Case of the Week 26

Clinical History:
51 year-old man with a history of right lower extremity DVT on Coumadin. He presented to the ER with a supratherapeutic INR of 7.3, R flank pain, and R flank ecchymosis.

Findings:
There is thickening of the wall of the right renal pelvis extending down to the proximal to mid right ureter.

Differential Diagnosis:
- Suburothelial hemorrhage
- Transitional cell carcinoma
- Infection, especially Mycobacterium tuberculosis

Diagnosis: Anticoagulation induced suburothelial hemorrhage

Discussion:
Retroperitoneal hemorrhage and intramural/suburothelial hemorrhage into the renal pelvis and proximal ureter is a well-documented complication of anticoagulation. The incidence of hemorrhage in anticoagulated patients varies from 4% to 24% and hemorrhage occurs commonly in the urinary tract. Renal complications of anticoagulant therapy include subcapsular, perinephric, intraparenchymal, renal sinus, and suburoepithelial hemorrhage. In the absence of urinary tract infection, with a history of hematuria and flank pain, anticoagulation use, and rapid resolution of the imaging findings should support the diagnosis of hemorrhage. This process is usually self-limiting and the intramural blood should resolve 3-6 weeks after correction of the coagulation factors.

Unenhanced helical CT of the urinary tract shows high-attenuation thickening of the right renal pelvis and proximal ureter, indicative of subepithelial hemorrhage. Contrast-enhanced CT usually shows a high attenuation thickening of the renal pelvis and proximal ureter with delay in contrast excretion. There may also be mild calicectasis and constriction of the renal pelvis. The regularity and homogeneous nature of the thickening in the urothelial system should suggest suburothelial haemorrhage, and indicate that TCC is less likely.

Unenhanced CT readily identifies the hemorrhage, which may be masked if only contrast-enhanced examinations are performed. High-attenuation material along the antidependent surface of the renal pelvis suggests a subepithelial rather than an intraluminal location. Subepithelial hemorrhage may compress the renal pelvis or rupture into the collecting system and cause "clot colic." Unenhanced CT of the urinary tract may be repeated several weeks after correction of the coagulopathy
to confirm resolution of the subepithelial hemorrhage. Pre and post-contrast images may assist in differentiation of haemorrhage from TCC.

On IV urography, focal pelviureteral wall irregularity may be indistinguishable from transitional cell carcinoma, pyeloureteritis cystica, or submucosal edema.

References

2. Bennett WF, Vaswani K, Vitellas KM, Bova, JG. Genitourinary Case of the day. AJR 2000;175:880-885