


Table 27.1 (Cont.) Differential Diagnosis of Abdominal Calcifications

Site and Pattern of Calcification	Common Causes	Radiographic Findings and Comments
E. Focal parenchymal calcification of the kidney 	Tuberculosis (Fig. 27.19) Adenocarcinoma (Fig. 27.20) Nephroblastoma (Wilms' tumor) (Fig. 27.21) Xanthogranulomatous pyelonephritis (Fig. 27.22)	May appear as a single nodular or irregular calcification (see above). About 10% of renal adenocarcinomas calcify. If a renal mass contains calcium in a nonperipheral location, it is very likely malignant. Even a curvilinear cystic peripheral calcification of a mass does not exclude malignancy. Cystic, streaky, or amorphous calcification of the tumor is uncommon, but may occur in older children and adults with nephroblastoma. Simulates carcinoma, but inflammatory masses may be multiple and diffusely calcified. A large pelvic calculus is present in the majority of cases, causing pelvocaliceal obstruction.

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Fig. 27.19 **Renal tuberculosis** of the left kidney with focal calcification. The calcification appears cystic but internal calcifications are also present.

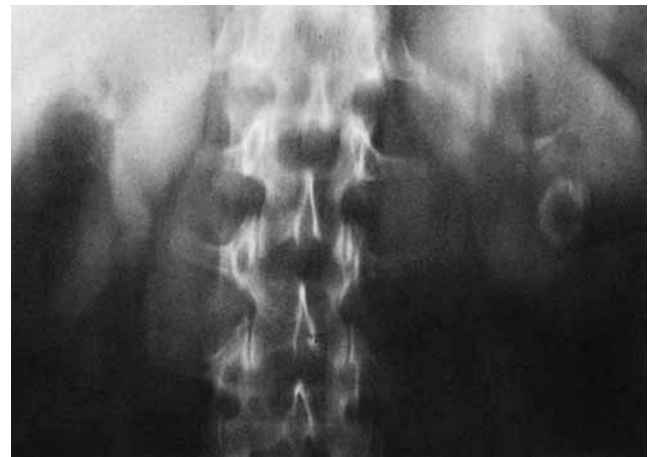


Fig. 27.20 **Adenocarcinoma** of the left kidney with calcification—a thick-walled, somewhat cystic calcification with irregular internal calcific deposits.




Fig. 27.21 **A large Wilms' tumor** in the right kidney of a three-year-old boy, seen as an enlarged, nonexcreting kidney containing tiny flecks of calcification.



Fig. 27.22 **Xanthogranulomatous pyelonephritis**. Scout film shows pelvic stones and parenchymal calcifications.

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F. Cystic (curvilinear) renal calcification 	Simple renal cyst (Fig. 27.23) Adenocarcinoma (Fig. 27.24) Polycystic or multicystic disease (Fig. 27.25) Echinococcal cyst Organized perirenal hematoma (Fig. 27.26) Old perirenal abscess Nephroblastoma (Wilms' tumor)	A thin curvilinear calcification can be demonstrated in 3%. 20% of thin curvilinear calcifications are due to a calcified fibrous pseudocapsule of a renal adenocarcinoma. Curvilinear calcifications similar to that of a simple cyst may occur. The majority are calcified. Complete circumferential ring of calcium is characteristic but not always present. May appear as large cystlike calcification. May appear cystic due to peripheral calcification.

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Fig. 27.23 Two calcified simple renal cysts in the right kidney (arrows) are seen.



Fig. 27.24 Adenocarcinoma of the kidney. Curvilinear calcification (with possible internal calcifications) in a large tumor of the lower pole of the right kidney.



Fig. 27.25 Polycystic kidneys with renal failure and calcification of the cyst walls bilaterally.

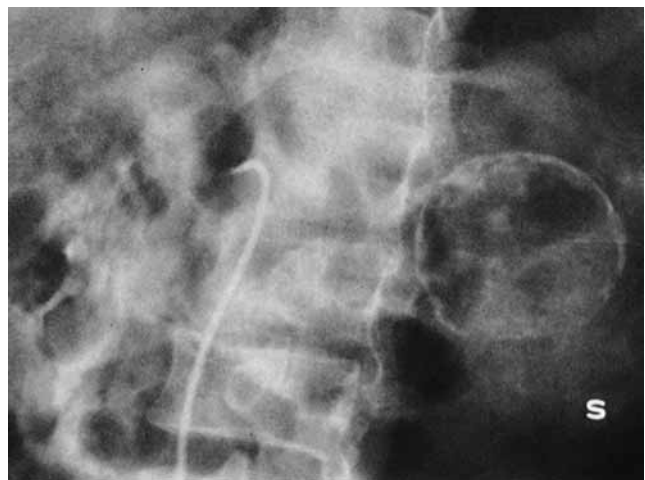
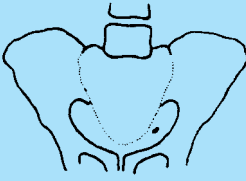





Fig. 27.26 Calcification of an organized perirenal hematoma on the left.

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Ureteral calcification 	Renal artery aneurysm	A cracked eggshell-like circular calcification at the renal hilus is seen in about one third of renal artery aneurysms.
	Renal milk of calcium DD: Residual Pantopaque from prior cyst puncture and Pantopaque injection	Calcium-containing sediment in a cyst, caliceal diverticulum, or obstructed renal pelvis. Mimics calculus in supine films. In upright position calcific material gravitates to the bottom of the cyst.
	Ureteral calculus: Mostly idiopathic but the following conditions predispose: – Decreased mobility – Pre-existing ureteral obstruction – Metabolic diseases (see nephrocalcinosis) – Pre-existing infection – Postoperative ureteral stump DD: Phleboliths (round, located laterally, and commonly below the interspinous line)	Characteristically irregular, often oval, lodged at three levels: Ureteropelvic junction (large calculi) Pelvic brim Ureterovesical junction (small calculi) Stones less than 4 mm will eventually pass spontaneously in over 80%. 4–6 mm stones will be passed spontaneously in 50%, but often cause renal obstruction. Stones larger than 6 mm rarely pass spontaneously and have a high incidence of serious complications.
	Schistosomiasis	Tubular calcification of the distal ureter occurs in about 15% of patients.
	Tuberculosis (Fig. 27.27)	Ureter calcifies less frequently than the kidney and its appearance is variable. Ipsilateral renal calcification is often present.
Adrenal and retroperitoneal calcification A. Triangular  B. Cystic (curvilinear)  C. Mottled mass calcification 	Neonatal adrenal hemorrhage	Occurs in infants born to mothers with diabetes and/or with an abnormal obstetric history. The periphery of the adrenal calcifies a few weeks after hemorrhage. Can be an incidental finding.
	Adrenal tuberculosis (Addison's disease)	In about a quarter of patients discrete, stippled densities outline the entire adrenal. Calcification can also be confluent and dense.
	Adrenal cyst: – Lymphatic – Necrotic pseudocyst (Fig. 27.28) – Cystic adenoma – Echinococcal – Old hemorrhage (Fig. 27.29)	A thin rim of curvilinear calcification above the kidney.
	Adrenal cortical carcinoma Pheochromocytoma (rare) Adrenal cortical adenoma (rare) Adrenal myelolipoma (a small mass of bone marrow and fat) (very rare)	Scattered flecks of calcification throughout the mass.
	Neuroblastoma	Calcification that is fine granular or stippled, rarely massive, occurs in about 50% of neuroblastomas. It is the second most common malignancy in children (after Wilms' tumor).
	Retroperitoneal teratoma	Calcified spicules of cartilage or bone are seen near the midline of the upper abdomen. Teeth inclusions may be identifiable.
	Retroperitoneal cavernous hemangioma (Fig. 27.30)	A large mass with multiple phleboliths.

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Fig. 27.27 Tuberculosis of the right distal ureter with characteristic ribbon-like calcifications (arrows).



Fig. 27.28 Necrotic pseudocyst of the right adrenal. A large cystic calcified mass, separate from the kidney, is seen.

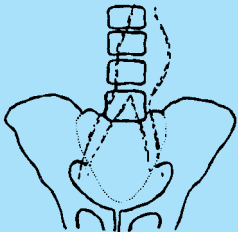


Fig. 27.29 Calcified old adrenal hemorrhage above the left kidney.



Fig. 27.30 Retroperitoneal cavernous hemangioma. Multiple phleboliths superimposed on the calcified and ectatic abdominal aorta and anterior to it are seen.

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<p>D. Longitudinal tubular calcification</p> 	<p>Other retroperitoneal tumors (Fig. 27.31)</p> <p>Calcified lymph node(s)</p> <p>Retroperitoneal hematoma</p> <p>Tuberculous psoas abscess</p> <p>Atherosclerosis</p> <p>Abdominal aortic aneurysm (Fig. 27.32)</p>	<p>Calcification is extremely rare.</p> <p>One or more 1 to 1.5 cm dense, often coarse calcifications. May present as a large calcification.</p> <p>Sclerotic plaques of the aortic wall are common in the elderly. The aorta characteristically narrows toward the bifurcation. It may be curved and simulate an aneurysm.</p> <p>The walls of the aneurysm tend to calcify more than the normal aorta. Calcified plaques outline the aneurysm that most commonly occurs below the renal arteries, Oblique films can be used to avoid superimposition of the spine.</p>

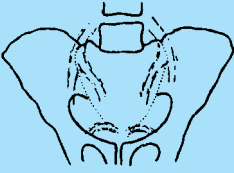
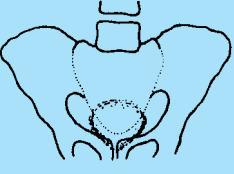
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Fig. 27.31 Retroperitoneal teratoma. A large calcified mass originating in the right retroperitoneum with extension into the subhepatic space is seen.



Fig. 27.32 Calcified abdominal aortic aneurysm.

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Site and Pattern of Calcification	Common Causes	Radiographic Findings and Comments
Pelvic calcification		
A. Tubular calcification 	Arteriosclerosis Vas deferens Associated conditions: Diabetes mellitus Tuberculosis Degenerative change (Fig. 27.33)	The aorta and the iliac arteries are frequently calcified and seen as irregular plaque-like densities. May be seen in young persons with diabetes. Bilaterally symmetric tubular densities that run medially and caudally to enter the base of the prostate, somewhat mimicking a medium-sized arteriosclerotic artery. Vas deferens calcification due to chronic inflammation (tuberculosis, syphilis) is intraluminal and has an irregular pattern.
B. Calcified bladder wall 	Schistosomiasis (Fig. 27.34) Tuberculous cystitis Encrusted cystitis: nonspecific infection post-irradiation	About 50% of patients with schistosomiasis of the bladder have visible calcifications of the bladder, most apparent at the base. A linear opaque shadow may surround a relatively normal-sized bladder. A disruption in the continuity of the homogenous line of calcification is suggestive of a squamous cell carcinoma of the bladder, a common complication. A rare cause of bladder wall calcification. Usually a faint calcified rim is seen in a contracted bladder, associated with calcifications in a kidney and ureter. A very rare cause of calcification of the bladder wall.

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Fig. 27.33 Calcified vas deferens in a 65-year-old patient, an incidental finding.



a



b

Fig. 27.34 a, b **a Schistosomiasis** of the urinary bladder. A linear calcified ring represents the bladder wall. **b** The same patient, two years later. The disruption of the right bladder wall calcification is virtually diagnostic for a complicating squamous carcinoma.