

## Acute Onset Vision Loss as A Presenting Manifestation of Carcinoma Lung

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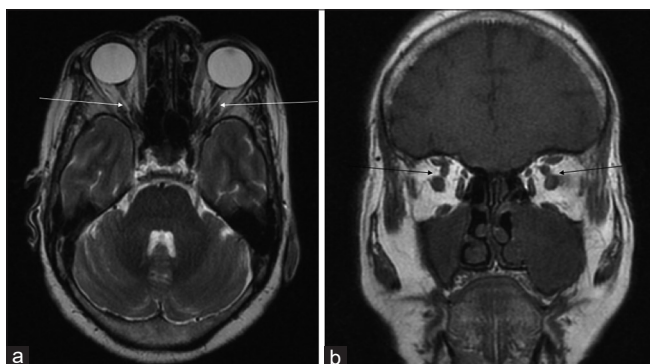
Vision loss in a known case of carcinoma lung raises the suspicion of ocular metastasis, paraneoplastic syndrome or treatment related complications.<sup>[1]</sup> Very rarely superior ophthalmic vein (SOV) thrombosis with or without cavernous sinus (CS) thrombosis can cause acute onset vision loss in carcinoma lung.<sup>[2,3]</sup> We report a case of acute onset unilateral vision loss as a presenting manifestation of carcinoma lung in an elderly lady without any apparent venous thrombosis.

A 70-year-old lady, chronic smoker (30 pack years), with past medical history of intermittent shortness of breath along with unintentional weight loss and reduced appetite of 6-month duration, presented with episodes of severe headache of two months duration. The headache was holocranial, more on left side and lasting for about 15 minutes to 1 hour. She experienced 15-20 such episodes per week, more during evening hours, disturbing her sleep. It was not associated with fever, vomiting or impairment of sensorium. A day before presenting to us, she developed acute onset painless vision loss in left eye with intact vision in right eye. There was no redness, pain or swelling in the eyes.

On examination, she was afebrile, pale and cachectic (body mass index -16.8) with palpable bilateral supra-clavicular (1 × 1 cm, hard, immobile and non tender) and left sided level III cervical lymph nodes. Neck veins were distended and she had minimal facial puffiness. A chest examination revealed reduced movements on right side with reduced breath sounds in right supraclavicular and suprascapular areas. Ophthalmologic examination showed normal anterior segments and ocular pressures. She had only perception of light in her left eye; best-corrected visual acuity in right eye was normal (6/6). The relative afferent pupillary defect (RAPD) was observed in left eye with normal pupillary reaction to light in right eye. Extra ocular movements were normal bilaterally. Left fundus showed blurring of inferior disc margin; right fundus was normal. Remainder of the neurological examination was unremarkable.

The contrast enhanced magnetic resonance imaging (MRI) of the brain with orbit showed bilateral optic nerve (ON) kinking (left >> right) and dilated SOV. There was significant pressure effect on left optic nerve by the dilated SOV [Figure 1a and b]. However, no thrombosis of SOV, CS or ON signal change was appreciated. There were no abnormalities in brain parenchyma. Chest X ray revealed right upper lobe opacity with widened mediastinum, and contrast enhanced computed tomography (CECT) thorax showed a large heterogeneous enhancing mass lesion in right upper lobe causing bronchus cut off and collapse along with multiple enlarged conglomerated mediastinal lymph nodes. There was long segment abutment and encasement of Superior vena cava (SVC) with resultant attenuation, but no obvious thrombus in SVC. The fine needle aspiration cytology (FNAC) of left supraclavicular lymph node confirmed poorly differentiated metastatic carcinoma Figure 2. A clinical diagnosis of metastatic adenocarcinoma of lung with SVC compression resulting in retro grade pressure on SOV causing left optic nerve compression and optic neuropathy was considered. She was referred to Oncology department for further management of metastatic adenocarcinoma of lung. Unfortunately, the patient didn't follow-up with medical oncology department, and she succumbed to her illness within 1 month of diagnosis of malignancy.

Neurological symptoms as presenting manifestations of lung cancer are seen in 5-10% cases irrespective of the chest symptoms at presentation.<sup>[4]</sup> Dasgupta *et al.*<sup>[5]</sup> in their study reported 3.7% (8/216) cases of lung carcinoma with primary neurological manifestations. SOV enlargement in the absence of thrombosis can occur in cavernous sinus thrombosis, diffuse cerebral swelling, various orbital lesions and SVC compression or thrombosis.<sup>[6]</sup> SOV enlargement is associated with increased retrograde flow in SOV or secondary to SVC, CS or SOV thrombosis or compression. SOV plays a major role in venous drainage of orbit via CS, petrosal sinuses, sigmoid sinus, internal jugular vein, subclavian vein, brachiocephalic vein and SVC. Any extrinsic compression or thrombosis in



**Figure 1:** (a) Magnetic Resonance Imaging (MRI) brain, axial section, showing bilateral optic nerve kinking (Left > Right) due to enlarged bilateral superior ophthalmic veins (Left > Right) [white arrows]. (b) Magnetic Resonance Imaging (MRI) brain, coronal section, showing bilateral superior ophthalmic vein (SOV) engorgement and left SOV abutting left optic nerve (black arrows)

this pathway is associated with increased retrograde SOV flow because of lack of valves in this vein.

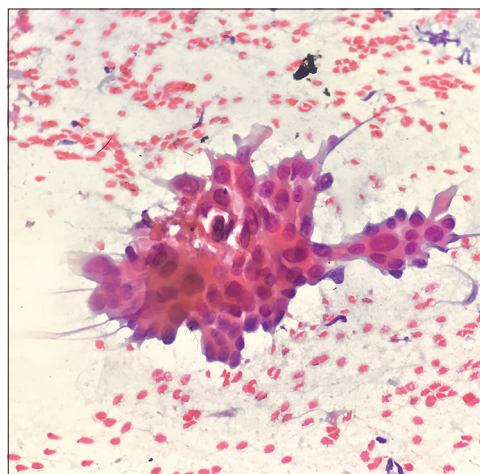
The vision loss in cases with enlarged vessels compressing optic nerve may result due to direct pressure or secondary ischemia from compression of small arterial branches.<sup>[7]</sup> The posterior segment of optic nerve seems more susceptible because of its tenuous blood supply.<sup>[8]</sup> Dilated SOVs leading to bilateral posterior ischemic optic neuropathy with normal fundus has been reported earlier in a patient of spinal canal stenosis after a prolonged surgery in prone position.<sup>[9]</sup>

In this article, we propose an additional mechanism of acute vision loss in patients with carcinoma lung in the absence of SOV or CS thrombosis. SVC obstruction due to carcinoma lung can cause high retro grade venous pressure in SOVs causing optic neuropathy due to direct compression or ischemic injury. The clinical findings of mild facial puffiness and distended neck veins along with brain MRI showing dilated superior ophthalmic veins and CT thorax showing right upper lobe lung mass with mediastinal lymphadenopathy and SVC compression, favor the possibility of venous hypertension secondary to SVC obstruction. Lack of venous congestion on ocular examination is likely because the SCV obstruction was recognized early. Alternative venous drainage through vertebral plexus and other compensatory mechanisms might be the reason for lack of cerebral edema despite venous hypertension in our patient.<sup>[10]</sup> The main limitation of our case report is lack of venogram or ultrasound studies to substantiate SVC obstruction.

SOV enlargement with ON compression should be suspected in lung cancer patients presenting with acute vision loss in the setting of SVC obstruction. A prompt diagnosis and early management may prevent permanent vision loss in such cases.

#### Declaration of patient consent

The authors certify that they have obtained all appropriate



**Figure 2:** Fine needle aspiration cytology of left supraclavicular lymph node showing atypical cells with high nucleocytoplasmic ratio, hyperchromatic nucleus and moderate cytoplasm suggesting poorly differentiated metastatic carcinoma

patient consent forms. In the form the patient and their family have given their consent for her images and other clinical information to be reported in the journal. The patient understands that her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

#### Conflicts of interest

There are no conflicts of interest.

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#### REFERENCES

1. Dropcho EJ. Neurologic complications of lung cancer. Handbook of clinical neurology 2014;119:335-61.
2. Lim LH, Scawn RL, Whipple KM, Oh SR, Lucarelli MJ, Korn BS, *et al.* Spontaneous superior ophthalmic vein thrombosis: A rare entity with potentially devastating consequences. Eye 2014;28:348-51.
3. Rao R, Ali Y, Nagesh CP, Nair U. Unilateral isolated superior ophthalmic vein thrombosis. Indian J Ophthalmol 2018;66:155-7.
4. Figlin RA, Cameron RB, Turisi AT. Non small cell lung cancer

- metastatic presentations. *Cancer Treat* 2001;5:602-4.
5. Dasgupta A, Sarkar D, Devi LG, Haldar S. Primary neurological manifestations of lung cancer--a retrospective analysis of 8 patients. *J Assoc Physicians India* 2005;53:208-12.
  6. Khanna RK, Pham CJ, Malik GM, Spickler EM, Mehta B, Rosenblum ML. Bilateral superior ophthalmic vein enlargement associated with diffuse cerebral swelling. Report of 11 cases. *J Neurosurg* 1997;86:893-7.
  7. Purvin V, Kawasaki A, Zeldes S. Dolichoectatic arterial compression of the anterior visual pathways: Neuro-ophthalmic features and clinical course. *J Neurol Neurosurg Psychiatry* 2004;75:27-32.
  8. Hayreh SS. Posterior ischaemic optic neuropathy: Clinical features, pathogenesis, and management. *Eye (Lond)* 2004;18:1188-206.
  9. Reddy A, Foroozan R, Edmond JC, Hinckley LK. Dilated superior ophthalmic veins and posterior optic neuropathy after prolonged spine surgery. *J Neuroophthalmol* 2008;28:327-8.
  10. Epstein HM, Linde HW, Crompton AR, Ciric IS, Eckenhoff JE. The vertebral venous plexus as a major cerebral venous outflow tract. *Anesthesiology* 1970;32:332-7.

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