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Scalp metastasis as an initial presentation of lung adenocarcinoma : A case report and literature review

Veena Gupta, Namita Bhutani*, Nisha Marwah, Rajeev Sen

Deptt. of Pathology, PGIMS, Rohtak, Haryana, India

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ABSTRACT

INTRODUCTION: Cutaneous metastasis from primary visceral malignancy is a relatively uncommon clinical entity, with a reported incidence of 0.22%–10% among various series. However, the presence of cutaneous metastasis as the first sign of a clinically silent visceral cancer is exceedingly rare.
PRESENTATION OF CASE: We describe here a case of an asymptomatic male patient who presented with a solitary scalp metastasis as the initial manifestation of an underlying lung cancer. Diagnostic evaluation revealed advanced disease.
DISCUSSION: The report emphasizes that physicians should be aware of this rare clinical entity, and appropriate investigation should be arranged for early diagnosis and initiation of the appropriate treatment. The occurrence of skin lesions in lung cancer announces an ominous prognosis.
CONCLUSION: We conclude that the possibility of metastatic skin disease should always be considered in the differential diagnosis in patients with a history of smoking or lung cancer presenting with cutaneous nodules.

1. Introduction

Cutaneous metastasis from a primary visceral malignancy is an uncommon entity, with an incidence ranging from 0.2%–10% [1,2]. It may occur due to direct extension of the tumor as a local metastasis or as a distant metastasis [3]. Generally, cutaneous metastasis develops after initial diagnosis of the primary internal malignancy and later in the course of the disease. In very rare cases, it may occur at the same time or before the primary cancer has been detected [4]. Skin metastasis from lung cancer is a rare clinical entity that has been reported to occur in 0.22%–12% of patients with lung cancer [1,2,5]. Skin metastasis as the initial and sole manifestation of an underlying lung cancer is a very rare occurrence [6].

Most common sites of skin metastases from lung cancer are the chest, abdomen, head and neck. They may rarely appear in the form of solitary lesion on the scalp [7]. Compared to other malignancies, lung cancer is the fastest in developing skin metastases after initial diagnosis [8]. Cutaneous metastatis of lung cancer are physically indistinguishable from those due to carcinoma originating elsewhere in the body. Lung cancer should always be considered in the differential diagnosis of patients with nodular skin lesions. With a very poor prognosis, the median survival time after the diagnosis of the cutaneous metastasis is between 2.9–4.9 months [9].

Here, we describe an exceedingly rare case of an asymptomatic male patient who presented with a solitary scalp metastasis as the initial manifestation of an underlying adenocarcinoma lung. Diagnostic evaluation and management are discussed along with a review of the literature.

We state that the work has been reported in line with the SCARE criteria [10].

2. Case report

A 51 years old male presented to surgery outdoor patient department with a 1 month history of a slowly growing, painless nodule in his scalp. He was a heavy smoker but had no history of lung disease. He denied any respiratory symptoms, fever, or weight loss, and his general condition was good. His blood results were as follows: haemoglobin 11.0 g/dl; total white cell count 18.0 × 10−3/μl with neutrophilia; platelets were normal, ESR was 110 mm/h.

Clinical examination revealed a painless, movable, nonulcerated nodule in scalp measuring approximately 0.5 × 1.0 cm. There were no signs of infection and the overlying skin was normal (Fig. 1). The Fine needle aspiration cytology (FNAC) was performed from the scalp lesion showed deposits of adenocarcinoma (Fig. 2). Further investigations with chest X-ray showed a large mass occupying the upper lobe of the right lung (Fig. 3). Subsequent computed tomography (CT) showed a large mass involving the right upper lobe associated with extensive mediastinal lymphadenopathy (Fig. 4).

* Corresponding author at: Kailash Hills, New Delhi 65, India.
E-mail addresses: guptaveena2015@gmail.com (V. Gupta), namitabhutani89@gmail.com (N. Bhutani), nmarwah@gmail.com (N. Marwah), dr.rajeevsen@gmail.com (R. Sen).

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Fig. 1. Photograph showing a non ulcerated nodule of 0.5 × 1.0 cm in scalp with overlying normal skin.

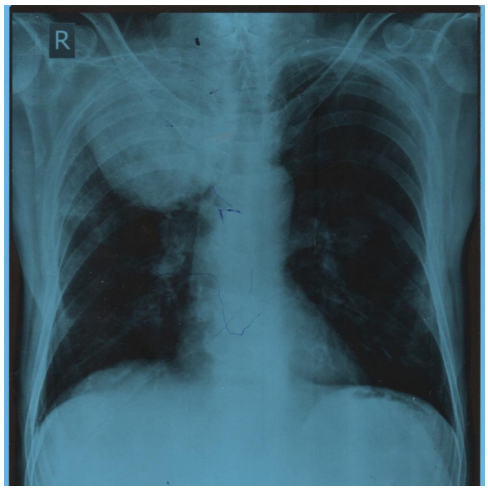

Fig. 3. Chest x ray showing a mass in right upper lobe.

A CT-guided biopsy of the lung tumor confirmed the presence of adenocarcinoma lung. Tumor cells were also positive for periodic acid Schiff (PAS). Immunohistochemically, the tumor cells were strongly positive for TTF-1 and Napsin A and focally positive EGFR, further corroborating the diagnosis (Figs. 5 and 6). The patient was advised to start chemotherapy and radiotherapy. The patient was treated with palliative chemotherapy with 6 cycles of Carboplatin and Gemcitabine and put on maintenance treatment with Pemetrexed. Unfortunately, there were no improvements on either the cutaneous metastatic mass or his general condition.

3. Discussion

Dissemination of visceral malignancies to the skin is rather rare and usually occurs in a later stage of the disease. However, cutaneous metastases may be the first indication of the clinically silent visceral malignancies. In case of lung cancer, metastasis to the skin is much less frequent than that to other organs (brain, bone, liver and adrenal glands). In a recent meta-analysis of six studies containing over 20 000 patients with cutaneous metastasis, the overall incidence from all visceral malignancies was estimated to be 5.3% [11]. A retrospective study in 2012 indicated that 2.8% of 2130 patients with advanced non-small cell lung cancer (NSCLC) showed cutaneous metastases as an initial presentation [12]. In a retrospective study by Lookingbill et al. including 7316 cancer patients, skin involvement as a presenting sign was seen in only 0.8% [3].

Scalp metastasis, however, is unusual in primary lung cancer. According to the *meta*-analysis mentioned earlier [4], scalp metastasis constituted 6.9% of all cutaneous metastasis from various visceral malignancies [11]. The reasons proposed for a tendency to scalp metastasis include the high degree of vascularity, immobility, and the warmth of this site [12].

Clinically, lung cancer may be initially detected by cutaneous metastasis, since the primary lung lesion often remains quiescent, such as in our case. The lung and breast carcinomas are the most common primaries that send cutaneous metastasis in men and women, respectively. The head and neck region and the anterior chest are the areas of greatest predilection in men. The anterior

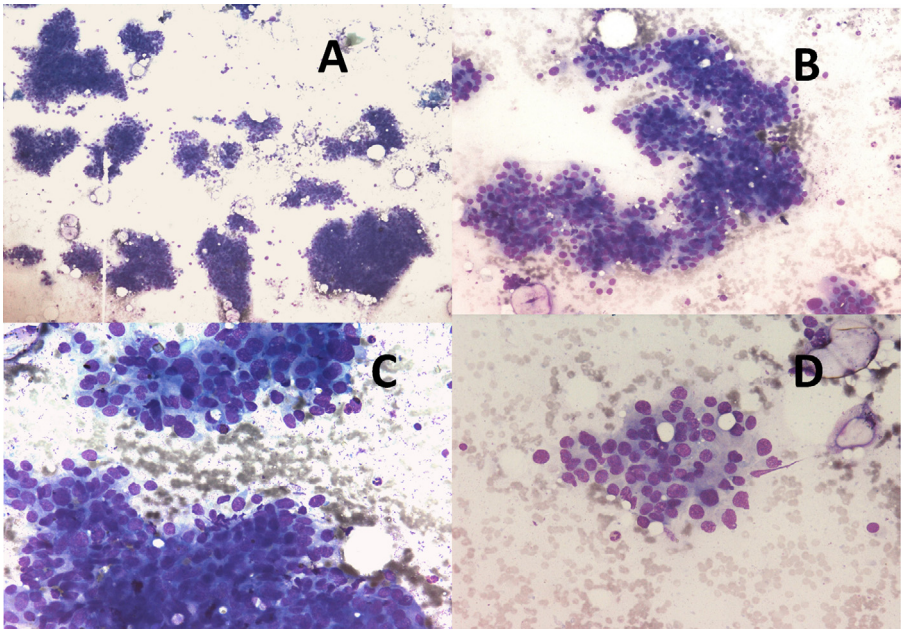

Fig. 2. Fine needle aspiration cytology showing deposits of adenocarcinoma on giemsa stained smears. (A-40X, B-100X, C-200X, D-200X).

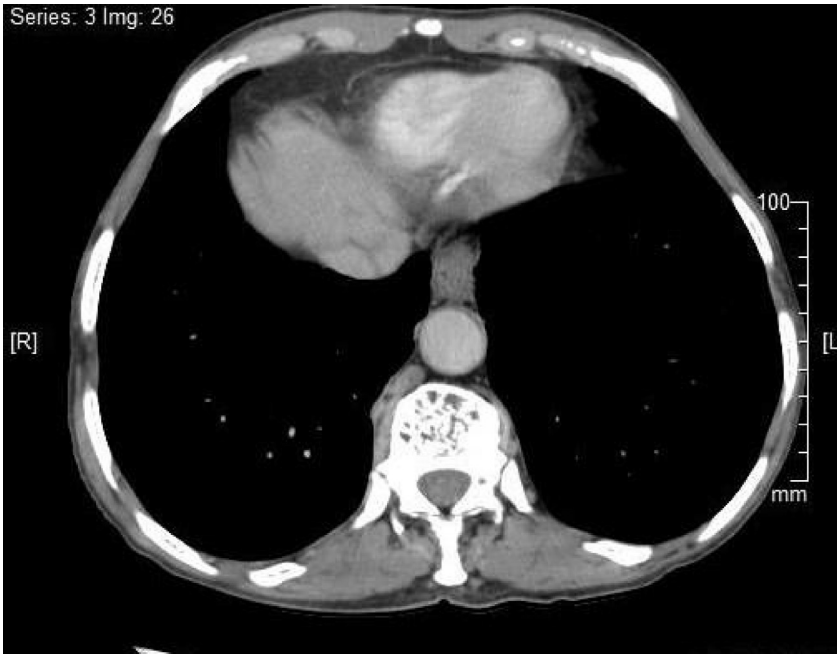

Fig. 4. Cect thorax showing heterogenously enhancing mass lesion in right upper lobe.

chest wall and the abdomen are the most commonly involved sites in women [13]. While certain cancer types are characterized by random distribution for cutaneous metastasis (liver cancer). In certain cases, however, cutaneous metastasis develops more frequently at specific distant locations, as evidenced by the dissemination of renal cancer to the head and neck region. A number of cancers demonstrate a colonization preference to the region of origin: lung cancer to the supradiaphragmatic (mostly chest) and colorectal cancers to the infradiaphragmatic (abdominal) skin regions. It was also found that cancer of the upper lobes of the lungs have a greater tendency to metastasizing in skin. These findings are clinically relevant and useful especially in patients where skin metastasis is the first indication of a malignancy. Metastasis of human cancer is an organ-selective process that is determined by anatomical and biological factors as well as by specific microenvironmental properties. The precise mechanisms determining the tropism of lung cancer for skin remain unsolved. Several recent studies indicate that there are unique genes and gene signatures that modulate specific tropisms of a primary tumor [14,15].

In literature, various data are reported related to the frequency of skin metastases of different histological types of lung cancer. Dreizen et al. [16] reported that adenocarcinoma has the highest tendency to metastasize to skin. Brownstein and Helwing [17] reported that adenocarcinoma and squamous cell carcinoma show

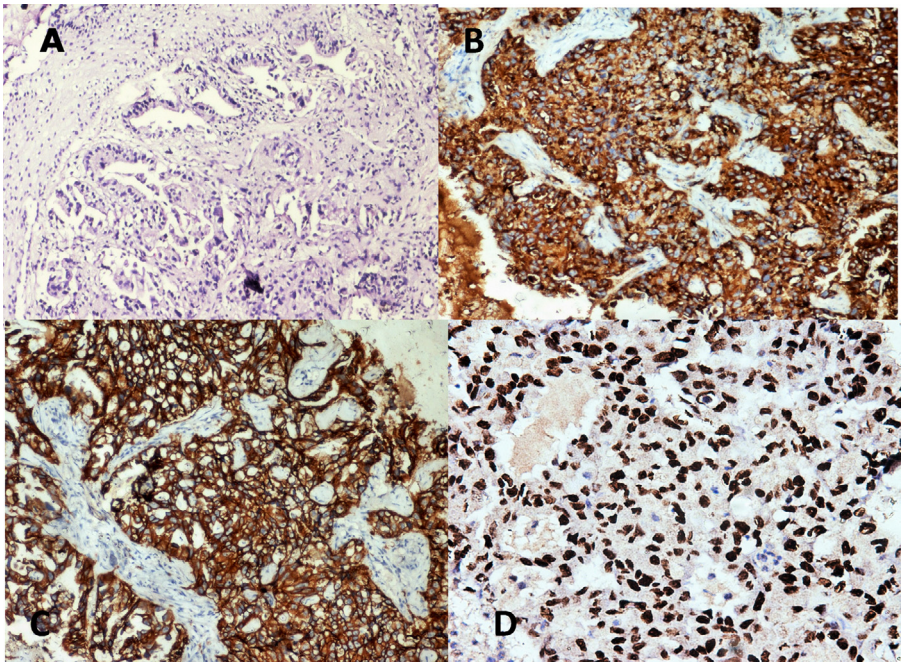

Fig. 5. Photomicrograph illustrating adenocarcinoma (A- H& e 100X), tumor cells are strongly positive for napsinna (B- 100X), EGFR (C-100X) and TTF-1 (D-100X).

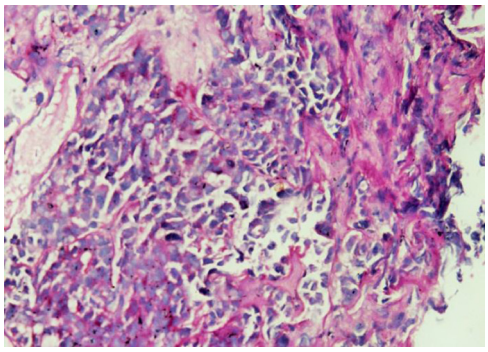

Fig. 6. Photomicrograph showing pas positivity in adenocarcinoma.

the equal tendency to involve the skin; while Terashima and Kanazawa and Hidaka et al. [6] noted that the cutaneous metastasis rate was high for large cell carcinomas and low for squamous and small cell variants. Therefore, the histological type of lung cancer with the highest incidence of cutaneous metastases seems to be debated yet.

Physically, cutaneous metastatic lesions due to lung cancer are indistinguishable from those due to carcinoma originating elsewhere in the body. They may arise from the pilosebaceous unit, from the interfollicular epidermis, or dermis. Cutaneous metastasis can manifest as a nodule, ulceration, cellulitis like lesion, bullae or fibrotic process. Generally, the nodular type is the result of hematogenous metastasis, and is likely to be the most common. Nodules are painless, mobile or fixed, firm or rubbery, discrete or multiple. They vary in colour from flesh tones to red-purple, or blue-black and vary in diameter from 5 mm to 6 cm. Multiple lesions are usually grouped. They initially grow rapidly, and then more slowly, and may necrotize or ulcerate [16].

Chiu et al. reviewed the data of 398 patients with malignant scalp tumors and found that the basal and squamous cell carcinomas were the most common histologic subtypes [18]. Scalp metastasis as the initial manifestation of an underlying lung cancer is an exceedingly rare clinical entity. In most cases the lesions are multiple [6]. In our patient, clinical presentation was very uncommon, since the solitary nodule was movable and the overlying skin was intact. Increased awareness is needed, as a similar clinical presentation can be attributed to an epidermoid or a trichilemmal cyst, especially when the patient is completely asymptomatic. Epidermoid and trichilemmal cysts are the most common causes of solitary scalp nodules in adults [19].

These patients have an extremely poor prognosis with an average survival ranging between three and five months in the majority of studies [9]. Patients that present with skin metastases earlier during the disease course, have poorer prognosis compared to those with later developed metastases. Miyazaki et al. reported a case of spontaneous regression of scalp metastases from lung cancer [20].

Cutaneous metastsis aid rapid diagnosis when they are the sole manifestation of an occult primary. Generally, only palliative chemotherapy is offered. The continuation of palliative treatment needs to be balanced between toxicity and benefits obtained. Radiation therapy to the metastatic skin lesion is not indicated unless associated with severe pain or bleeding.

4. Conclusion

We report this case to emphasize that careful skin examination can provide valuable clues to internal malignancy. Solitary scalp metastasis as the first sign of an occult non-small-cell lung cancer is an extremely rare occurrence. Despite its rarity, metastatic skin disease should always be considered in the differential diagnosis in patients with a history of smoking or lung cancer presenting with cutaneous nodules. Increased awareness of this rare entity is needed for early recognition and initiation of the appropriate treatment. Moreover, it helps in appropriate staging, altering therapy and a better estimation of prognosis. We also conclude that a cutaneous metastases is the most common dermatological manifestation of lung cancer.

Conflict of interest

We declare that there are no conflicts of interest amongst the authors.

Verbal as well as written patient consent was taken while performing any procedure

Consent

The consent has been taken from the patient for publication of this case report.

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Author contribution

Veena Gupta – Superwised the article and did the final editing.

Namita Bhutani – Reviewed the literature and wrote the article.

Nisha Marwah – Reviewed the literature and gave important inputs regarding the management of the case.

Rajeev Sen – Provided inputs for the diagnostic work-up of the patient.

Ethical approval

Not applicable as it is a case report.

Guarantor

Rajeev Sen

References

[1] J.H. Lee, S.J. Ahn, H.J. Kim, S.E. Jang, G.Y. Noh, H.R. Kim, et al., Cutaneous metastasis from lung cancer: a single-institution retrospective analysis, Tuberc. Respir. Dis. 70 (2) (2011) 139–142.

[2] Z. Song, B. Lin, L. Shao, Y. Zhang, Cutaneous metastasis as an initial presentation in advanced non-small cell lung cancer and its poor survival prognosis, J. Cancer Res. Clin. Oncol. 138 (10) (2012) 1613–1617.

[3] D.P. Lookingbill, N. Spangler, F.M. Sexton, Skin involvement as the presenting sign of internal carcinoma. A retrospective study of 7316 cancer patients, J. Am. Acad. Dermatol. 22 (1) (1990) 19–26.

[4] T.W. Mollet, C.A. Garcia, G. Koester, Skin metastases from lung cancer, Dermatol. Online J. 15 (2009) 1 (PubMed).

[5] M.J. Molina Garrido, C. Guillíen Ponce, J.L. Soto Martíinez, Y. Martíinez, C. Sevila, A. Carrato Mena, Cutaneous metastases of lung cancer, Clin. Transl. Oncol. 8 (5) (2006) 330–333.

[6] T. Hidaka, Y. Ishii, S. Kitamura, Clinical features of skin metastasis from lung cancer, Intern. Med. 35 (1996) 459–462.

[7] Y. Kikuchi, A. Matsuyama, K. Nomura, Zosteriform metastatic skin cancer: report of three cases and review of the literature, Dermatology 202 (2001) 336–338 (PubMed).

[8] J. Marcoval, A. Moreno, J. Peyrí, Cutaneous infiltration by cancer, J. Am. Acad. Dermatol. 57 (2007) 577–580 (PubMed).

[9] D.W. Perng, C.H. Chen, Y.C. Lee, R.P. Perng, Cutaneous metastasis of lung cancer: an ominous prognostic sign, Zhonghua Yi Xue Za Zhi (Taipei) 57 (1996) 343–347.

[10] R.A. Agha, A.J. Fowler, A. Saetta, I. Barai, S. Rajmohan, Orgill DP., for the SCARE group. the SCARE statement: consensus-based surgical case report guidelines, Int. J. Surg. 34 (2016) 180–186.

[11] R.A. Krathen, I.F. Orengo, T. Rosen, Cutaneous metastasis: a meta-analysis of data, South. Med. J. 96 (2003) 164–167.

[12] T. Fay, G.C. Henry, Correlation of body segmental temperature and its relation to the location of carcinomatous metastasis: clinical observations and response to methods of refrigeration, Surg. Gynecol. Obstet. 66 (1938) 512–514.
[13] M.R. Hussein, Skin metastasis: a pathologist's perspective, J. Cutan. Pathol. 37 (2010) e1–20 (PubMed).
[14] K.A. Kovacs, B. Hedegus, I. Kenessey, J. Timar, Tumor type-specific and skin region-selective metastasis of human cancers: another example of the seed and soil hypothesis, Cancer Metastasis Rev. 32 (3-4) (2013) 493–499.
[15] S.L. Kall, J.E. Koblinski, Genes That Mediate Metastasis Organotropism. In: Madame Curie Bioscience Database [Internet], Landes Bioscience, Austin (TX), 2000.
[16] S. Dreizen, H.M. Dhingra, D.F. Chiuten, T. Umsawasdi, M. Valdivieso, Cutaneous and subcutaneous metastases of lung cancer: clinical characteristics, Postgrad. Med. 80 (1986) 111–116.
[17] M.H. Browntein, E.B. Helwig, Metastatic tumors of the skin, Cancer 29 (1972) 1298–1307.
[18] C.S. Chiu, C.Y. Lin, T.T. Kuo, Y.Z. Kuan, M.J. Chen, H.C. Ho, et al., Malignant cutaneous tumors of the scalp: a study of demographic characteristics and histologic distributions of 398 Taiwanese patients, J. Am. Acad. Dermatol. 56 (3) (2007) 448–452.
[19] R. Farley, S. Manolidis, D. Ratner, Adenocarcinoma of the lung metastatic to the skull presenting as a scalp cyst, J. Am. Acad. Dermatol. 54 (2006) 916–917.
[20] K. Miyazaki, H. Masuko, H. Satoh, M. Ohtsuka, Lung cancer with spontaneous regression of scalp metastasis, Respir. Med. Extra 3 (2) (2007) 83–85.