

The Clinical Conundrum of the Incidentaloma.

Peter Rothstein, PGY-2, Department of Medicine, University of Colorado, Denver CO.

Story from the Front Lines:

A healthy 58-year-old man presented to the emergency department with flank pain. His pain began that morning and progressed to severe colicky right-sided flank pain with nausea and vomiting. Vital signs were normal. Exam revealed a non-distended soft abdomen with no focal tenderness or masses. Apart from a mild leukocytosis and microscopic hematuria (> 50 red cells per high powered field), basic labs were normal. Acute nephrolithiasis was suspected and non-contrast CT of the abdomen was obtained. On CT a 4 mm stone in the middle portion of the right ureter was observed, as was a 3.3 cm mass on the left kidney. A renal ultrasound was recommended as an outpatient to further characterize the incidental left renal lesion. With hydration and oral analgesics, his pain completely resolved over the course of the following week. His primary physician later obtained a renal ultrasound and, given findings concerning for malignancy, a dedicated 3-phase CT of the kidneys was performed. Radiographic concern for malignancy persisted and nephrectomy was advised. The patient underwent an uncomplicated nephrectomy, and the final pathology revealed a benign renal cyst.

Teachable Moment:

Acute nephrolithiasis is common, accounting for 1.3 million ED visits in 2009. [1] Though a history of renal colic and hematuria strongly support the diagnosis, physician society guidelines recommend imaging for confirmation.

Currently, non-contrast helical CT is the gold standard sensitivity (94%) and specificity (97%) for diagnosis. Due to its accuracy and ease of obtaining in the acute setting, it is widely recommended as the initial imaging modality. Ultrasound is also accepted as an initial imaging option, though is typically not first line given its lower sensitivity and specificity. A multicenter randomized trial in 2014 compared CT versus ultrasound in the initial evaluation of patients presenting to an emergency department with symptoms suggestive of nephrolithiasis. The results confirmed the reliability of CT in making the diagnosis, however, the rate of important missed diagnoses that resulted in complications was not statistically different between the groups (0.5 percent with ultrasonography versus 0.3 percent with CT). [2]

With its high sensitivity, CT is notorious for revealing incidental findings that may be difficult for the ordering clinician to interpret. A systematic review of multiple imaging modalities (CT, MRI, PET, US, plain radiograph) found the overall frequency of incidental findings to be 23.6%. When looking at CT alone, the frequency was 31.1%. [4]. One study estimated that over half of patients 50 years old or greater will have at least one renal cyst. [5] This presents a conundrum of how to optimally manage an incidental lesion that may appear concerning by radiographic

interpretation, but may of no clinical significance to the patient. Commonly, a cascade of further testing and interventions in ordered, which leads to increased health care costs and potential harm to the patient. As in the case presented, the patient's renal lesion was concerning for malignancy, but was in fact benign.

Imaging is indisputably a vital component of the physician toolbox, however it is not without risk. It would be a worthy endeavor to create guidelines that minimize this risk. Besides being less expensive and having no radiation, ultrasound discovers fewer incidental findings than CT, which makes it an appealing option as the initial imaging test in the evaluation of suspected nephrolithiasis. The European Association of Urology recommends ultrasound as the primary imaging tool that should be used for all suspected stones. [3]

If we are to accept that incidental findings are to a certain degree unavoidable, we should pursue guidelines that promote the least invasive approach to evaluating these lesions. For example, performing needle biopsy prior to proceeding to total organ removal. One study published in 2012 found that 80% of percutaneous renal mass biopsies were diagnostic, and of these 26% were benign. [6] Perhaps if this patient was initially imaged with ultrasound, his contralateral renal lesion would not have been revealed, and if he underwent percutaneous biopsy he might have been spared a nephrectomy.

1.)

Foster G, Stocks C, Borofsky MS. Emergency Department Visits and Hospital Admissions for Kidney Stone Disease, 2009: Statistical Brief #139. 2012 Jul. In: Healthcare Cost and Utilization Project (HCUP) Statistical Briefs [Internet]. Rockville (MD): Agency for Health Care Policy and Research (US); 2006 Feb-.Available from: <http://www.ncbi.nlm.nih.gov/books/NBK100827/>

2.)

Ultrasonography versus computed tomography for suspected nephrolithiasis. Smith-Bindman R, Aubin C, Bailitz J, Bengiamin RN, Camargo CA Jr, Corbo J, Dean AJ, Goldstein RB, Griffey RT, Jay GD, Kang TL, Kriesel DR, Ma OJ, Mallin M, Manson W, Melnikow J, Miglioretti DL, Miller SK, Mills LD, Miner JR, Moghadassi M, Noble VE, Press GM, Stoller ML, Valencia VE, Wang J, Wang RC, Cummings SR. *N Engl J Med.* 2014 Sep;371(12):1100-10.

3.)

Ray AA, Ghiculete D, Pace KT, et al. Limitations to ultrasound in the detection and measurement of urinary tract calculi. *Urology* 2010 Aug;76(2):295-300. <http://www.ncbi.nlm.nih.gov/pubmed/20206970>

4)

Lumbreras B, Donat L, Hernández-Aguado I. Incidental findings in imaging diagnostic tests: a systematic review. *The British Journal of Radiology*. 2010;83(988):276-289. doi:10.1259/bjr/98067945.

5) Stuart G. Silverman, MD, Gary M. Israel, MD, Brian R. Herts, MD, and Jerome P. Richie, MD. From the Division of Abdominal Imaging and Intervention, Department of Radiology (S.G.S.), and Department of Urology (J.P.R.), Brigham and Women's Hospital, 75 Francis St, Boston, MA 02115; Department of Radiology, Yale University School of Medicine, New Haven, Conn (G.M.I.); and Department of Radiology, Cleveland Clinic, Cleveland, Ohio (B.R.H.). Received May 7, 2007; revision requested June 18; revision received August 28; accepted September 27; final version accepted October 22; final review by S.G.S. April 23, 2008.

6) [Percutaneous core biopsy of small renal mass lesions: a diagnostic tool to better stratify patients for surgical intervention.](#)

Menogue SR, O'Brien BA, Brown AL, Cohen RJ.

BJU Int. 2013 Apr;111(4 Pt B):E146-51. doi: 10.1111/j.1464-410X.2012.11384.x.

Epub 2012 Jul 13.