent under X-ray control or blindly followed by a CT scan - it is used to demonstrate the communication of the fistula with other organs, and to determine the size of the cavity.

Fistulography: a cavity communicating with the pancreatic duct (http://atlas.mudr.org/Case-images-Fistulography-of-a-cavity-adjacent-to-pancreas-81)

CT-fistulography: post-splenectomy cavity communicating with lienal flexure (http://atlas.mudr.org/Case-images-CT-fistulography-enterocutaneous-fistula-677)

Ultrasound

Ultrasound is the basic examination method.

Pancreas

In many cases, it can only be visualized partially or not at all due to gas overlay from the gastrointestinal tract. You can view:

- enlargement of the Wirsungi duct (in case of chronic pancreatitis, blockage by a tumor),
- pancreatic expansion (tumor, cystoid),
- calcification in the pancreas and in the duct,
- seepage of the pancreas and the surrounding area in acute pancreatitis, but in the early stage (hours after the onset of symptoms) the USG is usually a normal finding.

Ultrasound: chronic pancreatitis (http://atlas.mudr.org/Case-images-Chronic-pancreatitis-489)

Ultrasound: pancreatic head tumor (http://atlas.mudr.org/Case-images-Tumour-of-the-head-of-pancreas-dilated-bile-duct-biliary-stent-dilated-pancreatic-duct-cholecystolithiasis-biliary-stones-259)

Spleen

Almost always viewable in its entirety. You can evaluate:

- size - normal is up to 4×7×11 cm, but it can be larger in larger individuals, there are many causes of splenomegaly,
- focal changes - most commonly cyst, hemangioma, granulomas, metastases,
- trauma - exclusion of spleen rupture and subcapsular hematoma.

Liver

In most cases viewable in its entirety. For good visualization, it is often necessary to examine in inspiration (necessity of patient cooperation). The problem in shown is in obese individuals and with significant steatosis. We rate:

- size - in the medioclavicular line up to 16 cm, there are many causes of hepatomegaly,
- parenchyma structure − hyperechoic parenchyma in steatosis, granular structure in more advanced hepatopathies, the most pronounced structural changes in cirrhosis,
- focal changes - most often cyst, hemangioma, focal nodular hyperplasia and tumors - metastases, hepatocellular carcinoma, cholangiocellular carcinoma, adenoma,
- traumatic changes − liver rupture, subcapsular hematoma,
- vascular supply − flow in the portal vein,
- bile ducts − enlargement of the intrahepatic bile ducts,
- ascites − many causes.

Ultrasound: liver hemangioma (http://atlas.mudr.org/Case-images-Liver-hemangioma-950)

Ultrasound: liver cirrhosis, ascites (http://atlas.mudr.org/Case-images-Liver-cirrhosis-938)

Ultrasound: pneumobilia (http://atlas.mudr.org/Case-images-Pneumobilia-208)

Contrast-enhanced ultrasound of the liver (CEUS)

Contrast-enhanced ultrasound of the liver makes it possible to assess the dynamics of oxygenation of focal processes of the liver and thus to better assess their extent and comment on their etiology.

CEUS: liver metastases (http://atlas.mudr.org/Case-images-Colon-metastases-in-the-liver-CEUS-160)

Computed Tomography (CT)

Computed tomography is performed with intravenous administration of iodine contrast substance. Excellent visualization of the pancreas, spleen and liver. It is usually performed in the portal phase (when the portal vein is well filled). In the differential diagnosis of focal changes in the liver, a multiphase examination is used, which allows for more detailed specification the character of the expansion, according to its oxygenation in a certain phase (native, arterial phase, portal phase, late phase).

Pancreas

CT: acute pancreatitis (http://atlas.mudr.org/Case-images-Acute-pancreatitis-exsudative-stage-391)

CT: necrosis and pseudocysts in severe pancreatitis (http://atlas.mudr.org/Case-images-Acute-necrosing-pancreatitis-282)

CT: chronic calcified pancreatitis (http://atlas.mudr.org/Case-images-Chronic-calcified-pancreatitis-40)

CT: tumor of pancreatic head (http://atlas.mudr.org/Case-images-Tumour-of-pancreatic-head-1026)

Spleen

CT: fissural cyst of spleen (http://atlas.mudr.org/Case-images-Fissural-cyst-of-spleen-666)

CT: spleen infarction (http://atlas.mudr.org/Case-images-Spleen-infarction-353)

CT: splenomegaly (http://atlas.mudr.org/Case-images-Splenomegaly-porcelain-gall-bladder-849)

CT: rupture of the spleen (http://atlas.mudr.org/Case-images-Rupture-of-the-spleen-231)

Liver

CT: liver steatosis (http://atlas.mudr.org/Case-images-Liver-steatosis-1013)

CT: cholangiocellular carcinoma, multiphase CT examination (http://atlas.mudr.org/Case-images-Cholangiocellular-carcinoma-958)

CT: focal nodular hyperplasia (http://atlas.mudr.org/Case-images-Focal-nodular-hyperplasia-704)

CT: Burkitt's lymphoma (http://atlas.mudr.org/Case-images-Burkitt%27s-lymphoma-of-small-bowel-and-liver-898)

CT: metastatic disease of the liver (http://atlas.mudr.org/Case-images-Metastatic-disease-of-the-liver-164)

Magnetic Resonance (MR)

Magnetic resonance has a better sensitivity for imaging focal changes in the spleen and liver than computed tomography. We are better able to comment on the etiology of the deposit as well. The examination is performed in T1, T2 and SPIR, and also as a dynamic examination in T1 after administration of gadolinium contrast substance. MRCP (MR Cholangiopancreaticography) is used in the non-invasive diagnosis of pathologies of the biliary tree and pancreatic duct.

MR: liver metastasis (http://atlas.mudr.org/Case-images-Liver-metastasis-of-colorectal-cancer-RFA-694)

MR: chronic fistula after enucleation of pancreatic tumor (http://atlas.mudr.org/Case-images-Chronic-cavity-and-fistula-after-enucleation-of-pancreatic-tumour-969)

MR: adenocarcinoma of the bile duct in the head of the pancreas (http://atlas.mudr.org/Case-images-Adenocarcinoma-of-biliary-duct-22)

Angiography

Angiography is used:

- in the interventional treatment of liver tumors (embolization),
- when introducing a portcatheter into *a. hepatica* for targeted chemotherapy of liver tumors.

Angiography: embolization of liver metastases (http://atlas.mudr.org/Case-images-Liver-metastases-of-carcinoid-embolization-860)

Links

External links

- Images at atlas.mudr.org (http://atlas.mudr.org):
  - [http://atlas.mudr.org/Radiology-images-system-and-organ-Pancreas-57
  - Liver (http://atlas.mudr.org/Radiology-images-system-and-organ-Liver-63)
  - Lymphatic System and Spleen (http://atlas.mudr.org/Radiology-images-system-and-organ-Lymphatic-67)
- Estimation of liver volume (http://www.mudr.org/web/jatra-velikost-na-ct) at www.mudr.org
- Estimation of spleen volume (http://www.mudr.org/web/slezina-velikost-na-ct) at www.mudr.org
- Teaching portal of the 1st Faculty of Medicine, UK - Radiodiagnostics: Quiz: imaging methods for the pancreas, liver and spleen (https://el.lf1.cuni.cz/p32313189/)

Related Articles

- Spleen • Spleen Disease • Splenomegaly • Hepatosplenomegaly • Spleen Injury

References