A man in his 70s presented with gross hematuria. He had a remote history of colorectal adenocarcinoma, for which he received multimodal treatment including pelvic radiation therapy.

Cystoscopic examination revealed a bladder mass, which was resected. On histopathologic examination, there was no evidence of a precursor urothelial lesion (flat urothelial carcinoma in situ or papillary urothelial carcinoma). The surface urothelium did not display any morphologic abnormality (Figure 1A). A neoplasm with epithelioid to spindled features was found extensively infiltrating the lamina propria and muscularis propria (Figure 1B, C). In addition, no immunophenotypic features of urothelial origin, based on absence of staining with P63/GATA3, was identified (Figure 1D).

As the tumor cells were associated with an extensive background of extravasated red blood cells and occasional intracytoplasmic lumina (Figure 1B), the possibility of an angiosarcoma was considered and the tumor was found to be positive for CD31 and ERG immunostains. The tumor was diagnosed as angiosarcoma.

What molecular feature is frequently identified in postirradiation angiosarcoma?
Angiosarcoma occurring in the urinary bladder has been infrequently reported in the current English-language literature. In 1 series of 9 cases, all patients presented with hematuria. Two-thirds of patients in this study had received prior radiation therapy to the pelvis, with an interval of 6 to 15 years between initial therapy and diagnosis of angiosarcoma. Whereas such cases can often be misdiagnosed as invasive high-grade urothelial carcinoma, absence of an in situ urothelial carcinoma component and ancillary studies (absence of staining for urothelial markers: P63, GATA3, uroplakin 2; positive expression of vascular markers: CD31 and ERG) can help establish the correct diagnosis. Immunostains were helpful in confirming the diagnosis in this case. The tumor was positive for CD31 and ERG and negative for the other markers evaluated (Figure 2).

At the molecular level, amplification of the MYC gene on chromosome 8q24 has been reported in postirradiation angiosarcoma at various sites including the urinary bladder. It is thought to contribute to tumor pathogenesis.

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