

# Leptomeningeal Metastasis Mimicking a Subacute Epidural Hematoma: Case Report

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**ABSTRACT:** Leptomeningeal carcinomatosis is extremely rare in colorectal adenocarcinoma, its incidence is far less than 1%. The neurological symptoms are pleomorphic. The most common symptoms included Headache, ataxia, cranial nerve palsies, meningismus, focal weakness or numbness. MRI is the most sensitive and specific imaging method for screening, positive diagnosis and pre-treatment of leptomeningeal carcinomatosis. The presence of appropriate neuroimaging abnormalities in a patient with typical clinical features and history of colorectal adenocarcinoma enables to make the diagnosis of leptomeningeal metastases. As well as a biological confirmation is necessary. Treatment usually comprises site-specific radiation therapy in addition to intrathecal and systemic chemotherapy.

The case aims to describe the MRI characteristics of leptomeningeal metastases so as to formulate the diagnosis and the subsequent treatment.

**KEYWORDS:** Leptomeningeal metastases, rectal adenocarcinoma, epidural hematoma

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## Introduction

Leptomeningeal carcinomatosis (LMC) was defined as seeding of the meninges and the subarachnoid space by malignant cells, it was a rare event but is nowadays increasingly detected.<sup>1</sup> Brain metastasis from colorectal cancer was rare occurring in 3% of cases, and leptomeningeal carcinomatosis was extremely rare in colorectal cancer (<0.02%).<sup>2</sup>

We report the case of a young male patient treated of rectal adenocarcinoma, who present a leptomeningeal carcinomatosis mimicking a subacute epidural hematoma. The case aims to describe the MRI characteristics of leptomeningeal metastases so as to formulate the diagnosis and the subsequent treatment.

## Clinical observation

A 38 years old patient, presented to the emergency room with a recent onset of headache associated with vomiting, confusion and acute left hemiparesis. Past history revealed an abdominoperineal resection performed 1 year ago for rectal adenocarcinoma. Clinical examination found an afebrile patient, in good general condition, with a stiff neck and left side spastic hemiparesis. The remainder of the physical examination was unremarkable.

An emergency CT scan showed two extra-axial lesions of the right temporal lobe and the right parieto-occipital region, spontaneously hyperdense and enhanced after contrast injection mimicking a subacute epidural hematoma (Figure 1).

A cerebral MRI showed an extra-axial process of the right temporal lobe, in iso signal T1, T2 and flair (Figure 2A and B), containing the zones with loss of signal in T2\* (Figure 2C). It is in restricted diffusion (ADC low at  $0.33 \times 10^{-3} \text{ mm}^2/\text{s}$ ) (Figure 2D), heterogeneously enhanced after injection of the

gadolinium (Figure 2E and F), measuring:  $48 \times 10 \times 50 \text{ mm}^3$  (T  $\times$  AP  $\times$  H) with a bone signal abnormality and invasion of the right sigmoid sinus (right sigmoid sinus thrombosis) (Figure 3A, B and D). It is associated with a right parieto-occipital process in similarly characteristic of a right temporal lesion with a bone signal abnormality.

Cerebrospinal Fluid cytology allows the identification of neoplastic cells in the cerebrospinal fluid establishes the diagnosis of leptomeningeal carcinomatosis.

## Discussion

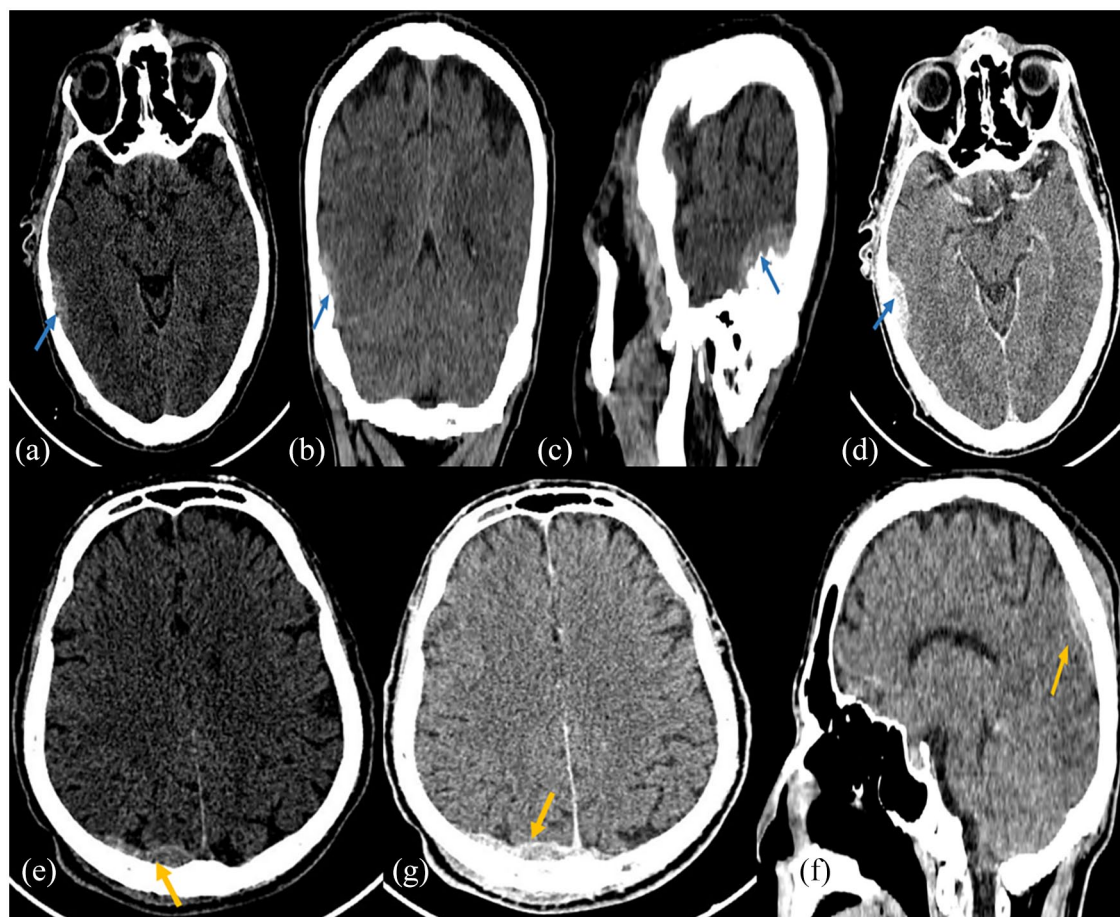
Leptomeningeal carcinomatosis was originally described by Eberth in 1870. It is defined as diffuse or multifocal seeding of the leptomeninges, the subarachnoid space and the cerebrospinal fluid by neoplastic cells.<sup>1</sup> It is an uncommon metastatic complication, most commonly arising from breast, none small-cell lung cancer, and melanoma with a frequency of 5% to 25%, its incidence in colorectal cancer colorectal is far less than 1%.<sup>3</sup> However, this entity is thought to be underdiagnosed since necropsy studies of cancer patients have shown a higher incidence of 8% to 19%.<sup>1</sup> Hence the interest in knowing them in order to make the diagnosis and oriented treatment.

The neurological symptoms was based on the site of involvement (cerebral hemisphere, cranial nerves, spinal cord and roots).<sup>4</sup> The most common symptoms included Headache, ataxia, cranial nerve palsies, meningismus, focal weakness or numbness.<sup>4,5</sup> Headache was common to most reported patients but was not mentioned as an isolated persistent sign.<sup>5</sup>

The CT brain scan is not a reference examination for the diagnosis of leptomeningeal carcinomatosis, its sensitivity being only 30%<sup>6</sup> lower than that of the MRI for meningeal



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**Figure 1.** Brain CT scan showed:

- Lesion of the right temporal lobe (blue arrow) spontaneously hyperdense in axial (A), coronal (B) and sagittal section (C) enhanced after contrast injection in axial section (D).
- Lesion of the right parieto-occipital region (orange arrow) spontaneously hyperdense in axial (E) and sagittal section (F) enhanced after contrast injection in axial section (G).

or ventricular lesions, its specificity lower than MRI in differential diagnosis (such as epidural hematoma). It should be reserved for contraindications for MRI. In this case, it must be carried out with injection of contrast.<sup>2-4</sup>

MRI with imaging gadolinium enhanced T1-weighted, remains the most sensitive imaging diagnostic tool,<sup>2,3</sup> with higher sensitivity (59%) and specificity (95%).<sup>2</sup> Leptomeningeal carcinomatosis defined by abnormal leptomeningeal enhancement, small subarachnoid nodules or leptomeningeal thickening.<sup>2,3</sup>

The presence of appropriate neuroimaging abnormalities in a patient with typical clinical features and history of colorectal adenocarcinoma enables to make the diagnosis of leptomeningeal metastases. As well as a biological confirmation is necessary.<sup>4</sup>

Cerebrospinal fluid cytology is the gold standard in leptomeningeal carcinomatosis diagnosis. Although cerebrospinal fluid cytology has 75% sensitivity and 100% specificity, it has a low negative predictive value.<sup>2</sup>

We concluded that any neurological symptoms finding in a patient with a known malignancy, should be considered as metastases which requires radiological and biological

confirmation in order to start the treatment. Although we cannot do much to save the patient in this stage.<sup>4</sup>

There is no consensus regarding leptomeningeal carcinomatosis treatment due to the low number of randomized clinical trials conducted. However, treatment usually comprises site-specific radiation therapy in addition to intrathecal and systemic chemotherapy. Nevertheless, in view of the bad prognosis of leptomeningeal carcinomatosis, the treatment is palliative rather than curative and multiple modalities are often needed to achieve optimal yet unsatisfactory results.<sup>1</sup>

## Conclusion

Although the incidence of leptomeningeal metastases in colorectal cancer is less than 1%, it is important to make the diagnosis because a specific adapted treatment combining several therapeutic weapons can allow prolonged survival.

MRI is the most sensitive and specific imaging method for screening, positive diagnosis and pre-treatment of leptomeningeal carcinomatosis.

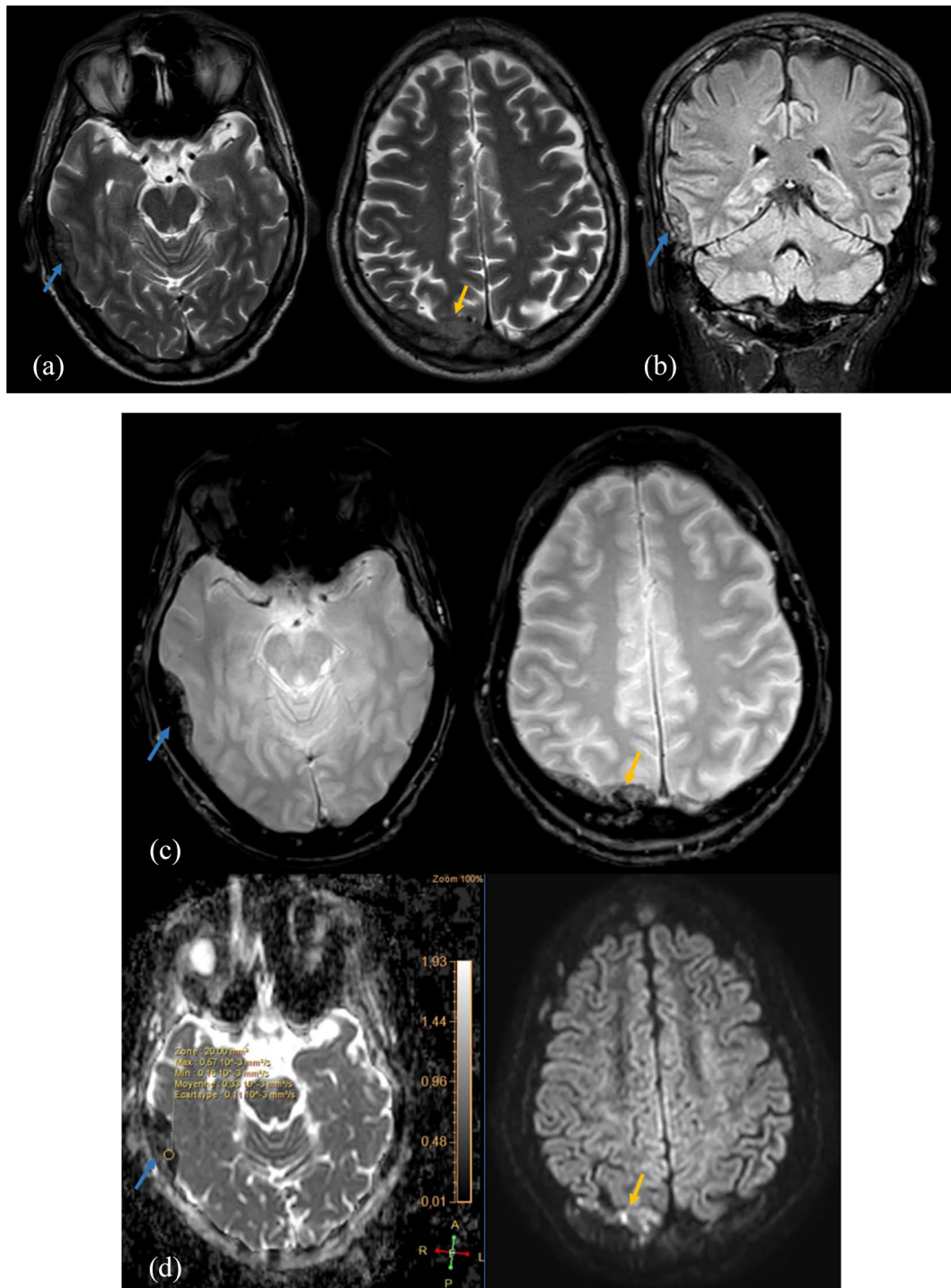
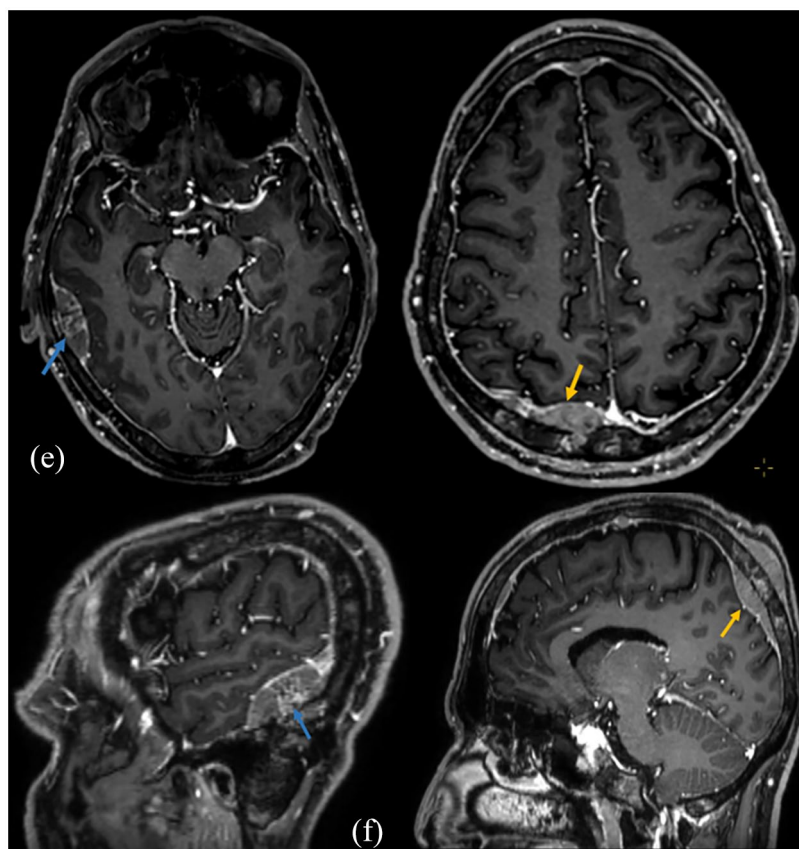
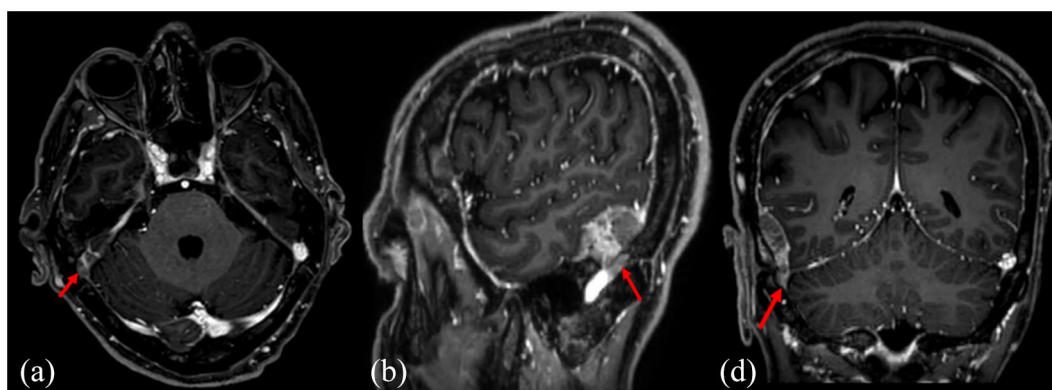


Figure 2. (Continued)





**Figure 2.** Brain MRI showed two extra-axial lesions of the right temporal lobe (blue arrow) and the right parieto-occipital region (orange arrow), in iso signal T2 (A: axial section), iso signal flair (B: coronal section), with loss zones of signal in T2\* (C: axial section). It is in restricted diffusion (ADC low at  $0.33 \times 10^{-3} \text{mm}^2/\text{s}$ ) in axial section (D), heterogeneously enhanced after injection of the gadolinium in axial (E) and sagittal (F) section.



**Figure 3.** Brain MRI in T1 fat sat after injection of gadolinium showed an invasion of the temporal process in the right sigmoid sinus responsible of the right sigmoid sinus thrombosis (red arrow), in axial (A), sagittal (B) and coronal (D) section.

## Ethical statement

Article produced in compliance with legal, ethical and institutional rules.

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