

DIFFERENTIAL DIAGNOSIS IN PERIRENAL FLUID COLLECTIONS

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Abstract: Perirenal fluid collections make up a chapter met with a relatively low frequency in the current pathology. Retroperitoneum is an area where large amounts of fluid can accumulate (blood-posttraumatic, use of anticoagulants, post-surgical,-pus, lymph or urine either posttraumatic or postsurgical) without being revealed by conventional radiology. For diagnosis, computerized tomography is preferred instead of ultrasound, because the first has higher sensitivity and specificity in identifying local collections.

Keywords: retroperitoneum, perirenal fluid collection

Rezumat: Colecțiile lichidiene perirenale constituie un capitol întâlnit cu o frecvență relativ redusă în patologia curentă. Retoperitoneul reprezintă o zonă unde se pot acumula mari cantități de lichid (sânge- posttraumatic, folosirii de medicamente anticoagulante, post chirurgical, puroi, limfă sau urină posttraumatic sau postchirurgical) fără a fi evidențiate prin radiologia convențională. Pentru diagnostic se preferă tomografia computerizată în locul ecografiei deoarece prima are sensibilitate și specificitate mai mare în identificarea colecțiilor locale.

Cuvinte cheie: retroperitoneu, colecție lichidiană perirenală

INTRODUCTION

Perirenal fluid collections make up a chapter met with a relatively low frequency in the current pathology. Retroperitoneum is an area where large amounts of fluid can accumulate (blood-posttraumatic, use of anticoagulants, post-surgical,-pus, lymph or urine either posttraumatic or postsurgical) without being revealed by conventional radiology.

For diagnosis, computerized tomography is preferred instead of ultrasound because the first has higher sensitivity and specificity in identifying local collections.

Brief notions of retroperitoneal anatomy

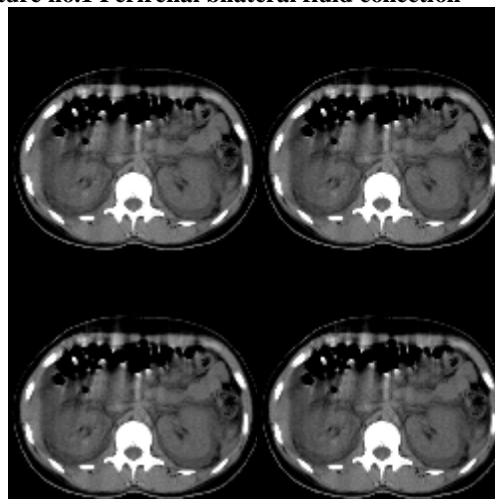
The abdominal cavity is divided in the peritoneal and retroperitoneal spaces. Retroperitoneum is bounded superiorly by the diaphragm, inferiorly by the terminal line of the lesser pelvis, anteriorly by the posterior layer of the peritoneum and posteriorly by the back muscles and the bony pelvis. It is continuous inferiorly with the subperitoneal space of the pelvis and anteriorly with the peritoneal space. It has connections with intra-abdominal

organs by the mesenteric root and the attachment sites of the liver, pancreas, duodenum, ascending and descending colon. Retroperitoneum is divided into three compartments by the layers of Gerota's fascia (fascia located anteriorly and posteriorly to the kidney), namely: the perirenal space formed by the anterior and posterior layer of Gerota's fascia, the anterior pararenal space between the posterior layer of the peritoneum and the anterior layer of Gerota's fascia, and the posterior pararenal space formed between the posterior layer of Gerota's fascia and the transverse fascia.

Anterior and posterior pararenal spaces communicate with the anterior preperitoneal space, approximately at the iliac crests. There is also a communication between right and left perirenal spaces.

Peritoneal fascia has a thickness of about 1-2 mm, and the fascial planes can be shown on CT in approximately 50% of cases. Fluid collections and fascial thickening emphasize delimitation plans.

Picture no.1 Perirenal bilateral fluid collection



Diagnosis and differential diagnosis in perirenal fluid collections.

1. *Eisenmenger syndrome*-Perirenal fluid was reported in association with Eisenmenger syndrome.(2) It is assumed that pulmonary hypertension is transmitted into the renal venous system and causes transudation of fluid from superficial stellate veins in the

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- subcapsular space.(3) Eisenmenger syndrome is a congenital heart defect with a large left-right shunt with pulmonary hypertension associated with reduced oxygen saturation and polycythemia. Sometimes it is associated with renal failure and proteinuria.(4) The perirenal fluid is probably a result of the glomerular compression syndrome with reduced renal glomerular filtration, increased vascular resistance and hypertension.
- Abscess* - It develops in the retroperitoneum as: superinfection of hematomas and urinomas, of trauma (pancreas, kidneys, blood vessels), complications of inflammatory diseases (Crohn's disease, retrocecal appendicitis, pancreatitis, pyelonephritis, spondylodiscitis, osteomyelitis), psoas abscess of pyogenic (staphylococcal or Gram negative organisms) or BK etiology. They can be located by encapsulation, by limiting to the fascial spaces or can be generalized to the entire retroperitoneum. CT examination is indicated in patients with inconclusive ultrasound examination and can reveal the following: collections with increased density, between 10-30HU (depending on the quantity of protein), fascial thickening and contrast enhancement, rim enhancement after administration of contrast, in older abscesses; exudative processes permeate and obscure retroperitoneal fat, increasing its density.(1)
 - Retroperitoneal fat necrosis* - is presented as low-density areas in fat and can be confused with abscesses. (1)
 - Hematoma and spontaneous hemorrhage* - hematoma can occur in vertebral and pelvis fractures; injuries of organs: kidneys (mostly), pancreas, urogenital tract, and spontaneous hemorrhage in vascular lesions (rupture of the aorta, rupture of gonadal artery, aneurysm of the renal artery, renal vein thrombosis, congenital AV malformation), in case of neoplastic processes (angiomyolipoma, renal cell carcinoma, adrenal tumour) or systemic causes such as polyarthritis nodosa, anticoagulation therapy, bleeding disorders. CT describes a mass of different sizes whose attenuation depends on the age and size of the collection. Acute bleeding is isodense with the aortic blood, or adjacent soft tissue to the collection. In evolution, in case of non-clotting collections, sedimentation occurs, resulting in stratification with the possible fluid-fluid layer, and if clotting occurs, the appearance is typical of hyperdense areas (up to 70HU), which are often imprecisely defined, rounded in appearance. Serous areas are hypodense and coexist with hyperdense areas. In administration of iv contrast, hematomas do not enhance, although there is a peripheral area of contrast as collection resorption occurs. Acute bleeding is indicated if there is extravasation of contrast and recurrent hemorrhage may be suspected if there is an increase in the hemorrhagic homogeneity. Large hematoma may compress the surrounding organs or may displace them.(1)
 - Urinoma*- renal collecting system lesions can lead to urine extravasations in the perirenal fat along the ureter or to accumulate perivascularly. Weeks or years may pass before symptoms appear. Infection of urinomas can lead to retroperitoneal abscess formation. CT is a great way to detect urinomas but late scans after IV contrast administration (15 minutes) are needed in order to detect leakage of urine. Extravasation of contrast, confirms the diagnosis of persistent urinary leakage.(1) A single case of polycystic kidney disease of adult type was cited, having chronic bilateral perirenal collection in impressive quantity, collection which was connected anteriorly with the aorta and inferior vena cava, with continuation above the diaphragm through the aortic hiatus.(5)
 - Retroperitoneal cysts* - are rare and may be congenital with origin in the intestine or urogenital tract, or acquired posttraumatic or postinflammatory in which case they are in direct contact with the primary lesion site (ex pancreas). It requires differential diagnosis with haematomas or old urinomas. CT morphology is of the an image with fluid density, well defined, encapsulated, smooth margins, of different sizes, homogeneous, not enhancing after administration of contrast substance. Dermoid cyst or teratomas include different embryonic elements.(1)
 - Lymphocele* – chylous fluid collections usually occur after lymphadenectomy for testicular or prostate neoplasms and occasionally, for upper abdominal tumors. They are also observed in renal transplant patients, where they may cause renal obstruction due to compression on the ureter. On CT examination, it appears as a mass with fluid (water) density, located along the abdominal lymphatic channels, round or oval, with very thin walls that can not be identified on CT and which do not enhance after contrast administration. Usually the mass can be seen adjacent to surgical clips.(1)
 - Bilateral perirenal lymphangioma* - a common benign tumor in childhood and youth (7) it has no fluid density.
 - Renal lymphangiectasia* –a rare condition, evidenced by hematuria, abdominal pain which appears in children and adults, whose origin is speculative. In some cases family association was described which would advocate for congenital nature of the disease. Imaging shows pelvic cysts and fluid perirenal collections which are actually ectasia of retroperitoneal lymphatic vessels. Renal lymphangiectasia was found associated with thrombosis of renal veins and hypertension.(8)
 - Bilateral perirenal lymphangiomatosis* occurs as bilateral fluid collection with fine septa.

CONCLUSIONS

Perirenal fluid collections suppose multiple diagnoses which have as a cause a variety of pathological

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situations less encountered in usual practice. Computed tomography is preferable to ultrasound because the first has higher sensitivity and specificity in identifying local collections.

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