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Liquid Ventilation: A Theoretically Beneficial Approach in Treating Systemic Air Embolism in Lung Trauma

To the Editor:—With great interest, I read the excellent article about systemic air embolism (SAE) after lung trauma by Ho and Ling.¹ Although I have not found any case report in the literature, liquid ventilation might be a theoretically beneficial approach in treating this condition. Total or partial liquid ventilation is used in many studies for the treatment of patients with severe acute respiratory distress syndrome (ARDS) and studied in various animal studies with different design.²⁻⁴ These studies show a marked reduction in peak airway pressures, which are identified by Ho and Ling¹ as detrimental in the setting of systemic air embolism in lung trauma. The used perfluorocarbon liquid does not seem to be toxic even if absorbed in larger quantities, as shown in a study in which it was used as a supplement for cardioplegic solution.⁵ Starting total liquid ventilation immediately after the diagnosis of systemic air embolism in lung trauma might therefore be a possibility to stop the entrance of gas in the systemic circulation until surgical repair of the leakage is completed. The spontaneous closure of small leaks might also be enhanced by changing the surface contact from gas to liquid. Especially in patients in whom an isolation of the injured lung is not possible, liquid ventilation offers a treatment opportunity for the complete organ. This “flooding of the field” might be accompanied by a significant entrance of perfluorocarbon in the systemic circulation and, if partial liquid ventilation is used, might not prevent air entrance completely. Before using this concept clinically, animal studies in a lung injury model should be initiated to

assess the feasibility and possible side effects of liquid ventilation for treatment or prevention of systemic air embolism after lung trauma.

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