



ETIOPATHOGENESIS OF VOCAL CORD PARESIS AND PALSY IN A TERTIARY CARE CENTRE- A PROSPECTIVE STUDY

Otorhinolaryngology

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ABSTRACT

The purpose of this study was to identify the patients with vocal cord paresis and palsy and to establish the etiology based on the study performed in a tertiary care centre. The study was done prospectively in the Department of ENT in Mahatma Gandhi Medical College & Hospital, Jaipur, for 1 year, from September 2020 to August 2021. 50 patients with vocal cord paresis and palsy were identified and examined by using flexible or rigid laryngoscopy to make the etiological diagnosis. The etiology of vocal cord immobility was determined by history and complete head and neck examination. Patients in whom no cause was found, a CT scan from base of skull upto thorax was done before labelling them as idiopathic. Most patients presented with complaints of change in voice (92%). Other common presenting complaints included difficulty in breathing, difficulty in swallowing, vocal fatigue and cough. Unilateral vocal cord paralysis (88%) was more common than bilateral paralysis (12%), of which left (58%) was more commonly affected than right (42%) vocal cord because of longer intrathoracic course of left recurrent laryngeal nerve. The most common age group affected was 51–60 years (26%) followed by 61–70 years (18%). Males (60%) were affected more than females (40%) in a ratio of 3:2 and among the affected males 80% were known smokers. The most common cause of vocal cord paresis and palsy was found to be malignancy larynx (36%), followed by idiopathic (28%). Other causes included carcinoma of lung, thyroid and oesophagus, inflammatory, traumatic, systemic diseases like Rheumatoid Arthritis and Hypertension leading to stroke. Identifying the exact etiopathogenesis of vocal cord paresis and palsy in patients has been a challenge and is very important in order to establish a proper diagnostic and treatment protocol for these patients.

KEYWORDS

Vocal cord paresis, Palsy, Hoarseness, Recurrent laryngeal nerve, Unilateral

INTRODUCTION

Vocal cord paresis and palsy implies to the reduced and absent movement of the vocal cords respectively. It is not a disease per se, but is a common manifestation of numerous diseases, which may be localized to the larynx or may be of the thorax, neck or cranial cavity or even of various systemic diseases [1]. The causes are variable and may be multifactorial, hence the symptoms also vary from being mild to severe. The symptoms depend on the severity of injury caused to the vagus nerve or its branches. The left recurrent laryngeal nerve branch is more frequently involved, because of its longer intrathoracic course which creates additional vulnerability especially within the mediastinum. Symptoms depend on whether the vocal cord palsy is unilateral or bilateral. The main presenting symptom in unilateral vocal cord palsy is change in voice, the degree of which depends on the position of paralysed vocal cord. Other common presenting complaints included difficulty in breathing, difficulty in swallowing, vocal fatigue and cough. Studies have been done in this field which have shown the importance of diagnosing the cause to be able to treat and explain the prognosis.

Objective

This study was conducted with a purpose of identifying patients of vocal cord paresis and palsy and to establish an etiological diagnosis based on detailed history, clinical examination findings and investigations.

Materials And Methods

The study was done prospectively in the Department of ENT in Mahatma Gandhi Medical College & Hospital, Jaipur, for 1 year, from September 2020 to August 2021. 50 patients with vocal cord paresis and palsy were identified. Detailed history was taken. General and systemic examination were done for patients who came with complaints related to voice and throat. Complete ENT examination was done for these patients which included indirect laryngoscopy followed by flexible or rigid laryngoscopy. Following this, the patients were sent for blood tests which included routine haematological tests (complete blood picture), renal and liver function tests, serum electrolytes, serology, lipid profile, thyroid function tests and urine tests. Imaging tests like X-Rays, Ultrasound scans (neck) and CT scans (neck, chest) were also done as per requirement. Those patients in whom no cause was found, a CT scan from base of skull upto thorax

was done before labelling them as idiopathic.

Patients who failed to come for follow up and those who did not cooperate for our examinations were excluded from the study.

Results

Total 50 patients with vocal cord paresis and palsy were studied. 92% of the patients came with complaints of change in voice. Some of the other complaints included difficulty in swallowing (26%), cough and aspiration (28%) and difficulty in breathing (16%), difficulty in voice production and vocal fatigue (20%) (Fig. 1).

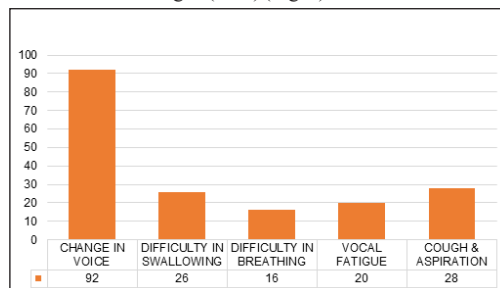


Fig.1 Presenting Complaints

The most common age group to be affected was 51–60 years (26%) followed by 61–70 years (18%). Next common age group to be affected was 41–50 years (18%) followed by 31–40 years (16%). Least to be affected was patients belonging to the age group of 20–30 years (8%) (Fig. 2).

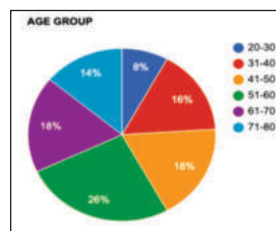


Fig. 2 Age Group

Males (60%) were affected more than females (40%), in a ratio of 3:2. Of the affected males, 80% were chronic smokers.

On examination, 88% of the patients had unilateral paralysis. Left vocal cord (58%) was found to be involved more than the right vocal cord (42%). 80% of the unilateral palsy cases, showed the vocal cords to be in paramedian position. 12% of these patients showed intermediate position of vocal cords and 8% showed median position of vocal cords. Bilateral vocal cord palsy showed vocal cords in paramedian position in about 86% cases and 14% were in intermediate position.

The most common cause of vocal cord paresis and palsy was found to be malignancy larynx (36%) causing mechanical fixation of cords, of which majority of patients presented with unilateral vocal cord growth and subsequently palsy. The next common cause was idiopathic, seen in 28% of patients with vocal cord paresis or palsy. 10% patients with lung carcinoma with secondaries and 2% with thyroid malignancies presented with vocal cord palsy.

8% patients (3 females and 1 male) presented with unilateral vocal cord paresis, post total thyroidectomy procedures, which were transient and recovered completely with proper conservative treatment. 6% other cases of vocal cord palsy were noted with inflammatory etiology. 4% of the patients presented with vocal cord palsy following intubation. 2% patients had come with vocal cord palsy following cerebrovascular accident (CVA) due to uncontrolled hypertension. 2% patients were diagnosed to have vocal cord palsy post radiotherapy (Fig.3).

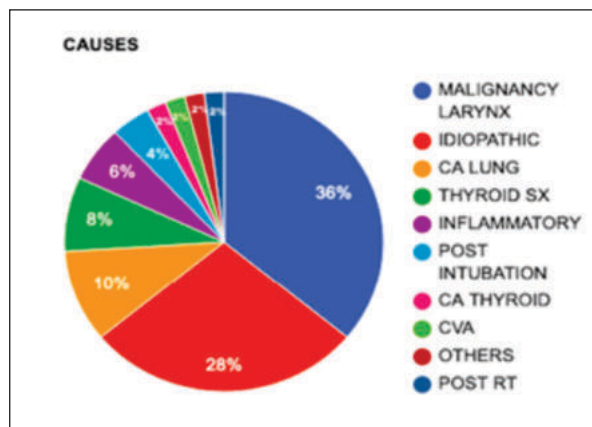


Fig.3 Causes Of Vocal Cord Palsy

DISCUSSION

Vocal cord paresis and palsy implies to the decreased and absent movements of the vocal cords respectively. It is a very common sign of underlying diseases, which may be variable and multifactorial. Symptoms include hoarseness of voice (most common), respiratory problems like difficulty in breathing, cough and aspiration, dysphagia and dysphonia [2]. The symptoms depend on the severity of injury caused to the vagus nerve or its branches, i.e. superior laryngeal and recurrent laryngeal nerves.

Most common age group to be affected was the elderly age group of 51-60 years, probably because of the history of chronic smoking and the higher incidence and prevalence of cancer and systemic comorbidities like diabetes and hypertension [1]. Ahmed et al. also reported maximum number of patients in the 5th and 6th decades of life [3]. Our results are also in alliance with Merati, Havas and Glazer who reported the mean age as 53 years [2, 4, 5].

The history of chronic smoking among males may also be a reason for males being affected more than females by a ratio of 3:2 [15]. Studies also reason it as males visiting the outpatient department in hospitals more than females, in our country [1]. These results are also in accordance with another study by Nerurkar in which the male to female ratio was 2:1 [6] and Benninger (Males 52.1%, females 47.9%) [7].

In our study, in most patients of unilateral vocal cord palsy, vocal cord is fixed in paramedian position (80%), followed by intermediate (12%) and median (10%). In patients with bilateral vocal cord palsy, the vocal

cords were also in paramedian position mostly (86%). Woodson proposed that the paramedian position was due to robust innervation of thyroarytenoid muscle in patients with recurrent laryngeal nerve injury [8].

Left vocal cord palsy was found to be 1.5–2 times more commonly involved than the right vocal cord due to the long intrathoracic course of the left recurrent laryngeal nerve in the mediastinum [9]. Our study was in concordance with studies performed by Ko et al. reporting nearly 68% paralysis in left side [10] and Srirompotong et al. reporting 73% paralysis on left side [11].

The most common cause identified in our study was malignancy larynx leading to mechanical fixation of cords. This was mainly seen in males with the cause being attributed to chronic smoking and poor dietary habits [15].

Idiopathic etiologies by definition have no identified cause. The incidence of idiopathic vocal cord palsies has reduced with improving imaging and fiberoptic endoscopy, but it still remains common etiological factor of vocal cord paresis and palsy.

Most common secondary cause of vocal cord palsy was lung cancer with secondaries which most commonly affected the left vocal cord, probably due to the direct compression of the recurrent laryngeal nerve by the cancer mass [15].

Our study is in concordance with a study done by Ko et al. showing lung and thyroid tumours to be the most common sites of tumour origin in cases of vocal cord palsy [10].

Studies state that the most popular causes of vocal cord palsy following surgery are thyroid, oesophagus and heart surgeries [12, 13]. Usually, it is unilateral and may be bilateral rarely in cases of total thyroidectomy of which the incidence reported is 0.58% [14].

The incidence of post-thyroidectomy vocal cord paralysis has been reported in the range of 3.5–6.6%, and 93–100% of these patients are reported to make complete recovery [16]. Amongst patients of post thyroidectomy vocal cord palsy, majority of the patients were females, owing to the high incidence of thyroid diseases in females [1]. Transient vocal cord palsy post thyroid surgery was also seen in case of extra laryngeal ramification of recurrent laryngeal nerve in the past [17]. Another possible cause of the same is neurapraxia while searching for the nerves [18].

Studies state incidence of intubation related vocal cord palsy as 0.2% [19]. Risk factors in these cases include: size of endotracheal tube, cuff pressure, duration of intubation, hypotension during surgery, neck in prolonged hyperextension position, patient being a smoker and associated co morbidities like diabetes and hypertension [20].

There is a three-fold rise in vocal cord palsy in patients being intubated after the age of 50 years, two fold rise in patients with hypertension and diabetes and 15-fold rise if the ventilator support is for more than 6 hours [21]. Over-extension of neck during intubation can cause stretching of both the vagus nerves [22].

Old age itself is considered a risk factor leading to tissue degeneration as compared to young age group. In hypertensive patients with atherosclerosis vessels, microvasculature is more vulnerable to mechanical damage caused by cuff that is inflated [15].

Vocal cord palsy after cerebrovascular accident due to uncontrolled hypertension is due to irreversible damage to nucleus ambiguus and nucleus solitarius.

Beyond the above explanations given for the etiopathogenesis of unilateral and bilateral vocal cord paresis and palsy, there are many more yet to be studied and explained.

CONCLUSION

Vocal cord paresis and palsy have got multifactorial etiopathogenesis which differ with age, sex, presence of systemic diseases, side of lesion, laterality of the vocal cord involvement, etc. Malignant causes predominated in our series, occurring in 36 % of the total, followed by idiopathic causes in 28%. Therefore, an amalgamated diagnostic and treatment plan is of utmost importance for patients presenting with

vocal cord paresis and palsy.

Compliance With Ethical Standards

Conflict Of Interest There is no conflict of interest in this study.

Ethical Approval This article does not contain any studies which experiments with human participants or animals and all institutional and international ethical standards have been followed.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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