Collaboration and Conquest: MTD as Viewed by Voice Teacher (Singing Voice Specialist) and Speech-Language Pathologist

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Summary: This study was designed as a qualitative case study to demonstrate the process of diagnosis and treatment between a voice team to manage a singer diagnosed with muscular tension dysphonia (MTD). Traditionally, literature suggests that MTD is challenging to treat and little in the literature directly addresses singers with MTD. Data collected included initial medical screening with laryngologist, referral to speech-language pathologist (SLP) specializing in voice disorders among singers, and adjunctive voice training with voice teacher trained in vocology (singing voice specialist or SVS). Initial target goals with SLP included reducing extrinsic laryngeal tension, using a relaxed laryngeal posture, and effective abdominal-diaphragmatic support for all phonation events. Balance of respiratory forces, laryngeal coordination, and use of optimum filtering of the source signal through resonance and articulatory awareness was emphasized. Further work with SVS included three main goals including a lowered breathing pattern to aid in decreasing subglottic air pressure, vertical laryngeal position to lower to allow for a relaxed laryngeal position, and a top-down singing approach to encourage an easier, more balanced registration, and better resonance. Initial results also emphasize the retraining of subject toward a sensory rather than auditory mode of monitoring. Other areas of consideration include singers' training and vocal use, the psychological effects of MTD, the personalities potentially associated with it, and its relationship with stress. Finally, the results emphasize that a positive rapport with the subject and collaboration between all professionals involved in a singer's care are essential for recovery.

Key Words: Singing voice Muscle tension dysphonia (MTD) Collaboration Retraining.

BACKGROUND

Muscular tension dysphonia (MTD) is a current, often misdiagnosed problem among singers and nonprofessional voice users. Much of the literature has focused on the speaking voice and nonprofessional voice users in this complex and multifaceted disorder.[1,2] In its subtlety, it is often missed by voice teachers and singers alike until the symptoms include such changes as loss of range, change in *fach*, or extreme vocal fatigue. When a singer is no longer able to sustain their singing voice demands, they may go to a doctor, only to be told that there is "nothing wrong" with their vocal folds. In another scenario, after treatment of the acute vocal fold issues (including reflux, allergies, nodules, polyps, and others), the chronic, muscular compensation remains as the primary pathology resolves.[3] "It is one of the most debilitating problems that singers may confront […], more commonly found in females than males and is typically exacerbated by stress ..."[4]

The traits of MTD include internal laryngeal variables (eg, increased subglottic pressure) and/or external variables (eg, allergies). The primary factors include (1) high breathing patterns (clavicular and thoracic), (2) increased subglottic pressure, (3) elevated vertical laryngeal position (VLP), (4) posterior glottic chink, (5) hyperadduction of false vocal folds, (6) chest voice dominant phonation (excessive thyroarytenoid function), (7) reduced coordination of registers, and (8) "bottom-up" approach in singing voice technique.

Among the literature, there are four MTD classifications:

- Type I: Gap between the vocal fold free edges during phonation, with a conspicuous posterior gap between the vocal processes; considered a laryngeal isometric pattern.
- Type II: Approximation of the false vocal folds; a supraglottic constriction termed dysphonia plica ventricularis.
- Type III: Partial anteroposterior contraction of the larynx during phonation; the arytenoids are pulled forward toward the petiole of the epiglottis, obscuring the posterior one-half to two-thirds of the vocal folds.
- Type IV: Extreme anteroposterior contraction; complete sphincter-like closure of the larynx, in which the arytenoids actually contact and squeeze against the petiole; phonation is achieved by the vibration of the supraglottic structures, usually the arytenoids against the epiglottis.[5]

Additionally, a coloratura soprano (generally small neck, short vocal folds, extreme high F_0 range in performance) is being reported as having a type where the back wall of the pharynx is squeezed or pressed against the arytenoid cartilages causing an additional "white" noise during phonation. This type may contribute to their voice classification, depending on the physical structures of the particular coloratura singer.

In short, the concept of MTD seems to be "a compensatory adaptation to glottal insufficiency …"[1] Literature suggests that many factors contribute to MTD including vocal fold issues (ie, gastroesophageal reflux disease or vocal fold trauma), physical state (ie, medical issues not related to the voice such as

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injury or surgeries, disease, or allergies), high stress levels, excessive amounts of voice use, and excessive loudness demands.[1] Given the nature of the singing voice, any conditions of the body have the potential to affect the voice. Regarding singers, Keidar[7] includes personality, singing style, technical training, and options of medical care. Furthermore, the demands of singing versus speaking are not clearly understood and determining whether problems arise from the speaking voice, singing voice, or both remain murky. In the recent literature, five compensation categories were defined: (1) technical misuse, (2) learned adaptations after upper respiratory infection, (3) increased muscle tone due to reflux, (4) psychological and/or personality factors that may induce elevated tension in the laryngeal region, and (5) extreme compensation for minor glottic insufficiency and/or underlying mucosal disease.[2] Given the range of issues to be addressed, an interdisciplinary approach to treating all contributing factors is recommended.[6]

Among singers, issues of MTD are not well documented. "The majority of voice problems in singers and actors result from vibratory trauma and reflect a cumulative process of misuse and/or overuse …"[7 (p. 126)] Keidar estimates between 10% and 20% of singers have some chronic voice disorders. Although research is limited in this area, it seems clear that there may be psychological issues involved in this disorder. Traits that may contribute include "overdoer" personalities (type A), vocal "overdoers" (someone who talks a lot) and stress. In addition, MTD is generally seen more often in women than men and higher voices may be more at risk.[4,7] Roy[8] refers to general traits among vocal nodules (VN) and vocal dysphonia (VD) patients. Although both demonstrate higher anxiety levels, VN patients were seen as socially dominant, more impulsive, and more aggressive. Generally, VD patients were more introverted.

Purpose

The purpose of this study was to understand and document the process of retraining a singer with MTD, with particular attention toward the collaboration between speech-language pathologist (SLP) and singing voice specialist.

METHOD

This study was designed as a qualitative case study to demonstrate the process of diagnosis and treatment between a voice team to manage a singer diagnosed (by her laryngologist) with MTD. Data collected included initial medical screening with laryngologist, referral to SLP specializing in voice disorders among singers, and adjunctive voice training with voice teacher trained in vocology. Perceptual assessments are included in the Addendum. Voice lessons were recorded in the end of the 2-year study along with interviews from singer's perspective. Current study involved four videotaped 1-hour singing lessons (transcribed and reviewed), informal interviews during the lessons (transcribed), journal entries for both participant and instructor, and follow-up questioning. Research questions include (1) What are the technical goals which may be addressed for a singer with MTD?, (2) What are other issues singers may confront with MTD? and (3) What pedagogical practices are effective in developing a healthy and expressive singer?

RESULTS

The study subject was a 28-year-old coloratura soprano who had completed her Masters in Music at a highly regarded, selective northeastern conservatory setting. She reported dysphonia symptoms beginning during her masters degree program, which she states were never addressed. They were reported to be inaudible to those around her and sensed only to her, although her repertoire and *fach* was changing due to loss of range. Only upon graduation and facing the audition circuit, did her problems become more acute and were no longer able to be dismissed. "I had studied through a Masters (degree) I had been able to get through … things got really bad after school … I was 28 and doing auditions and I fell apart …"

Upon medical examination, the vocal folds were found to be without vocal fold mass but had signs of MTD with incomplete closure at arytenoids during phonation and excessive thyroarytenoid function. Speech therapy and vocology assessment found MTD present and had additional factors of high breathing pattern (clavicular), increased perceived breath pressure, high larynx posture, excessive use of isolated chest voice (modal register) in upper frequencies, and an overall bottom-up approach to voice. The subject had recently returned to singing after a break for the birth of her first child.

Technical issues in singing and speech

Initial work with speech therapist was crucial in retraining of subject toward a sensory rather than auditory mode of monitoring. Target goals included reducing extrinsic laryngeal tension, using a relaxed laryngeal posture, and effective abdominal-diaphragmatic support for all phonation events. Circumlaryngeal massage was used, with attention to rebalancing muscular forces of extrinsic against the intrinsic laryngeal muscles. Balance of respiratory forces, laryngeal coordination, and use of optimum filtering of the source signal through resonance and articulatory awareness was emphasized. Lip flutters were used in five note patterns, ascending and descending to coordinate the power-source-filter. This further established the "top-down" approach for balanced phonation. Tongue stretches (extended tongue with speaking and vocalizing exercises) were also used. Posture of head and neck when sitting and standing was addressed. Finally, a pattern of ascending and descending /u/ with emphasis on loft resonance beginning in middle voice was used in addition to ng-sniff exercise on "ng" with diminuendo lower note and change on the highest note to "ee" and "oh." At the end of six speech therapy sessions, the subject reported therapy "really opened me up to a new sound …"

The subject was then referred to a specialized voice teacher who continued vocal retraining over a period of 2 years. Vocology assessment revealed the need for retraining of the singing voice in an effort to stabilize effective breath support system and encourage coordination of power-source (respiratory-laryngeal) coordination, including airflow resistance and monitoring excessive pressure. Panting and laughing helped alert the singer to respiratory and laryngeal muscle use. Specific attention toward the muscular engagement (placing hands above hips, with a laugh or careful throat clearing to demonstrate this engagement), less in filling forward or pushing out of