"A Sure Sign": Examples of Nuclear Medicine Signs Seen In the Emergent Setting

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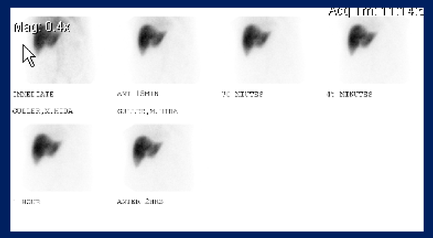
Overview

Emergency Departments in both rural and urban America are given the difficult task of quickly managing a variety of cases of varying acuity. With the overall increase of emergency department visits increasing from 129.9 million to 137.8 million between 2010 and 2014, physicians and other healthcare providers within the ED find themselves in the precarious situation of needing to see more patients in a shorter amount of time. This is in turn has arguably resulted in an increase of imaging in the acute setting and imaging utilizing a greater variety of modalities.

Often diagnostic dilemmas can arise in the acute setting and the available resources for imaging can vary dramatically between multiple institutions. In many scenarios, Nuclear Medicine Scintigraphy can be of invaluable assistance to Emergency Room personnel. There are many available emergent applications utilizing the Nuclear Medicine department such as hepatobiliary scintigraphy for identification of acute cholecystitis, ventilation and perfusion scintigraphy for identification of acute segmental pulmonary emboli, and tagged red blood cell studies for assistance in localization of gastrointestinal bleeds.

As with all of radiology and nuclear medicine there are certain pathognomonic findings (colloquially called "Aunt Minnies") which can lead to the immediate diagnosis when other modalities fail. Our exhibit provides interested practitioners with several interesting cases from our institution that demonstrated such pathognomonic signs, specifically from patients who presented in the acute setting.

"Liver Scan Sign"

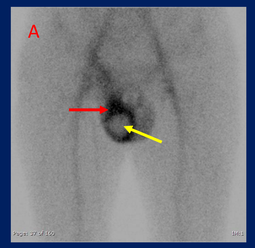


A young female presented with a history of periodic abdominal pain, nausea, and vomiting. She underwent workup including a HIDA scan demonstrating intense radiotracer activity within the liver at 15 min – 2 hrs. No activity was ever seen within the bowel. This patient was found to have an obstructing common bile duct stone.

"Honda Sign"

An elderly patient presented with intractable pelvic pain. Initial pelvic radiographs were limited and demonstrated generalized osteopenia. The patient later underwent a follow up nuclear medicine bone scan which demonstrated diffuse uptake within the bilateral sacral alae (red box), commonly referred to as the "Honda Sign" given it's similarity to the automotive company logo. The patient was diagnosed with a sacral insufficiency fracture.

"Bulls Eye Sign"

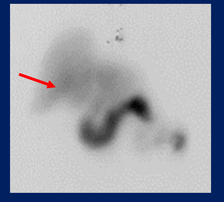


The following images were obtained from two patients who had presented with evidence of a delayed testicular torsion. The patient in image A suffered from a delayed right testicular torsion and the patient in image B suffered from a delayed left testicular torsion. Testicular Scintigraphy utilizing Tc99m-pertechnetate was performed to confirm suspicions of the infarcted testes because the patient could not tolerate ultrasound secondary to pain. On each image there is visualization of a hot rim sign (red arrow) indicating hyperemia and shunted blood flow to the surrounding scrotum. A central photopenic defect (yellow arrow) indicates evidence of no blood flow to the testicle itself.

"Cystic Duct Sign"

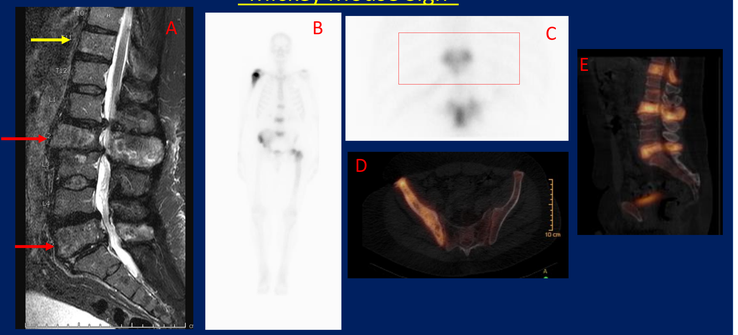
A small focus of uptake in the porta hepatis (red arrow) from a patient who underwent hepatobiliary scintigraphy. The activity was actually determined within the cystic duct indicating distal obstruction and acute cholecystitis. The cystic duct sign is important to remember as this finding can be mistaken for a small radiotracer filled gallbladder. This in turn can lead to a false negative diagnosis of a normal study.

"Gallbladder Rim Sign"



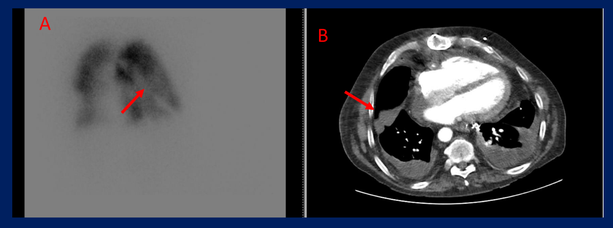
The gallbladder rim sign or hot gallbladder rim sign (red arrow) is an ominous finding on hepatobiliary scintigraphy. It is associated with increased severity of acute cholecystitis, such as emphysematous, gangrenous cholecystitis, and perforation. The presence of a rim sign on scintigraphy necessitates the need for immediate cholecystectomy or cholecystostomy.

"Mickey Mouse Sign"



A 59 year old male originally presented to our emergency department after suffering a fall. Initial spinal imaging including T2 STIR sequence (A) showed an acute mild wedge compression fracture of the T11 vertebral body with bony edema (yellow arrow). There was signal abnormality and deformity of the L2 and L5 vertebral bodies as well (blue arrows). The patient later returned for a follow up whole body bone scan with Tc-99m MDP (B,C) that revealed abnormal uptake in the right humerus, T11, L2, and L5 vertebral levels as well as the right iliac bone and left proximal femur. The affected vertebral bodies showed involvement of the entire vertebra including the pedicles on AP view ("Mickey Mouse Sign"). A SPECT/CT (D, E) confirmed areas of cortical hypertrophy and loss of trabeculation in the regions of uptake consistent with Paget's Disease.

"Fissure Sign"



Images obtained from a Ventillation-Perfusion (VQ) study with RPO/LAO positioning (A) and CTA Thorax (B) on a patient who presented with shortness of breath and with history of heart transplant. The patient demonstrated bilateral pleural effusions with fluid tracking into the right major fissure (red arrow) creating a matched linear photopenic defect on the VQ scan known as the "fissure sign." There were numerous other matched defects consistent with parenchymal airspace disease on the patients CT Thorax (not shown).

References:

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