CORRESPONDENCE

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Sympathetically Maintained Pain and the Use of Regional Anesthesia

To the Editor:—Although I agree that sympathetically maintained pain (SMP) may be "rekindled by surgery under general anesthesia" as described by Rocco,[1] it is important to emphasize that not all "regional techniques" may be efficacious in preventing its onset.

Pelisser and Eledjam[2] have described two cases in which patients with SMP developed a recurrence under general but not regional anesthesia following subsequent surgical procedures. The regional techniques employed were epidural anesthesia for lower extremity surgery and brachial plexus blockade for upper extremity surgery. It is important to realize that both of these regional techniques are associated with the preoperative onset of a sympathetic blockade, which could prevent the onset of SMP. Not all regional anesthetic techniques, however, result in a sympathetic block.

At our institution, carpal tunnel surgery frequently is performed using local anesthetic infiltration. From our experience, patients with SMP frequently develop a recurrence of their symptoms following this regional technique. Over the past year, it has been our practice to administer a stellate ganglion block to patients with SMP undergoing upper extremity surgical procedures with local anesthesia. Because of the success in decreasing the incidence of recurrent SMP, we also use this technique when these patients undergo general anesthesia.

Clearly, a large-scale randomized prospective study is required to confirm the possible benefit of preoperative sympathetic blockade in preventing recurrent sympathetically maintained pain.

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Echocardiographic Identification of Paradoxical Air Embolism

To the Editor:—Bedell *et al.*[1] report the first case of intraoperative paradoxical air embolism (PAE) during an episode of venous air embolism (VAE), as documented by transesophageal echocardiography (TEE), which can be attributed to transpulmonary passage of air. The idea of transpulmonary air passage is not new, nor is it a rare event in certain clinical situations in which VAE occurs. We commonly observe transpulmonary PAE during liver transplantation at the time of donor liver reperfusion and the release of the cross-clamps on the inferior vena cava.

The authors state in the discussion section that, during most clinical episodes of VAE, TEE utilization as a monitoring modality does *not* allow one to discriminate between PAE due to right-to-left interatrial shunting and transpulmonary passage of air. TEE *can* discriminate between intracardiac and transpulmonary passage of air emboli (fig. 1). Patients with intracardiac communications display immediate opacification of the left heart chambers after arrival of air emboli into the right heart chambers (fig. 1B). Patients with transpulmonary passage of air emboli display opacification of the left heart chambers approximately three to six (or more) ventricular contractions after air emboli leave the right heart chambers (fig. 1D).[2,3] Furthermore, real-time TEE interrogation of the right and/or left upper pulmonary veins can detect air emboli as they exit the pulmonary circulation and enter the left atrium. Thus, TEE *can* easily distinguish PAE resulting from intracardiac or transpulmonary air passage.

During surgical procedures in which there is significant risk of VAE, it is recommended that (1) continuous TEE monitoring be used; (2) two-dimensional contrast TEE with positive end-expiration pressure testing be performed to evaluate for the presence or absence of a potential right-to-left shunt[4]; (3) during an episode of VAE, the right atrium, left atrium, and interatrial septum immediately be in-