Cordotomy by Coblation in Bilateral Vocal Fold Immobility
Kyra Osborne MD, Paul C. Bryson MD and Michael S. Benninger MD
Head and Neck Institute

INTRODUCTION
Bilateral vocal fold immobility presents a challenging problem to the laryngologist. It is a potentially fatal condition that needs to be diagnosed promptly and accurately. The goal of treating patients with bilateral vocal fold immobility is to re-establish a patent airway, to preserve the function of the glottic sphincter, and to maintain voice quality. Early surgical intervention is important in patients with symptomatic airway compromise.

The etiology of bilateral vocal fold immobility includes intubation trauma, peripheral nerve injury from either neoplasia or surgery, neuromuscular diseases, central nervous system disease and psychogenic disorders. Bilateral vocal fold immobility rarely occurs in the absence of a clear cause. Complete evaluation prior to surgical intervention is important to establish the etiology and to guide further treatment.

Various procedures can be completed to accomplish this goal. Arytenoidectomy and transverse cordotomy can be performed to improve the airway. Arytenoidectomy can be performed externally by laryngofissure or endoscopically. Transverse cordotomy can be performed using a laser. The CO2 laser is often used to perform transverse cordotomy. Tracheotomy is also a treatment option for this patient population and was the long-standing treatment of choice for many years. The current gold standard to improve the posterior airway is to perform cordotomy.

The first coblation tonsillectomy was performed in the late 1990s. Since that time, the Coblator has been increasingly used in the field of otolaryngology. Because of this increased use, we chose to use this instrument to perform vocal cordotomy. We used the Arthrocure Coblator to perform cordotomy via a direct microlaryngoscopic approach.

MATERIALS AND METHODS
A case series using endoscopic coblation to perform vocal cordotomy in patients with bilateral vocal fold immobility is presented. Patients were diagnosed with bilateral vocal fold immobility after thorough history and physical exam, as well as flexible laryngoscopy and video stroboscopy. Ten patients underwent suspension microlaryngoscopy with either initial or revision vocal cordotomy with or without partial arytenoidectomy as part of airway management for bilateral vocal fold immobility. Routine follow-up was performed and wound healing was documented via distal chip videolaryngoscopy.

RESULTS
Ten patients underwent suspension microlaryngoscopy with initial or revision cordotomy with or without partial arytenoidectomy. Eight patients were female and two patients were male. Mean age was 48.6 (range 32-59). The etiology of bilateral vocal fold immobility included prolonged intubation (n=2), post-thyroideotomy (n=4), progressive degenerating cerebellar ataxia (n=1), and idiopathic (n=1). If the patient had a prior tracheotomy, general anesthesia was induced and the tracheotomy tube was removed. An endotracheal tube was then placed through the tracheostoma and used for ventilation. In the remaining eight patients who did not have a tracheotomy, the procedure was completed using jet ventilation. Suspension laryngoscopy was then performed. The larynx was evaluated using a 0 degree Hopkins rod. The operative microscope was then brought in for use.

The Coblator was utilized on a power setting of 7 for coblation. The coblator was performed with partial arytenoidectomy in four patients. The procedure was performed without arytenoidectomy in six patients.

Lidocaine was then applied to the vocal folds. The patient was then either intubated or mask ventilated by the anesthesia team. The procedure was completed in approximately five minutes for each patient. No patients required a tracheotomy with this procedure. Two patients had a tracheotomy at the time of the initial procedure. Procedure time was rapid with this technique.

Follow-up ranged from one day to 6 months postoperatively. Patients had minimal granulation tissue at the cordotomy site and appeared to have less prolonged healing when compared to patients in which the laser was used. The glottic airway and stridor were improved in all patients. Of the patients with a tracheotomy at the time of the initial procedure, one patient remains trach-dependent and the other patient was decannulated 8 weeks after the procedure.

One patient has required revision cordotomy with this technique. Thus far, no other patients have required revision procedures.

DISCUSSION
Coblation has been a useful tool for laryngologists throughout the years. It has been used for removal of laryngeal Teflon granulomas, treatment of recurrent respiratory papillomatosis, removal of large supratrochlear granulomas, neurofibromas and arteriovenous malformations. In each study coblation was described as an acceptable alternative to the CO2 laser.

There are many advantages to using the Coblator when compared to the laser. There is no laser protection required. This helped to reduce operative set-up and procedure time versus the laser. The Coblator device tip uses radiofrequency energy through a saline medium to create a plasma. The plasma’s energized particles break molecular bonds within the tissue, causing the tissue to dissolve at relatively low temperatures. This helps to avert significant lateral heat distribution into the tissue. This also reduces the risk of an airway fire. The Coblator also has the advantage of controlling superficial bleeding that can obstruct the surgeon’s view. Any further bleeding can be controlled using the bipolar cautery.

The ten patients in this case series showed improvement in the glottic airway and improvement in stridor immediately after the procedure and at follow up. Healing time was reduced as was shown on flexible laryngoscopy and video stroboscopy in follow up.

CONCLUSIONS
Initial outcomes of endoscopic coblation vocal cordotomy/medial partial arytenoidectomy reveal this technique to be safe and efficient with seemingly more rapid healing based on our short-term experience. More long-term data will need to be obtained to show continued benefit. We will continue to gather longer term data using coblation technology for bilateral vocal fold immobility and other laryngeal and airway pathology.

REFERENCES