

Vocal Fold Injection Augmentation: An Option for Temporary Pitch Elevation for the Male-to-Female Transgender Voice



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Abstract

Objective: To discuss a unique reversible method of pitch elevation in a male-to-female (MtF) transgender individual.

Study Design: A case report with description of surgical technique.

Methods: A 50 year old MtF patient presented with a desire to elevate her baseline pitch temporarily prior to her glottoplasty. A trial injection of 0.1ml of normal saline into each vocal fold gave her desirable results for around 45 minutes. The patient decided to pursue a longer lasting temporary filler with hyaluronic acid. One week after the saline injection, the patient had 0.1 ml of hyaluronic acid injected into each vocal fold.

Results: Prior to hyaluronic acid injection, her range was 100 Hz to 340 Hz with a baseline modal phonation of 135 Hz. After the injection her range changed to 206 Hz to 340 Hz with any attempts at phonating below 206 Hz causing her mucosal vibrations to be aperiodic and her voice to crack.

Conclusion: Although vocal fold injection augmentation with hyaluronic acid does not extend vocal range in the high frequencies, it does guide the patient to phonate within her upper limit, which is very desirable in certain transgender individuals. This may be an excellent, well-tolerated temporizing vocal management option as MtF patients approach and undergo gender transition.

Introduction

- **Gender dysphoria** is the marked discrepancy between a patient's experienced/expressed gender with assigned gender at birth¹.
- For research and treatment purposes, patients seeking a feminine-variant gender transition are often broadly considered to seek *male-to-female* (MtF) confirmation
- The voice, with or without visual cues, is a primary communication determinant of gender.²
- While a definitively feminine voice has variety of subjective characteristics bound by cultural and temporal expectations, objective assessment of female vocal gender is almost universally defined by high range of fundamental frequency². **Failure to transition vocal gender for MtF often leads to severe dissatisfaction and failure to "pass" as desired gender in society².**
- Here we discuss a unique reversible method of elevating pitch in an MtF patient using two sequential vocal fold injections with saline and hyaluronic acid.

Case Presentation

HPI: 41-year old transfeminine woman presents with lifelong vocal gender dysphoria especially pitch and dissatisfaction with masculine laryngeal prominence. She realized she was transgender when she was sixteen years old. She has not tried speech therapy

Past medical history: GERD, major depressive disorder, irritable bowel syndrome.

Past surgical history: Total hip arthroplasty in 2015 complicated by DVT/PE, bilateral breast implants in 1994, childhood appendectomy for ruptured appendicitis

Relevant medications: Pantoprazole, Estradiol 0.05mg/24 biweekly patch, nicotine patch

Social history: Former smoker (0.5 pack/years), no alcohol use

PEX: Bilaterally mobile vocal folds, mucosal waves with normal amplitude, periodic, in phase. Neck exam was consistent with a masculine laryngeal prominence.

Case Presentation

Thorough discussion of risks, benefits, and alternatives of novel procedure of bilateral vocal fold injections for a transfeminine vocal gender dysphoria. Patient aware that **injections would not elevate pitch, but instead lower pitch to make pitch more hoarse, forcing her to phonate at higher frequencies for clarity.** Patient agreed to series of bilateral vocal fold injections with saline to trial effect before moving to hyaluronic acid.

- **Bilateral vocal fold injection performed 9/8/16:**
 - Bilateral tanscricothyroid vocal fold injection with local superior laryngeal block. Trial 0.1mL normal saline each fold. Subsequently, 0.1 mL of hyaluronic acid introduced into each vocal fold.
- Pre injection:
 - 100 Hz to 340 Hz with a baseline modal phonation of 135 Hz.
- Post injection:
 - 206 Hz to 340 Hz with any attempts at phonating below 206 Hz causing her mucosal vibrations to be aperiodic and her voice to crack.
- Patient tolerated procedure well, satisfied with results at f/u
- **Second vocal fold injection performed 12/19/16:** Patient returned with effects from prior injection worn off, requesting second injection. Given excellent prior results, at patient's request, proceeded w/ bilateral tanscricothyroid vocal fold injection with local superior laryngeal block. 0.2 mL of hyaluronic acid introduced bilaterally.
- F/u: Returned at 3 months with similar hoarseness, with scope exam evidence of false cord phonation.
- Referred to voice therapy with serial f/u to monitor improvement.

Discussion

- Various phonosurgical techniques have been described to increase vocal pitch in the MtF population, with following mechanisms:³
 - Techniques of **increasing tension:** cricothyroid approximation
 - Techniques of **shortening vocal fold shortening:** cold knife shortening glottoplasty; laser shortening glottoplasty (Wendler's)
 - Techniques of **decreasing mass:** laser-reduction glottoplasty
- Not the first time vocal fold injections have been used in transgender phonosurgery: Anderson 2014, instead of using sutures in endoscopic shortening surgery, used Radiesse injections into anterior one-third of vocal folds to force contact of raw edges to great documented success⁴.
- This particular technique applies a contrasting **adaptive mechanism:** temporarily augments phonational frequencies by forcing the patient to phonate at higher frequencies to avoid aperiodic mucosal vibrations and a hoarse, cracking voice
- This technique may be used therapeutically to temporarily guide patient to higher frequencies as a pre-operative trial
- By nature of procedure, **concern for maladaptive behaviors such as pharyngeal squeeze is not insignificant**, and counseling regarding these behaviors should be provided

Conclusions

Although vocal fold injection augmentation with hyaluronic acid does not extend vocal range in the high frequencies, it does guide the patient to phonate within her upper limit, which is very desirable in certain transgender individuals. This may be an excellent, well-tolerated temporizing vocal management option as MtF patients approach and undergo gender transition. However, by nature of this procedure, counseling the patient regarding vocal maladaptive behaviors should be provided.

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