

7. Expansions of the abdomen

- this is a mass most often detected by palpation, painful or painless. The condition may be caused by enlargement of the abdominal organs, a pathological process outside the abdominal organs, or soft tissues of the abdominal wall. The physiological state of abdominal expansion is pregnancy.

Importance of imaging methods:

X-ray

A simple abdominal scan is usually **irrelevant for diagnosis**. It can be used only if there is a history of suspicion of bowel obstruction (the cause of palpable expansion is volvulus, intestinal contents in constipation), a foreign body (very rare) or suspicion that palpable expansion is caused by bone growth (eg ribs or pelvis).

Ultrasound

Ultrasound is the first-choice method. Ultrasound can be targeted to the site palpable expansion as individual organs and expansion outside the abdominal parenchymal organs.

In case of suspected expansion of parenchymal organs, the task of ultrasound is to determine whether it is an **enlargement of the organ as a whole** (eg compensatory renal hypertrophy, hepatomegaly, splenomegaly), or whether the **enlargement is due to a focal process** (solitary vs. multiple). From expansion beyond parenchymal organs can mention **urinary retention** (clinical signs and expansion in the area of distended urinary bladder), followed by **expansion of the wall of the intestinal loops**, especially tumors of the colon (characterized by an irregular thickening of the wall of the colon and enlarged lymph nodes in paracolic region). In asthenic individuals or in advanced states can be through the abdominal wall palpated a **retroperitoneal expansion** (kidney tumors, bulky packets of lymph nodes), an important characteristic is the pulsatility of the mass - ultrasound in this case is the method of choice for the detection of **abdominal aortic aneurysm** (and assessing its width can predict risk of complications).

Ultrasound is also the optimal method for assessing palpable expansions of the abdominal wall. These conditions can be caused acutely by **1. herniation of intestinal loops** or intra-abdominal fat into the abdominal wall (eg in the area of the scar, the advantage is the real-time examination using the Valsalva maneuver), **2. soft tissue bleeding** (hematoma has mixed echogenicity, is not perfused in Doppler examination even after the administration of a contrast agent), or **3. infection (abscess** is characterized by a fluid-filled formation with a significant vascularisation of the collection wall - pyogenic membrane). In the case of **4. soft tissue expansions** of the abdominal wall, the use of ultrasound is advantageous due to the proximity of the object to the probe (possibility to use higher frequencies), detailed resolution and visualisation of lesions smaller than 1 cm. In ultrasound, the most common pathologies have a characteristic picture: **lipoma** (hyperechoic, well-demarcated), **vascular malformations or pseudoaneurysms** (flow detection), **malignant lesions** (metastases or lymphoma, mostly hypoechoic, poor demarcation).

Free fluid can be detected on ultrasound - such as **ascites**, which in a broader sense can mimic the expansion of the abdominal cavity. The differential diagnosis of abdominal expansions can also include **inflammatory conditions** associated with **edematous swelling of the surrounding fat**, which thus becomes less compressible (palpable expansion within appendicitis, diverticulitis, etc.) or the **enlargement of the gallbladder** due to obstruction of the common bile duct.

CT

Computed tomography is the most accurate imaging method for evaluating the expansion of the abdominal cavity. Compared to ultrasound examination, it brings the diagnosis **faster and more accurately, unfortunately at the cost of high radiation dose**. In the case of inconclusive ultrasound examination, it makes sense to perform CT with a focus on the pathology that is most probable in the differential diagnosis based on the ultrasound findings, and then **adjust the examination protocol** accordingly. CT can be considered as a first-line examination in a patient with extreme obesity, or in urgent conditions, which are nevertheless exceptionally associated with expansions of the abdominal cavity. An intravenous contrast is used to assess soft tissue expansions, ischemia, or bleeding. Oral administration of a contrast is used to distinguish intestinal loops from expansion (eg lymph nodes) resp. for proof of communication with intestinal lumen. Both CT and ultrasound are suitable methods for navigating the biopsy of the expansions.

MR

MR can be used in patients who cannot receive an iodine contrast agent (allergic reactions or impaired renal function). The yield of MR in the characterization of intra-abdominal mass is generally not higher than in CT examinations, in addition, it is very problematic to perform acute examinations in routine praxis.

However, magnetic resonance imaging is better than CT for assessing **soft tissue expansions of the abdominal wall (lesions, tumors)**, in which ultrasound examination did not allow further specification. MRI uses a high soft tissue contrast (specific imaging of fat, signs of bleeding), for suspicious lesions it is necessary to intravenously administer the contrast agent.