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Office-Based Cordotomy for the Release of Superficial Injection of Hyaluronic Acid: A Novel Approach

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Injection laryngoplasty was first described by Bruening in 1911 for the treatment of vocal fold paralysis. The choice of injection material has always been a challenge given the need for long-term durability and optimal biocompatibility.[1,2] Hyaluronic acid (HA) has gained popularity over the last 2 decades as a safe filling material. A rarely reported complication is the injection of HA in the superficial layer of the lamina propria.[3] Affected patients suffer deterioration in their voice that may necessitate cordotomy for the release of the injected material. Traditionally, the cordotomy is performed using a sickle knife under direct laryngoscopy. Based on a literature review of PubMed, Scopus, and EMBASE using keywords such as "in-office," "office-based," "cordotomy," "needle," "slit," "hyaluronic acid," and "injection laryngoplasty," no reports were identified in which authors performed cordotomy using a needle in an office setting for the release of injected materials. The purpose of this manuscript is to report a case of adverse vocal fold subepithelial HA injection that was managed via a cordotomy using a needle in an office setting.

Case Report

A 76-year-old male patient presented to the clinic with a history of hoarseness and aspiration. Laryngeal examination showed left vocal fold paralysis with a 2 to 3 mm glottal gap during phonation. The patient underwent office-based injection laryngoplasty via the transnasal approach using HA. During surgery, part of the HA was inadvertently injected into the superficial layer of the lamina propria (**Figure 1**). The patient had a worsening of his voice and the procedure was immediately aborted. An office-based cordotomy for the removal of the excess subepithelial HA was discussed with the patient. A 19-G flexible needle was introduced through the working channel of the flexible nasopharyngoscope and kept at a distance of 1 cm from the end of the endoscope. The tip of the needle was inserted in the most bulging point of the bleb on the vocal fold and was directed posteriorly to create a "posterior slit" (**Figure 2A**). The subepithelial HA extruded immediately at the site of the slit. The tip of the needle was reinserted submucosally at the same entry site and directed anteriorly to create an "anterior slit" (**Figure 2B**). The 2 slits were connected to create a "cordotomy-like" incision at the free edge of the vocal fold (**Figure 2C**). The endoscope was introduced distal to the vocal fold caudally, and its shaft was used to milk and straighten the free edge of the vocal fold to ensure no residual HA in the subepithelial space. Laryngeal videostroboscopy postoperatively and 3 months later revealed normal mucosal waves and improvement in voice quality (**Figure 2D**).

Discussion

HA is a glycosaminoglycan polymer that is commonly used as a filling material for the treatment of glottic insufficiency. It is usually injected into the thyroarytenoid muscle lateral to the vocal process in patients with vocal fold paralysis. Over or inadvertent injection of HA in the superficial layer of the lamina propria due to inadequate placement of the needle may be detrimental. Three management strategies are adopted, the most common of which is close observation. The rationale behind the "wait and see" strategy is to allow gradual resorption of

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the injectate given its biodegradable nature. Another treatment option is the injection of hyaluronidase to enhance the absorption of HA and its fast reduction.[4] A third treatment strategy is the surgical removal of the HA via microflap or cordotomy that is performed in the operating room using a knife. Based on a literature review using the keywords "microlaryngoscopy," "phonosurgery," and "cordotomy," all cordotomies for the release of injection material were performed using a sickle knife.

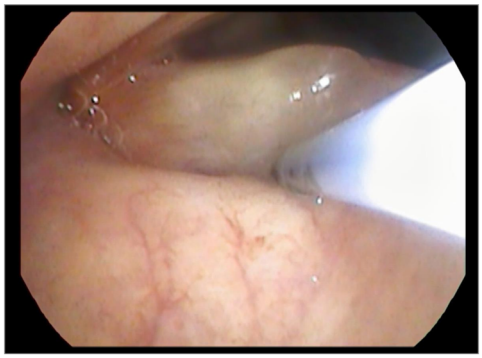

Figure 1. An endoscopic view of the larynx showing superficial injection of hyaluronic acid during injection laryngoplasty. Note the bleb formation medial to the site of injection.

Park et al reported the removal of the excess HA from the subepithelial space via an epithelial incision in 2 patients who had persistent HA in the subepithelial space.[3] This is the first case report of in-office cordotomy for the removal of HA that was inadvertently injected in the subepithelial space of the vocal fold. The cordotomy was performed using a needle via the transnasal approach, thus sparing the patient general anesthesia and direct laryngoscopy. Early intervention for the release of superficial injected HA in an office setting is recommended. The same needle used for injection can be used to create a cordotomy.

Author Contributions

Abdul-Latif Hamdan, design and writing of the manuscript; **Yara Yammine**, collection of patient information pertinent to the case; **Jad Hosri**, design and writing of the manuscript; **Marc Mourad**, critical review and final version approval.

Disclosures

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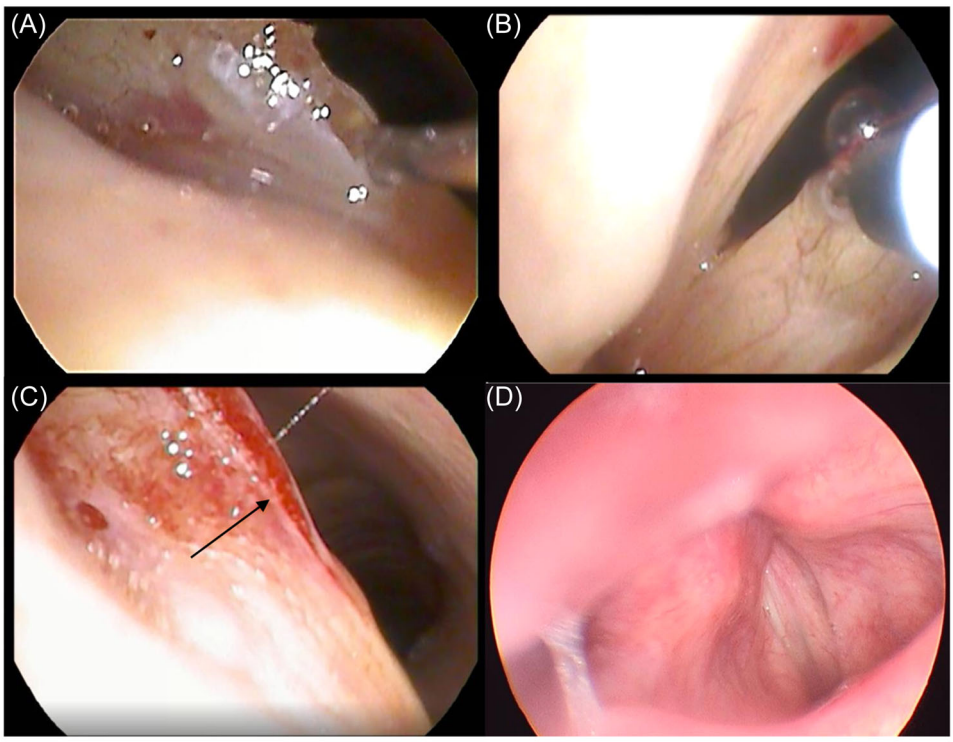

Figure 2. (A) An endoscopic view of the larynx showing extrusion of the hyaluronic acid through a posterior slit of the vocal fold mucosal lining that was performed using the tip of the needle. (B) An endoscopic view of the larynx showed extrusion of the hyaluronic acid through an anterior slit of the vocal fold mucosal lining that was performed using the tip of the needle. (C) An endoscopic view of the larynx shows a "cordotomy-like" incision at the free edge of the vocal fold as a final endpoint of the procedure. (D) A postoperative videostroboscopic view of the larynx showing complete closure of the vocal folds during phonation.

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