**INTRODUCTION**

Obstructive sleep apnea (OSA) is a medical problem that afflicts millions of Americans with considerable sequelae. For many patients, OSA is a multi-level disorder with obstruction in the nasal cavity, soft palate, lateral pharyngeal walls, and tongue base all contributing to airway impingement.1 While the nasal and oropharyngeal regions are easily accessed, the majority of existing procedures implemented for the management of OSA typically have restricted surgical access to the base of tongue and hypopharynx resulting in line-of-sight issues and difficulty controlling intraoperative bleeding. Transoral robotic surgery (TORS) provides excellent exposure to the tongue base and lingual tonsils. We aim to assess the success of robotically assisted partial glossectomy for tongue base reduction in patients with OSA.

**METHODS**

After approval was obtained from the Institutional Review Board of Columbia University Medical Center, the medical records of the patients with lingual tonsillar hypertrophy who had undergone TORS for surgical management of OSA from 2011 through 2012 were reviewed. All OSA patients of the senior author were prescribed to use CPAP for at least one month and only those who could not tolerate CPAP were considered for the surgical treatment. Every patient underwent drug induced sleep endoscopy (DISE) prior to the procedure, and only those patients found to have significant base of tongue hypertrophy were recommended to have TORS. Patients underwent a polysomnography evaluation prior to surgery and at least 3 months after surgery. Patients who did not undergo post-operative polysomnography were excluded from this study. Pre-operative and post-operative polysomnography results were compared to assess for improvement in OSA. Of the 23 patients included in this study, 20 had obstructive sleep apnea, 2 had obstructive hypopnea, and 1 had central sleep apnea.

The central portion of the lingual surface of the epiglottis was scored with the robotic camera, and the partial glossectomy (DISE) prior to the procedure, and only those patients found to have significant base of tongue hypertrophy were recommended to have TORS. Patients underwent a polysomnography evaluation prior to surgery and at least 3 months after surgery. Patients who did not undergo post-operative polysomnography were excluded from this study. Pre-operative and post-operative polysomnography results were compared to assess for improvement in OSA. Of the 23 patients included in this study, 20 had obstructive sleep apnea, 2 had obstructive hypopnea, and 1 had central sleep apnea.

**DISCUSSION (cont’t)**

TORS not only provides excellent exposure, but also greater surgical access to the base of tongue and lingual tonsils. In our study, we found that patients who had undergone TORS for the surgical management of their lingual tonsilar hypertrophy not only had a significant reduction in the AHI on their post-operative polysomnography evaluations, but also noted to have a significant increase in the lowest oxygen saturation nadir. It is well known that OSA is associated with various health conditions ranging from daytime hypotension to systemic hypertension, pulmonary hypertension, cardiac arrhythmias, and sudden cardiac death, and by reducing the AHI patients have lower risk of these conditions. Interestingly, the severity of nocturnal hypoxemia has also been found to be a predictive factor of sudden cardiac death independent of the presence of OSA.2 Hence, when examining the efficacy of tongue base surgery, it is important to evaluate the change in oxygen saturation nadir.

Every patient in this study was successfully extubated prior to leaving the operating room and none required a tracheotomy in the perioperative setting for airway management. One patient experienced a post-operative hemorrhage on post-operative day 10 which required a return to the operating room for control. Majority of the patients experienced minor complications such as change in taste sensation, globus sensation, and increased phlegm production, all of which were transient and resolved fully.

OSA is often a multi-level disorder and surgical intervention must focus on the site (or sites) of obstruction. Nasal and oropharyngeal obstruction can be readily treated, however, hypopharynx and base of tongue regions are difficult to access safely. TORS provides excellent surgical access to the tongue base, allowing for improved lingual and/or oropharyngeal exposure for the management of OSA. In our patients who underwent robotically assisted partial glossectomy for OSA, there was a significant reduction in AHI, as well as a significant increase in oxygen saturation nadir. Further investigations with larger study groups and longer follow up periods are needed to better evaluate the long-term benefits and limitations of this technique.

**REFERENCES**