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Intrarenal Arterial Flow in Chronic Heart Failure: Dopplerographic Study

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Purpose: The aim of this research was to study the changes of renal hemodynamics in patients with heart failure and arterial hypertension.

Material & Methods: We studied 63 normal persons (control), 70 untreated patients with arterial hypertension (AH) without heart failure (I group) and 56 untreated patients with arterial hypertension and heart failure (HF) (II group). Renal arterial flow was studied by intrarenal Dopplerography, which was registered from interlobar arteries of both kidneys. It was measured as: maximal systolic (V_{max}) and diastolic (V_{min}) velocities, acceleration time (AT) and acceleration (ACC) of systolic flow and calculated resistive index (RI).

Results: There was no significant difference in renal flow parameters between normal persons and patients with AH. In patients with HF, the V_{max} , RI and AT was significantly higher, and V_{min} lower than in controls and patients of I group. RI was more than 0.7 in 48.21% of patients in II group, only in 8.57% of patients in I group and 6.35% of controls. In patients with heart failure, RI was in positive correlation with age, HF NYHA functional class, mitral flow A wave velocity and tricuspid flow E wave velocity, and in negative correlation with S wave acceleration on RV DTI. There was no correlation between RI and LV EF%.

Conclusion: There are prominent changes in the renal arterial flow of patients with HF. About half of these patients have high-resistance arterial flow.

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Tardus-Parvus Doppler Waveform in Both Kidneys in an Adult Patient Suggesting Aortic Coarctation

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Purpose: To demonstrate and emphasize bilateral tardus-parvus Doppler waveforms of both renal arteries suggesting aortic coarctation.

Material & Methods: An 18-year-old girl with no remarkable medical history presented with hypertension (180/100 mm Hg). There was not a significant pressure difference between the upper and lower extremities. She was referred for renal Doppler imaging for ruling out renal artery stenosis.

Results: On greyscale ultrasound, both kidney lengths and parenchymal thicknesses were normal. Doppler ultrasound showed that both main renal arteries and segmental arteries demonstrated slowed systolic upstroke and decreased systolic peak systole velocities consistent with "tardus-parvus waveform". The spectral Doppler tracing of the abdominal aorta demonstrated similar waveform. Duplex Doppler examination of the left subclavian artery revealed normal triphasic high-resistance waveform. Definite diagnosis of aortic coarctation was made by magnetic resonance angiography (MRA), which showed severe aortic stenosis distal to the origin of the left subclavian artery and multiple enlarged intercostal arteries.

Conclusion: A tardus-parvus waveform pattern in unilateral renal artery is an indication for renal artery stenosis. However, if both arteries show tardus-parvus waveform pattern, the possibility of aortic coarctation should be considered.

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Sonography of Adrenal Glands in Adult Patients

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Learning Objectives: To discuss the scan technique, patient positioning and anatomic consideration for adrenal sonography in adult patients and to demonstrate the sonographic appearance of the normal adrenal gland. To illustrate the sonographic findings of various pathologies of the adrenal glands with CT, MR and pathologic correlation.

Background: Unlike in children, adrenal glands are most challenging structures to evaluate on sonography in adults. Because the adrenal glands are located deep in the abdomen, 2-5 MHz low frequency transducer is often adequate. On sonography, the adrenal gland is less echogenic than the surrounding perirenal fat, and the medulla is evident as a highly echogenic central linear structure.

Imaging Findings or Procedure Details: Sonography of the adrenal glands in adult patients. I. Scan technique, patient positioning and anatomic consideration for adrenal sonography. II. Sonographic Appearance of normal adrenal glands in adult patients. III. Various pathology of adrenal glands: sonographic findings with CT, MR and pathologic correlation. IV. Potential role of contrast enhanced sonography for adrenal lesion.

Conclusion: Although its capability has been overlooked, sonography can be a useful screening tool for adrenal lesions in adult patients. An awareness of scanning tips with proper patient positioning and an understanding of sonographic peri-adrenal anatomy illustrated in this exhibit are essential for radiologists to perform adrenal sonography.

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US Findings of Uterine and Ovarian Malignant Mixed Mesodermal Tumors

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Purpose: To describe the uterine and ovarian ultrasonographic (US) findings of malignant mixed mesodermal tumors (MMMTs), rare gynecologic tumors which typically present in elderly postmenopausal women.

Material & Methods: The US findings of pathologically proven uterine (n = 12) and ovarian (n = 4) MMMTs were retrospectively analyzed in terms of the size, location, shape, echogenicity, vascularity, local invasion, distant metastasis, etc.

Results: Of 12 uterine tumors, 4 were in the uterine fundus, 3 in the body, 4 in both, and 1 in the cervix. Ten cases showed myometrial invasion, and five showed distended endometrial cavity. Ovarian and/or lymph node metastases were found in three cases, omental involvement in two, and later lung metastasis in two. Bulky polypoid mass projecting into the uterine cavity was the most common US findings (n = 8). Of four ovarian tumors, two were in the left ovary, one in both and one in the right. Uterine surface involvement was present in one case, peritoneal seeding in one, and later distant metastases in two. Uterine or ovarian MMMTs (mean diameter of 5.2 cm, range, 2.7-14.5 cm) appeared as large irregular heterogeneously hyperechoic (n = 8), isoechoic (n = 6) or hypoechoic (n = 2) masses with necrotic/hemorrhagic portions (n = 8) and increased blood flow signals (n = 10).

Conclusion: Familiarity with the US findings of uterine and ovarian MMMT may facilitate the diagnosis and differential diagnosis from other gynecologic tumors.

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Endometrial Thickness in Different Cutoff Points for Predicting Abnormal Endometrium in Vietnamese Women with Postmenopausal Bleeding

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Purpose: The aim of this study is to find the suitable cutoff point of endometrial thickness for predicting abnormal endometrium in women with postmenopausal bleeding.

Material & Methods: A prospective study was carried out during 2 years. Of the 308 women, those who did not use any hormone therapy suffered from postmenopausal bleeding. All of them had their endometrial thickness measured by transvaginal sonography before an endometrial biopsy. Dilation and curettage was indicated in women with endometrial thickness ≥ 3 mm to diagnose an abnormal endometrium (hyperplasia atypia or cancer). We compared the sensitivity and false-negative rate at each 1-mm interval cutoff point of endometrial thickness for detecting these histopathologies.

Results: 292 women gave their consent to perform an endometrial biopsy. Their mean age was 59.4 ± 9.3 years. The median time of amenorrhea was 5 years (range 2-13 years); 12.67% (95%CI 9.10-17.04) was diagnosed with an abnormal endometrium in which the mean of endometrial thickness found was 4.0 ± 1.7 mm (95% CI 3.8-11.8). In comparison to seven cutoff points, the endometrial thickness at 4 mm showed the highest detection rate of abnormal endometrium in women with postmenopausal bleeding (95% of sensitivity for 4% false-negative rate).

Conclusion: The endometrial thickness at 4 mm is the most suitable cutoff point for predicting an abnormal endometrium in Vietnamese women with postmenopausal bleeding.

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Pseudo-Meigs' Syndrome: Large Uterine Leiomyoma Associated with Elevated CA 125, Massive Right Hydrothorax and Edematous Tissues Mimicking Ovarian Carcinoma

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Purpose: Introduction: pseudo-Meigs' syndrome is a rare syndrome secondary to pelvic tumours, but not ovarian fibromas.

Material & Methods: Case report: A 51-year-old Asian female first experienced SOB in 2008. CXR revealed a right-sided pleural effusion. MRI detected a pelvic mass. She was concurrently diagnosed with atrial fibrillation and treated with digoxin. She went overseas for a second opinion. CT scan revealed granulomas, right pleural effusion and enlarged mediastinal lymph nodes. Pleural tap showed likely malignant cells. MRI revealed a pelvic mass suggestive of Ca ovary, CA 125 was 147. She sought ayurvedic treatment and became asymptomatic until 2010. In June 2010, she was admitted to Hospital in her native country for SOB. She was found to have massive right pleural effusion and smaller left pleural effusion. Cytology: nil malignant cells; no microorganisms. CT scan revealed a large pelvic mass consistent with Ca ovary, with suggestion of peritoneal seeding and lymphadenopathy. CA 125 was 467. She came to Singapore for second opinion. Ultrasound revealed a 13-cm right subserous leiomyoma. CT scan showed a large subserous leiomyoma, a 6-cm adnexal tumour and small para-aortic lymph nodes.

Results: She underwent THBSO. Findings included a large fundal leiomyoma, edematous tissues, 200 ml ascites, no obvious malignant masses and lymph nodes were not enlarged. Post-operatively, pleural effusions decreased substantially, approximately 400 ml/day.

Conclusion: Atypical sonographic features of pelvic masses may represent benign appearances.

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Hemoperitoneum Secondary to Rupture of a Uterine Fibromyoma and Hemorrhagic Cyst

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Purpose: Introduction: the most common cause of gynaecological hemoperitoneum is ruptured ectopic pregnancy. Other causes include rupture of ovarian cyst or uterine fibromyoma. We present a case with rupture from two gynaecological lesions.

Material & Methods: Case report: A 53-year-old Chinese female complained of lower abdominal pain, giddiness, cold sweat, diarrhoea and nausea; UPT was negative. Portable ultrasound scan revealed a 4.3 x 3.2 x 5 cm left subserous hypoechoic mass. Fluid+ was noted in the pelvis. A repeat scan in the ultrasound department demonstrated a 4.5 x 3.7 x 3.8 cm heterogeneous mass arising from the left fundus. Although its features were not typical, the impression was that of a pedunculated fibromyoma. A solid cystic mass of 2.8 x 2.2 x 2.5 cm noted in the left adnexal region may represent a hemorrhagic or dermoid cyst. Echogenic fluid+ was noted in the pelvis and upper abdomen. CT scan noted a well-defined ovoid 3.2 x 3.4 cm enhancing mass in the left hemipelvis. A non-enhancing component that breaks the otherwise smooth outline of the mass may represent the rupture of a portion of the lesion.

Results: Laparotomy was performed. Intraoperatively, there was a 5-cm ruptured bleeding pedunculated fibromyoma; a 5-cm left ovarian bleeding hemorrhagic cyst and hemoperitoneum in the pelvis and upper abdomen.

Conclusion: Rupture from more than one pelvic mass would need to be considered in women with massive hemoperitoneum.

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In Echo Pattern Classification of Ovarian Masses of JSUM 2000, the Probability of Malignant and Borderline Malignant Tumors is Shown as Percentage

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Purpose: The echo pattern of ovarian masses was classified into six types in EPCOM of JSUM 2000; probability of malignant and borderline malignant tumors (PMBMT) of type 1, 2 and 3 were below 3%; type 4, about 50%; type 5, about 70%; type 6, about 30%. In this study, the ultrasound equipment used were all transabdominal machines using 3.5-5.0 MHz, from 1988 to 1992, containing 22% of malignant and borderline malignant (MBM) cases.

Material & Methods: After that, the transvaginal sonography became popular and more precise image by 5-7.5 MHz transducer could be visualized. So, from 1997 to 2000, about 228 cases of ultrasonogram with a mixture of abdominal and vaginal images were analyzed retrospectively using these EPCOM and the result was presented at JSUM 2001. The results were: PMBMT of type 1 and 2, 0%; type 3, 2%; type 4, 32%; type 5, 70%; type 6, 39%.

Results: To stabilize the probability of each echo pattern, we added the newly collected 166 transvaginal sonograms partially with transabdominal sonograms from 2008. The total 394 cases with MBM rate of 28% were analyzed and the results were: PMBMT of type 1, 0%; type 2, 6%; type 3, 1%; type 4, 52%; type 5, 67%; and type 6, 39%.