Airway Assessment Indicators as Predictors of Excised Volume of Tongue Base in Obstructive Sleep Apnea Patients Undergoing Transoral Robotic Surgery

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Objective: Previous research has established a strong correlation between the excised volume of tongue base (EVTB) and the surgical outcomes of transoral robotic surgery (TORS) for obstructive sleep apnea (OSA). This study aimed to examine potential predictors identified during preoperative airway assessments, particularly intubation parameters, that may influence EVTB in OSA patients undergoing TORS.

Methods: Patients who were newly diagnosed with OSA and scheduled for TORS for tongue base reduction between October 2018 and May 2024 were included following informed consent. We collected demographic data (e.g., age, gender, body mass index (BMI)), OSA severity assessments (e.g., questionnaire, polysomnography, drug-induced sleep endoscopy), pre-intubation evaluations (e.g., American Society of Anesthesiologists (ASA) classification, modified Mallampati score (mMallampati), anthropometric measurements, masking difficulty score), intubation records (e.g., Cormack-Lehane grading, intubation time, intubation difficulty scale), and surgical data (e.g., depth and distance to midline of the lingual arteries, EVTB). Univariate and multivariate linear regression analyses were conducted to identify correlations between EVTB and the various parameters.

Results: A total of 150 cases were included. Univariate regression indicated significant correlations between EVTB and several factors: male ($\beta = 1.59$, $p = 0.001$), mMallampati of IV compared to I ($\beta = -1.46$, $p = 0.016$), neck circumference ($\beta = 0.19$, $p = 0.003$), intubation time ($\beta = -0.01$, $p = 0.007$), and distance to midline of the lingual arteries ($\beta = 2.75$, $p < 0.001$). Multivariate analysis confirmed the following significant predictors: mMallampati IV versus I ($\beta = -1.60$, $p = 0.008$), intubation time ($\beta = -0.02$, $p = 0.015$), and distance to midline of the lingual arteries ($\beta = 2.34$, $p = 0.003$).

Conclusion: mMallampati of IV compared to I, intubation time, and distance to midline of the lingual arteries were found to predict the EVTB of TORS for OSA. This information could assist surgeons to anticipate the outcome of the surgery.

Key words: Obstructive Sleep Apnea, Airway Assessment, Transoral robotic surgery, Excised Volume of Tongue Base

中文題目： 針對接受經口機械手臂手術治療之睡眠呼吸中止症病患，探討舌根切除體積的預測因子

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