INTRAOPERATIVE TIDAL VOLUME AS A RISK FACTOR FOR RESPIRATORY FAILURE AFTER PNEUMONECTOMY

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Pneumonectomy is a high-risk surgical procedure that predisposes patients to postoperative respiratory failure and other pulmonary complications. Respiratory failure is a leading cause of postoperative morbidity and mortality in patients undergoing pneumonectomy. Several intraoperative risk factors for respiratory failure have been identified, including excessive perioperative fluid administration, duration of operation, extent of lung resection, right-sided pneumonectomy, and high intraoperative airway pressures. Mechanical ventilation of patients undergoing pneumonectomy is often accompanied by high intraoperative airway pressures. Potential causes of high airway pressures include a decrease in pulmonary compliance, an increase in pulmonary or airway resistance, and the use of large tidal volume (VT). Alveolar overdistension associated with the use of large VT may lead to alveolar stretch injury and the development of permeability pulmonary edema. Clinical and experimental studies identified large tidal volume (Vt) as an important risk factor for development of acute respiratory failure and acute lung injury (ALI). High tidal volumes can trigger an increase in some inflammatory mediators in both experimental and clinical settings. High inspiratory pressures and/or a collapse of alveoli in every respiratory cycle would lead not only to an impairment of oxygenation, but also to a further incidence of 'postpneumonectomy pulmonary edema. Pulmonary oxidative stress and an increase in proinflammatory cytokines are significant contributors to lung injury following thoracic surgery. Pulmonary damage in the form of acute lung injury and adult respiratory distress syndrome is a major cause of morbidity and mortality after thoracic surgery.