Injection Augmentation with Lidocaine-Containing Material
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Abstract
Awake vocal fold injection augmentation offers a safer option for high-risk patients with glottic insufficiency. Though topical anesthesia is administered, infiltrative anesthetics are considered inappropriate due to their additional volume effect. We have collected a group of patients who underwent VFI using hyaluronic acid (HA) with lidocaine. Injection results were measured using pre- and post-procedure VHI for five patients who underwent VFI with Restylane®-L. Follow-up averaged one month with a mean VHI improvement of 7.2. In our patient group those who received HA with lidocaine VFI for glottic insufficiency did not lose efficacy as lidocaine was resorbed. In addition, patients reported very little pain. This may be a very good option for patients who require excellent pain control, without compromising the effectiveness of the injection.

Results
Patient 1 – 85 year old male with hoarseness, laryngopharyngeal reflux (LPR), unilateral vocal fold paresis and muscle tension dysphonia. The patient underwent transoral VFI of 0.4 ccs of Restylane®-L bilaterally. His pre-operative VHI was 12, improved to 0 at his post-operative visit 6 weeks later.

Patient 2 – 85 year old female with dysphagia (PEG-dependent), dysphonia and unilateral vocal fold paralysis after a carotid endarterectomy. The patient underwent transoral VFI of 0.6 ccs of Restylane®-L on the right, 0.4 ccs on the left. Her pre-operative VHI was 36, improved to 16 at her post-operative visit 7 weeks later and she began tolerating oral intake without aspiration.

Patient 3 – 85 year old male with hoarseness, vocal fold atrophy, dysphagia and glottic insufficiency. The patient underwent transoral VFI of 0.3 ccs of Restylane®-L on the right, 0.4 ccs on the left. His pre-operative VHI was 16, improved to 1 at his post-operative visit 4 weeks later.

Patient 4 – 75 year old male with vocal fold granuloma, vocal fold atrophy, muscle tension dysphonia and glottic insufficiency. The patient underwent transoral VFI of 0.2 ccs of Restylane®-L on the right, 0.3 ccs on the left with concomitant injection of Kenalog into a left vocal fold granuloma. His pre-operative VHI was 21, worsened to 23 at his post-operative visit 5 weeks later.

Patient 5 – 14 year old male with cerebral palsy and unilateral vocal fold paralysis since undergoing patent ductus arteriosus repair 6 weeks later. The patient underwent transcutaneous VFI of 0.25 ccs of Restylane®-L on the left (Image 1 and 2 for post-augmentation results) His pre-operative VHI was 12, improved to 8 at his post-operative visit 1 week later. He reported no discomfort during the procedure.

Four patients had improved VHI scores. The remaining patient endorsed a subjective improvement in voice though VHI was not reflective. Follow-up averaged one month with a mean improvement in VHI of 7.2.

Table 1. Outcomes of patients with Restylane®-L awake VFI

<table>
<thead>
<tr>
<th>Patient</th>
<th>Age/Gender</th>
<th>Amount Injected</th>
<th>Pre-injection VHI</th>
<th>Post-injection VHI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient 1</td>
<td>85M</td>
<td>0.4 cc bilaterally</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>Patient 2</td>
<td>85F</td>
<td>0.6 cc right, 0.4 cc left</td>
<td>36</td>
<td>16</td>
</tr>
<tr>
<td>Patient 3</td>
<td>85M</td>
<td>0.3 cc right, 0.4 cc left</td>
<td>16</td>
<td>10</td>
</tr>
<tr>
<td>Patient 4</td>
<td>75M</td>
<td>0.2 cc right, 0.3 cc left</td>
<td>21</td>
<td>23</td>
</tr>
<tr>
<td>Patient 5</td>
<td>14M</td>
<td>0.25cc left</td>
<td>12</td>
<td>8</td>
</tr>
</tbody>
</table>

Discussion
Vocal fold injection augmentation is a common office-based procedure for the treatment of glottic incompetence and insufficiency. Awake procedures offer the advantage of a real time assessment of vocal fold closure and voice quality with immediate vocal feedback. As sub-milliliter volumes of injectable are commonly employed, the surplus volume from an incorporated anesthetic is undesirable. Based on our preliminary findings, we were able to achieve VHI-10 scores that remained satisfactory long after the additional anesthetic volume had disappeared. Over-augmentation at the time of the procedure probably accounts for this success.

The success of office-based procedures depends primarily on patient comfort and cooperation. Although topical anesthesia is generally sufficient, in some patients topical anesthetics alone is not acceptable, this includes pediatric patients. Injection medialization is well-established in children10,11 and there is a single case report of hyaluronic acid being used for injection augmentation in children.9 This is the first report of a successful office-based injection for a pediatric patient with cerebral palsy (patient 5) and excellent pain control likely contributed to its success.

Conclusions
Injectable anesthesia is avoided in general, secondary to its volume effect. However, in patients who received HA with lidocaine VFI for glottic insufficiency, the medialization was not compromised as lidocaine was resorbed. This may be a very good option for patients who require excellent pain control to achieve optimum medialization, such as pediatric populations. There is also a need for further studies with larger treatment groups of lidocaine containing injectable to confirm our findings.

References

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Image 1. Patient 5: Post-augmentation, open view
Image 2. Patient 5: Post-augmentation, closed view