Radiation-induced Angiosarcoma as a Cause of Pleural Effusion

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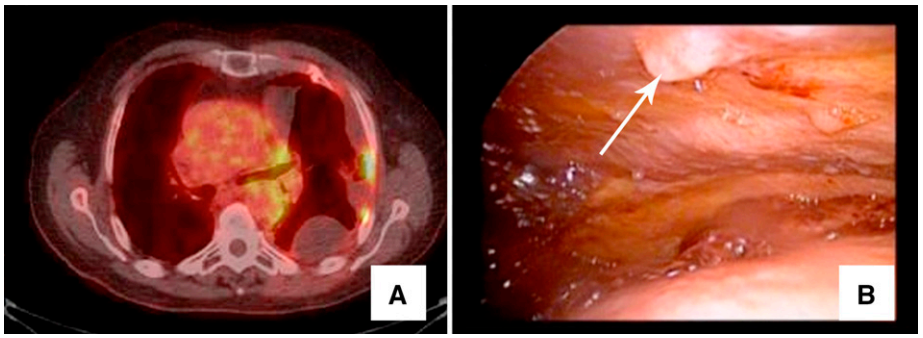

Figure 1. (*A*) Positron emission tomography–computed tomography scan of the chest demonstrating [^{18}F]fludeoxyglucose–avid areas along the pleural surface and loculated pleural effusion. (*B*) Pleuroscopic image showing the pleural surface with tumor studding (*arrow*).

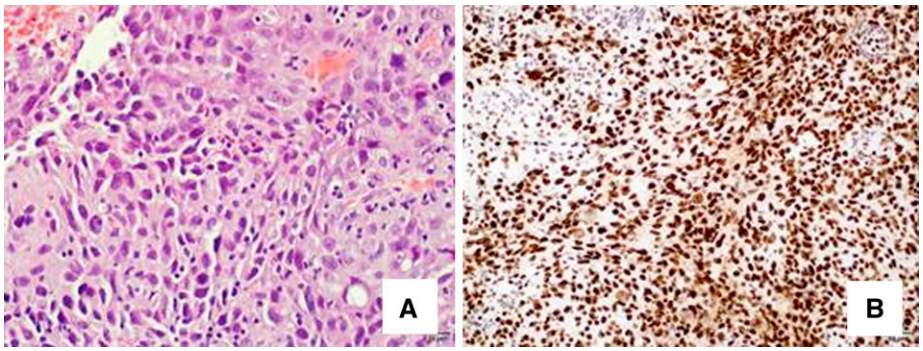

Figure 2. Pathologic images showing high-grade angiosarcoma with abundant extravasated red blood cells. (*A*) Tumor cells displaying a mixture of epithelioid and spindle cell features and marked nuclear pleomorphism with mitotic figures and prominent nucleoli. (*B*) Tumor cells displaying diffuse and strong nuclear staining for Friend leukemia virus integration 1.

A 75-year-old man presented with shortness of breath and recurrent pleural effusion. His history was significant for stage IIIA left upper lobe poorly differentiated squamous cell carcinoma, for which he was treated with definitive chemoradiation with a total radiation dose of 60 Gy 4 years before. Pleural fluid analysis results were consistent with an exudative effusion with a negative cytology. Positron emission tomography–computed tomography revealed increased fludeoxyglucose F 18 avidity along the middle to upper right pleural surface (Figure 1A) with no other [^{18}F]fludeoxyglucose–avid lesions. Further investigations included pleuroscopy with pleural biopsy that demonstrated tumor studding through the visceral and parietal pleura (Figure 1B). Pathologic examination of the pleural lesions was consistent with angiosarcoma. The tumor displayed diffuse membranous immunoreactivity for CD31 and CD34 and diffuse and strong nuclear staining for Friend leukemia virus integration 1 (Figure 2).

Radiation-induced sarcomas are rare, with a reported incidence of 0.03 to 0.2% in 5 years and overall up to 0.8% (1, 2). These malignancies typically occur within or at the edge of a previous radiation field, as in this case, and can present anywhere from 1 to 74 years after radiation. The treatment of choice for sarcomas of any histologic type occurring *de novo* or after exposure to radiation is a wide-margin surgical resection. However, advanced sarcomas are not cured with single-modality therapy, and a combination of surgical resection with chemotherapy and, at times, radiation therapy, is often needed (3). Unfortunately, disease-specific survival in patients with primary radiation-induced angiosarcoma is significantly worse than in those with sporadic soft tissue sarcoma independent of sarcoma histologic type, with a 5-year disease-specific survival rate of 32 to 58% (4–6). Our patient was started on treatment with gemcitabine and docetaxel; however, he died 4 months later owing to disease progression. Although this is a rare disease, it should be considered in the setting of prior radiation and new pleural effusion that cannot be explained by the primary malignancy. ■

Author disclosures are available with the text of this article at www.atsjournals.org.

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