

## Case Report

# Multiple scalp metastases from pulmonary adenocarcinoma seen on fluorodeoxyglucose positron-emission tomography/computed tomography

**ABSTRACT**

Scalp metastasis from a primary visceral malignancy is an uncommon clinical entity. Here, we report a case of scalp metastases from lung cancer seen on fluorodeoxyglucose positron-emission tomography-computed tomography.

**Keywords:** Fluorodeoxyglucose positron-emission tomography/computed tomography, lung cancer, scalp neoplasm

**INTRODUCTION**

In the scalp, metastases from a primary visceral malignancy are extremely rare. We report a case of scalp metastasis from pulmonary adenocarcinoma seen on fluorodeoxyglucose positron-emission tomography-computed tomography. Biopsy of the skin lesions of the scalp and the lung lesion in reference to the FDG uptake site confirmed our diagnosis. To the best of our knowledge, this is the second case reported of scalp metastasis from lung cancer in the literature<sup>[1]</sup> and probably the second demonstrated on FDG positron-emission tomography-computed tomography (PET/CT).<sup>[2]</sup>

**CASE REPORT**

We report a case of 67-year-old man, a heavy smoker, followed since 6 months ago for cutaneous nodules in the scalp [Figure 1]. His medical history was unremarkable. He exhibited signs of weight loss, anorexia, loss of appetite, tiredness, hoarse voice, and respiratory symptoms. Clinical examination revealed a multiple ulcerant cutaneous nodules, measured 1–5 cm in diameter in his parietal and left temporal region with no signs of infection.

Excision of one of the skin lesions of the scalp was performed. Histopathologic examination and immunohistochemical analysis

revealed extensive and moderate adenocarcinoma, very likely of pulmonary origin.

A PET/CT with <sup>18</sup>F-FDG scanner was performed and revealed a hot nodule in the right lung, right hilar, left carotid jugular lymphadenopathy, and left adrenal in addition to the three cutaneous nodule metastases located in parietal and temporal bone [Figure 2]. Biopsy of the lung lesion in reference to the FDG uptake site confirmed as a primary lung malignancy lesion, histologically an adenocarcinoma.

The patient was referred to oncology medical department where he underwent chemotherapy with cisplatin and etoposide. Meanwhile, our patient had an increase extensive skin lesions and a pathological fracture in the right femoral collar, which was operated by a total hip prosthesis.

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**Figure 1: Multiple nodules on the scalp in the parietal and left temporal region**

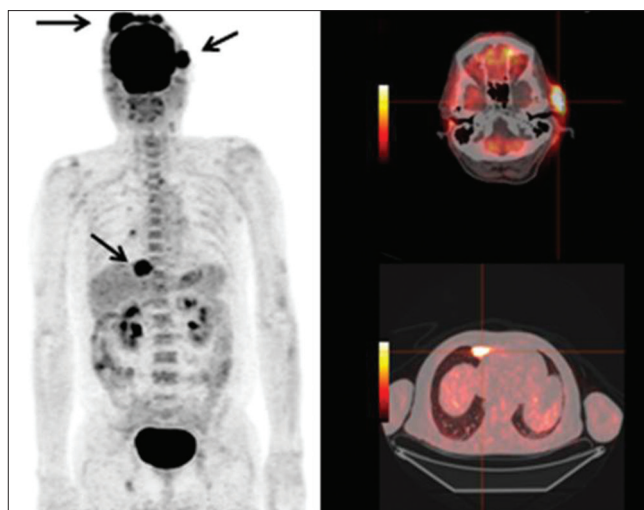
After the third cycle of chemotherapy, the scalp metastases increased in number and extended.

## DISCUSSION

Cutaneous metastasis from a primary visceral malignancy is a relatively uncommon clinical entity, with a reported incidence ranging from 0.7% to 9%.<sup>[3,4]</sup> The scalp accounts for 4% to 6.9% of all cutaneous metastases and for 2% of all skin tumors.<sup>[1]</sup> Primary scalp metastases are extremely rare. To the best of our knowledge, this is the second case reported case visualized on FDG PET/CT.<sup>[1,2]</sup> Available data indicated that most cutaneous metastases are nonspecific and do not have a characteristic presentation. The scalp metastases are typically in the form of firm, solitary, fast-growing and mobile, nodules<sup>[5]</sup> while ulcerant forms are rare.<sup>[6]</sup> Our report illustrate a case of multiple ulcerating nodules. When they are discovered, biopsy of lesions is recommended. It may readily establish the diagnosis and offer some important prognostic information.

Primary neoplasms of the lungs, kidneys, and ovaries are most frequently present with scalp metastasis.<sup>[7]</sup> Skin metastases from internal malignancies tend to occur at a site near the primary tumor through different pathways such as lymphatic spread, hematogenous spread, and direct contiguous tissue infiltration. In our case of lung cancer, hematogenous and lymphatic spread likely resulted in the development of adrenal and scalp lesions.

Considering histological types of lung cancer that metastasize to the scalp, the most common one is squamous cell lung carcinoma or adenocarcinoma followed by small-cell carcinoma.<sup>[1,2]</sup> Chiu *et al.*<sup>[8]</sup> reviewed the data of 398 patients with malignant scalp tumors and found that the basal and



**Figure 2: Maximal intensity projection of positron-emission tomography-computed tomography (left image) and fusion images in the axial sections (right images) showing several abnormal hypermetabolic lesions in the scalp (maximal standardized uptake value = 12.3) and focal uptake in the right lung (maximal standardized uptake value = 11.0 at 1 h post injection)**

squamous cell carcinomas were the most common histologic subtypes. In another study, Terashima and Kanazawa.<sup>[9]</sup> found that the most common histologic type of cutaneous metastasis was adenocarcinoma.

In many situations, PET with <sup>18</sup>F-FDG or combined PET/CT is used for detection of primary site and evaluation of the disease.<sup>[10]</sup> It is currently recognized that the sensitivity of FDG PET/CT (87.5%) is significantly higher than that of CT alone (43.7%) in detecting primary tumors. The rate of detection of the primary site on PET/CT in patients with carcinoma of unknown primary tumors varies between 22% and 73%.<sup>[11]</sup> When the scalp metastases are the first sign, special attention should be paid to the evaluation of the anatomical frequent sites of primary carcinoma (lungs, kidneys, and ovaries) without forgetting breast and pharynx localizations, sites which have a highly frequency of false positives in the literature.

In our case, FDG PET/CT allowed detection of a hypermetabolic focus in the right lung and to determine multiple hypermetabolic foci in the cervical and mediastinal lymph nodes in addition to a left adrenal hypermetabolic secondary with a maximal standardized uptake value (SUVmax) >5.0 for all foci. Finally, the diagnosis was determined further to the biopsy of the primary lung lesion.

Our report illustrates additional values of FDG PET/CT in detecting primary tumor in the inaugural scalp metastasis and biopsy allocation. Since lung carcinoma can rarely metastasize to the scalp, attention should be paid to that region during imaging interpretation.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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## Conflicts of interest

There are no conflicts of interest.

## REFERENCES

1. Salemis NS, Veloudis G, Spiliopoulos K, Nakos G, Vrizzidis N, Gourgiotis S, *et al.* Scalp metastasis as the first sign of small-cell lung cancer: Management and literature review. *Int Surg* 2014;99:325-9.
2. Tsai CJ, Gao HW, Chian CF, Chreng SC, Cheng CY, Shen Daniel HY, *et al.* The solitary scalp metastasis from pulmonary squamous cell carcinoma seen on FDG PET/CT. *Ann Nucl Med Sci* 2010;23:99-10.
3. Chopra R, Chhabra S, Samra SG, Thami GP, Punia RP, Mohan H. Cutaneous metastases of internal malignancies: A clinicopathologic study. *Indian J Dermatol Venereol Leprol* 2010;76:125-31.
4. Spencer PS, Helm TN. Skin metastases in cancer patients. *Cutis* 1987;39:119-21.
5. Dimitropoulos C, Kostara I, Kalkandi P, Kapoula A, Papaliodi E, Vlastos F. Buccal and cutaneous metastases of lung adenocarcinoma – A case study. *Pneumon* 2008;21:189-91.
6. Kamble R, Kumar L, Kochupillai V, Sharma A, Sandhoo MS, Mohanti BK. Cutaneous metastases of lung cancer. *Postgrad Med J* 1995;71:741-3.
7. Schwartz RA. Cutaneous metastatic disease. *J Am Acad Dermatol* 1995;33:161-82.
8. Chiu CS, Lin CY, Kuo TT, Kuan YZ, Chen MJ, Ho HC, *et al.* Malignant cutaneous tumors of the scalp: A study of demographic characteristics and histologic distributions of 398 Taiwanese patients. *J Am Acad Dermatol* 2007;56:448-52.
9. Terashima T, Kanazawa M. Lung cancer with skin metastasis. *Chest* 1994;106:1448-50.
10. Kwee TC, Basu S, Cheng G, Alavi A. FDG PET/CT in carcinoma of unknown primary. *Eur J Nucl Med Mol Imaging* 2010;37:635-44.
11. Kwee TC, Kwee RM. Combined FDG-PET/CT for the detection of unknown primary tumors: Systematic review and meta-analysis. *Eur Radiol* 2009;19:731-44.