



UNILATERAL VOCAL CORD PALSY: Study of the causes of palsy and the role of CECT neck and thorax in establishing diagnosis.

KEYWORDS

WSN, MOTE, NS-2, Packet.

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ABSTRACT

AIM: To study the common causes of unilateral vocal cord palsy and to analyze the role of CECT neck and thorax in evaluation of patients with unilateral vocal cord palsy.

MATERIAL AND METHODS: It is a retrospective study of 25 patients who were diagnosed with unilateral vocal cord palsy in Civil Hospital, Ahmedabad, ENT Department from the period of November 2013 to November 2014. Patients in whom iatrogenic or traumatic causes were implicated were excluded from the study.

OBSERVATION AND DISCUSSION: It was observed from our study that left vocal cord was more commonly involved. Idiopathic cause was the most common cause of palsy followed by bronchogenic carcinoma. In 6 out of the 8 cases with mass in the aortico-pulmonary window, the causative pathology was missed by x-ray chest (PA view). The common signs of vocal cord palsy on CT thorax were dilation of the ipsilateral pyriform sinus, thickening and medial position of the ipsilateral aryepiglottic fold, and dilated ipsilateral laryngeal ventricle.

CONCLUSION: CECT neck and thorax should be performed in all the cases of unilateral vocal cord paralysis with no apparent pathology on physical examination and chest x-ray. A case of palsy can be labelled as idiopathic only after thorough history taking, physical examination, Chest X-ray, CECT neck and thorax and after ruling out central causes. A thorough search for underlying cause of palsy should be made because it can be a sign of underlying malignancy in many cases.

INTRODUCTION:

Vocal fold paralysis (VFP) is the immobilization of the true vocal fold by neural injury (ipsilateral vagus or recurrent laryngeal nerve dysfunction) or by mechanical fixation of the vocal fold due to neoplastic invasion of the thyroarytenoid muscle, or cricoarytenoid joint fixation from joint ankylosis or posterior glottic scar formation.

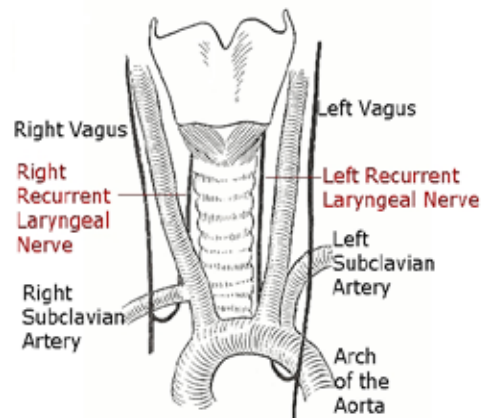
Clinically, these patients will often present with hoarseness, dysphonia, breathy voice, or aspiration. However, approximately 30-50% of patients can be clinically asymptomatic and the presence of VFP may be only incidentally detected. In many such asymptomatic cases, a slow-growing malignancy with secondary involvement of the vagus or recurrent laryngeal nerves may result in computed tomography (CT) imaging findings that precede the clinical manifestation of VFP. Alternatively, clinical identification of vocal fold immobility may prompt CT imaging to identify occult lesions along the vagus or recurrent laryngeal nerve.

Hence, once VFP has been identified in symptomatic or asymptomatic patients, every effort should be made to determine the underlying etiology of the VFP by carefully evaluating the course of the vagus and recurrent laryngeal nerves using appropriate imaging. With recent improved imaging techniques, a causative reason for VFP is often identified, resulting in a decrease in the incidence of cases labelled "idiopathic" after clinical examination.

RELEVANT ANATOMY:

All muscles of larynx are supplied by the recurrent laryngeal nerve, except the cricothyroid muscle which is supplied by the external branch of superior laryngeal nerve.

The right recurrent laryngeal nerve arises from the vagus at the level of subclavian artery and hooks around it and the left recurrent laryngeal nerve arises from the vagus nerve in the mediastinum at the level of arch of aorta, loops around it thus taking a longer course which makes it more prone to paralysis.



The causes of unilateral vocal cord palsy can be varied, like, neck trauma, iatrogenic, malignancy of lungs, thyroid or oesophagus, cervical lymphadenopathy, tuberculosis causing mediastinal lymphadenopathy or involving cervical pleura, aneurysm of subclavian artery or idiopathic.

The patients generally present with change in voice or neck mass due to underlying malignancy.

MATERIALS AND METHODS:

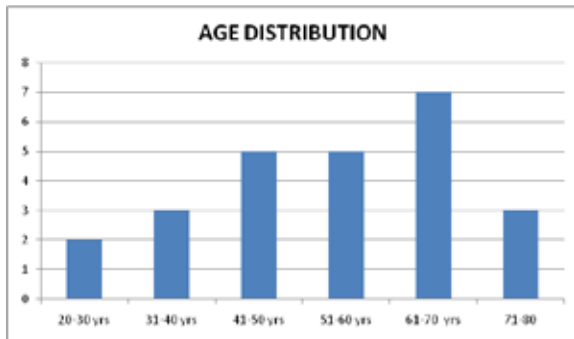
It is a retrospective study of 25 patients with unilateral vocal cord palsy who presented to Civil Hospital Ahmedabad, ENT Department, from the period of November 2013 to November 2014.

Patients with unilateral vocal cord palsy due to traumatic cause and iatrogenic cause were excluded from the study.

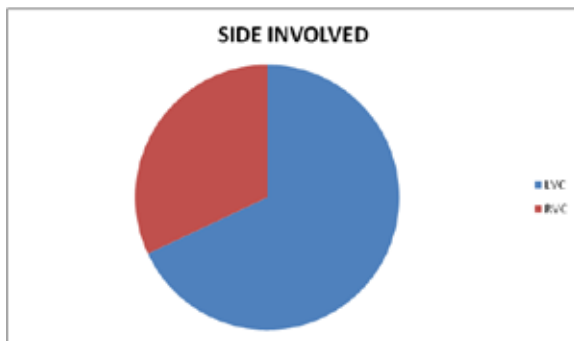
Routine Chest X-ray and CECT neck and thorax were performed for establishing diagnosis.

OBSERVATION:

Majority of the patients with vocal cord palsy were in the age group 61-70 years.



16 patients were males and 9 were females. LVC was involved in 17 cases and RVC in 8 cases.



CAUSES:

LEFT VOCAL CORD PALSY:

CAUSE	NO. OF CASES (17)
Idiopathic	7
Carcinoma of lungs	5
Carcinoma oesophagus	1
Papillary CA thyroid	1
Tuberculosis of lungs	3

Of the 17 cases of unilateral left vocal cord palsy, 7 cases were due to underlying malignancy, 3 cases were due to tuberculosis of lungs and 7 cases were found to be idiopathic.

Of 7 cases due to underlying malignancy, 5 were due to carcinoma of lungs, 1 was due to carcinoma of oesophagus and 1 was due to malignancy of thyroid.

3 cases were due to pulmonary tuberculosis causing mediastinal lymphadenitis and occupying the region of aortico-pulmonary window.

7 cases were found to be idiopathic after normal physical examination, CXR findings, skull base to thoracic outlet and posterior fossa MRI also turned out to be normal. Other causes like multiple sclerosis, jugular vein thrombosis, syphilis, tuberculosis and diabetic neuropathy were also ruled out.

8 of the 17 cases showed a mass 1-7 cm in diameter (average 3 cm) in the aortico-pulmonary window, probably involving the left recurrent laryngeal nerve as it passes below the aortic arch to ascend in the tracheo-oesophageal groove. The patients with tuberculosis of lungs had lymph node enlargement lateral to the aortic arch, along the course of the nerve, just cephalad to the aortico-pulmonary window.

Of the 8 cases with mass in the aorto-pulmonary window, 6 were missed on chest x-ray due to smaller (1-3 cm) diameter. However, masses with larger diameter (4-7 cm) were noticed on chest x-ray too.

RIGHT VOCAL CORD PARALYSIS:

Of the 8 cases with RVC palsy, 2 were due to carcinoma of the lungs, 1 case was due to carcinoma of oesophagus, 1 case due to tuberculosis and 4 were idiopathic.

In all the cases CT scan demonstrated a large soft tissue mass in the expected course of right recurrent laryngeal nerve.

CAUSE	NO. OF CASES (8)
Idiopathic	4
Carcinoma of lungs	2
Carcinoma of oesophagus	1
Tuberculosis of lungs	1

FINDINGS ON CT THORAX:

The most reliable signs of vocal cord palsy observed in more than 75% of cases in a study by Chin et al, include dilation of the ipsilateral pyriform sinus, thickening and medial position of the ipsilateral aryepiglottic fold, and dilated ipsilateral laryngeal ventricle -also known as the "Sail Sign".

Three additional findings, anteromedial position of the ipsilateral arytenoid cartilage, atrophy of the ipsilateral posterior cricoarytenoid muscle first described by Romo et al, and atrophy with fatty replacement of the ipsilateral thyroarytenoid muscle, form part of the constellation of imaging features of VFP. Our study of CT scan was consistent with the above findings.

DISCUSSION AND CONCLUSION:

It is clinically important to diagnose the primary disease in cases of vocal cord paralysis because many of its potential causes, such as symptom-free malignant tumours, can be fatal or cause serious morbidity if detected late. Radiologic evaluation is often useful for determining the etiology of VCP, especially for conditions within the thoracic cavity. However, chest radiographs can sometimes miss small lesions in the mediastinum. In these cases, computed tomography (CT) can be a valuable diagnostic tool.

It was concluded from the study that left vocal cord was more commonly involved (17 of the 25 cases) compared to right, due to longer course of the left recurrent laryngeal nerve.

Idiopathic cause was the most common cause of unilateral vocal cord palsy followed by bronchogenic carcinoma. Other causes were malignancy of oesophagus and thyroid gland. Tuberculosis of lungs is also a leading inflammatory cause of palsy due to enlargement of mediastinal lymph nodes. In these patients it is the left recurrent laryngeal nerve that is frequently involved as it courses through the aorto-pulmonary window. However, right sided mediastinal adenopathy extending cephalad to the region of the right subclavian artery can also involve the right recurrent laryngeal nerve.

Chest x-ray was normal in patients with masses of smaller diameter (1-3 cm) along the course of recurrent laryngeal nerve. So, every patient with unilateral vocal cord palsy and normal chest x-ray should be advised CECT thorax to rule out smaller attributing masses.

A case of unilateral vocal cord palsy can be labelled as idiopathic only after normal physical examination, chest x-ray, CECT skull base (to rule out pathology involving jugular foramina) to thorax, MRI brain to include posterior fossa pathology and after excluding other conditions like multiple sclerosis, syphilis, jugular vein thrombosis and diabetic neuropathy.

The age distribution (peak in the sixth decade) and sex distribution (more common in males) were consistent with the study performed by Yumato et al from Japan.

Rosenthal et al in their study of 363 patients with vocal cord palsy concluded that surgery (46%) was the most common cause followed by idiopathic cause (18%) and bronchogenic carcinoma (13%).

Sun Wha Song & Beom Cho Jun from Seoul, Korea performed a retrospective study of 110 patients with vocal cord palsy and concluded that CT is helpful for the early detection of primary malignancy or progression of malignancy between follow-ups and it can also reveal various non-malignant causes of vocal cord palsy.

In a study by Harvey Glazer and Dixie Aronberg of 33 cases of unilateral vocal cord palsy it was concluded that CT thorax plays an important role in identification of the neoplastic and non-neoplastic causes of unilateral vocal cord paralysis.

The results of our study are consistent with other similar studies; however complete history, physical examination and screening chest x-ray should be done in all the cases and CT thorax should be performed when the diagnosis cannot be established after thorough examination.

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