

Thyroarytenoid Muscle Ablation for Treatment of Spasmodic Dysphonia

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ABSTRACT

Adductor spasmodic dysphonia is the most common form of laryngeal dystonia and comprises about 80% of all laryngeal dystonias. It is characterized by strained and strangled voice quality causing significant impairment to the patient. This article focuses on the surgical treatment of adductor spasmodic dysphonia by thyroarytenoid muscle ablation. It provides longlasting control of symptoms and patient satisfaction is very high.

Keywords: Thyroarytenoid, Ablation, Spasmodic, Dysphonia.

INTRODUCTION

Adductor spasmodic dysphonia is a voice disorder characterized by the spasms of the adductor muscles causing strangled voice breaks and a strained-strangled voice quality. In the past, Botulinum toxin injection has emerged as an accepted modality of treatment but it has some disadvantages in the form of temporary effect, need for repeated injections and high cost of treatment. This article focuses on the surgical treatment of adductor spasmodic dysphonia by thyroarytenoid muscle ablation. It provides longlasting control of symptoms and patient satisfaction is very high.

MATERIALS AND METHODS

Two female patients aged 40 and 45 years and a male patient 22 years of age with adductor spasmodic dysphonia were included in this study. In both the female patients, the average duration of symptoms was 11 years and the male patient was symptomatic since 2 years. Their voice assessment was done by the speech pathologist. In all the three patients voicing was effortful with strain and occasional hoarseness, but the essential symptom was voice breaks. Speech was characterized by strained or strangled phonation with inability to vary loudness and pitch range. A subjective evaluation of voice quality by the patient was done to determine the deviance of voice quality and the severity of disability or handicap in daily life and to determine the possible emotional repercussions of the dysphonia. All the patients showed high voice handicap index (VHI) scores. The presurgery VHI score for the three patients were 97, 104 and 100 respectively. Videostroboscopy procedure was performed by an experienced otolaryngologist, which was suggestive of adductor spasmodic dysphonia. Written informed consent was obtained before the surgery.

SURGICAL TECHNIQUE

The patients were taken under local anesthesia which enabled us to monitor the voice changes intraoperatively. Standard neck flexion with head extension was used for positioning. A horizontal skin crease incision was taken in the neck between the thyroid cartilage and the cricoids cartilage. The subplatysmal skin flaps were elevated. Strap muscles were dissected away and thyroid cartilage was exposed. A window of approximately 4 × 8 mm was designed on the thyroid ala, starting 5 mm from the midline (Fig. 1). A patent lower rim of cartilage was maintained just below the window. The perichondrium overlying



Fig. 1: Window made in thyroid cartilage for accessing the muscle

the cartilage window was incised, elevated and removed. This exposed the thyroarytenoid muscle which was ablated by a bipolar cautery. The same procedure was repeated on the opposite side, and thus bilateral thyroarytenoid muscle was ablated. The patient was asked to phonate intraoperatively and there was marked improvement in voice. The wound was closed in layers and the patient was discharged next day.

RESULTS

Postsurgery, in all the three patients, easy onset of phonation was observed. There were no voice breaks or strain in the voice. The voice was less effortful because of less forceful closing of the vocal cords. The patients were able to vary their loudness and pitch, and even sing to rhythm. VHI was repeated post-surgery which showed a reduced score, i.e. 24 in first patient, 32 in the second patient, 30 in the third one, thus indicating improvement in the quality of life which was earlier disrupted due to the voice handicap.

DISCUSSION

Laryngeal dystonia is a focal action-induced dystonia that affects laryngeal muscle control. These patients suffer from hyperfunction of the laryngeal muscles with excessive closing or opening of the glottis during phonation or respiration. Laryngeal dystonia is also referred to as spasmodic dysphonia.

Laryngeal dystonias can be classified as adductor type, abductor type, mixed type and adductor laryngeal breathing dystonia.¹ The adductor spasmodic dysphonia is characterized by spasms of the adductor muscles with resultant strangled, strained short-lived speech with frequent voice breaks. Repeated, effortful phonation leads to fatigue and a resultant breathy voice quality.

Since the mid 1980s, Botulinum toxin injection has emerged as an effective and standard treatment for spasmodic dysphonia. However, it is characterized by certain limitations like transient effect, need for repeated injections, a high cost of treatment, a breathy voice quality and development of resistance over a long period of time. Furthermore, a meta-analysis of botulinum toxin suggested that botulinum toxin treatments were not uniform and could be sex and age dependent (i.e. males might experience vocal breathiness for longer, and older patients might not respond as well). In addition, botulinum toxin did not seem to affect the abnormal behavior of the false vocal folds. Also, following botulinum toxin treatment, breathy dysphonia was variable and of considerable duration.²

Voice therapy in patients with spasmodic dysphonia generally has limited benefit, although it may help them gain greater insight into their voice production and reduce the hyperfunctional compensatory behaviors.³ Hence, voice therapy is not considered as the primary management protocol for individuals with spasmodic dysphonia.

Classical surgical option in the treatment of laryngeal dystonia includes resection of the recurrent laryngeal nerve unilaterally as described by Dedo in the 1976.⁴ However, in a

review series of recurrent laryngeal nerve resection by other investigators, failure rates reported were as high as 64% at 3 years⁵ and many patients had worsening of their voice after surgery. So nerve section has largely fallen out of favor.

Other alternative therapies include ablation selective adductor denervation-reinnervation with ansa cervicalis, thyroplasty, recurrent laryngeal nerve avulsion, implantable nerve stimulator devices and bipolar radiofrequency-induced thermotherapy.⁶⁻⁸ The long-term effectiveness of these techniques remains to be seen.

The technique of thyroarytenoid muscle ablation that we describe is simple to perform, gives permanent relief and is cost effective. The procedure resulted in marked improvement in symptoms. The voice was not breathy and weak, and optimal fluency was achieved. The procedure can be performed on both the sides. It appears safe and no adverse effects were observed in our patients.

We acknowledge the limitations of this study, i.e. few patients and a short follow-up. The final outcome assessment was based on speech pathologist's voice assessment, the clinician's assessment of voice, the laryngoscopic appearance of vocal folds and finally the patients self assessment of their voice.

In two of our patients the average duration of spasmodic dysphonia was 11 years and the third patient had been symptomatic for 2 years. Postprocedure they described a much improved voice quality, a significant improvement in self confidence and a much better quality of life.

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