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## Preoperative Volume Assessment Using Bioelectrical Impedance Analysis For Minimizing Blood Loss During Hepatic Resection

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**Background :** Maintaining low central venous pressure is an effective strategy to reduce blood loss during hepatic resection. As an alternative to measuring central venous pressure, which requires the placement of a central venous catheter, bioelectrical impedance analysis is a noninvasive and rapid processing method recently used for monitoring volume status in critically ill patients. The aim of this study was to determine whether preoperative volume assessment using bioelectrical impedance analysis can be useful for minimizing blood loss during hepatic resection.

**Methods :** We investigated 149 patients with well-preserved liver function who underwent hepatic resection from January 2017 to December 2020. The ratio of extracellular water:total body water, as an index of volume status, was measured using InBody S10 (Biospace, Seoul, Korea). The correlation between the extracellular water:total body water ratio and central venous pressure was investigated, and the values were validated to determine their influence on intraoperative and perioperative outcomes.

**Results :** Extracellular water:total body water ratio and central venous pressure showed a significant correlation; an extracellular water:total body water ratio  $< 0.378$  correlated with a central venous pressure  $< 5$  mmHg ( $R^2 = 0.839$ ,  $P < 0.001$ ). Estimated blood loss was significantly increased in patients with an extracellular water:total body water ratio  $\geq 0.378$  compared to those with a ratio  $< 0.378$  ( $508 \pm 321$  mL vs.  $324 \pm 193$  mL,  $P < 0.001$ ). Identified predictors for an estimated blood loss  $\geq 500$  mL were body mass index (odds ratio, 1.151; 95% confidence interval, 1.037 – 1.278;  $P = 0.008$ ) and an extracellular water:total body water ratio  $< 0.378$  (odds ratio, 0.271; 95% confidence interval, 0.127 – 0.577;  $P = 0.001$ ).

**Conclusions :** Preoperative volume assessment using bioelectrical impedance analysis can be utilized for maintaining low central venous pressure to minimize blood loss during hepatic resection.

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