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Images in Anesthesiology: An Unexpected Embolism during a Craniotomy

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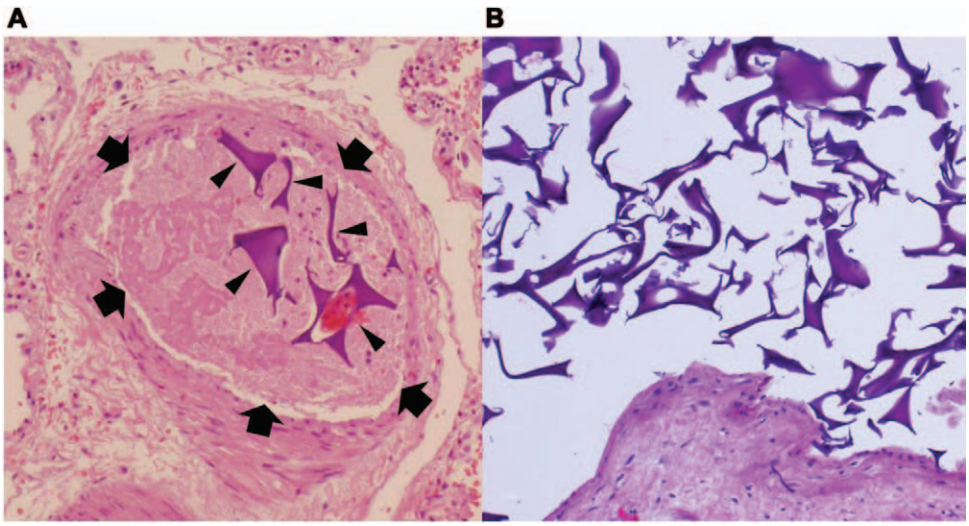

PULMONARY embolism during the course of anesthesia often presents without warning before sudden hypoxia and cardiovascular collapse. In addition to the ever-present risk of thromboembolism, disruption of the vasculature during the surgical procedure allows for the embolization of a host of foreign materials including air, gas, fat, bone marrow, and tumor.

The accompanying photograph (fig. A) was obtained at autopsy of a patient who sustained irreversible cardiopulmonary collapse after a brief episode of bleeding during a craniotomy for tumor resection. The cause of this patient's death was of great uncertainty until microscopic examination of the pulmonary vasculature demonstrated emboli (arrows) found to contain a foreign substance (arrowheads). This substance appeared identical to a control specimen of a commercially available thrombin–gelatin hemostatic matrix (fig. B). The hemostatic agent was applied by the surgeon during bleeding immediately before the collapse. The cause of death was determined to be a result of the embolization of the hemostatic matrix, leading to right heart failure and the development of coagulopathy. Right heart failure was likely related to the embolic load. Coagulopathy in this case may have resulted from either the embolic load itself or the intravascular introduction of thrombin; each of these mechanisms has been previously proposed.[1,2] Despite widespread topical hemostatic agent use, few cases of this phenomenon are published, and none have involved cranial surgery.[2,3] Anesthesiologists should be mindful of the possibility that a topical hemostatic agent, when introduced intravascularly, could become yet another source of intraoperative pulmonary embolism.

Competing Interests

The authors declare no competing interests.

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