PEEP and Grossly Obese Anesthetized Patients

To the Editor: —Salem et al. have recently reported that discontinuation of 10–12 cm H₂O PEEP from high-tidal-volume controlled ventilation in grossly obese anesthetized patients caused a decrease in A-aPo₂. The abrupt (2 min) initial decrease in A-aPo₂ from 365 to 350 torr was probably due to an increase in cardiac output following the removal of PEEP. The slower (5–30 min) subsequent decrease in A-aPo₂ from 350 to 325 torr was probably due to the reversal of the PEEP-induced "redistribution of pulmonary blood flow to nonventilated regions, thus augmenting intrapulmonary shunt flow and venous admixture." There are quantitative data to support this contention.* Salem et al. concluded "the use of PEEP superimposed on high tidal volumes does not have any salutary effect on Po₂ during the intraoperative management of grossly obese patients." We believe that their data do not warrant this conclusion.

First, Salem et al. imply by their conclusion that all levels of PEEP are ineffective in all obese patients undergoing surgical procedures. Surely with different age groups, position changes, presence of pulmonary disease, etc., the use of PEEP might be efficacious. Also, only one level of PEEP was used and, therefore, responses to lower or higher levels of PEEP were not determined. Kirby et al. have shown that high levels of PEEP are sometimes necessary to effect clinically significant decreases in intrapulmonary shunting.  


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In reply: —Dr. Koehler states that contrary to the findings of our recently published report, her experience has been that the application of PEEP is valuable in the anesthetic management of the morbidly obese. Her patients were anesthetized using a balanced technique while maintaining an inspired oxygen concentration (FiO₂) of 30 to 35 per cent. The use of an FiO₂ of 0.3 to 0.35 seems inadvisable and may be dangerous to the grossly obese patient. Vaughan and Wise have demonstrated that: 1) oxygen, 40 per cent, did not uniformly produce adequate oxygenation for intra-abdominal operations in otherwise healthy obese patients; 2) placement of a subdiaphragmatic pack resulted in a consistent decrease in PaO₂ in each patient to less than 65 torr even though FiO₂ was 0.41; 3) 77 per cent of these patients had PaO₂ values of less than 80 torr at FiO₂ 0.4. On the other hand, with the use of high FiO₂ and high tidal volumes, PaO₂ values were well above 100 torr in all patients intraoperatively.  

Dr. Koehler does not provide any evidence derived from a prospective study, but rather a simple observation that when a PaO₂ value below 100 torr was encountered, the application of PEEP resulted in improvement in arterial oxygenation. We do not think that the difference between her observations and our findings could be attributed to either the surgical procedure or the myocardial depression resulting from the combined effect of enflurane and PEEP. We have not observed any increase in arterial oxygenation dur-