

## **Abstract**

**PURPOSE:** Compared with open thoracotomy, minimally invasive esophagectomy (MIE) methods, such as transhiatal or thoracoscopic esophagectomy, likely have lower morbidity. However, the relationship between intraoperative fluid management and postoperative complications after MIE remains unclear. Thus, we investigated the association of cumulative intraoperative fluid balance and postoperative complications in patients undergoing MIE.

**METHODS:** This single-center retrospective cohort study examined patients undergoing thoracoscopic esophagectomy for esophageal cancer in the prone position. Postoperative complications included pneumonia, arrhythmia, thrombotic events and acute kidney injury (AKI). We compared patients with higher and lower intraoperative fluid balance (higher and lower than the median). Multivariable logistic regression analyses were performed to estimate the odds ratio of intraoperative fluid balance status on the incidence of postoperative complications.

**RESULTS:** In total, 135 patients were included in the study. Postoperative complications occurred in 43 (32%), including cardiac arrhythmia (n = 12, 9%),

thrombosis (n = 20, 15%), pneumonia (n = 13, 10%), and AKI required hemodialysis (n = 1, 1%). Patients with a higher fluid balance had higher incidence of complications than those with a lower fluid balance (46% vs. 18%,  $p < 0.001$ ). After adjusting for age, ASA-PS  $\geq$  III, blood loss, and the use of radical surgery, the higher intraoperative fluid balance group was significantly and independently associated with postoperative complications (adjusted OR 5.31, 95% CI 2.26 to 13.6,  $p < 0.0001$ ).

**CONCLUSIONS:** In patients undergoing thoracoscopic esophagectomy in the prone position, a greater intraoperative positive fluid balance was independently associated with a higher incidence of complications.