

CASE REPORT

Adenocarcinoma of the lung presenting with atypical cystic brain lesions

Ricardo Costa,¹ Rubens B Costa,² Carlos Bacchi,³ Filipe Sarinho⁴¹Department of Oncology, Real Hospital Portugues, Recife, Brazil²Cedar Valley Cancer Center, Waterloo, Iowa, USA³Laboratorio Bacchi, Botucatu, Brazil⁴Department of Internal Medicine, Real Hospital Portugues, Recife, Brazil**Correspondence to**

Dr Rubens B Costa, rcosta@cvmspc.com

Accepted 11 March 2014

SUMMARY

Brain metastases occur in up to 10–30% of patients with cancer. Metastatic lesions are usually diagnosed as multiple mass lesions at the junction of the grey and white matter with associated perilesional vasogenic oedema. Cysticercosis is an endemic disease in underdeveloped countries of Africa, Central and South America and is the most common parasitic infection of the central nervous system. The classical radiological finding of neurocysticercosis is cystic lesions showing the scolex in the brain parenchyma. We report a case of metastatic adenocarcinoma of the lung presenting with cystic brain lesions mimicking neurocysticercosis.

BACKGROUND

Brain metastases occur in up to 10–30% of patients with cancer.¹ Lung cancer is the most common cause of brain metastasis followed by melanoma and renal cell carcinoma. Contrast-enhanced MRI is the preferred method of diagnosis of brain metastasis. It is the most sensitive imaging modality to detect metastatic lesions from lung tumours.^{2–3} Metastatic lesions are usually diagnosed as multiple mass lesions at the junction of the grey and white matter with associated perilesional vasogenic oedema.⁴

Cysticercosis is an endemic disease in underdeveloped countries of Africa, Central and South America and is the most common parasitic infection of the central nervous system.^{5–6} The classical radiological finding of neurocysticercosis is cystic lesions showing the scolex in the brain parenchyma.⁷ There are rare reports of brain metastasis presenting as cystic lesions which may mimic neurocysticercosis.^{8–10}

We report a case of metastatic adenocarcinoma of the lung presenting with cystic brain lesions mimicking neurocysticercosis.

CASE PRESENTATION

A 61-year-old woman, non-smoker who was in her usual state of health presented at an outside institution with new onset generalised tonic-clonic seizure. MRI of the brain showed multiple cystic lesions. No chest imaging was performed at the outside facility. She received an 8-day course of albendazole 1400 mg daily along with dexamethasone for probable neurocysticercosis based on imaging findings and its high prevalence in north-east Brazil.

She presented to the emergency room at our institution with subjective dyspnoea, malaise and new neurological symptoms 4 weeks after initial

diagnosis of brain cystic lesions and 2 weeks after completion of albendazole treatment at outside facility. No headache, vomiting, visual disturbances were reported on arrival.

On physical examination, her vital signs including respiratory rate were stable. She was found to have right haemiparesis and gait abnormalities. Distal right lower extremity showed right foot drop (strength 3/5) which had been getting progressively worse after completion of albendazole treatment. The patient was alert, attentive, oriented to place, person and time. The lungs were clear to auscultation. The heart rhythm was regular. No cyanosis or clubbing was appreciated on lower extremities. There was no appreciable lymphadenopathy in the cervical, supraclavicular, infraclavicular, inguinal and axillary areas. The abdomen was soft without visceromegaly.

INVESTIGATIONS

Another MRI of the brain was performed showing multiple cystic brain lesions with associated perilesional enhancement (figure 1).

A chest X-ray showed spiculated opacities at the right parahilar and upper lobe areas (figure 2). A CT of the chest showed right and left superior lobe-spiculated lesions measuring 3.6×3 cm and 2×1.7 cm, respectively, and paratracheal lymphadenopathy (figure 3).

In the light of lack of clinical improvement of neurological symptoms and the presence of lung lesions, the patient underwent a left parietal cystic brain lesion resection. Pathological analysis revealed a poorly differentiated adenocarcinoma. Subsequent

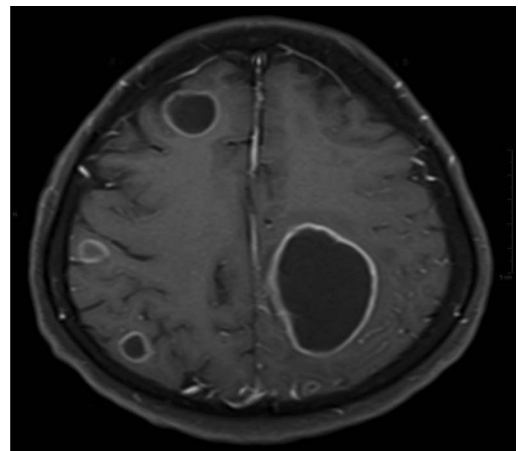


Figure 1 MRI showing multiple brain cystic lesions with associated perilesional enhancement.



CrossMark

To cite: Costa R, Costa RB, Bacchi C, et al. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2013-203506

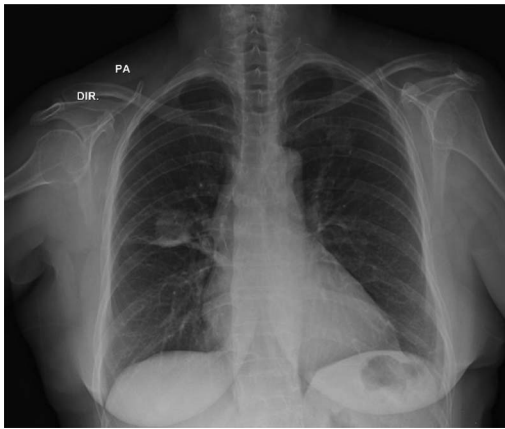


Figure 2 Chest X-ray showing bilateral lung and right parahilar mass. DIR, right side; PA, posteroanterior.

immunohistochemical evaluation was positive for cytokeratin 40, 48, 50, 5/6 AEA, thyroid transcription factor 1, napsin suggestive of lung primary (figure 4).

DIFFERENTIAL DIAGNOSIS

After lack of improvement on albendazole, other entities presenting as cystic brain mass lesions including primary or metastatic brain tumours, tuberculomas, pyogenic brain abscesses and mycotic granulomas were considered as part of the differential diagnoses. The development of respiratory symptoms prompted chest imaging. After results, we decided to pursue tissue biopsy to confirm our suspicion of metastatic lung carcinoma. The other diagnoses seemed less likely to us.

TREATMENT

The patient started systemic chemotherapy with carboplatin area under the curve (AUC) 5 and paclitaxel 150 mg/m² every 21 days after surgical recovery. Her brain metastases are being closely observed while on systemic treatment.

OUTCOME AND FOLLOW-UP

The patient has been tolerating treatment well with stable disease on follow-up MRI of the brain performed after two cycles of systemic chemotherapy.

DISCUSSION

There are very few reports of lung cancer presenting with metastatic cystic brain lesions.¹⁰⁻¹² Neurocysticercosis is the most common parasitic infection of the central nervous system. Imaging studies along with serological testing are the basis for diagnosis of neurocysticercosis when biopsy is not indicated.⁷ In endemic areas, cystic brain metastasis can be misdiagnosed for

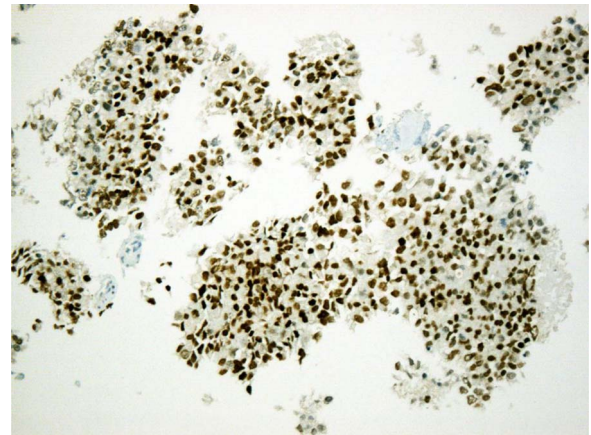


Figure 4 Immunohistochemistry staining of adenocarcinoma involving the brain showing strong expression of thyroid transcription factor 1.

neurocysticercosis, even when in the presence of seropositive markers.¹³ For those in other areas of the globe, brain metastases would have been considered at the time of initial imaging. However, this patient did meet the criteria for probable neurocysticercosis in that geographical region. In an area of limited resources, the initial course of action was appropriate. The lack of improvement led to further evaluation, diagnosis and definitive treatment. In retrospect, the patient could have undergone a less invasive diagnostic procedure such as lung biopsy for tissue diagnosis.

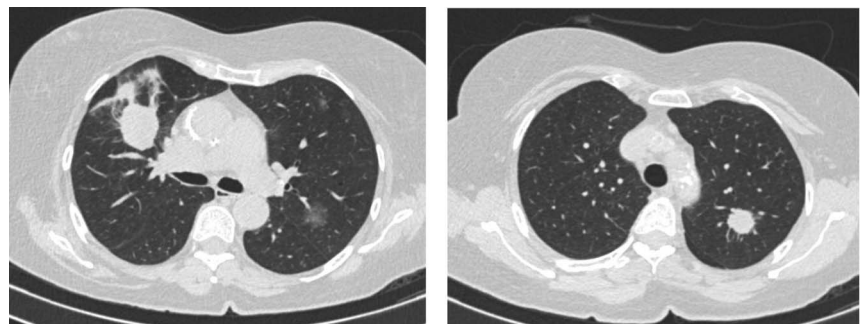
In summary, physicians as well radiologists, especially those practicing in endemic areas for cysticercosis, should be aware of the rare presentation of cystic brain metastasis of lung tumours.

Learning points

- ▶ Cystic lesions are an uncommon presentation of brain metastases of lung adenocarcinoma.
- ▶ Treatment with antiparasitics is a reasonable first step for patients with definite or probable neurocysticercosis.
- ▶ Other causes for brain cystic lesions should be investigated in case of initial treatment failure in areas where cysticercosis is endemic.
- ▶ Lung cancer should always be considered as a possible diagnosis in patients with brain lesions given its high prevalence.

Contributors All the authors were involved in the conception and design of the manuscript, acquisition and interpretation of the data, drafting the article or revising

Figure 3 Chest CT showing bilateral lung masses.



it critically for important intellectual content. All the authors gave final approval of the version published.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Johnson JD, Young B. Demographics of brain metastasis. *Neurosurg Clin N Am* 1996;7:337–44.
- 2 Yokoi K, Kamiya N, Matsuguma H, *et al.* Detection of brain metastasis in potentially operable non-small cell lung cancer: a comparison of CT and MRI. *Chest* 1999;115:714–19.
- 3 Davis PC, Hudgins PA, Peterman SB, *et al.* Diagnosis of cerebral metastases: double-dose delayed CT vs contrast-enhanced MR imaging. *AJNR Am J Neuroradiol* 1991;12:293–300.
- 4 Strugar J, Rothbart D, Harrington W, *et al.* Vascular permeability factor in brain metastases: correlation with vasogenic brain edema and tumor angiogenesis. *J Neurosurg* 1994;81:560–6.
- 5 Willingham AL III, Engels D. Control of *Taenia solium* cysticercosis/taeniosis. *Adv Parasitol* 2006;61:509–66.
- 6 Montano SM, Villaran MV, Ylquimiche L, *et al.* Neurocysticercosis: association between seizures, serology, and brain CT in rural Peru. *Neurology* 2005; 65:229–33.
- 7 Del Brutto OH, Rajshekhar V, White AC Jr, *et al.* Proposed diagnostic criteria for neurocysticercosis. *Neurology* 2001;57:177–83.
- 8 Troiani C, Lopes CC, Scardovelli CA, *et al.* Cystic brain metastases radiologically simulating neurocysticercosis. *Sao Paulo Med J* 2011;129:352–6.
- 9 Surov A, Hainz M, Kornhuber M. Multiple cystic metastases in the brain from adenocarcinoma of the lung. *Am J Med* 2009;122:e3–4.
- 10 Mota PC, Reis C, Pires NF, *et al.* Lung cancer: atypical brain metastases mimicking neurocysticercosis. *Int J Clin Oncol* 2011;16:746–50.
- 11 Choi HJ, Choi SK. Multiple cystic brain metastases from adenocarcinoma mimicking cysticercosis. Case report. *Clin Neuroradiol* 2012;22:105–7.
- 12 De Shields MS, Ruether J. Lung carcinoma presenting as multiple cystic lesions in the brain. *Del Med J* 1998;70:77–80.
- 13 Coulibaly B, Gautier G, Fuentes S, *et al.* [Degenerating neurocysticercosis cysts: differential diagnosis with cerebral metastasis]. *Rev Neurol* 2008;164:948–52.

Copyright 2014 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.

BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow