Case 14063

Eurorad

Intradural and intramedullary spinal metastases from lung neoplasm

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ISSN: 1563-4086
Section: Neuroradiology
Area of Interest: Thorax Neuroradiology brain Neuroradiology spine
Procedure: Diagnostic procedure
Imaging Technique: Digital radiography
Imaging Technique: CT
Imaging Technique: MR
Imaging Technique: MR-Angiography
Special Focus: Neoplasia Metastases Case Type: Clinical Cases
Authors: María José Raya Núñez, Luis Gijón de la Santa, Alfredo Joaquín Laguna, Ainhoa Camarero de Miguel.
Patient: 56 years, male

Clinical History:

A 56-year-old man presented with back pain, paresthesias and weakness in the lower extremities. He was diagnosed six months before of small cell lung cancer with a cerebral metastasis, with good response to chemotherapy. Thereafter, cranial and spinal cord MRI were done in order to complete the study.
Imaging Findings:

Chest X-ray showed mediastinal widening, right perihilar opacification extended to the upper right lobe and right pleural effusion (Fig. 1a).

Chest contrast-enhanced CT revealed right anterior soft tissue density mediastinal mass, corresponding with small cell lung neoplasm, infiltrating the pericardium and extending to the upper right lobe that abutted the right pulmonary artery, upper right lobe bronchus and intermediary bronchus (Fig.1b). Pulmonary consolidation in the anterior segment of the right pulmonary lobe and right pleural effusion.

Cerebral MRI showed small round lesion in right frontal lobe in the convexity with mild hypointense in T1-weighted images and mild T2 and FLAIR signal, with rim contrast enhancement and peripheric oedema (Fig. 2).

Lumbar spine MRI:
In spinal cord and nerve roots there were intradural extramedullary metastasis nodules, isointense in T1-weighted sequences and hyperintense in T2 weighted-images filling the thecal sac (Fig. 3b-c), with diffuse enhancement after contrast administration and an intramedullary component in film terminale (Fig. 3d).

Discussion:

Leptomeningeal metastases represent 8.5% of central nervous system metastases and account for 5% of all intramedullary lesions [1, 4]. Intradural disease can originate in primary central nervous system tumours like anaplastic astrocytoma, GBM or ependymoma as well as from distant tumours (breast cancer, lung cancer and melanoma) [2, 3].
Spread of malignant cells to the region is variable and includes: growth along the Virchow-Robin spaces, haematogenous dissemination or direct extension from leptomeninges, typically of paraspinal, retroperitoneal of pulmonary malignancies, and lymphatic (along the root sleeves) [3].

The metastatic localization may appear like nodular foci, micro- or macro-nodular or linear along the surface of the central nervous structures. They generally appear isointense with the spinal cord in T1-weighted sequences, hyper-intense in the T2-weighted sequences and enhancing nodules after contrast administration [4].

Differential diagnosis includes drop metastases from CNS primaries (ependymoma, astrocytoma, oligodendroglioma), piogenic meningitis and multifocal primary tumour [1, 3].
Presentation is highly variable. As the most commonly affected site is the lumbosacral spine, symptoms and signs include back or radicular pain, weakness, paraesthesias, gait disturbance, cauda equina syndrome and symptoms/signs of meningeal irritation [2].
Treatment is usually radiotherapy and chemotherapy [3].
Differential Diagnosis List: Intradural (extra and intramedullary) spinal metastases from small cell lung cancer, Drop metastases from CNS primaries (ependymoma, astrocytoma), Piogenic meningitis

Final Diagnosis: Intradural (extra and intramedullary) spinal metastases from small cell lung cancer

References:

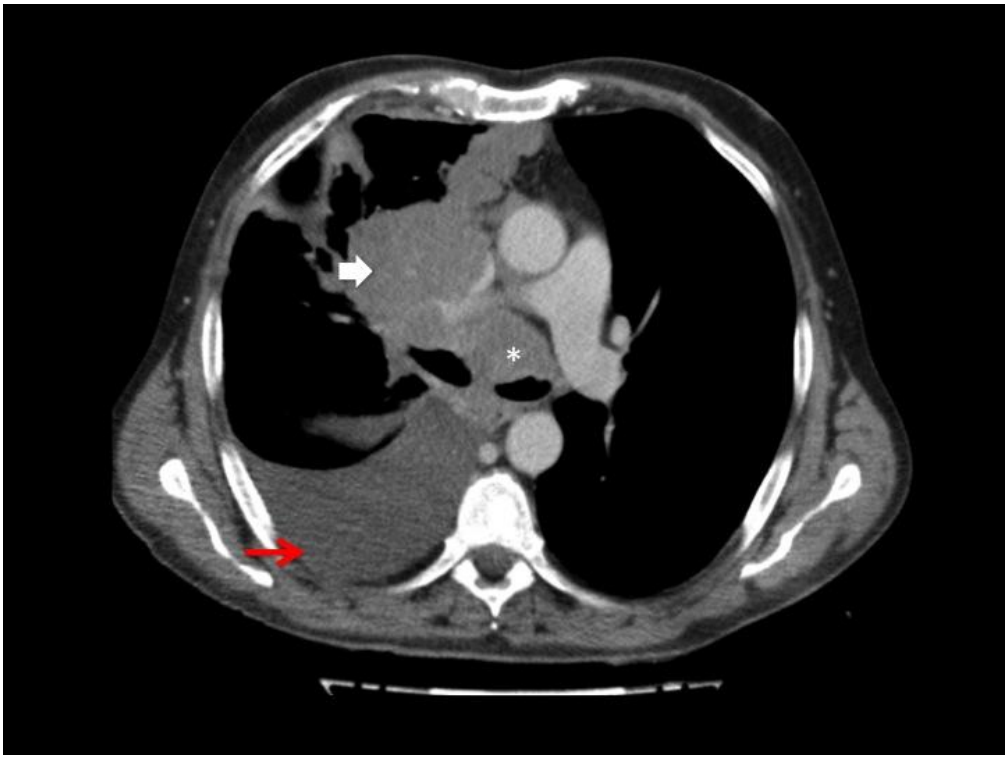
Soderlund KA, Smith AB, Rushing EJ et-al (2012) Radiologic-pathologic correlation of pediatric and adolescent spinal neoplasms: Part 2, Intradural extramedullary spinal neoplasms. AJR Am J Roentgenol 198 (1): 44-51. (PMID: 22194478)
J.B. Rykken, F.E. Diehn, C.H. Hunt, K.M. Schwartz, L.J. Eckel, C.P. Wood, T.J. Kaufmann, R.K. Lingineni, R.E. Carter, and J.T. Wald. (2013) Intramedullary Spinal Cord Metastases: MRI and Relevant Clinical Features From a 13-Year Institutional Case Series. AJNR Am J Neuroradiol 34(10):2043-9. (PMID: 23620071)
Grossman RI, Yousem DM. (2003) Neuroradiology, the requisites. Mosby Inc 2nd edition, 817-820
Balm M, Hammack J. (1996) Leptomeningeal carcinomatosis. Presenting features and prognostic factors. Arch. Neurol 53 (7): 626-32 (PMID: 8929170)

Figure 1

a

Description: Chest X-ray: mediastinal widening, pulmonary right hilar mass and right pleural effusion.
Origin: Department of Radiology. Hospital Universitario de Guadalajara.

b



Description: Axial contrast-enhanced CT: right anterior soft tissue density mediastinal mass (white arrow) extended to upper right lobe that abutted right pulmonary artery, upper right lobe bronchus and intermediary bronchus with right pleural effusion (red arrow). **Origin:** Department of Radiology. Hospital Universitario de Guadalajara

c

Description: Axial chest CT. Pulmonary consolidation in anterior segment of right pulmonary lobe.
Origin: Department of Radiology. Hospital Universitario de Guadalajara

Figure 2

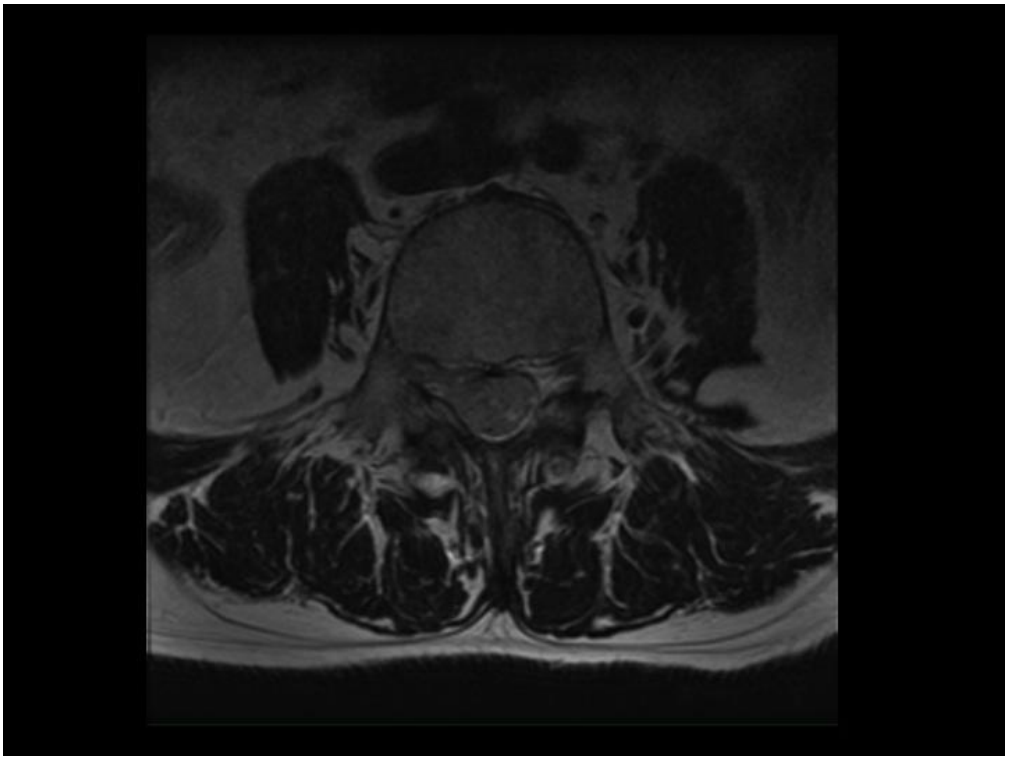
a

Description: Intradural extramedullary nodules isointense with the spinal cord in T1-weighted sequence. **Origin:** Department of Radiology. Hospital Universitario de Guadalajara

b

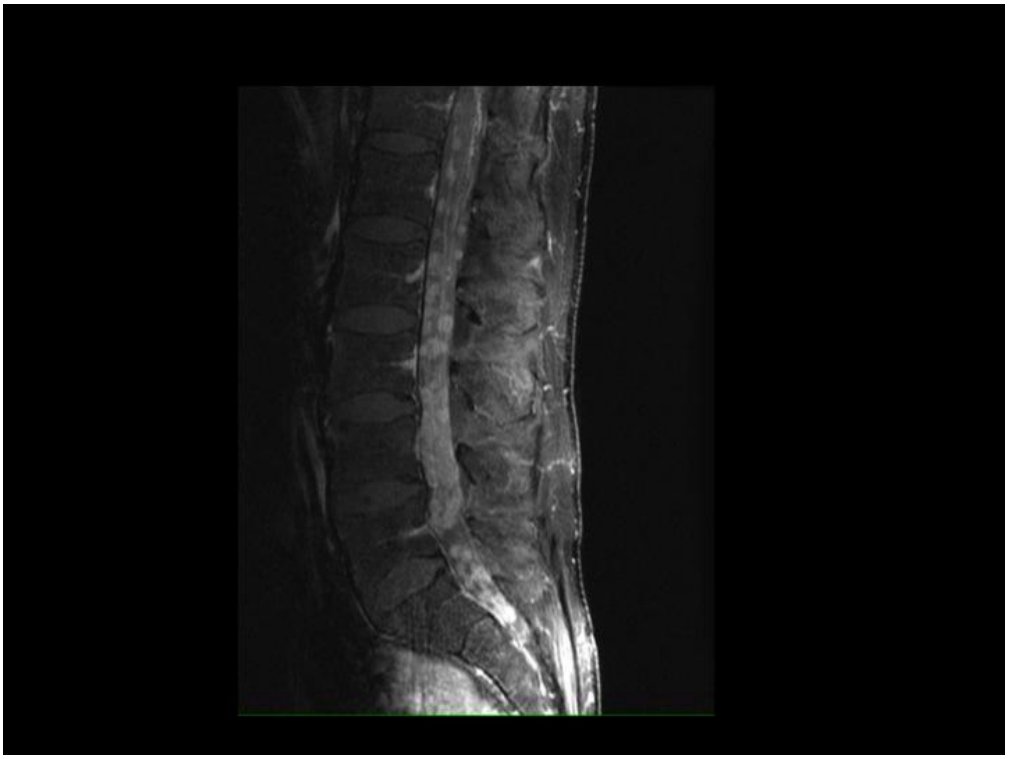
Description: Sagittal T2-weighted image shows multiple hyperintense nodular lesions in the spinal cord and nerve roots. **Origin:** Department of Radiology. Hospital Universitario de Guadalajara

c



Description: Axial T2-weighted image with metastasis nodules filling the thecal sac. **Origin:** Department of Radiology. Hospital Universitario de Guadalajara

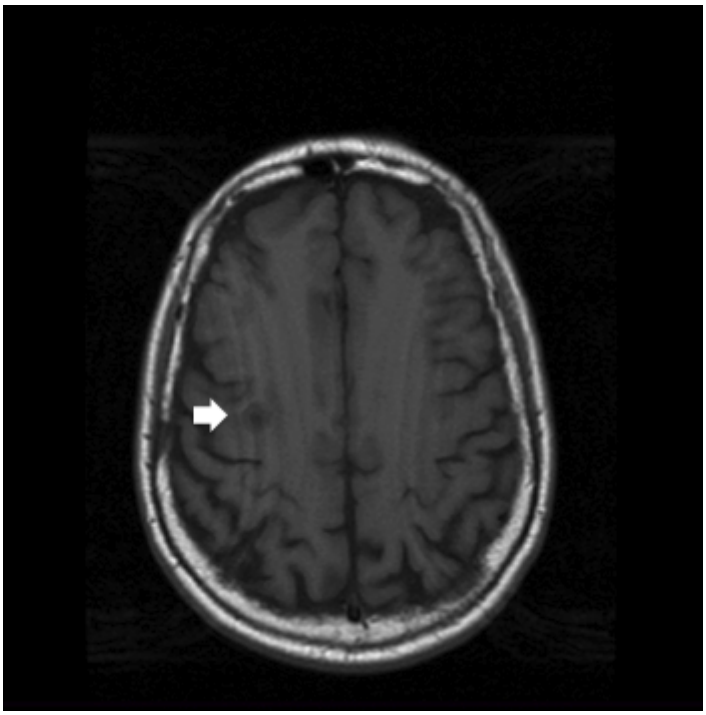
d



Description: Sagittal contrast T1-weighted image shows multiple intradural extra and intramedullary enhancing metastasic nodules. **Origin:** Department of Radiology. Hospital Universitario de Guadalajara

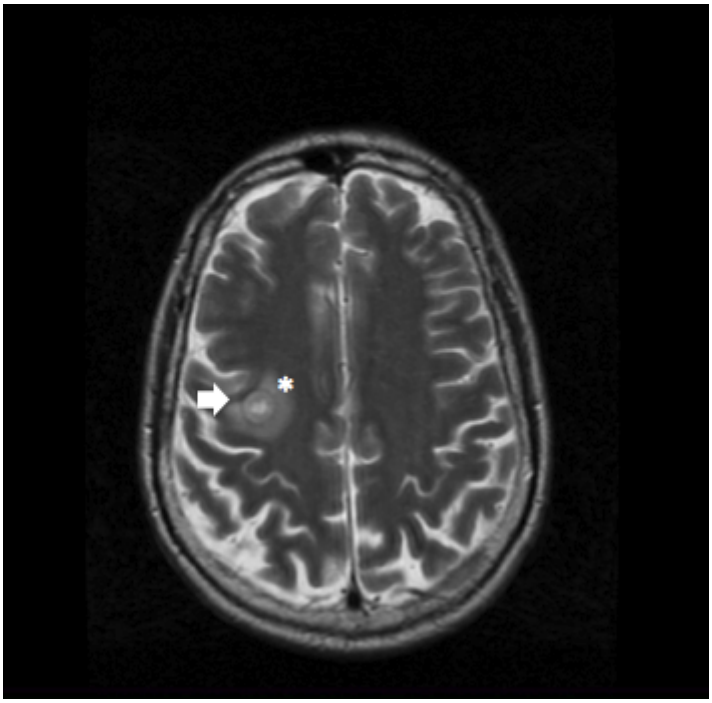
Figure 3

a



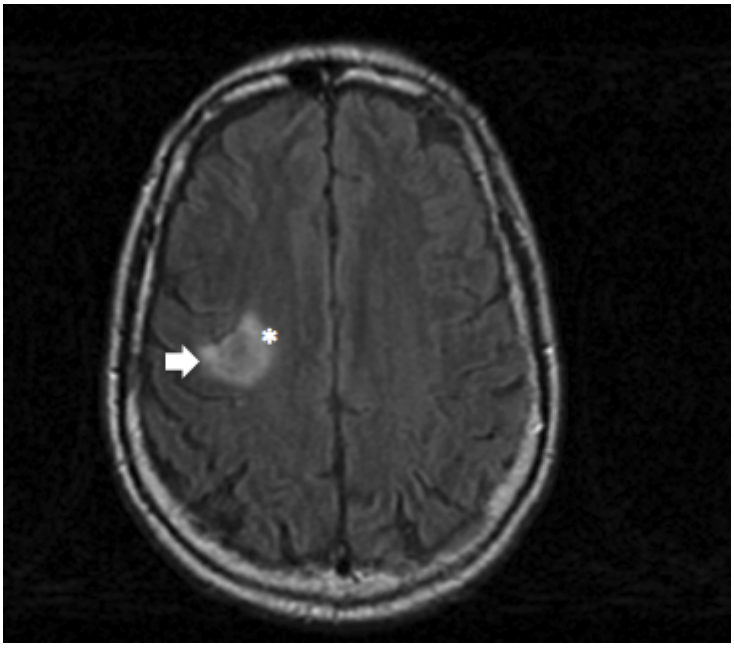
Description: Axial T1-weighted image shows a mild hypointense small round lesion in the right frontal lobe in the convexity (white arrow). **Origin:** Department of Radiology. Hospital Universitario de Guadalajara

b



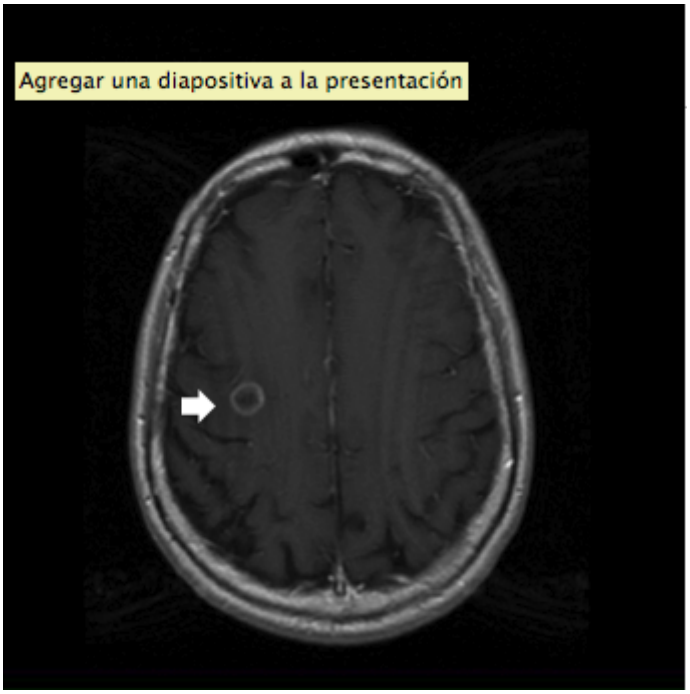
Description: Axial T2 and FLAIR images show a hyperintense small round lesion in the right frontal lobe in the convexity (white arrow) with peripheric oedema (asterisk). **Origin:** Department of Radiology. Hospital Universitario de Guadalajara

c



Description: Axial T2 and FLAIR images show a hyperintense small round lesion in right frontal lobe in the convexity (white arrow) with peripheric oedema (asterisk). **Origin:** Department of Radiology. Hospital Universitario de Guadalajara

d



Description: Axial contrast T1 sequences shows peripheric enhancement (white arrow). **Origin:** Department of Radiology. Hospital Universitario de Guadalajara