Case Report

Metastasis frontal sinus from rectal adenocarcinoma: A rare case

Amal Lahfidi, MD*, Kaoutar Imrani, MD, Lina Belkouchi, MD, Hounyada Jerguigue, MD, Rachida Latib, MD, Youssef Omor, MD

Department of Radiology, Oncology National Institute, UHC Ibn Sina, UHC Ibn Sina, Rabat, Morocco

A R T I C L E   I N F O

Article history:
Received 24 October 2020
Revised 12 November 2020
Accepted 13 November 2020

Keywords:
Sino nasal
Metastases
Adenocarcinoma rectal
Imaging

A B S T R A C T

Metastatic tumors of the nasal cavity and paranasal sinuses are much less common than primary cancer in this location. The clinical symptomatology is not specific. We report a case of frontal metastasis of a 49-year-old patient treated for a rectal adenocarcinoma without other secondary localizations. The treatment is based on radiotherapy or chemotheraphy. Hence the value of recognizing sinus metastases and differentiating them from infection affection.

© 2020 The Authors. Published by Elsevier Inc. on behalf of University of Washington.
This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/)

Introduction

Sinus paranasaux metastases are extremely rare [1]. They represent 3% of cancers in the sinonasal tract [2]. They represent 3% of cancers in the sinus nasal tract [2]. They are rarely due to rectal adenocarcinoma [1,2]. In the literature, the most famous metastatic cancer of the sinus nasal tract is renal cell carcinoma, accounts for nearly half of all cases. Other common metastatic cancers are bronchogenic carcinoma, urogenital cancer, thyroid cancer, breast cancer and prostate cancer [1,2].

The most predominant site is the maxillary sinus, followed by the sphenoid sinus, ethmoidal sinus, frontal sinus and nasal cavity [3].

We report a case of treated rectal adenocarcinoma, metastasized to frontal sinus and meninges.

Clinical observation

Forty-nine years old patient, followed for 1 year for adenocarcinoma of the treated lower rectum. It was revealed by rectal bleeding with constipation (Fig. 1). The biopsy was in favor of an invasive moderately differentiated lieberkuhn adenocarcinoma. Magnetic resonance imaging (MRI) revealed invasion of the sphincter system indicating Abdominoperineal resection with placement of an anal pseudo

* This research did not receive any specific subsidy from public, commercial or not-for-profit funding organizations.
* Article produced in compliance with legal, ethical and institutional rules.
* Competing Interests: The authors declare that they have no links of interest.
* Corresponding author.

E-mail address: lahfidial@gmail.com (A. Lahfidi).
https://doi.org/10.1016/j.radcr.2020.11.031
© 2020 The Authors. Published by Elsevier Inc. on behalf of University of Washington. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/)
continent colostomy followed by 6 courses of adjuvant chemotherapy.

He presented to the emergency room with a recent onset of headache associated with vomiting and dizziness. Clinical examination found an afebrile patient, in good general condition, the neck was flexible with sensitivity to pressure in the right frontal sinus. The remainder of the physical examination was unremarkable, including no signs of focusing.

A cerebral MRI shows a tissue process in the right frontal sinus with regular contours in T2 iso signal and flair, hyper signal diffusion, enhanced after injection of gadolinium (Fig. 2) suggesting a secondary sinus location.

The biopsy showed a well differentiated infiltrating adenocarcinoma of secondary origin. The patient received radiation therapy for the right frontal sinus mass. The evolution was favorable.

Discussion

The rectal adenocarcinoma metastases to paranasal sinuses are exceedingly rare, notably in the frontal sinus [2,3]. The spread of tumor cells can be hematogenous or meningeal [5].
Fig. 2 – Brain MRI showed:

Flair weighted image in coronal section (A), sagittal T1 (B) and axial T2 (C) section: showing a tissue process of the right frontal sinus well limited with regular contours, in iso signal measuring 26 x 9 x 14 mm (T x AP x H).

T1 fat sat after injection of gadolinium in axial section. (D) shows discretely enhancement of the tumor.

Diffusion image in axial section (E) shows a restriction to diffusion of the tumor.

The rectal venous plexus communicates with the azygos system via the middle rectal vein, the common iliac vein and the ascending lumbar vein [4]. Those veins are without valves, and an increase of abdominal pressure can drive tumor cells into the vertebral venous plexus [4], which has been postulated as a possible route for the hematogenous spread of cancer cells to the head and neck [2], since it communicates with the great venous plexus of the head and the plexus of the paranasal sinuses. The meningeal spread if it is reached is possible [5].

Five percent of patients are metastatic when the disease is discovered. Furthermore, metastatic disease may manifest up to 22 years later, as a result of which patients can never be considered cured after 5 years of follow-up [6].

In most cases, only one of the paranasal sinuses is involved in the metastatic disease and the clinical appearance is close to that of primary sinonasal tumors [3]. Usually, signs and symptoms are non-specific and include frequent epistaxis, nasal obstruction, headache and facial pain [3]. Ethmoidal and spheroidal sinus tumors may result in headache, proptosis, diplopia, or vision changes [2].

Brain computed tomography scan is not precise, can imply bone erosion and remodeling, lesion enhancement, hyper vascularity, or intracranial expansion can indicate an aggressive phase, but is typically unspecific and does not allow the primary tumor to be differentiated from metastasis [2,3].

MRI helps to evaluate the true extent of the lesion and can provide additional data, such as the presence or absence of skull base invasion and leptomeningeal involvement [3,5].

Definitive diagnosis requires confirmation from biopsy [5]. Differential immunohistochemical staining patterns can be
critical to the pathological distinction between these 2 entities in view of the resemblance of these lesions. Cytokeratins CK71, CK201, and MUC21 immunophenotypic tumors are likely to be primary sinonasal lesions; while CK7, CK201, and MUC21 profile tumors are gastrointestinal tract metastatic disease [3].

The treatment must be in a palliative context, such as radiotherapy or chemotherapy, although in some cases surgical excision may be indicated [1,5].

The outcome is generally poor, with a prognosis based on whether the sinonasal metastasis are isolated or widespread spread of the disease [3].

The goal of this review was to highlight the rarity of these tumors and to provide an update on presentation and diagnosis difficulties.

**Conclusion**

Paranasal sinus metastases are rare. The clinical symptomatology is not specific. The treatment is based on radiotherapy or chemotherapy. The differential diagnosis is made with the primary tumor pathology or infectious affection. Hence the value of recognizing their radiological aspects. Immunohistochemical and sometimes molecular studies should be performed to confirm the diagnosis.

**Patient Consent Statement**

The patient declares his consent for the publication of his case.

**REFERENCES**

[1] Conill C, Vargas M, Valduvieco I, Pedro L, Fernández, Cardesa A, et al. Metastasis to the nasal cavity from primary rectal adenocarcinoma. Clin Transl Oncol 2009;11:117–19. doi:10.1007/s12094-009-0325-y.

[2] Chang M-H, Kuo Y-J, Ho C-Y, Edward CK, Lan M-Y. Metastatic tumors of the sinonasal cavity: A 15-year review of 17 cases. J Clin Med 2019;8:539. doi:10.3390/jcm8040539.

[3] Opez FL, Devaney KO, Hanna EY, Rinaldo A, Ferlito A. Metastases to nasal cavity and paranasal sinuses. Clinical review head & neck month. Wiley Online Library; 2016. (wileyonlinelibrary.com). doi:10.1002/hed.24502.

[4] Tanaka K. A case of metastases to the paranasal sinus from rectal mucinous adenocarcinoma. Int J Clin Oncol 2006;11:64–5 © The Japan Society of Clinical Oncology. doi:10.1007/s10147-005-0531-8.

[5] Abi-Fadel F, Smith PR, Ayaz A, Sundaram K. Paranasal sinus involvement in metastatic carcinoma. J Neurol Surg Rep 2012;73:57–9. doi:10.1055/s-0032-1323157.

[6] VJ, Lund. Distant metastases from sinonasal cancer. Copyright © S. Karger AG, Basel, ORL 2001;63:212–213.