



Loin pain

Greg Fitt, MBBF, FRACR, is a radiologist, Austin and Repatriation Medical Centre, Victoria.

A 47 year old man, previously well apart from an appendicectomy four years earlier, presented to the accident and emergency department with left loin ache for two days, then several hours of severe, sharp, stabbing pain in the left loin with no radiation. The pain was initially intermittent then constant and associated with nausea, sweating and he vomited once.

There was no haematuria, dysuria, frequency, nocturia, fever or rigors and bowel actions had been normal.

On examination he was afebrile and pulse and blood pressure were normal. He had left loin tenderness. Bowel sounds were normal and scrotal examination was normal.

Urinalysis demonstrated blood ++. He was treated with intravenous morphine, his pain settled and he was discharged on Panadeine Forte and indomethacin (Indocid) and outpatient computed tomography (CT) of the urinary tract and urology appointment arranged.

He represented the next day with recurrent severe pain and CT of the urinary tract was performed (Figures 1–3).

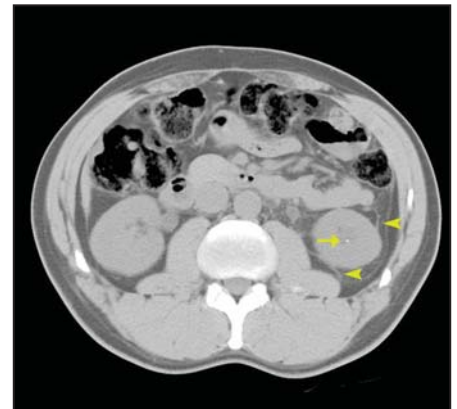


Figure 1. CT scan through lower renal poles.



Figure 2. CT scan through mid ureters.

Question 1

What are the findings?

- A. bilateral urinary tract calculi
- B. left sided urinary tract calculi
- C. bilateral hydronephrosis
- D. normal ureteric system with phleboliths.

Question 2

What features of ureteric obstruction are present in the scans?

Question 3

True or false?

Abdominal CT with intravenous contrast is the most sensitive imaging modality for detection of urinary tract calculi.

Question 4

True or false?

CT is more accurate than intravenous pyelography for diagnosing alternative pathology that may mimic renal colic.

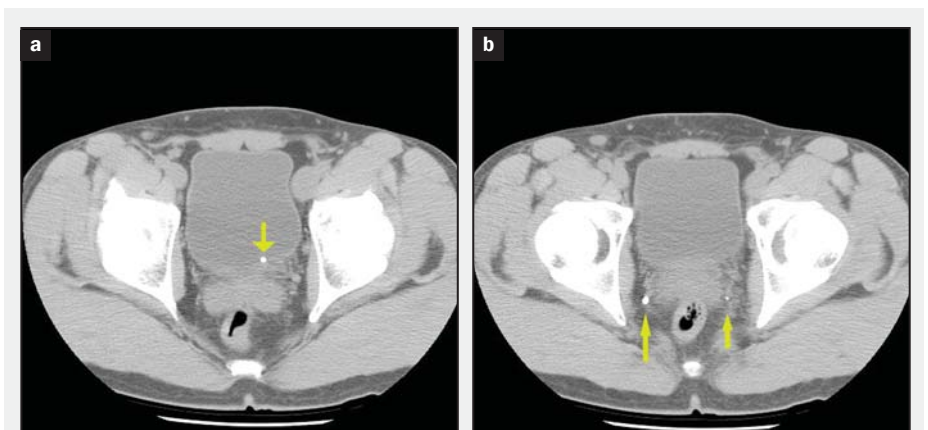


Figure 3a, b. CT scan through pelvis.

Answers

1. Answer B

A 2 mm calculus is demonstrated in a lower pole calyx on the left (see arrow, Figure 1) and a 4 mm calculus is demonstrated at the left vesico-ureteric junction (see arrow, Figure 3a). The two calcific lesions arrowed in Figure 3b are well posterior to the position of the ureters at this level and are typical of phleboliths. In Figure 3b, note the low attenuation fat extends to the lateral margin of the right sided phlebolith (long arrow). This is a further sign (together with the position) that this is not within the ureter. Tissue of the ureteric wall is usually visualised circumferentially around a ureteric calculus.

There are no right sided calculi shown.

2. Answer

In Figure 1, as well as the tiny left lower pole calculus, there is stranding (arrowheads) in the perirenal fat on the left, an accessory sign of ureteric obstruction. Compare this with the homogeneous low attenuation of the right perirenal fat.

In Figure 2, the left ureter (arrow) is distended. In the clinical context this suggests the presence of distal obstruction. However, it is important to remember that noncontrast CT is not a functional study and does not prove current obstruction. The differential diagnosis of a distended pelvicalyceal system and ureter includes previous obstruction and vesico-ureteric reflux.

3. Answer False

Intravenous contrast when excreted into the pelvicalyceal system and ureter has high attenuation similar to calculi which can be obscured by the contrast. Dedicated urinary tract CT for renal colic should always include noncontrast thin slice acquisition through the whole urinary tract which is the most sensitive imaging modality for detection of urinary calculi and is more sensitive than intravenous pyelography (IVP). Thin slice CT without contrast has a reported sensitivity of 98% and specificity of 97% in detection of urinary tract calculi.¹ It is also faster to perform, more comfortable for the patient and safer (without contrast) although without the functional information of IVP such as degree of obstruction.

4. Answer True

Alternative pathologies of clinical significance involving the renal tract or extra-renal locations and which may mimic renal colic are better diagnosed with urinary tract CT than with intravenous pyelography, although for some of these CT is not the first line investigation of choice. Such alternative pathologies include leaking aortic aneurysm, retroperitoneal bleeding of other causes, pyelonephritis, appendicitis, diverticulitis, hepatic hydatid cyst, renal cell carcinoma, ureteric transitional cell carcinoma, carcinoma of the colon with perforation, bowel obstruction, bowel ischaemia, ectopic pregnancy and ovarian cyst.^{1,2} The diagnostic benefits and avoidance of the risks of contrast medium administration need to be weighed against the increased radiation dose reported with CT³ although the difference in dose is dependent upon the technique of CT or IVP being compared.

References

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3. Denton E R, MacKenzie A, Greenwell T J, Popert R, Rankin S C. Unenhanced helical CT for renal colic: is the radiation dose justifiable? *Clin Radiol* 1999; 54:444–447.

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