References


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In Reply—Drs. Singh Heir and Gottumukkala are right: If a surgeon asks for an “extreme Trendelenburg” position, one cannot use the head-up position as a strategy to counteract hypoxemia, unless in an emergency!

The negative effects of the Trendelenburg position have been investigated by others. 1–3 Any conclusion taken from our data on the Trendelenburg position is merely speculative, provided we set out to investigate the beach chair position and positive end-expiratory pressure (PEEP). 4 Nevertheless, our data allow some speculation on the aspect brought up by Drs. Singh Heir and Gottumukkala in their letter.

In a sedated and paralyzed patient, pleural pressures displace the relaxed diaphragm downward, hence increasing end-expiratory lung volume, while intraabdominal pressure (IAP) acts as a counterpressure to the forces shifting the diaphragm upward. When we estimated pleural pressure as $P_{pl} = (PEEP + P_{PEEP}) \times \frac{Ew}{(El + Ew)}$ in the supine and beach chair positions with and without PEEP, and considered changes of IAP due to the beach chair position ($\Delta IAP$) to obtain an indicative “push-down pressure” ($P_{pl} + \Delta IAP$), we found that this was positively correlated with end-expiratory lung volume ($R^2 = 0.857, P < 0.001, m = 0.67$, multiple linear regression analysis). We did not measure IAP changes occurring in the extreme Trendelenburg position. However, we would anticipate that an increase in the forces shifting the diaphragm upward would ensue following the same physical rule. In this condition, PEEP (hence $P_{pl}$) may be used as a counterpressure that opposes diaphragm upward shift, thus preserving lung volume.

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