KTP Laser in the Treatment of Early Glottic Cancer: A Viable Alternative

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Introduction

The vast majority of early glottic cancers are treated with single modality therapy: radiation or CO2 laser surgery. An emerging technique utilising the potassium titanyl phosphate (KTP) laser also appears to be effective as a single modality treatment. The project’s aim was to assess the efficacy and voice outcomes of KTP laser in the treatment of early glottic cancer.

Methods

A retrospective chart review was undertaken of consecutive patients treated with KTP laser for T1aN0M0 and T1bN0M0 early glottic cancer under a single treating surgeon. Ethics approval was granted. Patients underwent routine tumor board workup, biopsy and 2 definitive staged KTP laser treatments 6 weeks apart. Routine cancer follow-up was conducted with a final assessment and data collection at 2 years. Videostroboscopy was performed and the voice handicap index (VHI) form completed before surgery and at 2 years following treatment.

Results

Of the 12 cancers (11 patients) included (10 male, 1 female) 8 were T1a and 4 T1b with one patient having bilateral T1a lesions. All patients completed follow up at 2 years and remained disease free. The mean VHI was 72 preoperatively improving to 19 postoperatively at 2 years.

Conclusion: KTP laser provides a reasonable alternative to radiation or CO2 laser excision for T1aN0M0 glottic cancer. The success rate in this pilot study is comparable to existing treatment methods and voice outcomes appear to be very good. In addition, radiotherapy was avoided preserving it as a future treatment option in all cases. This avoids the short and long term toxicity of that treatment.

INTRODUCTION

Treatment of early glottic squamous cell carcinoma has a high cure rate of over 90% using either of the two widely accepted modalities: radiation or transoral CO2 laser microsurgery (TLM). Given that both are highly effective modalities, one can look to other metrics to help guide the treatment path. Voice function following treatment is very important for patients both in occupational and social settings so treatment providing maximal voice preservation is critical.

The KTP laser has shown promise in treating early glottic cancer when used both as a photoangiolytic laser and as an ablative cutting tool, much like the CO2 laser. The ability of the KTP laser to permit maximal glottal tissue preservation enables optimal function of the post-surgery layered microstructure of the vocal fold. Many patients after KTP laser treatment have near normal/normal voice not requiring reconstruction and such voice outcomes exist out to 2 years.

In a setting where the KTP laser is used as first line treatment, radiotherapy can be preserved as a second line modality and in doing so, may spare many patients the short and long term effects of toxicity.

Consecutive patients with early glottic squamous cell carcinoma (SCC) presenting to the author’s tertiary referral laryngology practice over 12 months were included. All patients had not undergone prior treatment of any kind. All patients were biopsy proven SCC and staged as T1aN0M0 or T1bN0M0.

Microscopy was performed on all with high definition video recording and basic aerodynamic and acoustic measurements were obtained (maximal phonation time, pitch range, fundamental frequency). In addition, the voice handicap index (VHI) was completed prior to treatment.

All patients underwent a 2 staged KTP laser microlaryngoscopy and treatment protocol separated by 6 weeks and remained disease free for the entire study period. Final results were collected at 2 years following completion of treatment.

RESULTS

Twelve glottic cancers (11 patients) were included in this study with all completing the preliminary follow-up period of 2 years. There were no local or regional failures and no patients progressed to additional salvage surgery (either endoscopic or open) or radiation. At the 2 year follow-up review, all patients were alive without disease and had improved maximal phonation time. The voice quality was significantly better than pre-KTP laser treatment.

Of the 12 cancers, there were 11 males and 1 female with average age 58.6 years (45-76 years).

Eight cancers were T1aN0M0 with 4 cancers T1bN0M0. The voice handicap index (VHI) was 72 (34-108) before treatment and at 2 years was 19 (0-40). Maximal phonation time improved after treatment from 8.1 seconds (6-11) to 11.5 (7-17).

No patients had complete pre and post aerodynamic and acoustic data so the fundamental frequency and frequency range were excluded from analysis.

No patients experienced any peri-operative complications.

CONCLUSIONS

KTP laser treatment of selected early glottic cancers may provide a viable treatment modality with similar efficacy but improved vocal outcomes. It is well tolerated by patients and can preserve radiation treatment for future use should the need arise. It is feasible a large proportion of early glottic cancer patients could therefore avoid radiation as a first line treatment and with that, its short and long term toxicity. A larger study into long term outcomes from KTP laser treatment of early glottic cancer is currently underway.

REFERENCES


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