

Air Eliminating Filters that Allow Air to be Entrained When Negative Pressure is Applied

Presenting Author: Roger Marks, M.D. Assistant Professor of Clinical Anesthesia. University of Miami Miller School of Medicine. Miami, Florida.

Co-Author: Keren Marks, Medical Student. Hadassah School of Medicine. Jerusalem, Israel.

Introduction: A 27 yr old women with a tectal glioma presented for occipital craniotomy. Her past medical history included Factor V Leiden Heterozygosity, PFO with syncope and was further complicated by her now also being 26 weeks pregnant.

Methods: She was prepared with perioperative steroid therapy, lovenox and placement of an IVC filter. Intraoperatively, we placed a multi-lumen CVP catheter, precordial Doppler and fetal monitors before positioning the patient in the left lateral decubitus for surgery. At the recommendation of Cardiology, we also placed air-eliminating filters (Filtered Extension Set, B. Braun, PA, USA) on all her IV's, including the CVP, in order to reduce the risk of venous air embolism (VAE).

Results: During the procedure, while testing the CVP line for the ability to extract air from the right atrium, we noticed that air was being entrained into the line. We removed the filters, which solved the problem. We subsequently tested the filters and noted that air could be entrained by applying negative pressure, both proximal and distal to the filter.

Discussion: The fact that the air-eliminating filter allowed air to be entrained could have put this patient at risk for VAE, because we would not have been able to remove air via the CVP. Additionally, we avoided using muscle relaxants after induction in order to allow for monitoring of transcranial motor evoked potentials. This means that the patient could theoretically have begun to breath spontaneously, in which case she could "suck air" directly in to her heart via the filter that was attached to her central line. In conclusion, the air-eliminating filter should not be used on a port that is connected to a central line as this puts the patient at risk for VAE. We recommend that the manufacturer add this warning to the packaging.

