

# Role of Impulse Oscillometry in Children with Airway Narrowing After Bronchoscopic Stent Implantation, a Pilot Observational Study

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## Abstract

**Introduction:** Airway stent implantation may alleviate respiratory difficulties in pediatric patients with airway narrowing, yet its physiological changes in pulmonary function tests remain unknown. Our objective is to determine the aerodynamic changes after stent implantation by spirometry and impulse oscillometry in children with airway stent implantation. **Methods:** A retrospective chart review was conducted at China Medical University Children's Hospital, Taichung, Taiwan between January 2019 and October 2022. **Results:** Four adolescents with successful stent implantation received impulse oscillometry examination (IOS) before and after BONA stent implantation. The results showed no significant reduction in total airway resistance (R5) ( $1.66\pm 0.44$  vs.  $1.25\pm 0.21$ ,  $P = 0.10$ ) or central airway resistance (R20) ( $0.74\pm 0.21$  vs.  $0.70\pm 0.11$ ,  $P = 0.63$ ). However, there was significant improvement in small airway resistance ( $0.92\pm 0.36$  vs.  $0.56\pm 0.27$ ,  $P = 0.04$ ) after stent implantation. Meanwhile, all patients had a positive bronchodilator test response in impulse oscillometry before and after stent implantation. Inhaled corticosteroids with long-acting beta-2 agonists were given to all four patients after stent implantation. **Conclusions:** IOS could be used as a non-invasive tool for monitoring pulmonary function after airway stent implantation. Peripheral airway resistance, but not total or central airway resistance, may be improved after airway stent implantation. However, chronic airway inflammation may remain and require long-term inhaled steroid with bronchodilator treatment.

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