Case Report

Unilateral Endoscopic Laser Medial Arytenoidectomy in Transient Bilateral Palsy of the Recurrent Laryngeal Nerve after Thyroid Surgery: Is it Worth the Candle?

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Abstract
During the acute phase of transient bilateral paralysis after thyroid surgery, a tracheotomy unfortunately remains the solution in most emergency situations. The author describes and discusses the case of a totally thyroidectomized female patient, who presented fifteen days after surgery with bilateral vocal cord paralysis resulting in dyspnea and exhaustion. After tracheotomy refusal, a unilateral endoscopic laser medial arytenoidectomy was performed that enabled the patient to lead a normal daily life without dysphonia. Bilateral vocal cord mobility recovered slowly but completely. This is the first and only case of this procedure during the acute phase of bilateral vocal cord paralysis reported in the literature. The benefits versus the risks are discussed.

INTRODUCTION
The management of bilateral vocal cord paralysis after thyroid surgery is a challenge for physicians in terms of the long-term balance between voice preservation, airway protection and quality of life. However, during the acute phase of transient bilateral paralysis, a tracheotomy unfortunately remains the solution in most situations [1]. Endoscopic CO2 laser medial arytenoidectomy was described by Crumley in 1993 as an expert surgical procedure to be used in long-term paralysis of the vocal cord, to open the respiratory glottis and to preserve the phonatory larynx [2,3]. The place of this surgical procedure in acute phase has never been evaluated to date.

CASE PRESENTATION
The patient was a 54 year-old woman with no previous medical history. She underwent a total thyroidectomy, and bilateral extra laryngeal bifurcation of the recurrent laryngeal nerve near the suspensory ligament of Berry was observed and entirely preserved. Fifteen days after the surgical procedure, the patient was admitted for dyspnea and exhaustion. Examination of the larynx revealed bilateral recurrent nerve palsy with a very thin glottic gap. Intravenous steroids were administered, concomitantly with steroid aerosols and a permanent oxygen mask. No improvement was observed after six hours. Patient refused the advocated tracheotomy and an endoscopic laser medial arytenoidectomy was proposed, with explanations about the procedure and the risks incurred. A direct laryngoscopy under general anesthesia was normal. Arytenoid cartilages were freely movable at palpation. The patient was intubated with a laser-compatible endotracheal tube. Moistened neurosurgical pledgets were placed in the subglottic space to protect the trachea and endotracheal tube. A right endoscopic laser medial arytenoidectomy was performed according to the procedure described by Crumley, using a continuous-wave Deka CO2 laser set at 3 watts (Lyon, France) [2]. As the airway appeared sufficiently enlarged after the right side procedure, the left side procedure was not performed. The patient was extubated in the operating room at the end of the procedure. Broad-spectrum antibiotic therapy and oral steroids were administered for 5 days. The patient remained under observation overnight in the intensive care unit and oral feeding was successfully resumed at day 1 under careful monitoring. The patient’s voice was nearly normal, and dyspnea had resolved (Figure 1). She was discharged on day 3. Five days after the procedure, the fibroscopic laryngoscopy found a posterior respiratory airway estimated at...
20 percent. The patient showed no signs of dyspnea or stridor in daily life. She was able to climb stairs and to walk for ten minutes without having to stop. Oral feeding and drinking were normal without aspiration, and the patient had no cough. Post-surgical wound healing of the larynx was achieved without edema. Four months after the thyroidectomy, the left arytenoid and vocal cord showed good abduction during breathing and good adduction during phonation. Seven months after the thyroidectomy the mobility of the left arytenoid and vocal cord was normal and the right vocal cord was still trophic. An electromyography of the thyroarytenoid muscles found patterns of reinnervation on both sides with better recruitment on the left side. An electromyography of the thyroarytenoid muscles found patterns of reinnervation on both sides with better recruitment on the left side. Four months after the thyroidectomy, the left arytenoid and vocal cord showed good abduction during breathing and good adduction during phonation. Seven months after the thyroidectomy the mobility of the left arytenoid and vocal cord was normal and the right vocal cord was still trophic. An electromyography of the thyroarytenoid muscles found patterns of reinnervation on both sides with better recruitment on the left side.

DISCUSSION

Bilateral vocal cord immobility is a rare complication after a total thyroidectomy but can be life threatening for patients and may require emergency reintubation and a tracheotomy [1]. The primary goal of long-term management is then to remove the tracheotomy tube in these patients and to preserve their quality of life as much as possible. Many surgical procedures have been established to improve airway insufficiency, from outdated external surgical procedures such as a ventriculo cordectomy or an arytenoidectomy to more recent endoscopic procedures such as anarytenoidectomy or posterior transverse cordotomy using a CO2 laser. They are all designed to permanently enlarge the airway. However, even in skillful hands, these procedures are al [4-8] ways a compromise between improved breathing by airway opening and the risk of aspiration and a worsening of voice quality, which explains why physicians are still seeking to improve their skills and techniques. That is why these procedures are performed more than six months after thyroid surgery in the absence of spontaneous laryngeal mobility recovery, which fortunately occurs in 85%of cases [1]. A temporary tracheostomy for emergency management of dyspnea until the recovery of laryngeal function is therefore an acceptable palliative solution as it preserves the vocal framework but it is clearly associated with decreased quality of life for patients until decannulation.

Endoscopic laser medial arytenoidectomy was first described by Crumley in 1993 to treat patients with bilateral vocal cord paralysis who “seek a small increment of airway enhancement” with a minimal risk for suboptimal voice quality [2]. This procedure is safe for the laryngeal framework and it preserves the vocal cords with good functional results [3]. Therefore it may be a perfect candidate for temporary laryngeal rehabilitation during transient bilateral vocal cord immobility. However, it is probably a risky procedure for the cricoarytenoid joint and even the most experienced surgeons are not immune to complications. That is why the patient in this case report had a direct laryngoscopy under general anesthesia with palpation of the right arytenoid cartilage to rule out cricoarytenoid ankylosis. But it may also be a risky procedure for the neuromuscular unit because of the direct proximity of this structure. The left side recovered rapidly in four to seven months, while the operated right side required twelve to eighteen months to fully recover its normal mobility which is quite long. This single case prohibits statistical conclusions but it is difficult not to see a causal relationship that would deserve further investigations. Fortunately, the patient’s quality of life was good throughout the period of this case report allowing a normal daily life with a normal voice, and bilateral vocal cord mobility finally recovered normally without sequels. But did the benefit justify the risks? With hindsight and from the surgeon’s point of view, it is not certain whether the risk was worth the candle.
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REFERENCES


