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Chapter 1 : A Practical Guide to Gratitude | Thermographic Diagnostic Imaging, TDI

Here is a quick-reference pocket guide to imaging techniques and indications. It relies on brief, outline text and comparative charts to simplify complex issues and enhance recollection of principal points.

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Chapter 2 : Ferri's Best Test: A Practical Guide to Clinical Laboratory Medicine and Diagnostic Imaging, 3e

*Practical Guide to Diagnostic Imaging: Radiography and Ultrasonography [Han, Hurd] on www.nxgvision.com *FREE* shipping on qualifying offers. This text provides an illustrated guide to techniques used in radiography and ultrasonography of small and large animals.*

When noncontrast scans have not been obtained, relative enhancement washout can be calculated as follows: Loss of signal intensity of the adrenal mass on out-of-phase images, compared to the in-phase pulse sequence, is diagnostic of the presence of intracellular lipid. Although pheochromocytomas showed higher apparent diffusion coefficient ADC values in this series, ADC value has not been found to have significant utility for differentiating adenomas and metastatic tumors. However, adrenal mass activity, which is visibly lower than liver activity, is more specific for adenoma, whereas adrenal mass activity visibly greater than liver activity is more specific for malignancy. An important characteristic of adrenal adenoma is the presence of intracellular lipid. CT is the most sensitive and specific imaging modality for characterization of adrenal masses. Most adrenal adenomas demonstrate a loss of signal intensity on out-of-phase compared to in-phase images Figure 3. The lipomatous tissue may represent degenerative phenomena within an adrenocortical adenoma or may be an additional neoplastic component of a tumor. Regardless of their origin, extensive myelo lipomatous changes in adrenocortical tumors can lead to misinterpretation in the preoperative work-up of patients with adrenal masses. However, simple cysts do not enhance on postcontrast series, and they also exhibit high-signal intensity on T2-weighted MR images Figure 4. Metastatic deposits containing intracellular lipid could develop secondary to primary malignancies containing intracellular lipid such as hepatocellular carcinoma or renal cell carcinoma clear cell subtype. Adrenal cortical carcinoma ACC has also been reported to contain intracellular lipid. Adrenal metastases Metastases are the most common malignant lesions involving the adrenal gland. The most important diagnostic feature is the lack of signal loss on out-of-phase images in contradistinction to that seen with adrenal adenoma. If a collision tumor is not recognized, however, biopsy only of the benign component of the tumor can result in potential misdiagnosis. Myelolipoma is an uncommon benign tumor composed of mature adipose tissue and hematopoietic tissue. Most of these lesions are discovered incidentally. The fatty component of this tumor can be diagnosed by the presence of areas of negative attenuation value on CT. On MRI, macroscopic fat is hyperintense on nonfat-suppressed T1-weighted images. The use of fat suppression can help confirm the diagnosis by demonstrating a loss of signal intensity within the fatty component Figure 6. Rarely, large myelolipomas can be confused with other retroperitoneal lipomatous tumors such as liposarcoma. The authors have described a rare entity presumed to represent lipomatous metaplasia. Because all the cases reported previously have been in the pathology literature, it is not surprising that they have been in patients with hypersecretory adrenal lesions such as hyperplasia, adenoma, and carcinoma that required surgical resection. In our cases, there was no clinical evidence of hypersecretory or structural adrenal abnormalities. Simple cysts, however, exhibit no significant enhancement on postcontrast series. On MRI, simple cysts are typically hypointense on T1-weighted images and hyperintense on T2-weighted images, with no soft-tissue component and no internal enhancement. They are more likely than simple adrenal cysts to be symptomatic. Pseudocysts typically arise after an episode of adrenal hemorrhage and do not have an epithelial lining. Peripheral curvilinear calcification may be present, which represents a characteristic pattern of a complicated cyst that is well depicted by CT Figure 8 , but difficult to appreciate on MR images. The hyperplasia may be diffuse or nodular and typically is bilateral. On CT and MRI, the attenuation and signal intensity of hyperplastic adrenal glands are usually similar to that of the normal adrenal gland, although noncontrast attenuation could be lower in some cases. Similarly, signal intensity may also decrease on out-of-phase pulse sequences compared to in-phase pulse sequences, especially in patients with adenomatous cortical nodules. On CT, adrenal hemorrhage can be seen as high density on unenhanced images Figure 9. Its appearance overlaps with that of other lesions following contrast enhancement. MR imaging features vary according to the age of the hematoma. The appearance of blood products at MR imaging varies with their stage of evolution. Acute blood in the form of deoxyhemoglobin is isointense relative to muscle on

T1-weighted images and has low intensity on T2-weighted images. Subacute blood in the form of methemoglobin is hyperintense on T1-weighted images. Initially, methemoglobin is intracellular and has low signal intensity on T2-weighted images. Subsequently, as the red cells lyse and the methemoglobin becomes extracellular, it has high signal intensity on T2-weighted images. Old hemorrhage has low signal intensity on both T1- and T2-weighted images because of the presence of hemosiderin. T1-weighted fat-saturated images are quite sensitive in the detection of methemoglobin. GRE images can magnify the susceptibility effects of decreased signal intensity seen with hemosiderin and deoxyhemoglobin, thereby increasing their conspicuity. Similarly, a lesion that loses a substantial amount of signal intensity on in-phase images compared with out-of-phase images obtained with a shorter echo time may contain blood products. Pheochromocytoma Pheochromocytomas are uncommon tumors arising from the adrenal medulla and the sympathetic paraganglia. Sympathetic ganglia are found predominantly in the para-axial region of the trunk along the prevertebral and paravertebral sympathetic chains and in the connective tissue in or near the walls of pelvic organs. It is difficult to differentiate benign pheochromocytomas from malignant, histologically. Therefore, malignancy is usually established by local invasion or metastases. The appearances of pheochromocytomas are non-specific by CT and frequently overlap with other adrenal masses. MRI is increasingly used because of its multiplanar capability, high sensitivity for contrast enhancement, and lack of ionizing radiation. In our series of 18 surgically proven pheochromocytomas, the MRI appearances were variable. Most cases demonstrate high intensity on T2-weighted images. However, markedly increased T2 signal intensity is not as common as thought in the past. Pheochromocytomas do not contain intracellular lipids leading to lack of signal dropout on chemical shift pulse sequences. Variable postcontrast appearances can be also seen in these tumors with a characteristic persistent enhancement on delayed phase. The tumors can present either due to hormone production causing Cushing syndrome or Conn syndrome, or due to mass effect from the primary or metastatic lesions. Other manifestations include an abdominal mass and abdominal pain. Typically, adrenal cortical carcinoma is large at presentation, usually measuring more than 6 cm. Heterogeneous texture on CT and MRI is usually noted, owing to the presence of internal hemorrhage, necrosis, and calcification Figure Conclusion Adrenal adenoma is the most common adrenal mass, and metastases is the most common malignant adrenal mass. Most imaging techniques were developed to differentiate adenoma from metastatases, with CT washout technique as the most sensitive and specific imaging technique. MRI is helpful in the setting of heterogeneous mass as well as in contrast issues, such as allergy, or renal insufficiency. Simple cysts may also mimic adenoma on noncontrast CT. Rarely, adrenal cortical carcinoma contains intracellular lipid and very rarely contains macroscopic fat. The presence of macroscopic fat is consistent with myelolipoma, until proven otherwise. Pseudocyst can have a large heterogeneous pattern, thus mimicking carcinoma. Pheochromocytomas are better characterized by MRI. Although variable, a constellation of features, including lack of intracellular lipid, high signal intensity on T2-weighted images, and contrast enhancement, is suggestive of pheochromocytoma. Elevated plasma metanephrine levels are also consistent. Adrenal cortical carcinoma is typically large and heterogeneous at presentation. The tumor can present due either to hormone production causing Cushing syndrome or Conn syndrome or to mass effect. Characterization with combined unenhanced and delayed enhanced CT. Characterization of adrenal tumors by chemical shift fast low-angle shot MR imaging: Comparison of four methods of quantitative evaluation. Does it still have a role? Diagnostic utility of diffusion-weighted MR imaging and apparent diffusion coefficient value for the diagnosis of adrenal tumors. J Magn Reson Imaging. Diagnosis with chemical shift MR imaging. Characterization of adrenal masses with chemical shift and gadolinium-enhanced MR imaging. Quantification of fat content with double-echo chemical shift in-phase and opposed-phase FLASH MR images for differentiation of adrenal adenomas. Evaluation of adrenal masses with gadolinium enhancement and fat-suppressed MR imaging. MR imaging features with pathologic correlation. Lipomatous changes in adrenocortical adenomas: Report of two cases. Metastatic adrenal tumor from clear-cell renal cell carcinoma: A pitfall of chemical shift MR imaging. Intracellular lipid within metastatic hepatocellular carcinoma of the adrenal gland: A potential diagnostic pitfall of chemical shift imaging of the adrenal gland. Adrenal carcinoma with a signal loss on chemical shift magnetic resonance imaging. J Comput Assist Tomogr. Analysis of autopsied cases. Collision tumors of the adrenal gland: Demonstration and characterization at MR imaging. Their magnetic resonance assessment. Computed tomography findings in 2 presumed cases. Ferrozzi F, Bova D. CT and MR demonstration of fat within an adrenal cortical carcinoma. State-of-the-art MR imaging of the adrenal gland. Miscellaneous conditions of the adrenals and adrenal pseudotumors.

Chapter 3 : Practical Guide to Lab Medicine & Diagnostic Imaging

Practical Guide to Lab Medicine & Diagnostic Imaging $ Ferri's Best Test, 4th Edition, A Practical Guide to Laboratory Medicine and Diagnostic Imaging, equips you to quickly choose the most efficient and cost-effective diagnostic approach, including imaging or lab tests.

Abdominal film, plain kidney, ureter, and bladder [KUB] 2. Barium swallow esophagram 4. Computed tomographic colonoscopy CTC, Virtual colonoscopy 6. Hepatobiliary iminodiacetic acid [IDA] scan 9. Endoscopic retrograde cholangiopancreatography ERCP Percutaneous biliary procedures Magnetic resonance cholangiography MRCP Meckel scan TCm pertechnetate scintigraphy MRI of abdomen Ultrasound of abdomen Ultrasound of appendix Ultrasound of gallbladder and bile ducts Ultrasound of liver Ultrasound of pancreas Ultrasound of spleen Video capsule endoscopy VCE B. Magnetic resonance imaging of breast C. Cardiovascular radionuclide imaging Thallium, Sestamibi, Dipyridamole [Persantine] scan 3. Multidetector computed tomography 5. Trans-esophageal echocardiogram TEE 6. CT of chest 3. Helical Spiral CT of chest 4. MRI of chest E. Adrenal medullary scintigraphy meta-iodobenzylguanidine [MIBG] scan 2. Transvaginal endovaginal ultrasound 7. Urinary bladder ultrasound 8. Intravenous pyelography IVP and retrograde pyelography G. Musculoskeletal and spinal cord imaging 1. Plain x-ray films of skeletal system 2. Bone densitometry dual-energy x-ray absorptiometry [DEXA] scan 3. MRI of spine 4. MRI of shoulder 5. MRI of hip 6. MRI of pelvis 7. MRI of knee 8. CT of spinal cord 9. Neuroimaging of brain 1. CT of brain 2. MRI of brain I. Positron emission tomography PET J. Captopril renal scan CRS 5. Computed tomographic angiography CTA 7. Magnetic resonance angiography MRA 8. Venous Doppler ultrasound

Chapter 4 : Adrenal imaging: A practical guide to diagnostic workup and spectrum of imaging findings

Diagnostic Imaging Staff; Algorithm may help better predict how likely it is a woman will have cancer in her future. The practical guide to striking a coding balance.