Efficacy of Jaw Elevation Device (JED) for maintenance of upper airway patency during transcatheter aortic valve replacement under deep sedation

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Introduction

There has been a growing popularity of performing transcatheter aortic valve replacement (TAVR) under sedation. However, insecurity of upper airway patency caused by deep sedation poses great challenges. To counteract the collapse of upper airway, we have adopted Jaw Elevation Device (JED®: Hypnoz Therapeutic Devices), an externally applicable device that holds up the mandible so that the upper airway can be kept patent non-invasively. The purpose of this study was to determine whether the intraoperative use of JED® is efficacious in improving the upper airway patency during deep sedation for TAVR.

Methods

We retrospectively reviewed medical and anesthetic records from patients who underwent transfemoral TAVR under sedation with or without JED between May 2018 and November 2018. The primary outcome was the upper airway obstruction (UAO) score; 0: no snoring/obstruction, 1: snoring, 2: spontaneously resolving UAO within a few breaths, 3: UAO resolved with manual jaw thrust, 4: UAO requiring mask ventilation, 5: UAO required airway devices. This study was approved by the institutional human research committee (Approved No. 20130023) and the written informed consents for data collection were obtained from the patients prior to the procedures.

Results

Data were collected from 46 patients, of which 31 were anesthetized with JED [JED (+) group] and 15 were managed without any airway device [JED (-) group]. Baseline characteristics and preoperative variables were comparable between groups. None of the patients in either group required insertion of any alternative airway devices or conversion to general anesthesia during the procedure. JED (+) group showed significantly less upper airway obstruction scores at valve deployment with median (interquartile range) of 0 (0-1) compared with 3 (2.5-3) in JED (-) group (P < 0.0001). There were frequent needs for manual jaw thrusts in JED (-) groups, whereas none required in JED (+) group.

Discussion

Our data suggest that JED is effective in securing upper airway patency in a non-invasive manner, and therefore can be a viable option for deep sedation during TAVR procedure. Considering complicated and demanding anesthetic managements during TAVR procedure, provision of hands-free environment by JED may significantly contribute to the improvement in safety.