Paediatric Injection Medialization Laryngoplasty for Management of Aspiration and Voice: Report of two cases
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CONCLUSION
We found that injection medialization laryngoplasty (IML) using calcium hydroxylapatite (CaHA) and hyaluronic acid was a reliable, safe, temporary, and effective technique. Consistent use of comparable measures such as acoustic analysis and the Voice Handicap Index is recommended. IML can be considered as an important tool in the management of unilateral vocal cord paralysis (UVCP).

INTRODUCTION
Paediatric aspiration is a multifactorial process that is often complex to manage. In a subset of children, it is due to a UVCP. Iatrogenic injury of the recurrent laryngeal nerve during cardiovascular surgery is the most frequent cause. Many of these patients have persistent aspiration and voice disorders, and conservative measures have been unsuccessful. IML is a minimally invasive approach option which may be favoured in the paediatric population due to the potential for laryngeal growth, recovery and adaptation. Hyaluronic acid and CaHA was used for vocal cord medialization.

OBJECTIVES
To describe our experience with vocal cord injection medialization in children.

METHODS
CASE 1: A 17-year-old boy, with dysphonia, persistent aspiration of liquids and a left vocal cord immobility with a history of occipital meningioma that required surgical resection. Figure 1. He underwent an injection laryngoplasty with CaHA.

CASE 2: A 4-year-old boy, with a history of surgery because of transposition of the great vessels 1 year previously, presented with dysphonia, a history of one episode of aspiration pneumonia and persistent aspiration of liquids, and right vocal cord immobility. He underwent an injection laryngoplasty with hyaluronic acid.

All IML procedures were performed transorally with suspension microlaryngoscopy under general anaesthesia and spontaneous ventilation without endotracheal intubation. The CaHA and the hyaluronic acid was injected using a 19-gauge butterfly needle. The volume of material injected was tailored according to direct observation of vocal cord medialization. The voice (paediatric Voice Handicap Index and Acoustic Analysis) and swallowing (modified barium swallow and fiberoptic endoscopic evaluation of swallowing) were evaluated pre- and postoperatively.

RESULTS
In both patients at the 5-month postoperative control the hoarseness, dysphagia, and aspiration had improved markedly. Complications were not recorded. Figure 2 and Table 1.

<table>
<thead>
<tr>
<th>VOICE</th>
<th>SWALLOWING</th>
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<tr>
<td>pVHI / acoustic analysis before</td>
<td>pVHI / acoustic analysis after</td>
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<td>CASE 1</td>
<td>90/Altered</td>
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<td>CASE 2</td>
<td>31/Altered</td>
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Table 1. Outcomes before and after IML. pVHI, paediatric Voice Handicap Index; MBS, modified barium swallow; FEES, fiberoptic endoscopic evaluation of swallowing.

DISCUSSION
Numerous treatments exist for the management of dysphonia and aspiration secondary to UVCP, including speech therapy, IML, thyroplasty, and reinnervation techniques.

-Each treatment is applied depending on the patient’s symptoms, UVCP cause, and the duration of effects. CaHA and hyaluronic acid seem to provide beneficial effects for 4 and 6 months, respectively.

-Objective measures are necessary to evaluate voice and swallowing outcomes.

Use of laryngeal electromyography and videostroboscopy in children to guide management and improve timing of intervention.