

Individualized vs. fixed PEEP for intraoperative mechanical ventilation in patients with obesity

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Video Abstract

Keywords: positive end-expiratory pressure, PEEP, individualized PEEP, fixed PEEP, laparoscopy, laparoscopic surgery, obese patients, bariatric patients, alveolar recruitment, recruitment maneuver, atelectasis, lung collapse, pulmonary complications, mechanical ventilation, pulmonary function, lung function, PROBESE, anesthesia, anaesthesia, anesthesiology, anaesthesiology

Posted Date: October 12th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-966062/v1>

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Abstract

It's well known that anesthesia can cause lung collapse and poor oxygenation in patients with obesity. Positive end-expiratory pressure, or PEEP, helps keep alveoli open and improve ventilation during surgery. But the best method of applying PEEP remains controversial. Standardized PEEP levels are applied with the intent to ensure that alveoli stay open during surgery, but they may be too high or low for an individual patient and may therefore cause unintended lung damage that persists well after surgery. It's also unclear whether fixed or individualized PEEP leads to better outcomes. To find out, a recent study published in the journal *Anesthesiology* analyzed data from two trials on patients with obesity undergoing laparoscopic bariatric surgery. Researchers split the patients in the two trials into three groups: one with a low fixed PEEP of 4–5 cm H₂O, one with recruitment maneuvers and a higher fixed PEEP of 12 cm H₂O, and one with recruitment maneuvers and individualized PEEP levels determined by electrical impedance tomography. The PEEP levels in the individualized group ranged from 10 to 26 cm H₂O, with a median of 18 cm H₂O. The results showed that tailoring PEEP levels to patients offered substantial benefits in terms of alveolar recruitment and lung function during surgery. Compared with the fixed PEEP approaches, the individualized PEEP strategy resulted in greater arterial oxygenation, lower driving pressures, and more tidal ventilation in the dependent lung. Notably, because these benefits did not persist after extubation, it's unclear whether the individualized strategy could reduce postoperative complications. The findings of this study are also applicable only to laparoscopic surgery in which 30-degree reverse Trendelenburg positioning is used and in which PEEP titration is performed before initiation of capnoperitoneum. Further research is needed to determine if the alveolar recruitment enabled by the individualized PEEP strategy can be preserved after extubation through various measures intended to prevent lung collapse. If so, using individualized PEEP rather than fixed PEEP may help improve pulmonary outcomes for patients with obesity who are undergoing bariatric surgery.