A 78-year-old woman was admitted to the hospital because of urinary retention for 3 days. Her past surgical history was significant for an abdominal hysterectomy 40 years prior. An unsuccessful attempt was made to insert a Foley catheter. An ultrasound examination revealed a distended bladder with a left anterior pelvic mass with a heterogenous echo texture. A subsequent preoperative computed tomography scan revealed 2 pelvic masses with calcifications (Figures 1 and 2, arrows) and a diverticulum in the left lateral wall of the urinary bladder.

Eventually, a Foley catheter was placed, and the bladder was drained. Magnetic resonance imaging of the lumbar spine was performed to rule out a neurologic cause for the urine retention. Subsequently, an exploratory abdominal laparotomy was performed to remove the masses.

The larger left-side mass was $13 \times 13 \times 8$ cm and had a tan-white surface. A cut section of this mass revealed a large area of necrosis. The right-side mass was $4.5 \times 4.5 \times 3.8$ cm and appeared to have arisen from the right ovary. Sectioning of this mass revealed a tan-white cut surface with diffuse calcification. Hematoxylin-eosin stained sections of formalin-fixed tissue from the left-side mass are shown in Figures 3 and 4. The right-side mass had similar histologic features.

**What is your diagnosis?**
Pathologic Diagnosis: Brenner Tumor

The Brenner tumor is generally a benign growing mass that accounts for approximately 1% to 2% of all ovarian neoplasms. It occurs predominately in women between 40 and 60 years of age. The origin of Brenner tumor is thought to be the surface epithelium and stroma, based on the following features: (1) the common presence of mucinous epithelium, (2) the occasional presence of serous ciliated epithelium, (3) the occasional finding of a communication between Brenner tumor epithelial nests and surface epithelium, and (4) the close histologic, immunohistochemical, and ultrastructural resemblance between the epithelial nests in Brenner tumors and Walthard nests, which arise from mesothelium.

Brenner tumors can be unilateral or bilateral and can accompany other ovarian neoplasms, such as mucinous tumors. Ten percent of these tumors are over 10 cm in diameter, and rare examples are over 20 cm in diameter. Radiologically, Brenner tumors are heterogeneous, low-density masses with scattered foci of calcification. The ultrasound examination usually reveals a solid hypoechoic mass. Magnetic resonance imaging usually reveals T2 weighted signal intensity lower than that of nonfibrous masses, similar to what is seen in fibromas.

Grossly, Brenner tumors are sharply circumscribed, firm, and nodular with a smooth or slightly bosselated external surface. Cut sections usually have a tan-yellow surface with a gritty consistency. Microscopically, typical benign Brenner tumors are characterized by the presence of round or oval nests of transitional cells within a fibrous meshwork. The nests contain cells with pale cytoplasm and oval nuclei, which often have conspicuous grooves and a “coffee bean” appearance (Figure 4, arrows).

A small percentage of Brenner tumors can undergo malignant degeneration. Invasive components of malignant Brenner tumors are made up exclusively or predominately of malignant-appearing transitional cells or squamous cells and may also contain mucinous cells. Genetic mutation common to both the mucinous cystadenocarcinoma and the Brenner tumor are in the oncogene region of the long arm of chromosome 12, bands 14–21 (12Q, 14–21).

The differential diagnosis of Brenner tumors includes transitional cell carcinoma (TCC), a Walthard nest, and TCC of the ovary. It is often difficult to distinguish among these entities based on histologic patterns alone. Immunohistochemistry may help in this regard. Brenner tumors, like urothelium and bladder TCC, stain positively for uroplakin, whereas ovarian TCC does not.

Because there is a lack of evidence of spread of borderline Brenner tumors, they are usually treated conservatively with surgery, particularly when they occur in young women. Malignant Brenner tumors are managed like other epithelial cancers, and the prognosis is excellent when the tumor is confined to the ovary.

References