### **Original Research Article**

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# Vocal cord palsy and getting to know it better

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#### **ABSTRACT**

**Background:** Vocal cord palsy is a challenging entity encountered by otolaryngologists in clinical practice. It is a sign of an underlying pathology. Vocal cord palsy requires thorough examination and needs to be investigated. We conducted a study to identify the various etiology of vocal cord palsy and the various modalities of treatment.

**Methods:** A prospective study was conducted to study the various etiologies and modalities of treatment of vocal cord palsy. A total of 55 patients with vocal cord palsy were included in our study based on the inclusion and exclusion criteria. Patients diagnosed with vocal cord paralysis were followed up and the various modalities of treatment were studied.

**Results:** Males outnumbered females. Among patients of unilateral vocal cord paralysis left vocal cord was paralyzed in majority of the cases (30 patients). Vocal cord paralysis has a variable etiology. Neoplastic causes accounted for the largest number of patients followed by iatrogenic causes. The modality of treatment depends on the etiology. Patients with unilateral vocal cord palsy speech therapy were our modality of treatment. No surgical intervention was done for unilateral vocal cord palsy. Five patients with bilateral vocal cord palsy underwent Kashima's operation.

**Conclusions:** Vocal cord palsy is a symptom of an underlying disorder and not a disease. In our study malignancy is the commonest etiology for vocal cord palsy.

**Keywords:** Vocal cord palsy, Etiology, Treatment

#### INTRODUCTION

Vocal cord paralysis is caused by paralysis of intrinsic muscles of larynx. The intrinsic muscles of the vocal cord are supplied by the vagus nerve. Vocal cord paralysis is not a disease per se but is a sign of underlying disease process that may be central (10%) or peripheral (90%) in origin. Left vocal cord is more involved because of the longer intrathoracic course of left recurrent laryngeal nerve. Left.

Vocal cord paralysis is a common entity encountered which results from a pathological process involving the vagus nerve or the recurrent laryngeal nerve. The etiology of vocal cord paralysis is vast. Clinical diagnosis of vocal cord paralysis is usually made by indirect laryngoscopic examination and confirmed by videolaryngoscopy. Symptoms of vocal cord paralysis depend on whether the paralysis is unilateral or bilateral. The early recognition of this problem and the application of appropriate therapy will prevent life-threatening sequelae from hypoxia, anoxia or contamination of the lower respiratory tract.

Our study aims to identify patients with vocal cord paralysis, to establish an etiological diagnosis and to study the various modalities of management.

#### **METHODS**

A prospective study was conducted in Justice K.S. Hegde Medical Academy Mangalore over a period of 6 months from October 2015 - April 2016. A detailed history was obtained from all the patients included in our study followed by an ENT examination and relevant radiological hematological, and endoscopical examination to obtain an etiological diagnosis. Patients diagnosed with vocal cord paralysis were followed up and the various modalities of treatment were studied. Only when all the procedures had been performed without uncovering an etiological agent, a patient with vocal cord paralysis was placed in the category of "idiopathic". A total of 55 patients were studied.

#### Inclusion criteria

Clinically diagnosed patients with vocal cord palsy were selected

#### Exclusion criteria

Exclusion criteria were fixed vocal cord due to laryngeal and other malignancies; patients who were not willing for further evaluation

Collected data was analysed by frequency and percentage. Software SPSS 13 was used for analysis of data

#### **RESULTS**

Males outnumbered females. Out of the 55 patients studied 33 [63%] were males and 22 [37%] were females. Majority of our patients were above 61 years of age (23 patients). The youngest patient was of 5 years while the eldest was 82 years old. Among patients of unilateral vocal cord paralysis left vocal cord was paralyzed in majority of the cases (30 patients). Vocal cord paralysis has a variable etiology. Neoplastic causes accounted for the largest number of patients followed by iatrogenic causes.

In the neoplastic group, malignancy of the hypopharynx accounted for 33% of these cases while Bronchogenic carcinoma accounted for 29% of the cases. Thyroid malignancy constituted 17% and esophageal malignancy constituted 17% in this group. One patient had Gliosarcoma.

Mechanical factors in the form of stretch and pressure causing vocal cord paralysis were pulmonary tuberculosis in 2 patients, AV Malformation and Vascular ectasia in 1 patient and Ortner's syndrome in 1 patient and thyroid swelling in 4 patients. Accidental trauma to reccurent laryngeal nerve during thyroid surgery was the cause in 11 patients.

Table 1: Etiolo	gy of vocal	l cord pa	lsy.
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Etiology	Left vocal cord palsy	Right vocal cord palsy	Bilateral vocal cord palsy
Neoplastic	14 (46.7%)	6 (66.6%)	4 (25%)
Iatrogenic	2 (6%)	2 (22.2%)	8 (50%)
Idiopathic	5 (16%)	0	1 (6.25%)
Goitre	4 (13.3%)	0	0
Cerebrovascular accident	1 (3%)	1 (11.1%)	1 (6.25%)
Tuberculosis	2 (6%)	0	0
Guillian barre syndrome	0	0	1 (6.25%)
Av malformation	0	0	1 (6.25%)
Diabetic neuropathy	1 (3%)	0	0
Ortner's syndrome	1 (3%)	0	0
Total	30	9	16

In 6 patients no apparent cause for vocal cord paralysis was found and was thus grouped under the "idiopathic" heading. Various management modalities were studied in detail. Among the Iatrogenic causes of vocal cord palsy 11 patients who underwent Thyroidectomy 8 patients had Bilateral Vocal cord palsy and all the eight patients underwent tracheostomy. 5 patients underwent Kashima's operation, 1 patient had recovery after tracheostomy & decannulation was done and 2 patients were not willing for surgery. 4 patients had unilateral vocal cord palsy and Speech therapy was given and their voice improved. Palsy persisted in 2 patients. 3 patients who had thyroid swelling and vocal cord palsy underwent thyroidectomy 1

patient had full recovery following thyroidectomy and in 2 patients voice improved but palsy persisted.

Patients with unilateral vocal cord palsy speech therapy were our modality of treatment. No surgical intervention was done for unilateral vocal cord palsy.

#### **DISCUSSION**

Diseases within larynx rarely cause vocal cord paralysis itself. The most common cause is usually involvement of the vagus or its recurrent laryngeal branch somewhere between the jugular foramen and its entrance into the

larynx proper.<sup>4,5</sup> Certain cases are also caused by some intracranial diseases before the nerve leaves the skull such as, tumor, abscess, bulbar paralysis or cerebrovascular accidents.<sup>4</sup>

Most of our patients were in the 6<sup>th</sup> decade of life. Males outnumbered females in our study. This is in accordance with Cunning and Srivastava.<sup>4,6</sup> Vocal cord paralysis was not related to any type of occupation. This has also been emphasized by Srivastava.<sup>6</sup>

The patient with unilateral vocal cord paralysis continues to commonly present a diagnostic dilemma to the otolaryngologist. Left vocal cord was more frequently involved than the right one in our study. This is attributed to the longer and more tortuous course of the recurrent laryngeal nerve on that side. 4,6 With the advent of advanced imaging studies of the head and neck (CT and MRI), it is now possible to image the entire course of the laryngeal nerves. The etiological factors for vocal cord paralysis could be grouped as neoplastic, iatrogenic, idiopathic, mechanical trauma, neurological and congenital. The leading cause of unilateral vocal cord paralysis according to historical data was syphilitic aortic aneurysm in the early 20<sup>th</sup> century.<sup>4</sup> Neoplastic causes are the commonest identifiable cause of vocal cord paralysis as has also been reported by Cunning, Goff, and Stell and Maran. 3,4,7 29% incidence of bronchogenic carcinoma as a cause of vocal cord paralysis falls within the range of incidence reported by Clerf (21.8%).7 Carcinoma esophagus was the next common (17%) neoplastic cause of vocal cord paralysis. Relatively higher incidence of oesophageal carcinoma in the present study is because of overall increased incidence of upper gastrointestinal malignancy in this part of the country. Thyroid malignancy constituted 17% of vocal cord paralysis. In neoplastic cases, vocal cord paralysis can occur either by direct involvement of recurrent laryngeal nerve by the malignant disease or by the involvement of the nerve by secondaries to the lymph nodes of mediastinum and neck.

In the present study, 12 cases of vocal cord paralysis followed accidental injury to reccurent laryngeal nerve. Out of these, 11 cases followed thyroid surgeries and the remaining 1 case had history of lymph node excision. Our centre being a tertiary health care centre we have had many of our cases referred from other centres when patient had a history of total thyroidectomy and presented with stridor to our centre.

Various mechanical causes that may stretch, compress or otherwise disturb the reccurent laryngeal nerve may include aneurysm of aorta, cardiomegaly, apical tuberculosis, scoliosis and achalasia. In the present study mechanical causes were pulmonary tuberculosis in 2 patients, AV Malformation and Vascular ectasia in 1 patient and Ortner's syndrome in 1 patient and thyroid swelling in 4 patients.

Central neurological causes of vocal cord paralysis have been identified which include cerebrovascular accidents, diabetic neuropathy, tumors, abscesses, poliomyelitis, syphilis, multiple sclerosis etc. In the present study, 5 cases were identified wherein the underlying cause was a neurological one. Three patients had a history of cerebrovascular accident and in one diabetic neuropathy and in one Guillian Barre Syndrome. In a study conducted by Jayanthy et al idiopathic causes was the major subgroup for vocal cord palsy followed by iatrogenic causes. Barre Syndrome is subgroup for vocal cord palsy followed by iatrogenic causes.

The various modalities of treatment depend on the type of vocal cord palsy. The various treatment options include speech therapy and phonosurgery. Phonosurgery is defined as 'any surgery designed primarily for the improvement or restoration of the voice. Phonosurgery includes a wide range of surgical techniques such as microlaryngoscopic surgery, vocal fold injection, and laryngeal framework surgery, nerve grafting and neuromuscular surgery. In our study 8 patients who had bilateral vocal cord palsy following total thyroidectomy underwent tracheostomy. 5 of these patients underwent Kashima's operation, 1 patient had recovery after tracheostomy & decannulation done and 2 patients were not willing for surgery.

#### **CONCLUSION**

Vocal cord palsy is a symptom of an underlying disorder and not a disease. In our study malignancy is the commonest etiology for vocal cord palsy. Relevant investigations have to be conducted in order to diagnose the etiology and the modality of treatment varies depending on the etiology of the condition.

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Institutional Ethics Committee

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