Neurological deterioration of unknown aetiology: Leptomeningeal Carcinomatosis in the Intensive Care Unit

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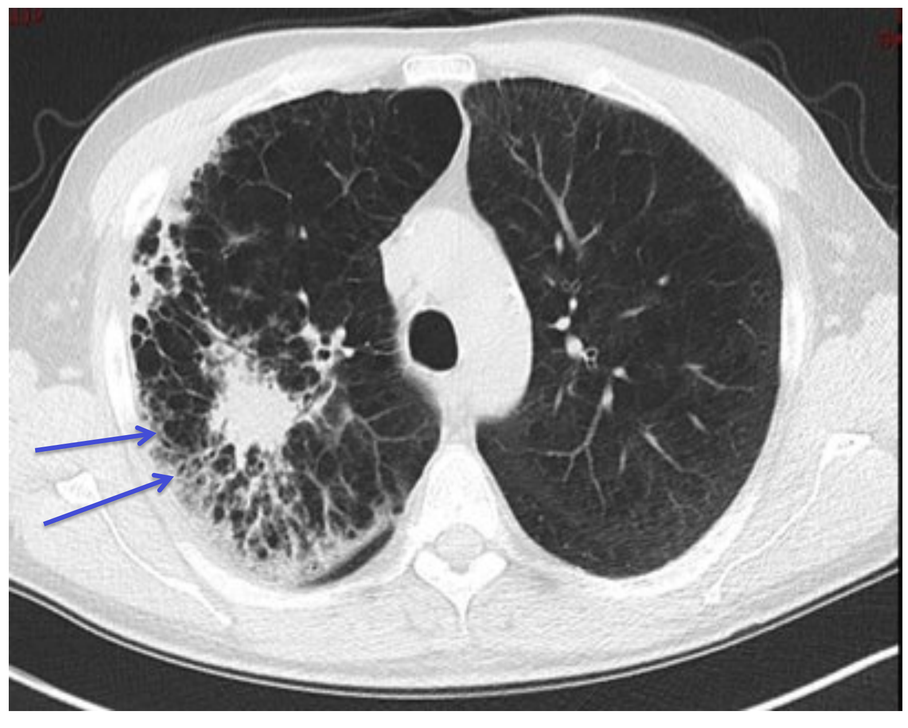
Background

- Leptomeningeal carcinomatosis is a late stage complication of systemic cancer caused by haematogenous spread of malignant cells infiltrating the pia mater, arachnoid and subarachnoid space.
- We present a case of leptomeningeal metastasis from a single primary lung nodule who presented to the intensive care unit following neurological deterioration of unknown aeitology.

Case Description

- A 62 year old man was admitted to hospital with a 6 week history of global headache, photophobia, fever and hypertension. Past medical history included obstructive airway disease, peripheral vascular disease and a small 6mm lung nodule thought to be benign under respiratory MDT follow up **(Figure 1)**
- He was admitted under medicine with an initial diagnosis of acute migraine however failed to improve with conventional analgesic treatment.
- Initial diagnostic work up included a CT brain which demonstrated developing hydrocephalus with generalised sulcal effacement; subsequent LP demonstrated a high opening pressure of 34cm with a CSF protein of 976 and treatment for viral encephalitis was commenced.
- Despite maximal medical therapy the patient deteriorated neurologically requiring transfer to the critical care unit for on going management.
- On arrival to the intensive care unit he required intubation and ventilation for deteriorating GCS and was noted to have a left fixed and dilated pupil.
- A repeat CT Brain demonstrated progressive dilation of cerebral ventricles with severe sulcal effacement and cerebral oedema at risk of herniation.
- Neurosurgical opinion was sought; unfortunately the patient was too unstable for transfer to tertiary care for a potential ventricular drainage device.
- CSF was therefore drained via LP with concurrent osmotic diuresis to reduced ICP; an opening pressure of > 40 cm was identified and required approximately 70mls of CSF to be drained until pressure was normalised
- Unfortunately the patient continued to deteriorate, repeat CT scan showed severe sulcal effacement with cerebral oedema and significant tonsillar herniation consistent with unsurvivable brain injury.
- A post mortem examination confirmed the diagnosis of leptomeningeal metastasis from a malignant adenocarcinoma of the lung.

Figure 1:
CT thorax, demonstrating 6mm right upper lobe nodule reported as benign with peripheral opacification involving the pleura with some central cavitation



Discussion

- Metastatic leptomeningeal disease is a rare and late complication of metastatic malignancy with an unfortunately poor prognosis. It is thought to be present in 5-8% of cases of solid tumors, most commonly breast, lung, gastrointestinal, and primary central nervous system tumours.[1,2]
- Our case demonstrated the diagnostic challenge of the disease due to the limited and varying sensitivities of diagnostic modalities the diagnosis and requires a high degree of clinical suspicion.
- Important differentials of hydrocephalus with raised protein include meningoencephalitis and in this particular case with a cavitating lung lesion TB meningitis.
- Once diagnosed there is limited treatment options and focus should be one of a palliative approach one

Conclusion

- The clinical presentation of leptomeningeal disease is variable and can present a diagnostic challenge with a wide range of potential differential diagnosis. It should be considered in any patient presenting with potential malignancy with hydrocephalus with unexplained neurological signs and symptoms

References: 1). Cheng H, Perez-Soler R. Leptomeningeal metastases in non-small-cell lung cancer. Lancet Oncol. 2018 Jan;19(1):e43-e55. doi: 10.1016/S1470-2045(17)30689-7. PMID: 29304362 2) Ko Y, Gwak HS, Park EY, Joo J, Lee YJ, Lee SH, Kwon JW, Shin SH, Yoo H. Association of MRI findings with clinical characteristics and prognosis in patients with leptomeningeal carcinomatosis from non-small cell lung cancer. J Neurooncol. 2019 Jul;143(3):553-562.

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