Classification and Approach to Patients with Functional Voice Disorders

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Functional voice disorders result from vocal misuse or abuse; they are more easily recognized than other psychosomatic disorders because the clinician is able to visualize the laryngeal structure and function. If those structures appear normal, then an aberration of voice quality can be assumed to be functional. Functional dysphonia with prolonged aberrant vocal usage may lead to development of secondary pathological lesions of the larynx, which, although true pathological entities, must be recognized as resulting from the underlying and preceding functional disorder. In this report, we present a classification of and an approach to the diagnosis and treatment of functional voice disorders. On the basis of our clinical experience with 52 patients, we distinguished five types of functional voice disorders: type 1, hysterical aphonia/dysphonia; type 2, habituated hoarseness; type 3, falsetto voice; type 4, vocal abuse; and type 5, postoperative dysphonia. Forty-eight of the 52 patients (92%) were followed for a median period of 16 months (range 2-51 months). Therapy yielded excellent results in patients with types 1, 2 and 3; good results with types 4 and 5.

INTRODUCTION

A voice disorder is termed “functional” when it is primarily due to abuse or misuse of the anatomically and physiologically intact vocal apparatus. The underlying cause may be obscure or obvious, but prolonged abuse may result in the development of nodules, polyps, ulcers, or granulomas of the vocal cords.

The purpose of this paper is to present a classification and approach to treatment of functional voice disorders. The proposed system abandons the use of terms such as hypokinetic and hyperkinetic and focuses on the underlying mechanism and the clinical presentation. Although we present five clinically discrete groups (types), we have only limited data on some of the types and may not have identified other types or subtypes of voice disorders that can be termed truly functional.

MATERIAL AND METHODS

The medical records of 52 patients with a diagnosis of functional voice disorder were reviewed and yielded the data for this report. All patients were private patients seen by the senior author (JAK) from July 1978 through December 1981.

There were 39 female and 13 male patients (female to male ratio, 3:1). Their median age was 42 years (range: 6-76 years); seven patients were younger than 16 years. The median duration of symptoms before the patients were seen was 7 months (range 1-216 months); twelve patients (23%) had had a preceding bout of viral laryngitis.

To have been diagnosed as having a functional voice disorder, a patient had to have had a poor voice and a normal mirror laryngoscopy or had to have demonstrated patterns of vocal abuse with associated secondary pathological lesions. Patients with unilateral lesions or a lesion attributed to smoking, or with altered laryngeal physiology due to trauma or systemic illness (specifically, reflux esophagitis, thyroid disease, postinflammatory polyps, and spastic dysphonia) were specifically excluded from the study group. The voice problems were classified into one of five types by the senior author (Table 1). The criteria for each classification were as follows:

Type 1. Hysterical Aphonia/Dysphonia
1. Onset: sudden.
2. Indirect laryngoscopy: normal.
3. Often associated with a discrete precipitating event.
4. No history of prior laryngitis.
5. Associated symptoms: none.
6. Voice quality:
   a. Aphonia or whisper.
   b. Pitch-locked (if any voice present).
   c. Stable dysfunction (not intermittent or fluctuant).

Type 2. Habituated Hoarseness
1. Onset: persistence of hoarseness (for months or years) usually following an acute episode of laryngitis.
2. Indirect laryngoscopy: normal (except for occasional plica ventricularis).
3. Associated symptoms: none.
4. Not associated with a discrete precipitating event but frequently associated with “secondary gain.”
5. Voice quality:
   a. Breathy, raspy, diplhonia, plica ventricularis (or a combination).
   b. Pitch-locked.
   c. Stable dysfunction (not intermittent or fluctuant).

Type 3. Falsetto
1. Onset: developmental or sudden.
2. Indirect laryngoscopy: normal.
3. Associated symptoms: none.
4. Voice quality:
   a. Abnormally high-pitched.
   b. Pitch-locked.
   c. Stable dysfunction (not intermittent or fluctuant).

Type 4. Voice Abuse
1. Onset: usually long-standing, intermittent or fluctuant dysphonia.

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Presented at the meeting of the American Laryngological Association, Palm Beach, Florida, May 1-2, 1982.

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372
2. Vocal abuse resulting from:
   a. Overuse.
   b. Pitching the voice abnormally low.
   c. Abnormal muscular tension in the larynx and neck muscles.
   d. Any combination thereof.
3. Indirect laryngoscopy: normal or associated with “secondary” vocal nodules, polyps, ulcers, or granulomas.
4. Associated symptoms: throat pain coincident with the dysphonia (worse after voice strain).
5. Voice quality:
   a. Variable dysphonia.
   b. Hard glottal attack.
   c. Not pitch-locked.
   d. Intermittent and/or fluctuant dysfunction.

Type 5. Postoperative Dysphonia
1. Onset: severe dysphonia secondary to vocal abuse after operation.
2. Indirect laryngoscopy: normal or plica ventricularis, ulcers, or granulomas.
3. Associated symptoms: throat pain coincident with dysphonia (worse after voice strain).
4. Voice quality:
   a. Variable dysphonia.
   b. Hard glottal attack.
   c. Not pitch-locked.
   d. Frequent plica ventricularis.

All patients had undergone a complete otolaryngological examination and 40 patients had been evaluated by a speech pathologist. Eight of the patients underwent a neuropsychological evaluation which included an interview with a trained psychologist and a Minnesota Multiphasic Personality Inventory (MMPI). A neuropsychological evaluation was carried out in selected cases, both for research as well as for clinical purposes. (Such an evaluation may not be necessary for most patients with functional voice disorders; rather, referral to a psychologist or psychiatrist may suffice when referral is indicated.)

Treatment consisted of voice therapy alone in 67% of patients, voice therapy and operation in 17%, and voice therapy and psychiatric therapy in 5%. Five patients (10%) had been counseled but had received no formal therapy; it had not been recommended for 2 patients, and had been refused by 3 patients. The therapeutic procedures employed are discussed later.

Follow-up examinations of all 52 patients were carried out by the authors. ‘‘Late’’ follow-up (in March 1982) was also obtained by telephone interviews with 48 of the patients (92%). The results were judged by the authors as follows: excellent — voice normal without recurrent episodes of aphonia or dysphonia during the follow-up period; good — voice usually normal, but relapse occurred at least once during the follow-up period; poor — voice unimproved or improved but still poor.

Statistics. Due to the small sample size, medians and ranges rather than means were used. Statistical significance of the observed differences in the results of treatment in patients with type 1, 2, 4 and 5 disorders and type 4 subgroups was computed using the chi-square and ANOVA methods.

**RESULTS**

_Hysterical aphonia/dysphonia (Type 1)._ Four female patients and one male patient (10%) had exhibited hysterical conversion reactions. Each presented with a sudden loss of voice: two were aphonic and three whispered softly. In all, the vocal loss was stable and not fluctuant, and the dysphonia (if a voice was present) was “pitch-locked.” The median duration of symptoms before presentation was two months (range: 0.5-17 months).

Complete voice restoration was accomplished with voice therapy during the initial visit in four patients, and after two therapy sessions in the fifth patient. Neuropsychiatric evaluation including MMPI was recommended to each of these patients, but only one patient agreed to be tested (a 45-year-old male with multiple somatic complaints and severe dysphonia; MMPI results showed elevated scales 1, 3, and 8 consistent with the diagnosis of hysteria).

The four female patients have remained asymptomatic with normal voices (median follow-up period: 16 months; range: 3-34 months). The male patient continues to have occasional relapses, and psychiatric therapy is in progress.

_Habituated Hoarseness (Type 2)._ Thirteen female and two male patients (28%) were classified as having habituated hoarseness. The female to male ratio in this group was twice that of the overall group (6:5:1). The median age was 38.7 years (range: 14-76 years); the median duration of symptoms at presentation was 11 months (range: 2-24 months). In 12 of the 15 patients (80%), the dysphonia had begun with a bout of viral laryngitis. Three patients who denied having had laryngitis were included in this group because of the chronicity of their hoarseness and because, in all other respects, they resembled type 2 patients.

Indirect laryngoscopy had yielded normal findings in 10 patients; 3 patients had had false vocal cord voice and 2 had had mild Renke's edema.

Voice therapy and counseling were the only forms of therapy employed in this group. All 15 patients regained a completely normal voice, 12 (80%) doing so on the initial visit. Neuropsychological evaluation with counseling was suggested for three patients; however, only one patient was actually evaluated. Only 1 of the 15 patients has had recurrence of their hoarseness (median follow-up period: 16 months; range: 1-50 months).

_Falsetto Voice (Type 3)._ Only one patient fell into this category, a 53-year-old female who had suddenly developed an abnormally high voice one year before we saw her. Her voice was restored with voice therapy, and she was referred for psychological evaluation and counseling because the neuro-
TABLE 2. TYPE 4 RESULTS OF TREATMENT ACCORDING TO SUBTYPE AND SEX

<table>
<thead>
<tr>
<th></th>
<th>Excellent</th>
<th>Good</th>
<th>Poor</th>
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<tbody>
<tr>
<td>TFS M</td>
<td>3/7 (44%)</td>
<td>2/7  (28%)</td>
<td>2/7  (28%)</td>
</tr>
<tr>
<td>F</td>
<td>4/5 (80%)</td>
<td>1/5  (20%)</td>
<td>—</td>
</tr>
<tr>
<td>Nodules M</td>
<td>1/2 (50%)</td>
<td>—</td>
<td>1/2  (50%)</td>
</tr>
<tr>
<td>F</td>
<td>5/10 (50%)</td>
<td>3/10 (30%)</td>
<td>2/10 (20%)</td>
</tr>
<tr>
<td>Polyps F</td>
<td>1/3 (33%)</td>
<td>2/3  (67%)</td>
<td>—</td>
</tr>
<tr>
<td>Granuloma M</td>
<td>1/1 (100%)</td>
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TFS = Tension-fatigue syndrome.

The psychological evaluation had revealed a high psychosomatic score and possible impending psychological decompensation. Her voice is normal at 5-months follow-up.

**Voice Abuse (Type 4).** Of the 52 patients, 27 (52%) were classified as vocal abusers. The female to male ratio was 1:7:1. Sixteen (60%) had developed vocal nodules, polyps, or granulomas, and the remaining 11 (40%), who had had normal mirror laryngoscopic examinations, were classified as having musculoskeletal tension disorders, hereafter referred to as "tension fatigue syndrome." All nine of the patients in the entire study group who used their voices professionally were in this type 4 group. The median duration of symptoms for these 27 patients was 18 months (range: 2-216 months).

The results of treatment according to subclass and sex are shown in Table 2. Follow-up ranged from 1 to 38 months (median: 17 months). The best results were obtained in women with tension fatigue syndrome; the worst results in men with tension fatigue syndrome. However, the 5 patients with poor results had received no treatment (2 males with tension fatigue syndrome and 1 female with nodules had refused therapy, and no therapy was recommended for 2 children with nodules).

A chi-square test of the differences observed in results between male and female patients as well as between the subclasses revealed that none was statistically significant.

The nine patients in the entire series who were treated surgically all had type 4 disorders. All were women, three of whom had polyps and six of whom had nodules. The final results of operation were excellent in six patients (67%) and good in three patients (33%). (Of the 9 patients treated surgically by one of the authors, 3 developed transient postoperative plica ventricularis, which was responsive to voice therapy in every case).

The overall results for type 4 subjects were: excellent — 56%; good — 26%; and poor — 18%.

**Postoperative Dysphonia (Type 5).** Four patients had presented with severe dysphonia following operations at other institutions: bilateral vocal cord stripping in three patients, unilateral vocal cord stripping in one patient. One of the 4 had had severe dysphonia of the tension fatigue syndrome type; 1, a child, had developed recurrent nodules within six months of operation; and the other 2 patients employed a false vocal cord voice. The median duration of symptoms before presentation was three months (range: 1-6 months). Combining these four patients who had presented with type 5 disorders with the four type 4 patients who had developed type 5 disorders after operative treatment provided a group comprising 15% of the study population.

In this group, 5 of the 8 patients (63%) employed false vocal cord voices postoperatively. Late follow-up of those eight patients showed 50% with excellent results, 25% with good results, and 25% with poor results. The median follow-up period was 12 months (range: 6-28 months). These results are similar to the results observed in type 4 dysphonias.

**Neuropsychological Evaluation.** Four patients from group 4 and one patient each from the other groups had neuropsychological evaluations. The MMPI was interpreted as "psychosomatic" (classic conversion "V"; elevated 1, 3 scales) for 6 of the 8 patients, while two of the scores were normal. Evaluations suggested psychiatric disturbances in three patients (for which psychiatric referral was made); none of the patients were psychotic.

The neuropsychological evaluations were recommended for the few patients (15%) who were felt to be unresponsive to voice therapy due to psychological factors and for patients who seemed to display obvious psychopathological behavior. Further study is needed to clarify the contributing psychological factors in order to achieve a better understanding of the most effective therapeutic approach.

**Comparative Results of Treatment: Types 1-5.** The results of treatment for each type suggest that the overall prognosis in the functional voice disorders is dependent upon the presence or absence of pathological lesions of the larynx (Table 3). A statistical analysis of the differences in results of the individual types was not possible due to the small numbers in some of the groups. However, when the "non-lesion types" (types 1, 2, and 3) were grouped and compared with the grouped "lesion types" (types 4 and 5), the difference in the results of therapy was significant at a p < .01 level.

**DISCUSSION**

Arnold and Pinto, 1 Arnold2,3 and Aronson 4 have contributed toward the classification of functional voice disorders; however, no unifying classification has been presented in the medical literature, despite the available data on many such disorders. Hysterical mutism, aphonia and dysphonia, for example,
are well-described and are easily recognized, but are considered to be clinically discrete disorders. Polyps, nodules, contact ulcers, and granulomas, all well-known sequelae of vocal abuse, tend to be reported as separate entities rather than together as a single group. Indeed, all the components of the classification presented here are well-known, but are seldom considered in the context of a common etiology.

**Hysterical Aphonja/Dysphonia (Type 1).** Carter studied 100 cases of hysterical conversion reaction, excluding cases with diffuse or complicated symptoms, and noted that aphonja was, indeed, the most common conversion symptom (29%). In his series, 70% of patients were females, and while initial therapy successfully restored the voice in 100% of patients, follow-up of 27 patients 4 to 6 years later showed that only 68% had maintained a restored voice; 28% were improved; and 4% were unimproved. However, Carter concluded that “hysterical aphonja by itself is a symptom of only mild mental dissociation and has a very good prognosis.”

**Habituated Hoarseness (Type 2).** In Carter’s series of patients with hysterical conversion reactions, many had aphonja following viral laryngitis. Aronson has also suggested that “conversion aphonias and dysphonias are often triggered by cold or flu and associated laryngitis.” However, it is useful to separate the true hysterical conversion reaction from postviral chronic hoarseness: first, because more significant psychopathology may be associated with the true conversion reactions; second, because the long-term prognosis is probably better for the patient with postviral chronic hoarseness; and third, because the underlying cause is different for each group. In conversion reactions, the hysterical symptom (aphonja) is unconsciously selected and is usually of symbolic significance. In postviral habituated hoarseness, on the other hand, the patient has simply made a chronic adaptation to an acute dysfunction, usually with some secondary gain.

**Falsetto Voice (Type 3).** Falsetto voice is uncommon, but is easily recognized. The larynx appears normal but the voice is disproportionately and inappropriately high-pitched. Correction is almost uniformly achieved by suggestion and reassurance.

It is likely that patients with falsetto voice can be divided into two subcategories. The first includes adolescents with preadolescent voices (mutational falsetto), and the second includes adults with acute onset falsetto (probably representing hysterical conversion reactions).

**Vocal Abuse (Type 4).** Unlike the first three types discussed which are associated with vocal misuse, this type is associated with functional abuse. Type 4 patients are prone to developing vocal nodules, polyps, ulcers, granulomas and lesions unassociated with the other functional types.

Other vocal abusers experience intermittent tension, fatigue, hoarseness and throat pain (the tension fatigue syndrome) without producing histopathological changes in the larynx. Patients in this group seem to be exclusively adult and are predominantly male. They are frequently ambitious, aggressive, hard-driving persons, and some are overly masculine, employing a fundamental voice pitch that is excessively low. Our data and that in the literature suggest that tension-fatigue syndrome is the only functional voice disorder other than speecher’s nodules that is more common in male patients. While type 4 females may develop tension-fatigue syndrome, they seem more prone to developing nodules or polyps. Children who abuse their voices are most prone to develop nodules.

**Postoperative Dysphonia (Type 5).** Some patients who undergo an endolaryngeal operation return to the surgeon’s office for follow-up with severe dysphonia. These patients demonstrate a violent glottal attack, which represents a vain attempt to produce a normal voice. Some may speak with a false vocal cord voice or may even have developed postoperative ulcers or granulomas of the vocal cords. (We do not consider false vocal cord voice a distinct disorder type, even though 8 of the 52 patients (15%) in this series presented with or developed false vocal cord voice. Five of the 8 patients had developed postoperative plica ventricularis and 3 had had postviral laryngitis. Arnold suggested that false vocal cord voice was a secondary form of “laryngitis” resulting from a primary vocal disorder. The data from this study also suggest that false vocal cord voice may simply be a compensatory mechanism associated with painful speaking, and that habituation is common. False vocal cord voice may, therefore, represent a symptom only and not a disorder entity.)

Postoperative dysphonia seems to occur in patients who either are not adequately prepared preoperatively or are noncompliant with postoperative voice conservation measures. Thus we believe that the incidence of postoperative dysphonias may be reduced by preoperative vocal reeducation of certain surgical patients.

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**TABLE 3. FUNCTIONAL VOICE DISORDERS: RESULTS BY TYPES (1-5)**

<table>
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<tr>
<th>Type</th>
<th>Excellent (%)</th>
<th>Good (%)</th>
<th>Poor (%)</th>
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<tr>
<td>1</td>
<td>4/5 (80%)</td>
<td>1/5 (20%)</td>
<td>—</td>
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<tr>
<td>2</td>
<td>12/13 (92%)</td>
<td>1/13 (8%)</td>
<td>—</td>
</tr>
<tr>
<td>3</td>
<td>1/1 (100%)</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>4</td>
<td>15/27 (56%)</td>
<td>7/27 (26%)</td>
<td>5/27 (18%)</td>
</tr>
<tr>
<td>5</td>
<td>1/4 (25%)</td>
<td>1/4 (25%)</td>
<td>2/4 (50%)</td>
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<tr>
<td></td>
<td>4/8 (50%)</td>
<td>2/8 (25%)</td>
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*Type 5 results including four type 4 patients who also had developed postoperative dysphonia.*
Approach to Patients with Functional Voice Disorders. In laryngology, when the voice is disproportionately poor compared to the laryngeal findings, a functional voice disorder should be suspected. Since prompt voice restoration is the best confirmation of the diagnosis, the clinician should proceed with therapy as soon as the diagnosis is made, and avoid labeling the patient as psychosomatic, even though that may be the case. Since most patients seem to accept the concept that dysfunction may be the result of stress, the clinician should suggest it. Such an explanation serves three purposes: First, the patient is reassured that many normal persons have functional problems; second, the clinician suggests that he or she is willing to help; and third, the clinician implies that the patient will have a role in the therapeutic process.

Prompt vocal restoration may be achieved through techniques that encourage the patient to use any other voice, e.g., falsetto; the clinician then works with the patient to extend incrementally the phonatory signal until a normal voice is achieved (asking the patient to cough, to clear his or her throat, or to meow like a kitten are effective maneuvers). If the clinician is successful in reestablishing the patient’s voice, he or she should still refer the patient to a speech pathologist, who can reinforce the initial success. When the clinician is unsuccessful, he or she must be careful not to risk alienating the patient by expressing displeasure in the patient’s response.

The speech pathologist employs relaxation techniques such as deep abdominal breathing, and repeats those methods already tried by the otolaryngologist. Biofeedback is another useful tool in the treatment of functional voice disorders, and a Vocal-2 Visible Training System or Fundamental Frequency Indicator may be employed. In resistant cases, a portable audiometer can be used to produce white noise masking.

Type 4 patients vary widely in terms of age, occupation, duration of symptoms, and motivation. Voice therapy remains the cornerstone of treatment, but the proportion of noncompliant patients resistant to such therapy is notably higher in this group than in the others.

Voice therapy techniques for type 4 patients are similar to those used in type 1, type 2, and type 3 patients, with the exception that the primary focus is on reducing or eliminating vocal abuse. Techniques toward this end include charting vocal behavior on a daily basis and voice taping for playback purposes, which are important because they reinforce the patient’s awareness of normal versus abusive vocal patterns. Relaxation exercises and efficient use of the breath stream are also emphasized.

Postoperative dysphonia (type 5) patients may represent a special variety of type 4 patients. Postoperative dysphonia patients tend to be hostile and are poorly motivated. They are inclined to blame the surgeon for the poor result if not preoperatively counseled, and they may be resistant to therapy.

Routine preoperative voice therapy may be indicated for every vocal abuse patient with a surgical lesion. The patient should be forewarned that a hard glottal attack or any vocal abuse in the postoperative period may result in severe dysphonia and possibly even lead to the development of new lesions.

Patient motivation is the key to a successful therapeutic outcome in the functional voice disorders, and some patients with functional voice disorders may actually prefer dysphonia to a normal voice. This preference is especially common in those who use their voices professionally. Some use a “character” voice; in others (the late Louis Armstrong, for example), vocal abuse had led to the development of a uniquely individual voice quality. Patient motivation should therefore be evaluated in each case before formulation of a treatment plan.

Neither our experience nor that reported in the medical literature suggests the need for routine psychiatric therapy in patients with functional voice disorders. Such referral should be made whenever failure of treatment is thought to be due to psychological factors, or whenever a significant psychopathological condition is suspected.

CONCLUSIONS

1. A functional voice disorder should be suspected whenever a patient’s dysphonia seems out of proportion to the laryngeal findings.

2. Chronic (habituated) hoarseness resulting from an acute viral laryngitis may be a discrete functional syndrome with an excellent prognosis.

3. Hysterical aphonia, habituated hoarseness and falsetto voice are more easily treated than the vocal abuse and postoperative dysphonia syndromes.

4. Voice therapy is essential for patients with functional voice disorders and particularly preoperatively for vocal abusers with surgical lesions.

REFERENCES


5. Carter AB. The prognosis of certain hysterical symptoms.


