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Vocal cord paralysis and its etiologies: A retrospective study in tertiary care hospital

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Abstract

Background: Vocal cord paralysis (VCP), defined as the loss of normal adduction/abduction caused by a lesion distant from the cords, result from neural injury to the recurrent laryngeal nerve. Present study was aimed to study various etiologies of vocal cord paralysis at a tertiary hospital.
Material and Methods: Present study was hospital based, retrospective observational study, conducted patients with vocal cord palsy confirmed with endoscopy.
Results: In present study, 52 cases were of vocal cord paralysis were evaluated in detail. Majority were from 41-60 years age group (53.85%) followed by 41-60 years age group (28.85%).Male patients (57.69%) were more than female (42.31%). Common symptoms noted in present study were dyspnoea (75%), hoarseness of voice (55.77%), dysphagia + dyspnoea (30.77%) & dysphagia (25%). Majority of cases had unilateral vocal cord palsy (92.31%) as compared to Bilateral (7.69%) vocal cord palsy. Among cases left (61.54%) side involvement was common than right (30.77%). In present study, various neoplasms (thyroid, bronchogenic, esophageal) & post surgical (thyroidectomy, esophagectomy) were most common etiology in 26.92% patients each. Other etiologies were idiopathic causes (17.31%), neck nodes/cervical metastases (11.54%), mediastinal masses/lymph nodes (5.77%), CNS causes (5.77%), cardiovascular (3.85%) &blunt Trauma (1.92%).
Conclusion: Vocal cord paralysis was common in males, at 5th& 6th decade & it was unilateral in majority of cases. Common causes of vocal cord paralysis are neoplasm, post-surgical & idiopathic.

Keywords: Vocal cord paralysis, neoplasm, post-surgical, idiopathic

Introduction

Vocal cords (VCs) respond to the flow of air across them by producing various sounds which are later articulated by peripheral mechanisms producing the speech[1]. Vocal cord paralysis (VCP), defined as the loss of normal adduction/abduction caused by a lesion distant from the

cords, result from neural injury to the recurrent laryngeal nerve[2].
Common causes of vocal cord paralysis (VCP) are a consequence of surgeries (thyroid, esophageal, cardiac), neurologic, viral infection, idiopathic and intubation trauma, oesophageal, thyroid and gastric malignancy, Wegener's granulomatosis, congenital and rheumatologic diseases, etc[3, 4].
Diagnosis is made mainly through indirect laryngoscopic examination. Early detection is remarkable as late diagnosis could result in serious symptoms or even death. The pathology can be either along the course of the tenth cranial nerve from cerebral cortex to neuromuscular junction or could be from mechanical fixation of cricoarytenoid joint[5].
Present study was aimed to study various etiologies of vocal cord paralysis at a tertiary hospital.

Material and Methods

Present study was hospital based, retrospective, observational study, conducted in department of ENT, at Indira Gandhi Institute of Medical Sciences, Sheikhpura, India. Study duration was of 2 years (July 2019 to June 2021). Study was approved by institutional ethical committee.Patients with vocal cord palsy confirmed with endoscopy were considered for present study.
Patients underwent complete history along with complete physical examination, ENT examination. Evidence of cranial nerve pathology was looked for along with intensive diagnostic work-up, the only exception were those patients whose vocal cord paralysis symptoms followed surgical interventions, the traumatic group.
Routine investigations like complete blood picture, renal and liver function tests, serum electrolytes, serology, lipid profile, thyroid function tests and urine tests were done in all patients. For selected patients ANCA and CRP tests were also done. Other investigations such as chest X-ray, X-Ray neck, Ultrasound scans (neck) and CT scans (neck, chest) were also done. Indirect and Video Direct Laryngoscopy, bronchoscopy and Esophagoduodenoscopy were also done.
Only when all these procedures had been performed without a diagnosis of an etiological agent, patient with vocal cord paralysis were classified as "idiopathic". All variables such as age, sex, duration of paralysis, clinical signs, laryngoscopic findings, unilateral or bilateral paralysis, diagnostic tests and history of brain, chest, heart, thyroid, esophagus and larynx surgery were noted in case record proforma.
Data was collected and compiled using Microsoft Excel & statistical analysis was done using descriptive statistics.

Results

In present study, 52 cases were of vocal cord paralysis were evaluated in detail. Majority were from 41-60 years age group (53.85%) followed by 41-60 years age group (28.85%).Male patients (57.69%) were more than female (42.31%).

Table1: Age & gender distribution

Characteristic	No. of cases (N=52)	Percent
Age Group (Years)		
21-40	9	17.31%
41-60	28	53.85%
> 60	15	28.85%

Gender		
Male	30	57.69%
Female	22	42.31%

Common symptoms noted in present study were dyspnoea (75%), hoarseness of voice (55.77%), dysphagia + dyspnoea (30.77%) & dysphagia (25%).

Table2: Symptomatology

Symptoms	No. of cases (N=52)	Percent
Dyspnoea	39	75.00%
Hoarseness of voice	29	55.77%
Dysphagia + Dyspnoea	16	30.77%
Dysphagia	13	25.00%

Majority of cases had unilateral vocal cord palsy (92.31%) as compared to Bilateral (7.69%) vocal cord palsy. Among cases left (61.54%) side involvement was common than right (30.77%).

Table 3: Laterality of palsy

Laterality	No. of cases (N=52)	Percent
Unilateral		
Right	16	30.77%
Left	32	61.54%
Bilateral	4	7.69%

In present study, various neoplasms (thyroid, bronchogenic, esophageal) &postsurgical (thyroidectomy, esophagectomy) were most common etiology in 26.92% patients each. Other etiologies were idiopathic causes (17.31%), neck nodes/cervical metastases (11.54%), mediastinal masses/lymph nodes (5.77%), CNS causes (5.77%), cardiovascular (3.85%) &blunt Trauma (1.92%).

Table 4: Various etiological factors

Etiopathology	No. of patients	Percentage
Neoplasm	14	26.92%
Post-surgical (thyroidectomy, esophagectomy)	14	26.92%
Idiopathic	9	17.31%
Neck nodes/cervical metastases	6	11.54%
Mediastinal masses/lymph nodes	3	5.77%
CNS causes	3	5.77%
Cardiovascular	2	3.85%
Blunt Trauma	1	1.92%

Discussion

Vocal cord paralysis (VCP) can be caused by any lesion along the course of the vagal nerves above the branching of the recurrent laryngeal nerves or of the recurrent laryngeal nerves itself[6].

The etiology of laryngeal paralysis has changed over time, with a decrease in the prevalence of malignancies and a recent increase in cases that are attributable to thyroid surgery. Vocal fold paralysis in patients who are subject to open-heart surgery, lung surgery and cervical

spine surgery increases due to more frequent operations[7].The presence of adhesions, anatomical derangement in recurrent goitres and vascular masses obscuring surgical field dueto excessive bleeding are few predisposing factors rendering the identification of the recurrent laryngeal nerve cumbersome intra-operatively[8].

Symptoms depend on whether the VCP is unilateral or bilateral. The main presenting symptom in UVCP is hoarseness of voice, the degree of which depends on the position of paralysed vocal cord. Other associated symptoms include weak voice, cough, aspiration and swallowing symptoms[4].

Vocal cord paralysis can occur in both benign and malignant thyroid disease. In malignant disease, recurrent laryngeal nerve (RLN) paralysis can be caused by direct invasion of malignant cells or by nodular compression. In the case of benign thyroid disease, compression, as well as stretching of the nerve, are possible etiologies.

Yadlapalli A K *et al*.,[9] studied 38 cases of VC paralysis, male-female ratio was 0.9. Left VC palsy was identified in maximum persons (63.2%). The age group of 41-60 years was common (47%). In left VC palsy, dyspnoea (31.6%) was most common. Among the etiological factors, lung lesions and idiopathic cases accounted for 23.68% each.

In study by Gupta J *et al*.,[4] among 120 patients with vocal cord paralysis, majority patients presented in 5th (26.67%) and 6th (21.67%) decade. Males outnumbered females in the ratio 2.3:1.0. The most common symptom of vocal cord paralysis was change in voice (98.21%). Bilateral vocal cord palsy was found in 6.67% patients and unilateral vocal cord palsy was found in 93.33% patients. Among patients of unilateral vocal cord paralysis left vocal cord was paralyzed in 69.64% and right cord in 30.36%. Malignant (34.16%) causes accounted for largest number of patients followed by central (15.00%) and idiopathic causes (14.16%).

Wang *et al*.,[10] studied 194 patients of vocal fold paralysis (VFP) with a determined etiology. Unilateral VFP was present in 178 patients, causes were surgical (61.3%), neoplastic (17.5%), idiopathic (10.3%), traumatic (1.5%), central (4.7%). Thyroidectomy (54 patients) & Lung cancer (15 cases) were common etiology of unilateral VFP. In bilateral VFP, surgery was the most common cause (56.3%). In terms of gender, surgery was the most common cause for both sexes, accounting for 62 of 113 male patients and 57 of 81 female patients.

In study by Seyed J *et al*.,[11] mean duration of symptoms was 18.95±6.50 months. The reason for referral was phonation changes (97.8%) and aspiration (37.8%) in the subjects. There was bilateral paralysis in 6.82%, left paralysis in 56.82% and right in 63.36% of subjects. The type of vocal cord placement was midline in 52.8%, paramedian in 44.4% and lateral in 2.8% of the subjects. The causes of vocal cords paralysis were idiopathic paralysis (31.11%), tumors (31.11%), surgery (28.89%), trauma, brain problems, systemic disease and other causes (2.2%).

Vocal cord paralysis is more common due to left recurrent laryngeal nerve infiltration than right recurrent laryngeal nerve infiltration. This is because the left recurrent laryngeal nerve has a longer anatomical pathway and passes through the aortopulmonary window.

The initial treatment options for unilateral vocal cord palsy include voice therapy, observation for spontaneous return of function, or temporary medialization. Early medialization of a paralyzed vocal fold into a more favorable position can affect the final resting place of the vocal fold. This may be due to fibrosis caused by inflammation induced by the temporary agent or from reinnervation maintaining the medialized position after the injection material resorbs. If the paralysis does not resolve, permanent medializationlaryngoplasty may be performed[12].

Conclusion

Vocal cord paralysis was common in males, at 5^{th}& 6^{th} decade & it was unilateral in majority of cases. Common causes of vocal cord paralysis are neoplasm, post-surgical & idiopathic. Before the cause of recurrent laryngeal nerve paralysis is labeled idiopathic, the possibility of

a neoplasm must be ruled out.

Conflict of Interest: None to declare

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