ORIGINAL ARTICLE

Posterior Cordectomy. Our Experience

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Received 2 March 2011; accepted 30 June 2011

KEYWORDS
Bilateral vocal fold paralysis;
Laser surgery;
Respiratory distress

Abstract

Objective: Several surgical procedures have been proposed for the treatment of respiratory distress secondary to bilateral cord palsy. We performed a retrospective study of our experience in posterior cordectomy with a laser CO₂, analysing the improvement of dyspnoea and voice quality after surgery.

Methods: This was a retrospective study of 13 cases (9 female, 4 male). The age range was 25–79 years. Iatrogenic post-thyroidectomy (4 cases) was the most common aetiology of bilateral laryngeal palsy in our study.

We assessed the subjective improvement of respiratory function and voice quality after laser surgery using the Spanish adaptation of the Voice Handicap Index (VHI).

Results: Dyspnoea improved in all patients. Two cases had a worsening of dyspnoea in the immediate postoperative period and one case was successfully solved with a new surgical intervention.

After surgery, most of patients suffered from mild or middle dysphonia.

Conclusions: The posterior cordectomy is an easy, safe, and effective treatment for dyspnoea secondary to bilateral laryngeal palsy, maintaining acceptable voice quality.

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PALABRAS CLAVE
Parálisis cuerda vocal bilateral;
Cirugía laser;
Insuficiencia respiratoria

Cordectomía posterior. Nuestra experiencia

Resumen

Introducción y objetivos: La parálisis bilateral en adición de las cuerdas vocales ocasiona una disnea de intensidad variable, que puede ser tratada con diferentes procedimientos quirúrgicos. Se realiza una revisión retrospectiva de nuestros casos tratados mediante cordectomía posterior con laser CO₂, analizando tanto el resultado respiratorio (mejoría de la disnea) como el resultado vocal.

Métodos: Se realiza un estudio retrospectivo de 13 casos (9 mujeres y 4 varones) con edades comprendidas entre 25 y 79 años. En nuestra serie la causa más frecuente de la parálisis laringea bilateral es la tiroidectomía (4 casos).


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We conducted a retrospective study of 13 patients who underwent posterior cordectomy due to bilateral vocal fold paralysis. Of these, 9 were female and 4 were male. Their ages ranged between 25 and 79 years. When classifying by etiology, three cases of recurrent paralysis were found (due to traumatic injury, 2 and unknown etiology). Clinically, all patients presented dysphonia on moderate to severe level. In addition, all patients had previously undergone surgical procedures for this condition. We found that patients who underwent bilateral parotidectomy had significantly better outcomes than those who underwent unilateral parotidectomy.  

Methods

Discussion

Blaleral paralysis of both vocal folds accounts for 25% of cases of recurrent paralysis. The most common cause of bilateral recurrent paralysis is the trauma, especially in the immediate postoperative period, perhaps requiring urgent intervention. It may appear as sudden dysphonia (usually in the immediate postoperative period, perhaps requiring urgent intervention). In addition, it is characterized by dysphonia and without dyspnea. Furthermore, it is important to do so because their surgical management is different. Clinically, it is characterized by dysphonia and without dyspnea. Therefore, surgical treatment of this problem includes several options. Resection techniques of cordectomy (cordectomy and arytenoidectomy) are the most commonly used, but there are also other alternatives such as arytenoidectomy or arytenoidectomy.

Results

All cases presented significant improvement in dysphonia 1 year after the intervention. Two patients required additional surgery after their initial intervention. Two patients suffered a worsening of their dysphonia in the first 2 weeks after surgery. All patients were satisfied with the surgical outcome, except for the one who underwent cordectomy for vocal fold paralysis.

CO2 laser was used due to the technical problems. No patient underwent tracheotomy at the time of the intervention. This patient was scheduled prior to total thyroplasty in only 1 case. The surgical intervention was large multinoval polypectomy with intubation surgery and removal of a partial adenoid. The tracheotomy was removed after 1 month, without any problems.

Introduction

Laryngeal paralysis in adduction is an uncommon condition that can cause dysphonia of varying intensity and that can be treated with different surgical procedures. Posterior cordectomy is a surgical intervention, first described by Blaleral and Kashima in 1999, which is indicated in cases of recurrent bilateral paralysis. The tracheotomy was removed after 1 month, without any problems.
The first surgical intervention for this problem was a cordoventriclec- tumy performed by Chevalier Jackson in 1922. In 1941, King proposed an arytenoidopexy with suture to the omohyoid muscle and Kelly performed an external arytenoidectomy that same year. Thornell carried out the first endoscopic arytenoidectomy (1948), which Ossoff later repeated with CO₂ laser in 1983. In 1989, Dennis and Kashima published posterior cordectomy, an even more restricted procedure on the glottis. With the development of endolaryngeal microsurgery and lasers, external approaches have been practically abandoned (except in children, in whom endoscopic approaches can still be performed); some authors have obtained better results with external approaches (10, 11).

The most commonly used techniques are resections, including cordectomy (endoscopic or external), which often causes severe dysphonia. Arytenoidectomy (external or endoscopic) has aspiration as a major complication (although some technical variants have been described that avoid it) or cricoid necrosis (especially in irradiated patients). Lastly, posterior cordectomy achieves sufficient air passage with moderate vocal sacrifice.

Possible non-resection surgical procedures include arytenoidopexy, which can be external or endoscopic (Lichtenberger has designed instrumentation that facilitates it). Its main advantage is that arytenoidopexy is potentially reversible, while its main disadvantage is that its results seem to worsen over time.

Laryngeal reinnervation was first described by Tucker in 1976, with excellent results (he used a myoneural pedicle from the hypoglossal loop to the posterior cricoarytenoid muscle). The intervention is technically difficult and has shown worse results in other series.

Other procedures such as a laryngeal pacemaker or botulinum toxin may become important alternatives in the future.

Posterior cordectomy consists in a transverse incision of the vocal fold in front of its insertion into the vocal process, which must completely sever the elastic cone reaching the cricoid perichondrium (Figs. 1 and 2). Some authors employ variants of posterior cordectomy, such as procedures on both

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BT: brain trauma; VHI: Voice Handicap Index.

Figure 1 Posterior cordectomy. Immediate postoperative period (the day after the intervention).

Figure 2 Posterior cordectomy. Final outcome (at 3 months postoperatively).
vocal folds\textsuperscript{12,19,20} or extending the resection to the ventricular band or the vocal fold or vocal process.\textsuperscript{21-23} Although it was originally described with CO\textsubscript{2} laser, it can also be performed with KTP laser\textsuperscript{23-25} or with electrocautery, as in 1 case within our series.

Some authors employ a prior tracheotomy,\textsuperscript{7,13} although we generally do not consider it necessary and have only used it in 1 case.

This intervention is simple to perform, but its main drawback is the appearance of dyspnoea in the immediate postoperative period (15\% of our cases). This dyspnoea is caused by granulomas, oedema, or crusts attached to the surgical site during scarring.\textsuperscript{12,25} Nevertheless, it is transient and can be treated medically (with anti-inflammatory drugs, antibiotics, mucolytics, humidifiers, etc.).

It is important to distinguish whether the bilateral immobility of the vocal folds is caused by recurrent paralysis or cricoarytenoid ankylosis, although few series make this distinction.\textsuperscript{5,19,26} Cricoarytenoid ankylosis is mainly due to endotracheal intubation,\textsuperscript{5,26} followed by autoimmune diseases (Wegener, rheumatoid arthritis\textsuperscript{12,27}). Cricoarytenoid ankylosis can be resolved through other surgical procedures such as sectioning scar tissue or adhesions that fix the arytenoids, intra-articular injection of corticosteroids or others.\textsuperscript{6} Laryngeal electromyography can be of great help in differentiating both conditions, as well as in establishing a prognosis in recurrent paralysis.\textsuperscript{5,15,6}

With respect to respiratory outcomes, almost all studies report satisfactory results, between 95\%\textsuperscript{24} and 100\% of cases (as in our series), although with reoperation rates ranging from 50\%\textsuperscript{21,24,25} to 33\% as in the first communication by Dennis and Kashima\textsuperscript{1} or 7\% as in our series. The parameters used to measure these results differ from 1 study to the next. Some, including ours, use the subjective improvement of dyspnoea or the degree of patient satisfaction,\textsuperscript{24} while others use the percentage of decannulations\textsuperscript{8,21} or pulmonary function tests (flow volume curves,\textsuperscript{1} body plethysmography\textsuperscript{19,22,23}).

We used the Spanish version of the VHI to evaluate the vocal results.\textsuperscript{28,29} This is a questionnaire with 3 parts (functional, physical, and emotional), with 10 questions each, which are answered with a value of 0–4, that is, with a maximum score of 120. A VHI below 30 is considered as a mild dysphonia, between 30 and 60 as moderate dysphonia, between 60 and 90 as intense dysphonia, and between 90 and 120 as severe dysphonia. Other studies use patients’ subjective assessments\textsuperscript{19,20,24} or resort to other parameters (Yanagihara scale based on spectrogram,\textsuperscript{21} Göttingen scale,\textsuperscript{19} or Dejonckhere scale\textsuperscript{26}). We obtained good vocal results in most cases (85\% of mild or moderate dysphonia in our series) and all patients reported being satisfied with their voice.

Neither our series nor any of those reviewed reported deglutitive disorders after the intervention.

Some studies compared the outcome between posterior cordectomy and arytenoidectomy.\textsuperscript{26,30} Without finding significant differences in either vocal or respiratory results. Nevertheless, they have found that arytenoidectomy often causes subclinical aspiration whereas posterior cordectomy does not.\textsuperscript{26} No differences in outcome were found when using either CO\textsubscript{2} or KTP laser.\textsuperscript{21,24,25}

Conclusions

Dyspnoea caused by bilateral paralysis of vocal folds in adduction is rare, but it represents a delicate problem. Posterior cordectomy is a rapid, simple intervention that has few complications. In most cases, this intervention provides a sufficient increase in glottic space (similar results to other techniques), with a mild or moderate dysphonia without aspiration. We believe that, at present, this is the technique of choice in this pathology.

Conflict of Interests

The authors have no conflicts of interest to declare.

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