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Clinical Profile and Etiopathogenesis of Vocal Cord Paralysis in A Tertiary Care Centre

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Abstract
Vocal cord paralysis is a common symptom of various diseases1. It may be due to neurogenic or mechanical fixation of the vocal cords1. Clinical diagnosis of the underlying cause leading to paralysis of the vocal cords is important. Vocal cord paralysis is a sign of a certain underlying disease, a diagnosis which can be attributed to various causes. This study was conducted to identify patients with vocal cord paralysis and to know the etiological diagnosis in a tertiary care centre. A prospective study was carried out in the Department of ENT over a period of six months from November 2023 to April 2024. A total of 32 patients with vocal cord paralysis were identified and examined using various tests and investigations to determine the aetiology. The most common presenting complaint was change in voice (78%). Unilateral paralysis (78%) was more prevalent than bilateral paralysis (22%), with the right vocal cord (41%) more commonly affected than the left (37%). The most commonly affected age group was 51-60 years (44%). Males (66%) were affected more often than females (34%), with a ratio of 1.9:1. Among the affected males, 86% were known smokers and 71% were known alcoholics. The most common cause of vocal cord paralysis was found to be Carcinoma Larynx (31%), followed by Carcinoma hypopharynx (16%). Carcinoma larynx is the most common cause of vocal cord paralysis. Identifying the exact etiopathogenesis of vocal cord paralysis in patients has been difficult and is very important in order to establish a proper diagnostic and treatment protocol for these patients.

INTRODUCTION

All laryngeal muscles are supplied by recurrent laryngeal nerve except cricothyroid muscle (which is supplied by external branch of superior laryngeal nerve). On the right side the recurrent laryngeal nerve arises from the vagus nerve and loops behind the right subclavian artery and ascends to the larynx[1]. On the left side the recurrent laryngeal nerve arises from the vagus nerve in the superior mediastinum, where it loops around the aortic arch before returning to the larynx[1]. Any damage to the vagus nerve or its branches-the recurrent laryngeal nerve (RLN) and the superior laryngeal nerve may cause vocal cord paralysis which may be affected unilaterally or bilaterally[1]. Unilateral paralysis are common, but bilateral paralysis are rare and can be life threatening[1].

Vocal cord paralysis is defined as the loss of normal adduction and abduction of the vocal cords[2]. This condition is not diseases as such but common manifestations of various underlying disorders, which can be localized to the larynx, thorax, neck, cranial cavity, or related to systemic diseases[1,4]. The aetiology of vocal cord paralysis is diverse and can be multi factorial and evasive, leading to a wide range of symptoms from mild to severe[1]. In addition to neurological causes, mechanical fixation of the vocal cords can also result in vocal cord paralysis[1,5].

Objective: The aim of the study is to identify patients with vocal cord paralysis and establish an etiological diagnosis based on detailed history, clinical examination findings and investigations.

MATERIALS AND METHODS

This prospective study was conducted in the Department of ENT at Sree Mookambika Institute of Medical Sciences over a six-month period from November 2023-April 2024. A total of 32 patients with vocal cord paralysis were identified. Detailed histories were taken and general physical and systemic examinations were performed on patients presenting with voice and throat-related complaints.

Comprehensive ENT examinations were conducted including videolaryngoscopy (Picture-1). Following these examinations, patients underwent blood tests, which included routine haematological tests (complete blood count), renal and liver function tests, serum electrolytes, serology, fasting lipid profile, thyroid function tests and urine tests. As needed, imaging tests such as X-rays, ultrasound scans (neck) and CT scans (skull base to diaphragm) were conducted.

Patients who did not cooperate with the examinations or failed to follow up were excluded from the study.

RESULTS AND DISCUSSIONS

Totally 32 patients with vocal cord palsy were studied. 78% of the patients came with complaints of change in voice. Some of the other complaints the patient came with included difficulty in breathing (28%), cough and aspiration (9%), Difficulty in swallowing (9%) and difficulty in voice production (3%) (Fig 1).

The most common age group to be affected was 51-60 years (44%) followed by 61-70 years (22%). Next common age group to be affected was 41-50 years (16%) followed by 31-40 years (12%). Least to be affected was patients belonging to the age group of 31-40 years (6%) (Fig. 2).

Males (66%) were more affected than females (34%), in a ratio of 1.9:1. Among the males, 86% are Smokers and 71% are alcoholics.

On examination, 78% of the patients had unilateral paralysis. Right vocal cord was found to be more involved than the Left by 40% (Fig 4).

The most common cause of vocal cord palsy was found to be CA larynx (31%). The next common cause was CA Hypopharynx 16% of patients with vocal cord palsy, of which majority of patients presented with unilateral vocal cord growth and subsequently palsy. 4 patients with carcinoma thyroid, 3 with carcinoma lung, 2 patients of Post Thyroidectomy and 1 case each of Carcinoma oesophagus, Post CABG, Pott's spine, Cerebrovascular accident, Parkinson's disease, Skull base osteomyelitis, Metastasis of Unknown Origin and Idiopathic presented with vocal cord palsy (Table 1)

Vocal cord paresis and palsy refers to the decreased and absent movements of the vocal cords respectively[4]. It is a very common sign of underlying diseases, which may be evasive and multi factorial. Symptoms include hoarseness of voice (most common), respiratory problems like difficulty in breathing, cough and aspiration, dysphagia and dysphonia[1]. These depend on the severity of injury caused to the vagus nerve or its branches superior laryngeal and recurrent laryngeal nerves[4].

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 chronic alcoholic and the higher incidence and prevalence of cancer and systemic comorbidities like diabetes and hypertension. The history of chronic smoking among males may also be a reason for males being affected >females by a ratio of 1.9:1. Studies also reason it as males visiting the outpatient department in hospitals more than females, in our country[4].

Right vocal cord palsy more commonly involved than the left vocal cord. The common cause identified in our study was malignant growth larynx leading to

mechanical fixation of the cords. This was mainly seen in males with the cause being attributed to chronic smoking, chronic alcoholic and poor dietary habits. Most common secondary cause of vocal cord palsy was Carcinoma Hypopharynx. Other common causes are Carcinoma Thyroid, Carcinoma Lung and Post Thyroidectomy. Carcinoma oesophagus, Post CABG, Pott's spine and Cerebrovascular accident, Parkinson's disease, Skull base osteomyelitis, Metastasis of Unknown Origin and Idiopathic are rare causes. Idiopathic aetiologies by definition have no identified cause[4]. The incidence of idiopathic vocal cord palsies has reduced with improving imaging and fibreoptic endoscopy[4].

The most common causes of vocal cord palsy following surgery is thyroid surgeries. It occurs due to injury to the recurrent laryngeal nerve or external branch of superior laryngeal nerve. Usually, it is unilateral and may be bilateral rarely in cases of total thyroidectomy[4,6,7]. Causes of vocal cord palsy following thyroid surgery include the presence of adhesions, derangement of normal anatomy in recurrent goitres and a huge multin odular goitre (highly vascular mass) that can bleed massively during surgery obscuring the surgical field, making identification of the nerve intra operatively difficult[4,6]. Age is also a risk factor considering tissue degeneration with age which may cause cord damage easily as compared to the younger patients[4].

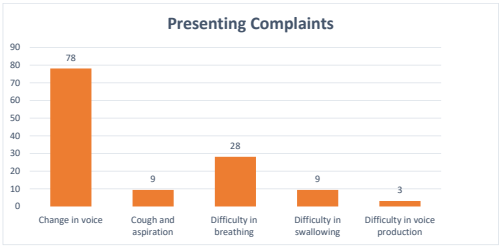

Fig. 1: Some of the other complaints the patient came with included difficulty in breathing (28%), cough and aspiration (9%), Difficulty in swallowing (9%) and difficulty in voice production (3%)

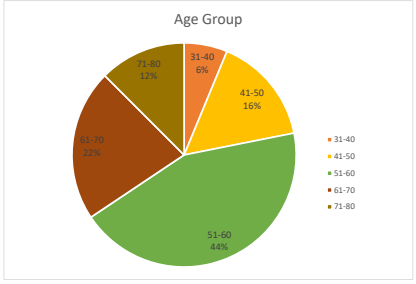

Fig. 2: Least to be affected was patients belonging to the age group of 31-40 years (6%)

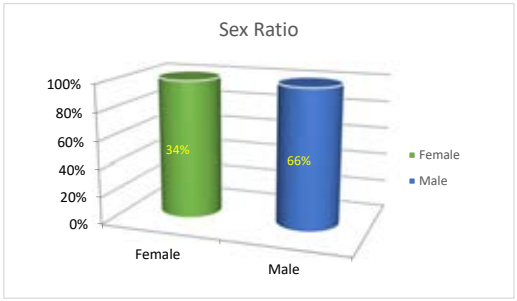

Fig. 3: Males (66%) were more affected than females (34%), in a ratio of 1.9:1. Among the males, 86% are Smokers and 71% are alcoholics.

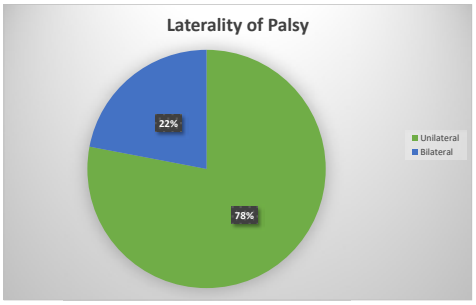

Fig 4: On examination, 78% of the patients had unilateral paralysis. Right vocal cord was found to be more involved than the Left by 40%

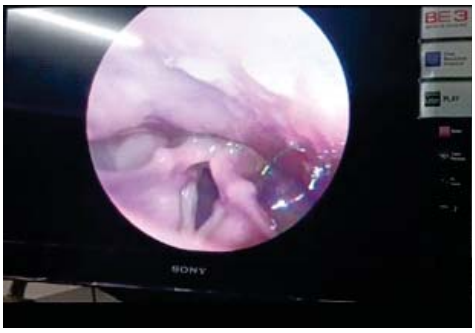

Fig 5: Videolaryngoscopic picture of normal vocal cords

Fig 6: Videolaryngoscopic picture of right vocal cord palsy

Table 1: Caption provided on next page.

Sl no	Cause	No: cases	% of total
1	Idiopathic	1	3.125
2	CA larynx	10	31.25
3	CA lung	3	9.375
4	CA thyroid	4	12.5
5	CA esophagus	1	3.125
6	Post thyroidectomy	2	6.25
7	CA hypopharynx	5	15.625
8	Cerebrovascular accident	1	3.125
9	Post CABG	1	3.125
10	Pott's Spine	1	3.125
11	Parkinson's disease	1	3.125
12	Skull Base Osteomyelitis	1	3.125
13	Metastasis of unknown origin	1	3.125

Table 2: Unilateral comes no mse of cares of total percentage

Sl no:	unilateral cause	No: cases	% of total
1	Idiopathic	1	3.125
2	CA larynx	8	25
3	CA lung	2	6.25
4	CA thyroid	2	6.25
5	CA esophagus	1	3.125
6	Post thyroidectomy	1	3.125
7	CA hypopharynx	5	15.625
8	Cerebrovascular accident	1	3.125
9	Post CABG	1	3.125
10	Pott's Spine	1	3.125
11	Parkinson's disease	1	3.125
12	Skull Base Osteomyelitis	0	0
13	Metastasis of unknown origin	1	3.125

Table 3: Bilateral cauris with number of cares reported

Sl no:	Bilateral cause	No: cases	% of total
1	Idiopathic	0	0
2	CA larynx	2	6.25
3	CA lung	1	3.125
4	CA thyroid	2	6.25
5	CA esophagus	0	0
6	Post thyroidectomy	1	3.125
7	CA hypopharynx	0	0
8	Cerebrovascularvaccident	0	0
9	Post CABG	0	0
10	Pott's Spine	0	0
11	Parkinson's disease	0	0
12	Skull Base Osteomyelitis	1	3.125
13	Metastasis of unknown origin	0	0

Cerebrovascular accidents (stroke) due to uncontrolled hypertension can affect nucleus ambiguous and nucleus solitarius, the central connections of vocal cords, which can lead to vocal cord palsy[4].

CONCLUSION

Vocal cord palsy have got variable aetiologies which vary with age, sex, presence of systemic diseases and side of lesion. Hence, an integrated diagnostic and treatment programme is necessary for patients presenting with vocal cord palsy. Early identification of the vocal cord palsy and finding out the aetiology are important to treat the primary cause. Thus improving the prognosis of patient with vocal cord palsy.

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