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ORIGINAL ARTICLE

Electromyography-Guided Hyaluronic Acid Injection Laryngoplasty in Early Stage of Unilateral Vocal Fold Paralysis☆

Itziar Gotxi-Erezuma,[a,*] Mónica Ortega-Galán,[b] Ainhoa Laso-Elguezabal,[a] Gonzalo Prieto Puga,[a] Carolina Bullido-Alonso,[a] Susana García-Gutiérrez,[c,d] Ane Anton-Ladislao,[c] Enrique Moreno-Alonso[a]

[a] *Servicio de Otorrinolaringología, Hospital Galdakao-Usansolo, Vizcaya, Spain*
[b] *Servicio de Neurofisiología Clínica, Hospital Galdakao-Usansolo, Vizcaya, Spain*
[c] *Unidad de Investigación, Hospital Galdakao-Usansolo, Vizcaya, Spain*
[d] *REDISSEC – Red de Investigación en Servicios de Salud en Enfermedades Crónicas, Spain*

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KEYWORDS
Laryngology;
Electromyography;
Laryngoplasty;
Unilateral vocal cold paralysis;
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Abstract
Introduction and objective: To assess the effectiveness of electromyography-guided hyaluronic acid injection laryngoplasty in the early stage of unilateral vocal fold paralysis in terms of patient recovery from dysphonia and quality of life.
Methods: Between January and December 2014, 28 patients with unilateral vocal fold paralysis underwent electromyography and injection of hyaluronic acid in the thyroarytenoid muscle. We compared the voice handicap index, grade, roughness, breathiness, asthenia, strain scale (GRBAS), videostroboscopic parameters and maximum phonation time assessed before, 15 days and 6 months after the intervention, using the non-parametric Wilcoxon rank test.
Results: Out of the 28 patients, 1 had a haematoma in the injected vocal fold (3.57%) and 6 required second injections. The maximum phonation time of the vowel /e/ increased from 6.07 to 12.14 s (15 days post-intervention) and subsequently 12.75 (6 months post-intervention). There was also a significant improvement in the grade, roughness, breathiness, asthenia, strain scale in parameters G, B and A both 15 days and 6 months after the intervention. The voice handicap index score decreased from 58.29 to 37.63 (15 days post-intervention) and 29.64 (6 months post-intervention).

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* Corresponding author.
E-mail address: i.gotxierezuma@gmail.com (I. Gotxi-Erezuma).

Conclusions: Electromyography-guided hyaluronic injection laryngoplasty in unilateral vocal fold paralysis enables, in the same intervention, neuromuscular assessment and temporary treatment of glottic insufficiency with a low risk of complications and improvement in patient's quality of life. This may reduce the need for subsequent treatments, but further research is required to confirm these findings.

PALABRAS CLAVE
Laringología;
Electromiografía;
Laringoplastia;
Parálisis unilateral de cuerda vocal;
Ácido hialurónico

Laringoplastia de inyección con ácido hialurónico guiada por EMG en etapa precoz de parálisis unilateral de cuerda vocal

Resumen
Introducción y objetivos: Evaluar la efectividad de la laringoplastia de inyección con ácido hialurónico guiada por electromiografía en la etapa precoz de la parálisis unilateral de cuerda vocal en función de la mejoría de la disfonía y de la calidad de vida del paciente.
Métodos: Se realizó estudio electromiográfico y laringoplastia de inyección con ácido hialurónico a 28 pacientes con parálisis unilateral de cuerda vocal entre diciembre del 2013 y diciembre del 2014. Se analizaron los resultados del cuestionario de índice de incapacidad vocal, escala de GRABS, tiempo máximo de fonación y valoración videoestroboscópica, preintervención, a los 15 días y a los 6 meses, con el Wilcoxon rank test no paramétrico.
Resultados: De los 28 pacientes, 1 tuvo un hematoma en la cuerda vocal infiltrada (3,57%) y 6 requirieron una segunda infiltración. Los parámetros evaluados muestran una mejoría estadísticamente significativa a los 15 días y 6 meses postinfiltración; el tiempo máximo de fonación aumentó de 6,07 a 12,14 (15 días), 12,75 (6 meses); la escala de GRBAS muestra una mejoría estadísticamente significativa en los parámetros de G, B y A. El valor del índice de incapacidad vocal se redujo de 58,29 a 37,63 (15 días) y 29,64 (6 meses).
Conclusiones: La laringoplastia de inyección guiada por electromiografía en la etapa precoz de parálisis unilateral de cuerda vocal proporciona, en un mismo acto, la evaluación neuromuscular y el tratamiento temporal del defecto de cierre glótico con bajo riesgo de complicaciones y mejoría de la calidad de vida del paciente. Podría disminuir la necesidad de tratamientos ulteriores, siendo necesario otro estudio que lo demuestre.

Introduction and Objectives

Unilateral paralysis of the vocal folds (UPVF) is a cause of glottic incompetence and presents symptoms such as dysphonia, aspiration and phonasthenia, significantly affecting the patient's performance and quality of life. Traditionally these patients have been managed by observation awaiting spontaneous recovery of vocal fold mobility or compensation, by speech therapy to promote recovery of function.[1] Injection laryngoplasty has been introduced recently, using temporary material as another option in the initial management of this disorder, with a view to temporarily reducing glottic insufficiency while awaiting recovery of mobility or compensation.[2] This consists of medialisation of the immobile vocal fold, by injecting a resorbable agent into the paraglottic space or the lateral portion of the thyroarytenoid muscle (TA) leaving it in a more favourable position for glottic closure.[3–6] It can also improve swallowing in patients who have this problem associated with vocal fold paralysis.[7]

Since Bruening[8] started injecting paraffin into the vocal folds in 1911 to compensate for glottic defect in UPVF, various absorbable or temporary and nonabsorbable or permanent materials have been used.[9–11] Resorbable materials have the advantage of being more similar biomechanically to the tissue into which they are injected. Although the temporary effect can be a disadvantage when long-term medialisation is required, it can be advantageous when our objective is a short to midterm result as in the early stages of vocal fold paralysis when the extent of nerve regeneration that will take place and the long-term sequelae are uncertain.[12] Injectable materials include autologous fat, calcium hydroxylapatite (Radiesse Voice™), polydimethylsiloxane (PDMS or particle silicones), and historically, polyethylene paste (teflon). Temporary injection materials include bovine gelatine (Gelfoam™, Surgifoam™), collagen-based products (Cymetra, Zyplast, Cosmoplast/Cosmoderm), hyaluronic acid (HA) (Restylane, Hyalaform) and carboxymethylcellulose (Radiesse Voice Gel™).[9] Hyaluronic acid has become