KTP Laser Safety and Efficacy in Benign Laryngeal Lesions

Mike C. Sheu, MD, MS, MPH; Benjamin C. Paul, MD; Shaum Sridtharan, MD; Sean Wang, MD; Maggie Kuhn, MD; Naren Venkatesan, MD; C. Blake Simpson, MD; Michael Johns, MD; Colin W. Fuller, MS; Aron Pollack, MD; Pavan Mullur, MD; Milan Amin, MD; Ryan C. Branski, PhD

ABSTRACT

Objective: The potassium titanyl phosphate (KTP) laser is increasingly used to treat laryngeal papillomatosis and other laryngeal lesions and has been shown to be safe and effective in treatment of vocal nodes and nodules. In this study we introduced a method to quantify the safety and efficacy of the KTP laser in laryngeal lesions.

Methods: Pre- and post-KTP laser treatment videos were obtained from three institutions. The change in size of lesions in all cases was measured using a novel objective computerized method. A number of videos were evaluated by blinded raters and presented the measures of safety.

Results: More than 100 larynges underwent treatment for a variety of laryngeal lesions. Regardless of lesion type, there was a decrease in size based upon objective computerized measurement. All KTP laser cases were evaluated using this method.

Conclusion: KTP laser in laryngeal mucosal lesions is safe and effective based upon our safety rating method and computerized measurement system. This system can be reliably used as a reproducible measure of lesion regression post therapy and will provide the necessary data to evaluate KTP efficacy in laryngeal procedures.

INTRODUCTION

METHODS

RESULTS - EFFICACY

DISCUSSION

CONCLUSIONS

REFERENCES

ABSTRACT

Objective: The potassium titanyl phosphate (KTP) laser is increasingly used to treat laryngeal papillomatosis and other laryngeal lesions and has been shown to be safe and effective in treatment of vocal nodes and nodules. In this study we introduced a method to quantify the safety and efficacy of the KTP laser in laryngeal lesions.

Methods: Pre- and post-KTP laser treatment videos were obtained from three institutions. The change in size of lesions in all cases was measured using a novel objective computerized method. A number of videos were evaluated by blinded raters and presented the measures of safety.

Results: More than 100 larynges underwent treatment for a variety of laryngeal lesions. Regardless of lesion type, there was a decrease in size based upon objective computerized measurement. All KTP laser cases were evaluated using this method.

Conclusion: KTP laser in laryngeal mucosal lesions is safe and effective based upon our safety rating method and computerized measurement system. This system can be reliably used as a reproducible measure of lesion regression post therapy and will provide the necessary data to evaluate KTP efficacy in laryngeal procedures.

INTRODUCTION

The clinical use of non ablative laser therapy continues to mature. The KTP laser has gained popularity for treatment of vocal nodes and nodules due to its good correlation to clinical outcome similar to vascular lesions; possibly due to a non-specific thermal injury sustained from light therapy (1). The KTP laser is considered to have greater potential for use in benign laryngeal lesions due to minimal side effects and its potential to preserve normal vocal fold tissue (2). The blood vessels are in the larynx proper; after KTP laser application, the epithelium should remain intact with minimal side effects. Given this background, the first objective was to ensure that fibrosis resulting in altrient mucosal wave and glottic closure did not accompany KTP laser use.

Quantifying lesion change after KTP use:

Objective: Quantitative measurement of lesion size before and after laryngeal KTP laser therapy using computerized measurement of lesion size demonstrated that the change in lesion size at initial presentation, first follow-up, and second follow-up visit were statistically significant with a p<0.0001 for each.

Intra-observer Reliability: 0.999 correlation coefficient was observed across three raters at two institutions.

Inter-rater Reliability: The second objective is to further apply a standardized technique to evaluate lesion size across different pathologies focusing on inter-rater reliability.

METHODS

RESULTS - EFFICACY

DISCUSSION

CONCLUSIONS

REFERENCES

KTP laser caused lesion regression in a diversity of vascular and nonvascular laryngeal pathology. The outcome of the KTP laser may be more accurately evaluated by the lesion treated rather than the photocoagulation.

The effect of KTP laser appears to persist for extended durations.

Our novel vocal fold lesion quantification protocol is in progress for assessing lesion size/shape with high inter-rater reliability. 0.999 correlation coefficient was observed across three raters at two institutions.

Given this background, the first objective was to ensure that fibrosis resulting in altrient mucosal wave and glottic closure did not accompany KTP laser use.

Quantifying lesion change after KTP use: Objectives: Quantitative measurement of lesion size before and after laryngeal KTP laser therapy using computerized measurement of lesion size demonstrated that the change in lesion size at initial presentation, first follow-up, and second follow-up visit were statistically significant with a p<0.0001 for each.

Intra-observer Reliability: 0.999 correlation coefficient was observed across three raters at two institutions.

Inter-rater Reliability: The second objective is to further apply a standardized technique to evaluate lesion size across different pathologies focusing on inter-rater reliability.

METHODS

RESULTS - EFFICACY

DISCUSSION

CONCLUSIONS

REFERENCES