A Clinical Study of Vocal Disorders in Patients Singing Classical Songs

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Introduction

It is well known that singers often develop voice trouble secondary to vocal abuse and overuse. Although vocal nodules are very common in singers, other types of vocal disorders can also be seen in clinical practice.

Treatment of vocal disorders in singers is often a very difficult task for the laryngologist. Since singers have a good knowledge of the voice and voice training, they would hardly give consent for treatment to a doctor unless he understood their desire to maximize their voice quality. It is often the case that even when the pathology in a singer's larynx does not appear to be serious, it is still a very important problem for the singer.

Punt[1] has stated, "Laryngology is insufficiently applied to singers, actors and other professional voice-users. The basic diagnosis may well be accurate, but lacking in detail, and treatment and advice superficial". This statement is easy to agree with . When we examine and treat professional voice users, we have to have a good knowledge of singing and other performance-practices and pay special attention to the physiology and pathology of their vocal organs.

In the author's clinical experience of vocal disorders in patients singing classical songs, vocal polyp, vocal nodules and acute laryngitis can be treated satisfactorily. On the other hand, chronic laryngitis is difficult to cure completely. Those cases with so-called hypertrophic vocal cords are often especially resistant to treatment. I will call this condition "chronic hypertrophy of the vocal cords". In this paper, a review will be made of 522 patients singing classical songs and the characteristics of "chronic hypertrophy of the vocal cords "will be discussed.

Materials and method

A retrospective study was made on 522 cases (male: 204, female: 322),patients singing classical songs who visited the ENT departments of Shouwa University and/or Kanto Rosai Hospital during the period from 1983 to 1989 (except for 1986). Most of these patients were referred from other hospitals or singing teachers. All the patients were professional singers or music students. These professional singers often teach singing at music schools.

Routine laryngeal examination and stroboscopy were performed on all the cases after careful recordings of personal histories. A clinical statistical study was then made with of the patients' conditions and the singing histories of the patients.

Results

1) Sex and age distributions

Of the 522 cases, 204 were male and 318 were female. Figure 1 shows the age distribution of these patients. Since many of the patients were students of music schools, younger cases were predominant.

It was postulated that skillfulness in singing might be related to vocal disorders in singers. Since it is rather difficult to measure degree of skillfulness, length of experience was taken as an indication of skillfulness in the present study. For this reason, patients above the age of 26 were classified as "skilled".

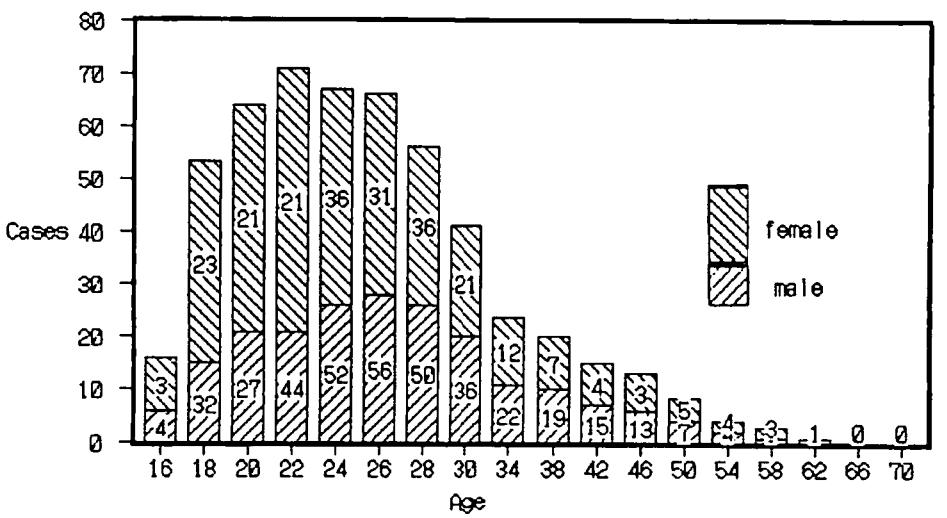


Fig.1 Vocal Disorders among 522 singers
(Distribution of Sex and Age)

2) Classification of disorders

All the cases were diagnosed clinically as shown in Fig. 2. Acute corditis was the most common diagnosis, followed by vocal nodules. There were 64 cases of "chronic hypertrophy of the vocal cords".

3) Vocal range and vocal disorders (Table 1 and Fig. 3)

The vocal range of each patient was given by his or her own report. In those patients with a higher vocal range (tenor in males and soprano in females), the incidence of vocal nodules was relatively higher, while in patients with a lower vocal range (baritone in males and mezzo-soprano in females), "chronic hypertrophy of the vocal cords" was often observed.

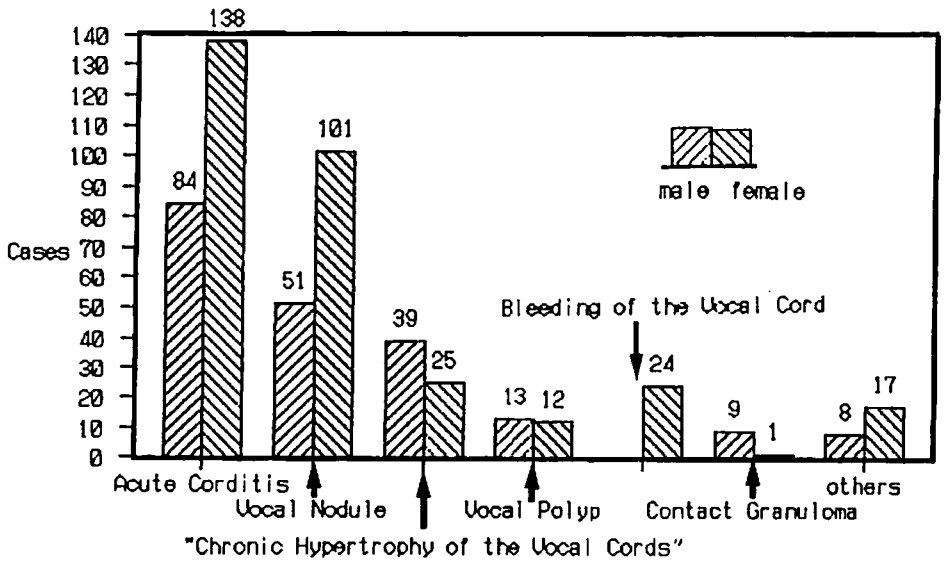


Fig.2 Classification of Disorders

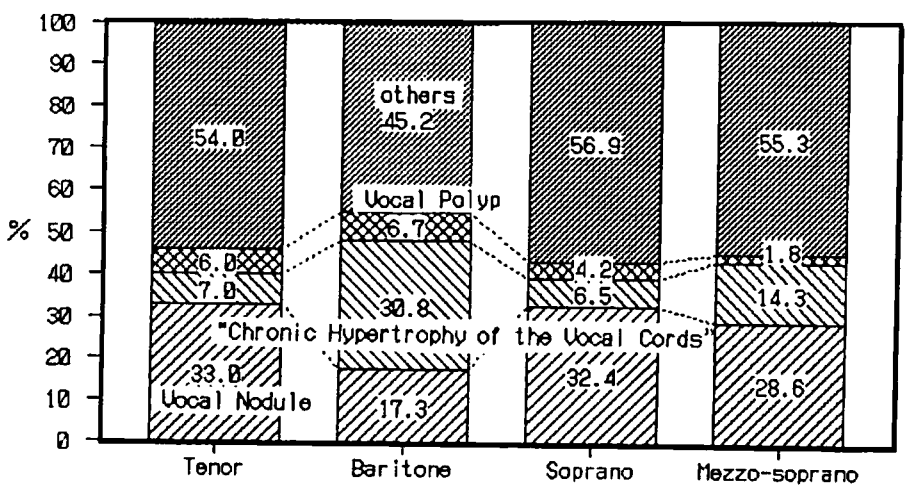


Fig.3 Vocal Ranges and Disorders

Vocal Ranges (Table 1)

	Tenor	Baritone	Soprano	Mezzo-Soprano
total	100	104	262	56
under 26 years	58	59	185	35
over 26 years	42	45	77	21

4)Skillfulness and vocal disorders (Fig. 4 and Fig. 5)

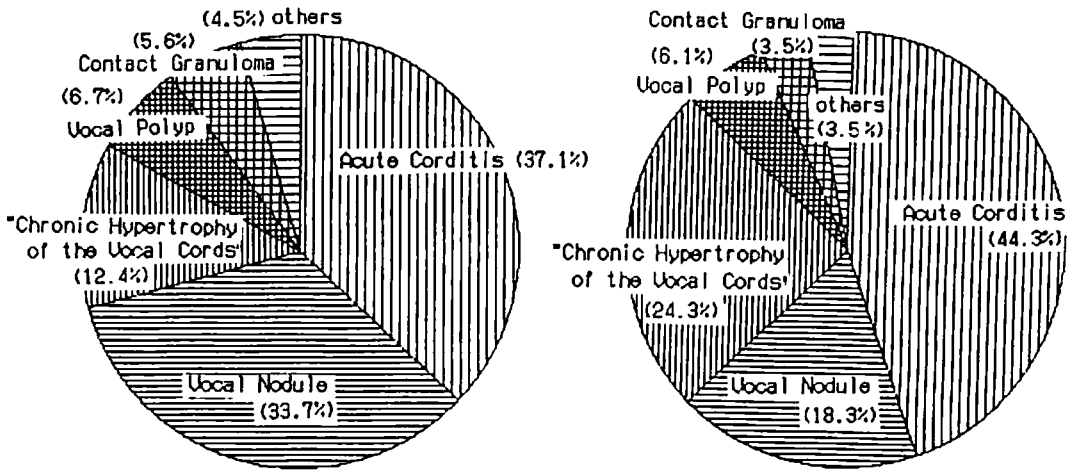
The incidence of vocal nodules was higher in the group under the age of 26, which was defined as the unskilled group. On the other hand, the incidence of "chronic hypertrophy of the vocal cords" was higher in the skilled group (above the age of 26). There was no difference in the incidence of vocal polyp in the two groups in males, while it was slightly higher in the skilled group of females.

5) Symptoms (Table 2)

Out of the 522 cases, 201 complained of hoarseness of a mild degree (Grade 1 on the severity scale of the Japan Society of Logopedics and Phoniatrics[2]), and 194 complained of hoarseness of a medium to severe degree (Grade 2 or above)in daily conversational voice, while the remaining 127 had no complaints for conversational voice. As for symptoms other than hoarseness, 85 patients complained of difficulty in high pitched phonation; 76 complained of difficulty in singing near the voice register change; 64 complained of a fatigue sensation around the pharynx or larynx: 23 complained of voice pitch problems; and 21 complained of discomfort in the pharyngo-larynx.

Symptoms (Table 2)

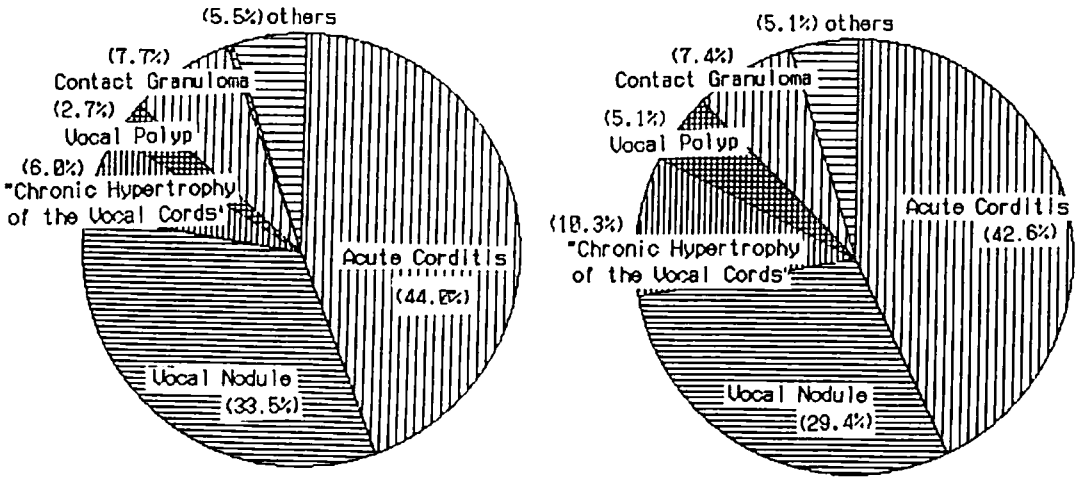
hoarseness (G1)	201 cases
hoarseness (G1,G2)	194 cases
no hoarseness in conversation	127 cases
disorders at high pitch area	(85)cases
disorders with change in voice	(76)cases
fatigue of laryngeal region	(64)cases
disorders of vocal color	(34)cases
disorders of vocal pitch	(23)cases
discomfort in laryngeal area	(21)cases



under 26 years (89 cases)

over 26 years (115 cases)

Fig.4 "Skillfulness"and Disorders (male)



under 26 years (182 cases)

over 26 years (136 cases)

Fig.5 "Skillfulness"and Disorders (female)

6) Physical and environmental conditions (Fig. 6)

Figure 6 shows the result of the patients' subjective judgments on their own physical and environmental conditions at the time of the development of their voice disorders. In the older (or skilled) group, patients tended to report their conditions to be poor. Environmental condition included environmental noise, humidity, temperature, air pollution etc.

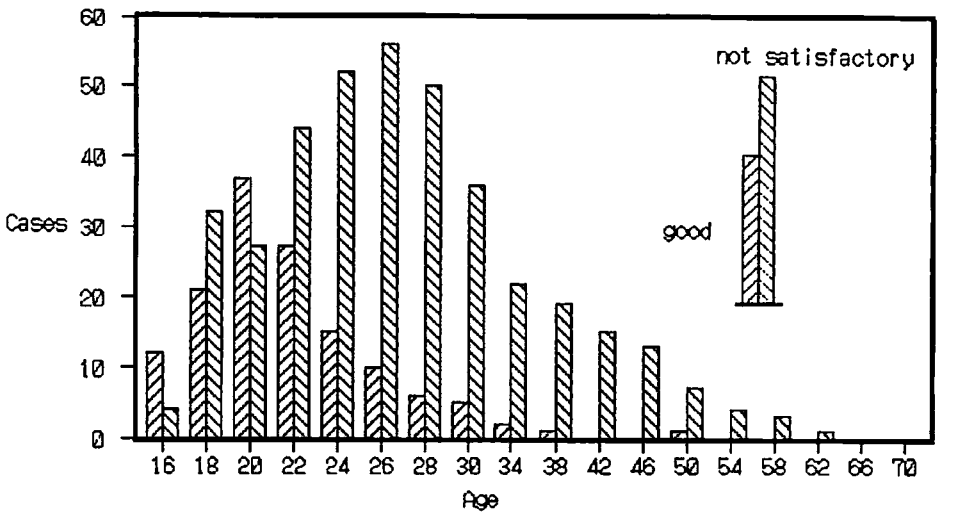


Fig.6 Physical and Environmental Conditions (522 cases)

7) Causes of voice disorders

All the patients were asked to report on the possible causes of their voice disorders. The results are summarized in Table 3, in which multiple answers were permitted. Catching a cold was the most common reported cause of disorders, followed in order by excessive or strained singing, singing for long hours, singing in an exhausted state, overuse of non-singing voice, singing in a with poor sound effect, singing during menstrual period and singing in dry or dirty air.

Causes of Vocal Disorders (Table 3)

a cold	420 cases
excessive or strained singing	385 cases
singing for many hours	341 cases
singing in exhaustion	235 cases
uttering except for singing	165 cases
singing with a bad sound effect	86 cases
singing during menstrual period	56 cases
singing in dry or dirty air	52 cases

8)Treatment (Fig. 7 and Fig.8)

As for treatment, a conservative approach was the primary choice. Most cases were treated by a combination of medication, inhalation and restriction of voice usage. In some cases, advice on singing technique or singing or voice usage was effective. In this advice, relaxation and the use of abdominal breathing were particularly important.

Thirty one cases (5.9%) underwent surgical treatment. As shown in Figure 8, these consisted of cases with vocal nodules, vocal polyp and contact granuloma.
In certain cases, surgery was performed on an out-patient basis under topical anesthesia. A Patient was subjected to surgery under topical anesthesia only when the location and the size of the lesion permitted an easy, indirect laryngoscopic or fiberscopic approach and the patient was cooperative . It was also desirable that the patient show a weak gag reflex.

Microscopiclaryngeal surgery was performed in 9 cases; 4 cases out of these 9 were operated on under NLA anesthesia. The NLA anesthesia permitted stroboscopic observation during the surgery which enabled observation of vocal cord vibration even during the surgical procedure.

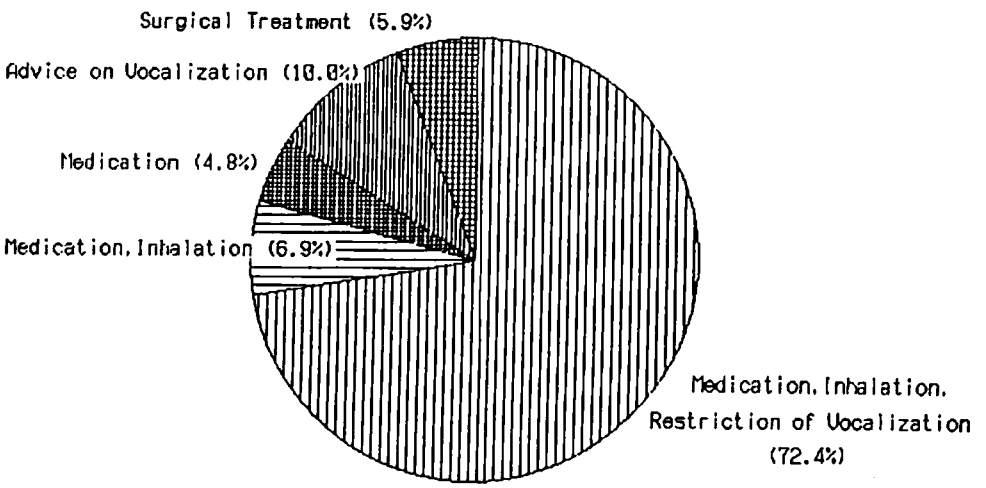


Fig.7 Treatment in 522 Cases

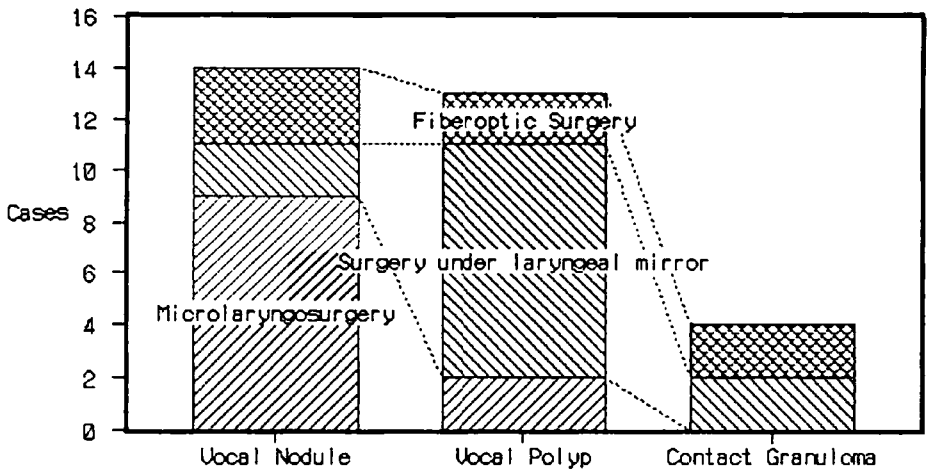


Fig.8 Surgical Treatment

Discussion and Concluding Remarks

It has often been stated that vocal nodules are very common among singers. In the present study, the incidence of acute laryngitis was the highest, probably because the patients generally came to the author's clinic immediately after the onset of their vocal complaints.

The incidence of vocal disorders associated with localized or diffuse vocal cord swelling, such as Rheinke's edema, polyp or nodule, was also fairly high.

However, in a good number of cases who complained of abnormal singing voice, ordinary laryngoscopy did not show any appreciable pathology, while stroboscopy revealed an abnormality in the wave-like movement of the vocal cord mucosa. This finding might represent a chronic thickening of the mucosa,which I term " chronic hypertrophy of the vocal cords".

"Chronic hypertrophy of the Vocal Cords" has been noted by previous authors. For example, Boone [3] stated that there is a form of enlargement along the glottal margin of the vocal cords known as "vocal cord thickening". He also postulated that there are basically two types of thickening, in that one represents an early tissue reaction to vocal cord trauma, often a precursor to vocal nodules or polyps, while the second is the result of prolonged irritation that often results in extensive polypoid degeneration. A apparent vocal cord thickening, as a form of "chronic hypertrophy of the vocal cords", is a probable consequence of the long-standing irritation of the vocal cords due to excessive use of voice. However, it is not necessarily a precursor to polyps or nodules, but rather can be

taken as a separate clinical entity.

In the present study, "chronic hypertrophy of the vocal cords" was more frequently observed in the so-called skilled group with a lower vocal range. It can be assumed that the vocal cords tend to contact each other with a broader area when singing in a low-pitched voice than at a higher pitch. Therefore, it may be the case that excessive phonation in a low- pitched voice results in diffuse vocal cord pathology such as "chronic hypertrophy of the vocal cords". On the other hand, more localized lesions, like nodules, may develop in singers with a higher vocal range.

As revealed in the present study, skilled singers generally claimed that they were not singing in ideal physical and environmental conditions when they developed their vocal trouble. Even if skilled singers are in good physical condition, poor environments such as bad acoustic conditions, dry air in a theater or hotel may affect performances. Skilled singers may develop vocal problems if they are forced to sing in a different mode from their own. This would happen when they have to sing even when they are in a bad physical condition, in overwork, or when they have to sing in an unfamiliar language etc.

When skilled singers develop vocal trouble under bad physical or environmental conditions, the trouble may continue even after these conditions are improved. This may happen mainly because singers have to sing without resting their voice. As singer's vocal troubles must be treated immediately before his/her the next performance. If the vocal trouble is not treated until the next performance, it may become worse.

The most difficult to treat are chronic or repeated vocal disorders. The doctor should not hesitate to tell a singer to refrain from singing at a coming performance for his or her future. In order to give such conclusive advice, the doctor should know precisely about the performance, for example, what song will be sung where and when, in what environmental conditions and so on. The doctor must estimate whether the coming performance will make a patient's vocal disorder worse. If there is any possibility of worsening, the doctor must advise the singer to stop singing.

Non-skilled singers may develop vocal troubles even under good physical environmental conditions. Music school students often develop vocal disorders when they encounter a different teacher at the beginning of a new semester. Each student may have his own habit or mode of singing. If a new teacher tries to change the student's habits, he may not be able to understand the new style. On the teacher's side, he may have difficulty in precisely evaluating the student's vocal habits in the past. This is a problematic situation which may enhance vocal trouble in students.

As for the treatment of a singer's vocal disorders, conservative treatments was selected in general. Usually, acute corditis can be treated without any problem. In many cases, acute vocal disorders are treated by immediate medication or inhalation. In some cases,

In the treatment of chronic vocal disorders, it is necessary to understand the cause of the disorders first. In many cases, vocal nodules, polyps or "chronic hypertrophy of the vocal cords" are the results of a bad singing mode or habit. Such bad singing habits must be eliminated. This does not mean that the doctor should give voice therapy. Rather, voice therapy must be done by the singer or a singing teacher, since these persons have a good knowledge of vocalization. The doctor can give useful advice to singers, particularly using video-stroboscopy and other audio-visual data to show patients their diseased vocal cords or strained laryngeal adjustment. The doctor can also give advice on ideal abdominal breathing.

There are several surgical approaches to vocal cord pathology. At the beginning of the present study, surgery was often made under a laryngeal mirror with microscopy. Recently, however, fiberscopic surgery under video monitoring has become common. Magnification under video monitoring is satisfactory even under stroboscopic illumination. The fiberscopic technique is simple and feasible even on an outpatient basis.

Microscopic-laryngeal surgery is usually performed under general anesthesia. Vocal nodules are mainly operated on using this technique. A careful incision is always necessary for a small lesion on the vocal fold, for which the stabilization of vocal cord under general anesthesia is mandatory. Since the postoperative scar on the edge of the vocal fold could affect the ideal wave-like movement of the vocal cord, great care should be taken not to damage the vocal cord tissue. I tend to restrict such surgery to cases of irreversible, voluminous pathology of the vocal cords.

References

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