

**Special Feature:****Horner's syndrome due to Pancoast tumour**J. Harikrishna,<sup>1</sup> B. Raga Deepthi,<sup>1</sup> V. Arun Raja,<sup>1</sup> P. Suneetha,<sup>1</sup>Amit Kumar Chowhan,<sup>2</sup> B. Vijaya Lakshmi Devi,<sup>3</sup> Abha Chandra,<sup>4</sup> Alladi Mohan<sup>1</sup>Departments of <sup>1</sup>Medicine, <sup>2</sup>Pathology, <sup>3</sup>Radiodiagnosis, <sup>4</sup>Cardiothoracic Surgery,

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**INTRODUCTION**

A 37-year-old male, a life-long non-smoker, presented to medicine out-patient service with pain in the right shoulder and upper chest radiating to right upper limb for the past one year. He also complained of cough with scanty mucoid sputum for the past two weeks. General physical examination revealed findings suggestive of Horner's syndrome (Figure 1A). On respiratory system examination, findings suggestive of a right upper lobe mass lesion were evident. Chest radiograph (Figure 1B) showed a right upper lobe mass lesion. Computed tomography (CT) of the chest (Figure 1C) revealed an irregular lobulated soft tissue density mass lesion in the apex of the right lung (*Pancoast tumour*) and destruction

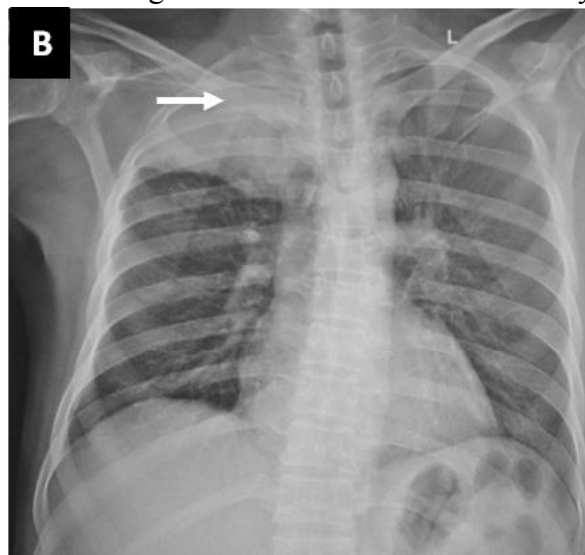
of the first rib. CT-guided tru-cut biopsy from the lesion confirmed the diagnosis of adenocarcinoma of lung (Figure 1D).

Horner's syndrome results from the interruption of the oculo-sympathetic nerve supply between its origin in the hypothalamus and the eye. The first-order neurons arise from the hypothalamus and synapse at Budge's centre in spinal cord (C-8 to T-2 level). Second-order neurons exit the spinal cord at the T-1 level and travel close to the apex of the lung and synapse at the superior cervical ganglion. Third-order neurons travel along with the internal carotid artery



**Figure 1(A):** Clinical photograph showing right-sided ptosis, miosis and apparent enophthalmos suggestive of Horner's syndrome

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**Figure 1(B):** Chest radiograph (postero-anterior view) showing a dense opacity in the right upper zone suggestive of a mass lesion with destruction of the anterior and lateral end of first rib (arrow)

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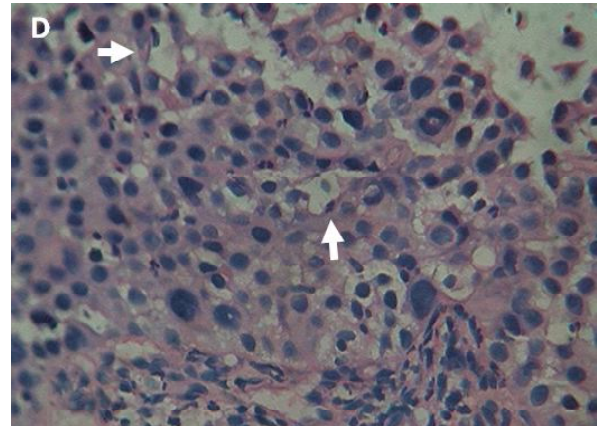
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**Figure 1(C):** Non-contrast computed tomography of the chest (mediastinal window) showing a lobulated soft tissue density lesion in the apex of the right lung (asterisk); destruction of the first rib is also evident (arrow head)

through the cavernous sinus and enter the orbit with the third cranial nerve.<sup>1</sup> Horner's syndrome is characterized by miosis, partial ptosis, apparent enophthalmos and anhidrosis. Less constant features include facial flushing, arteriolar or venular dilatation, transient lowering of intraocular pressure, hemi-atrophy of the face and iris heterochromia (in congenital Horner's syndrome).<sup>2</sup>

Johann Friedrich Horner (1831-1886), a Swiss ophthalmologist has been credited with the description of this eponymous syndrome.<sup>3,4</sup> He described ptosis, miosis, apparent enophthalmos, flushing, warmth and anhidrosis on right side of the face in a 40-year-old woman. By instilling belladonna (atropine) and calabar (physostigmine) drops, he demonstrated



**Figure 1(D):** Photomicrograph of CT-guided tru-cut biopsy specimen showing pleomorphic cuboidal to columnar tumour cells arranged in ill-defined glandular pattern (arrows) suggestive of adenocarcinoma (Haematoxylin and eosin, × 400)

paralysis of the *dilatator pupillae*, along with the paresis of the *levator palpebrae superioris* and vasomotor paralysis and suggested that the condition resulted from interruption of the cervical sympathetic pathway.<sup>3,4</sup> Edward Selleck Hare (1812-1838) described a patient with a tumour in left inferior triangular space of the neck with miosis and ptosis. However, he could not relate these signs to the interruption of the sympathetic nervous system.<sup>3</sup> Claude Bernard (1830-1878) observed that cutting the rabbit's cervical sympathetic nerve resulted in constriction of the pupil, flushing and rise in the temperature of the ear on that side. Based on these observations he proposed that sympathetic nerves control the

**Table 1: Common causes of Horner's syndrome**

Site of the lesion	Common causes
Central	Stroke
	Tumours
	Trauma
	Demyelination
Pre-ganglionic	Apical lung tumours (e.g., Pancoast tumour)
	Subclavian artery aneurysm
	Mediastinal tumours
	Cervical rib
	Iatrogenic (jugular cannulation, chest tube placement)
Post-ganglionic	Internal carotid artery trauma, dissection, arteritis, aneurysm, thrombosis
	Cavernous sinus thrombosis
	Tumours

Source: reference 5

blood circulation.<sup>4</sup> The common causes of Horner's syndrome are listed in Table 1.<sup>5</sup> Pancoast tumour (also called superior sulcus tumour) named after Henry Khunrath Pancoast, a Radiologist from the United States of America (USA), is a frequently encountered cause of Horner's syndrome.<sup>6</sup> Identification of Horner's syndrome on physical examination is crucial as it may sometimes be the only clue to a serious underlying disease.

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