## CASE REPORT

# Cavernous Sinus Syndrome Secondary to Metastasis from Small Cell Lung Carcinoma

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#### ABSTRACT

We report a case of cavernous sinus syndrome presenting with painful trigeminal neuropathy secondary to metastasis from a small cell lung carcinoma, which responded to radiotherapy.

#### INTRODUCTION

We report a case of cavernous sinus syndrome (CCS) presenting with painful trigeminal neuropathy secondary to metastasis from a small cell lung carcinoma, which responded to radiotherapy.

#### CASE REPORT

A 68-year-old woman presented with a tingling sensation on the right side of her upper lip which spread to her brow and scalp. Her paresthesia gave way to constant pain over her right temporal and orbital region, causing her to seek medical attention. During this time she also developed intermittent binocular vertical and horizontal diplopia, which worsened gradually over a period of 2 months. Her diplopia was noticeable on looking down, especially when reading and watching television. There was no significant past ocular history.

She had been a smoker for 50 years smoking approximately 15–20 cigarettes/day and had unintentionally lost 4 kg in weight over 1 month. She was on a combination of weekly methotrexate, sulfasalazine, and prednisolone for rheumatoid arthritis.

On examination her corrected visual acuity was 6/9 + 3 in the right eye and 6/9 in the left. There was involvement of the right third, fourth, fifth and sixth cranial nerves, suggesting a lesion at the right cavernous sinus. There was moderate limitation of the right eye ductions in all positions of gaze (Fig. 1, Hess Chart). She also had sensory loss in all three divisions of the right trigeminal nerve. Slit lamp and posterior

#### REPRINTS

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The authors report a case of cavernous sinus syndrome presenting with a painful trigeminal neuropathy secondary to a metastasis from small cell lung carcinoma which responded to radiotherapy.

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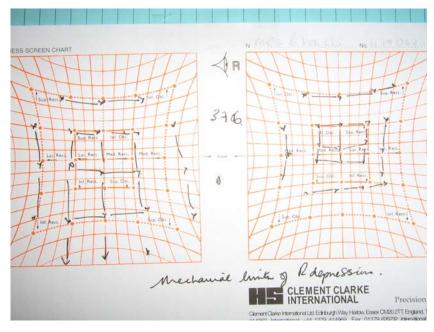


Figure 1—Hess Chart shows limitation of right eye movements compared with the left eye.

segment examination were normal with no proptosis. Visual field, colour vision and pupillary reactions were normal. She was alert, ambulant, fully orientated with normal speech.

Magnetic resonance imaging (MRI) revealed a low signal-enhancing lesion on T1-weighted sequences in the posterior fossa, extending through the right foramen ovale into the right middle cranial fossa and



**Figure 2**—Magnetic resonance imaging of the brain showing the lesion at the right cavernous sinus.

measuring  $33 \times 20$  mm. There was involvement of the cavernous sinus (Fig. 2). In addition, there was an 18-mm cystic lesion in the left cerebellar hemisphere and multiple lesions < 1 cm in size seen in the right cerebellar hemisphere, left medulla and right parietal lobe. No orbital lesion was detected. The appearances were typical of multiple metastases.

Chest radiograph showed a lobular mass at the left hilar region (Fig. 3). Computed axial tomography (CT) of the thorax showed a small spiculated lesion in the left mid zone, a mass encasing the left main pulmonary artery (Fig. 4) and multiple low density lesions in the liver and spleen. The right adrenal gland contained a soft tissue mass. A fine needle aspiration biopsy of the lung lesion revealed a small cell lung carcinoma. In view of the extensive involvement of her disease, she was treated with palliative radiotherapy to her head and chest. Her symptoms resolved within a few weeks of starting palliative radiotherapy. At the time of writing (September 2006), she remains well.

#### **DISCUSSION**

Bartholew first mentioned the cavernous sinus syndrome in 1872 where he described a case of intracavernous aneurysm. In 1922, Foix reported a patient with a pituitary tumour causing pain in the region of the ophthalmic nerve and paresis of the oculomotor, trochlear and abducent nerve of the same side (1).

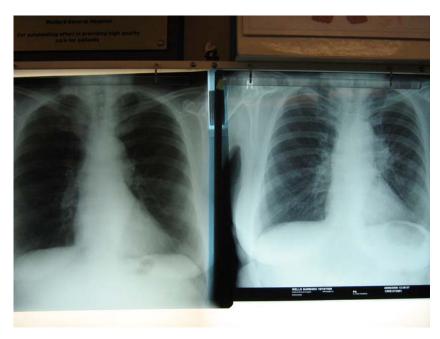
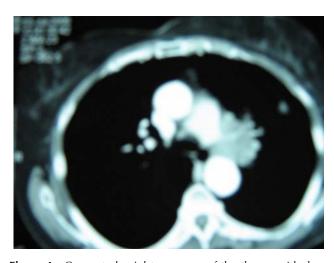


Figure 3—Chest radiograph showing the left lung lesion.



**Figure 4**—Computed axial tomogram of the thorax with the tumour encasing the left pulmonary artery.

Jefferson in 1938 subdivided the syndrome into the anterior, middle and posterior parts of the lateral wall of the cavernous sinus with differential involvement of the trigeminal nerve. Anterior cavernous sinus syndrome involved the first division, middle cavernous sinus syndrome involved the first and second divisions, while posterior cavernous sinus syndrome caused complete paralysis of all three divisions, as in our patient (2).

The MRI findings in our patient clearly demonstrated local extension of a lesion at the right Meckel's cave with invasion of the cavernous sinus. However, not all patients with cavernous sinus syndrome have abnormal imaging, e.g., cases of neurocysticercosis

with cerebral vasculitis involving small diameter vessels causing small infarcts (3).

There are also cases of misdiagnosed CSS. One study suggested that the correct diagnosis increased in proportion with the number of nerves involved. For a diagnosis to be more than 50% correct, at least three cranial nerves at the cavernous sinus had to be affected (4). The involvement of the oculomotor, trochlear, abducent, sensory divisions V1 and V2 of the trigeminal nerves with sparing of the optic nerve is suggestive of cavernous sinus syndrome. Neoplastic causes of cavernous sinus syndrome include meningioma, lymphoma, nasopharyngeal carcinoma and metastasis from the lung, breast and malignant melanoma (5).

Our patient presented with an initial tingling sensation on the right side of her upper lip, which spread over the brow and the scalp. Only later did symptoms of diplopia indicate possible involvement of other cranial nerves. Clinicians should take note that cavernous sinus involvement may mimic other conditions such as trigeminal neuropathy and a low threshold for contrast-enhanced MRI is recommended.

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