October 2013

CT abdomen - Do we need a "complete" CT with and without IV contrast?

While unenhanced CT of the abdomen is certainly valuable in the workup of acute abdominal pain, urolithiasis and others, often IV contrast provides better detail, more specificity and affords confident interpretation. The "CT abdomen complete" protocol scans the abdomen first without IV contrast followed by a repeat scan through the abdomen during IV contrast infusion. It would seem this approach provides the best of both studies combined into one. But is the extra cost and radiation exposure worth the potential improvement in diagnostic yield, or can we eliminate the need for the unenhanced phase entirely?

The cost of a CT with and without IV contrast is generally 20-25% higher than scanning once with IV contrast alone. The same is effectively true about radiation dose to the patient . While risk from a single CT scan is admittedly very small, each phase of the CT scanning protocol contributes to the radiation dose. In pediatric patients, women of child bearing age and oncology patients requiring repetitive restaging studies, cumulative dose can be significant.

So, is the extra cost and radiation exposure worth it? The answer is "sometimes". If there is a known liver, pancreas, adrenal or kidney mass, multiphase CT can be very helpful in further characterization, often distinguishing benign and malignant lesions. These CT scans are ordered specific to the organ (i.e liver, pancreatic, adrenal or renal protocol). However, if we are restaging known cancer or following previously characterized visceral lesions, non-contrast CT is generally non-contributory. Further, in the evaluation of organ dysfunction, generalized abdominal symptoms or just screening for a possible mass, the additional non-contrast phase is very unlikely to add imaging value over the post IV contrast CT alone. Almost all metastatic lesions are visible with IV contrast. Abscesses, venous thrombosis and inflammatory processes are also discernible. The "risk" of removing the non-contrast portion is the unlikely event the patient has to return for workup of an incidental lesion, but not that IV contrast study was inadequate in the first place.

In summary, except in specific situations where we need to further characterize visceral lesions with multiphase protocols, the combined CT abdomen with and without IV contrast is probably not necessary. The best test is either CT abdomen with IV contrast OR CT without it, not both. Almost always the scan is diagnostic, substantially decreasing cost and radiation exposure to our patients.