Ultrasonic Surgical Aspirator-assisted Phonosurgery: A novel technique for laryngeal cartilage dissection

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ABSTRACT

Since the first description of type I Thyroplasty by Ishikki in 1974,1 medialization thyroplasty has been a mainstay of treatment for many patients suffering from glottic insufficiency. Though the technique is simple, complications such as inability to intubate, and the slow healing of the thyroplasty window are well described. The use of a three-dimensional surgical navigation system (SonoPet Ultrasonic Surgical System, Stryker Neurovascular, Kalamazoo, MI) has allowed for increased precision and the ability to plan a surgical course without the use of conventional techniques.

INTRODUCTION

The ultrasonic surgical aspirator was used in our series to facilitate window creation in 50 patients undergoing laryngeal framework surgery. Of these, 10 patients underwent primary type I thyroplasty, 10 underwent bilateral type I thyroplasty, and 30 underwent bilateral internal arytenoid adduction. The new surgical aspirator utilizes a lightweight handpiece which is familiar to the most otolaryngologists. The handpiece is connected to an ultrasonic transducer which produces tissue vibration at a frequency of 25KHz. The energy is then converted to heat where it acts to create a surgical opening. The device can be used independently or in combination with a saline infusion system to create a window without the necessity of a drill.

METHODS AND MATERIALS

A retrospective chart review was performed over a two year period from July 1, 2010 through June 30, 2012. We included 50 patients that underwent laryngeal framework surgery, without previous laryngeal surgery, with a thyroplasty window created by ultrasonic surgical aspirator. We excluded patients undergoing revision thyroplasty as there was no previously dissected thyroplasty window. The study was performed as a retrospective cohort analysis. The mean age of patients was 64 years (range, 48-85 years) and 58% were male. The mean operative time was 76.5 minutes while the mean follow-up was 99 days (range, 6-424 days).

RESULTS

The mean operative time in the ultrasonic dissection group was 76 minutes while the mean operative time in the sharp dissection/drill group was 85 minutes (Table 1). This was a nonsignificant difference in operative times with a p-value of 0.22 using a two-sample t-test with equal variance.

CONCLUSIONS

We describe the first in-vivo series using the ultrasonic surgical aspirator for laryngeal framework surgery. Our preliminary results indicate that this is an efficient, effective and alternatives for the drill for creation of a medialization thyroplasty window and other laryngeal framework surgery. Larger studies comparing the operative times and complication rates are required to compare the surgical aspirator with the standard techniques.

REFERENCES


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