INTRODUCTION

Medical lasers have tissue ablative, cutting and hemostatic properties which depend on wavelength, method of delivery and mode of delivery. An understanding of these properties will allow the clinician to best utilize the lasers available. Although the majority of lesions requiring laser management can be handled with the traditional CO2 laser using a micromanipulator, occasionally there is need for a fiber-based delivery due to patient anatomical or functional constraints. This poster describes the use of the Ho:YAG laser for ENT lesions. This laser is commonly used by the Urology community for treatment of ureteral stones and prostatic hypertrophy. ENT physicians should be familiar with the properties of this laser to apply it to amenable lesions.

BACKGROUND

The Ho:YAG laser has a wavelength of 2.1 μm and preferential absorption of water. Thus it has similar tissue ablative properties as the Thulium and CO2 lasers with a shallow depth of penetration and minimal affinity for hemoglobin. The laser cannot be focused and thus has less incisional capability and causes more collateral thermal effect than the free-beam CO2 laser with the micromanipulator. Although the KTP laser also has a fiber-based delivery system and better absorption of hemoglobin, the depth of penetration can be up to several millimeters, which can be dangerous when working in the thoracic trachea with surrounding critical structures. The Ho:YAG laser has a pulsed delivery which does cause some tissue splatter and any hemostatic properties are through simple cautery.

STUDY METHODS

DESIGN: Retrospective Clinical Series

METHODS: Six patients underwent surgical treatment of upper airway lesions: 3 obstructing tracheal granulomas, 2 subglottic or tracheal respiratory papillomas, and 1 patient with benign tracheal stenosis. These patients had either anatomical or medical reasons that favored use of a fiber-based delivery system to expose and treat their lesions.

RESULTS: All patients had successful treatment of their airway lesions. The laser demonstrated coagulative and ablative properties in minimally vascular tissue. There were no complications related to the surgical procedure or to the use of the laser in any patient.

CONCLUSIONS

The Ho:YAG laser is excellent for superficial ablation of granulomas and papillomas of the upper airway when a fiber-based delivery is preferred. The shallow depth of penetration allows for safe use in the thoracic trachea. The laser’s hemostatic properties are through coagulation and thus it is not optimal for highly vascular lesions. Although there are only selected lesions that are optimal for use with this laser, the laser is commonly used by our urology colleagues and thus is widely available. Otolaryngologists should be familiar with this potential tool to optimize patient care.

Ho:YAG ablation of tracheal papillomatosis, and topical application of cidofovir. She has done well with these treatments requiring maintenance ablation on a 4-6 month schedule. Our ability to use the LMA with flexible bronchoscopy and maintenance of spontaneous ventilation has improved her tolerance of the anesthetic, and despite her significant medical comorbidities it is now a same day procedure.

REFERENCES