Voice and Ventilation: Unilateral Laryngeal Pacing Versus Unilateral Cordotomy for the Treatment of Iatrogenic Bilateral Vocal Fold Paralysis

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INTRODUCTION

Currently, the treatment of bilateral vocal fold paralysis (BVFP) is mediocre at best. Options include cordotomy, suture lateralization, arytenoidectomy, or tracheostomy. The problem with these treatment modalities is that they leave the patient and the otolaryngologist in the uncomfortable position of choosing between good voice and tracheotomy, or a good airway and bad voice [1-3].

Laryngeal pacing, a novel method of treating BVFP, has been studied for several years. Laryngeal pacing works by direct electrical stimulation of the Posterior Cricoarytenoid Muscle (PCA), thereby resulting in abduction of the vocal folds [4]. Laryngeal pacing leaves the endolarynx unharmed and is a functional means of treating BVFP (Figure 1). To date, laryngeal pacing has been studied extensively in the canine model [5]. A study by Zealear et al. in 2003 also proved the validity of the technology in humans [6].

However, to date, there have been no clinical studies comparing laryngeal pacing to the current gold standard of treatment for BVFP, cordotomy (Figure 2). Therefore, we felt it necessary to compare unilateral laryngeal pacing to unilateral CO₂ laser cordotomy for the treatment of BVFP.

METHODS

A total of seven patients were identified, four in the laryngeal pacing arm, and three in the cordotomy arm. All seven patients had undergone a thyroidectomy leading to BVFP. The patients in the laryngeal pacing arm were previously published in the 2003 article by Zealear et al [6]. The four patients in the cordotomy arm were treated at the Vanderbilt Voice Center since that time. All patients underwent post-operative pulmonary function testing (PFTs) and post-operative voice assessment by a board certified Speech Pathologist. The PFTs were performed to determine the peak inspiratory flow (PIF), a well known marker of inspiratory airway resistance [6]. The speech pathologists specifically analyzed each patients voice and rated the quality of their voice using the GRBAS scale (Table 1) [7].

RESULTS

The results of our study show that laryngeal pacing provides an adequate airway while preserving voice in patients with iatrogenic BVFP. The structure of the endolarynx and the true vocal folds is preserved while allowing for functional abduction of the vocal folds through direct electrical stimulation of the PCA muscle.

CONCLUSIONS

In a subset of patients who have iatrogenic injury to the RLN and subsequent BVFP, laryngeal pacing may be an option for providing an adequate airway while preserving voice. With the advent of newer, more reliable NMS devices, an upcoming clinical trial comparing bilateral laryngeal pacing to bilateral cordotomy will hopefully prove the benefit of laryngeal pacing for treatment of BVFP.

REFERENCES