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Hemangioma

- Hemangioma is a rare mesenchymal benign tumor of the *bladder*, which accounts for 0.6 % of all bladder tumors. The most common symptom is gross, painless hematuria.
- CT scans have been reported to detect diffuse thickening of the bladder wall with multiple loci of calcification or extravesical extension. CT scans were also useful in revealing a hypervascular mass of the bladder in the present case.
- MR imaging has been reported to be valuable in the diagnosis of soft tissue hemangiomas. Hemangiomas demonstrate relatively low signal intensity on T1-weighted images and an intense signal on T2-weighted images. These MR images reflect the content of the lesions, that is, stagnant or slowly flowing blood. MR imaging is useful in defining the extent, size, and location of the tumor in three dimensions. MR imaging has been reported to be superior to CT and US in demonstrating the extent of hemangioma.

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Hemangiopericytoma

- Hemangiopericytoma (HPC) is one of the rarest renal tumors. HPC is an unusual perivascular tumor, classified as a soft tissue vascular tumor featuring the uncontrolled proliferation of pericytes, which are cells spiralling around capillaries.
- No characteristic signs of renal HPC have been described on ultrasonography, CT, or MRI that might aid in the differential diagnosis. These studies usually depict a large mass, which may grow insidiously to a diameter of 25 cm, but with no pathognomonic features. CT may show a large heterogeneous mass, with calcifications and areas of necrosis. These tumors may have a characteristic pattern in the early arterial phase of angiography, with displacement of the main arteries, presence of large vessels encircling the tumor, and a well-demarcated tumor stain.

Hemorrhage, Renal

- The most common cause of renal hemorrhage is trauma, either blunt or penetrating. Extracorporeal shock wave lithotripsy for nephrolithiasis is not infrequently associated with parenchymal and perinephric hemorrhage. Spontaneous renal hemorrhage may be caused by anticoagulation, blood dyscrasias, renal infarction, polyarteritis nodosa, renal aneurysms and arteriovenous malformations, renal cell carcinoma (RCC), acute myeloid leukemia, renal abscess, renal vein thrombosis, and rupture of hemorrhagic solitary cysts or of hemorrhagic cysts in renal cystic disease. Some cases are idiopathic. RCC is probably the most common cause of spontaneous subcapsular and perinephric hemorrhage.
- CT is the most valuable examination in the evaluation of patients with suspected acute renal hemorrhage because it accurately diagnoses the presence and location of such hemorrhage and

often shows the underlying cause. Renal hemorrhage may be suburothelial, intraparenchymal, subcapsular, perinephric, or pararenal in location or may involve the renal sinus. Recent renal hemorrhage is characterized by high-attenuation blood, which is best shown by unenhanced CT scans. Postcontrast scans should also be obtained to facilitate identification of disorders such as small neoplasms causing spontaneous renal hemorrhage. Suburothelial hemorrhage is characterized on CT by thickening of the wall of the renal pelvis and upper ureter by blood that has a high-attenuation value on unenhanced scans. Spontaneous hemorrhage into the renal sinus is characterized by a high-density blood collection in the renal sinus with displacement of the renal pelvis. On an unenhanced CT scan, a recent subcapsular hematoma is characterized by a mass with a higher attenuation value than that of adjacent renal parenchyma. Pressure on the underlying renal parenchyma characteristically causes flattening of the kidney, elevation of the renal capsule, and medial displacement of the collecting system. However, although subcapsular hematomas are confined to the kidney by the renal capsule, perinephric hematomas often extend caudally below the kidney into the cone of renal fascia.

Hernia, Inguinal

- An hernia is defined as a protrusion or projection of an organ or a part of an organ through the body wall that normally contains it. Collectively, inguinal and femoral hernias are known as groin hernias.
- Inguinal hernia is more common than femoral hernia and other abdominal wall hernias (e.g., umbilical, epigastric), but femoral hernias present with complications more often. Groin hernias are the third leading cause of ambulatory care visits for gastrointestinal complaints.

- Hernias are more common in men compared with women and in whites compared with nonwhites. Indirect inguinal hernias are the most common type of hernia in males and females.
- Groin hernias can broadly be classified by etiology (congenital versus acquired) and anatomical location.
- In the majority of cases, a diagnosis of inguinal or femoral hernia can be made based upon history and physical examination, without the need for further studies. When the diagnosis is not apparent, imaging can help to identify occult hernia, differentiate inguinal from femoral hernia, and distinguish hernia from other clinical entities. Imaging is also important for evaluating patients for hernia complications.
- CT of the groin region can help differentiate femoral from inguinal hernias. Sufficiently thin slices using multidetector CT may allow localization of the hernia sac. If the hernia sac extends medial to the pubic tubercle on CT, a diagnosis of inguinal hernia can be made with certainty, but an hernia sac located lateral to the pubic tubercle associated with venous compression suggests a diagnosis of femoral hernia.
- Magnetic resonance imaging (MRI) appears to differentiate inguinal from femoral hernia with a sensitivity and specificity of more than 95 %, which is superior to computed tomography. However, cost and lack of uniform availability limit the practicality of MRI.

Horseshoe Kidney

- Horseshoe kidney is the most common fusion anomaly, which occurs with fusion of one pole of each kidney.
- The majority of patients with horseshoe kidneys are asymptomatic. In these patients, the horseshoe kidney is diagnosed serendipitously. However, some patients present with pain and/or hematuria due to obstruction or infection.

Hydronephrosis is reported to occur in approximately 80 % of children with horseshoe kidneys. Renal calculi are reported to occur in 20 % of cases. Patients with a horseshoe kidney are at increased risk for infection. One-third to one-half of patients with horseshoe kidneys will have another congenital anomaly.

- CT and MR are able to fully visualize the malformed urinary tract: in more than 90 % of cases, fusion occurs at the lower poles; as a result, two separate excretory renal units and ureters are maintained. The isthmus (fused portion) may lie over the midline (symmetric horseshoe kidney) or lateral to the midline (asymmetric horseshoe kidney). Depending on the degree of fusion, the isthmus can be composed of renal parenchyma or a fibrous band.

Hydrocele

- A hydrocele is a collection of peritoneal fluid between the parietal and visceral layers of the tunica vaginalis, the investing layer that directly surrounds the testis and spermatic cord.
- Hydroceles are believed to arise from an imbalance of secretion and reabsorption of fluid from the tunica vaginalis. Hydroceles range in size from small, soft collections that still allow palpation of the scrotal contents to massive, tense collections of several liters that make examination impossible.
- Symptoms of pain and disability generally increase with the size of the mass. Inflammatory conditions of the scrotal contents (epididymitis, torsion, appendiceal torsion) can produce an acute reactive hydrocele, which often resolves with treatment of the underlying condition. Hydroceles discovered in infancy are usually "communicating," since they are associated with a patent processus vaginalis, which allows flow of peritoneal fluid into the scrotal sac. They usually

disappear in recumbent position and are often associated with herniation of abdominal contents (indirect hernia) through the processus vaginalis. Surgical repair is advised in these cases.

- On MRI, hydroceles are characterized by a low signal in T1-weighted images and a high signal in T2-weighted images. This reflects the content of the hydrocele, that is, simple fluid.

Hydronephrosis

- Hydronephrosis, a direct consequence of urinary tract obstruction (UTO), is a relatively common problem. The obstruction to urinary flow may be acute or chronic, partial or complete, and unilateral or bilateral and may occur at any site in the urinary tract.
- The major causes of UTO vary with the age of the patient. Anatomic abnormalities (including urethral valves or stricture and stenosis at the ureterovesical or ureteropelvic junction) account for the majority of cases in children. In comparison, calculi are most common in young adults, while prostatic hypertrophy or carcinoma, retroperitoneal or pelvic neoplasms, and calculi are the primary causes in older patients.
- The clinical manifestations of UTO vary with the site, degree, and rapidity of onset of the obstruction. Pain is frequently present, due to distention of the bladder, collecting system, or renal capsule; patients with complete or severe partial bilateral obstruction also may develop acute or chronic renal failure; urinary findings are generally nondiagnostic with the only possible exception of anuria; hypertension is occasionally induced by UTO.

- Early diagnosis of UTO is important, since most cases can be corrected and a delay in therapy can lead to irreversible renal injury.
- CT scanning should be performed if the ultrasound results are equivocal or the kidneys cannot be well visualized or if the cause of the obstruction cannot be identified. The combination of a plain film of the abdomen (including tomographic cuts to detect radiopaque calculi), ultrasonography, and, if necessary, CT scanning will be adequate for diagnostic purposes in over 90 % of cases.
- Diffusion-weighted MR imaging may allow noninvasive detection of changes in renal perfusion and diffusion that occur during acute ureteral obstruction. The advantage of this method is that it does not require the use of contrast agents.

Suggested Reading

1. Khadra MH, Pickard RS, Charlton M, et al. 2000. A prospective analysis of 1,930 patients with hematuria to evaluate current diagnostic practice. J Urol; 163:524.
2. Amano T, Kunimi K, Hisazumi H et al. 1993. Magnetic Resonance Imaging of Bladder Hemangioma Abdom Imaging; 18:97–99.
3. Cocheteux B, Mounier-Vehier C, Gaxotte V et al. 2001. Rare variations in renal anatomy and blood supply: CT appearances and embryological background. A pictorial essay. Eur Radial; 11: 779–786.
4. Argyropoulos A, Liakatas I, Lykourinas M. 2005. Renal haemangiopericytoma: the characteristics of a rare tumour BJU International; 95:943–947.