



CUTANEOUS METASTASIS OF LUNG CANCER

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ABSTRACT

Cutaneous metastasis from lung cancer is rare but should be ruled out in patients with suspicious skin lesions and a history of smoking or lung cancer. All types of lung cancer can metastasize to the skin, with varying clinical manifestations. The incidence of cutaneous metastasis in lung cancer patients ranges from 1 - 12%. In 20 - 60% of cases, skin lesions appear before or simultaneously with the diagnosis of the primary tumor. Skin lesions are typically nodular, mobile or fixed, hard or soft, solitary or multiple, and painless. Histologically, cutaneous metastases often show moderate to poor differentiation. Treatment for solitary cutaneous metastasis typically includes surgery alone or combined with chemotherapy and/or radiation therapy. If multiple skin lesions or metastases to other organs are present, chemotherapy is the primary treatment option. Cutaneous metastasis from lung cancer is associated with a poor prognosis, with an average survival time of around 5 - 6 months. In this report, we present a case of a 58-year-old male patient with these manifestations.

Keywords: *Cutaneous metastasis, lung cancer, skin metastasis.*

1. INTRODUCTION

Lung cancer is the second most common malignancy and the leading cause of cancer-related death¹. The disease occurs more frequently in males, with the highest incidence between the ages of 55 and 65. The prognosis for lung cancer is poor, with a general five-year survival rate of about 15%. Common metastatic sites include hilar lymph nodes, adrenal glands, liver, brain, and bones.² Although cutaneous metastasis from the lungs is rare, it should be considered in patients with suspicious skin lesions and a history of smoking or lung cancer. In this report, we present a case of a 58-year-old male with cutaneous metastasis from lung cancer.

2. CASE PRESENTATION

2.1. Clinical features

The disease developed over the past 2 - 3 months, starting with multiple red papules on the scalp, which later became pustular and crusted. The patient self-treated with Tyrosur gel, but the

lesions worsened, and additional red papules appeared on the scalp, progressively enlarging and becoming painful. Despite seeking care at

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a central hospital, no definitive diagnosis was made, and treatment was ineffective. A month before admission, the patient experienced chest pain and was diagnosed with a lung abscess at a local hospital, where he was hospitalized for 20 days with some improvement. The patient works as a farmer, does not smoke or drink alcohol, and has no known medical or allergic history.

Clinical examination revealed multiple red nodules scattered across the scalp, with some pustular centers and crusting. No other skin lesions were noted. The patient was not experiencing chest pain or shortness of breath. Lung auscultation revealed reduced ventilation bilaterally with no rales.



Figure 1,2,3. Clinical images of the patient's scalp lesions

2.2. Laboratory features

Complete Blood Count: RBC 4.74 T/L, Hb 128 g/L, HCT 0.385, WBC 8.9 G/L, Neutrophils 6.2 G/L, Lymphocytes 1.21 G/L, Eosinophils 0.126 G/L, Platelets 344 G/L. Blood Biochemistry: Glucose 6.0 mmol/L, Urea 4.8 mmol/L, Creatinine 75 μ mol/L, AST 25 U/L, ALT 34 U/L. Urinalysis: No abnormalities detected. Fungal and Bacterial Tests: No fungi or bacteria were found in direct smears or cultures from skin lesions. Bronchial Lavage: Negative for AFB, bacteria, and fungi. Cervical Ultrasound: No abnormalities detected in lymph nodes. Chest X-ray: A hazy mass in the lower third of the right lung, suspected to be a lung abscess or tumor. Skull X-ray: No abnormalities detected. Bronchoscopy: A tumorous mass was obstructing the right lower bronchus, causing narrowing of the lobar bronchus opening. CT Scan: Right lung: A mass in the lower lobe measuring 34 x 43 mm with irregular spiculated margins, associated with a nearby 11mm nodule. Middle lobe: A

consolidation measuring 36 x 65 mm with partial cavitation. Left lung: A 15 mm spiculated nodule at the apex. Imaging was suggestive of a lung tumor with nodular metastases in both lungs.

Skin Histopathology: Epidermal hyperplasia with dermal and subdermal infiltration of large, irregular, hyperchromatic tumor cells, some with spindle shapes, invading dermal collagen fibers and skin appendages. Immunohistochemistry: Ki67 > 30%, Vimentin and CK positive; CK7, CD45, CD34 negative. Bronchial Biopsy: Non-small cell lung carcinoma.

2.3. Treatment

The patient was treated with Cefazolin 2 g/day and topical Mupirocin. After consultation with the Oncology department, a diagnosis of stage IVB non-small cell lung cancer with cutaneous metastasis was made. The patient was placed on palliative care.

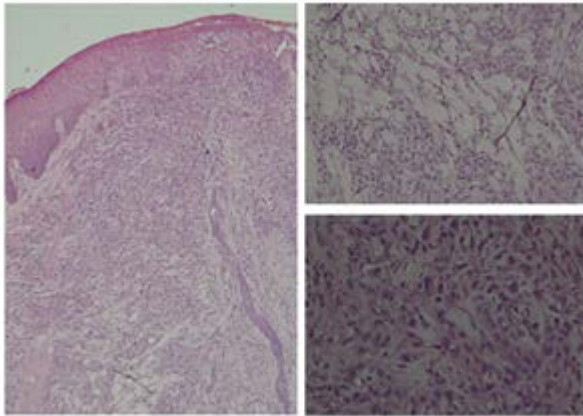


Figure 4,5,6. Histopathology images of the patient's skin lesions

3. DISCUSSION

Lung cancer is the second most common malignancy and the leading cause of cancer-related death¹. The incidence is higher in men than in women, and the most common age range is between 55 and 65 years. The prognosis for lung cancer is generally poor, with a 5 - year survival rate of approximately 15%. The most common histological type is adenocarcinoma, followed by squamous cell carcinoma, small cell carcinoma, large cell carcinoma, and carcinoid. Common metastatic sites for lung cancer include the pulmonary hilar lymph nodes, adrenal glands, liver, brain, and bones². Although cutaneous metastasis from the lung is rare, it must be ruled out in patients with suspicious skin lesions, especially those with a history of smoking or lung cancer. All types of lung cancer can metastasize to the skin, and clinical presentations can vary significantly.

Malignant tumors from the lung, breast, melanoma, oral cavity, colon, kidney, ovaries, and stomach account for 80 - 90% of all cutaneous metastases in adults³⁻⁵, though conflicting data exist regarding the causes and gender distribution. Previous literature indicates that for men with cutaneous metastases, the lung is the

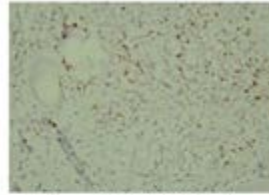


Figure 7. Positive Ki67 staining

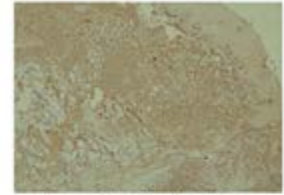


Figure 8. Positive CK staining



Figure 9. Positive Vimentin staining

most common primary site (24%), followed by colorectal cancer (19%), melanoma (13%), and oral cavity cancer (12%). In women, the lung is reported as the fourth most common primary site (4%) after breast cancer (69%), colon cancer (9%), melanoma (5%), and ovarian cancer (4%)⁴.

The incidence of skin metastases in lung cancer patients ranges from 1 - 12%^{3,7-12}. In a large series, the skin was only the 13th most common site for lung metastasis⁷, but diagnosis should be considered in any patient with a history of lung malignancy or tobacco use⁹. Lung cancer is the fastest internal malignancy to metastasize to the skin after initial diagnosis, with a median time of 5.75 months¹³. In 20 - 60% of cases, skin lesions appear before or simultaneously with the diagnosis of the primary tumor^{4,12,14}.

Visceral malignancies generally metastasize to sites near the primary tumor, but they can spread anywhere on the skin's surface¹⁵. Lung cancer, melanoma, and breast cancer are the most likely to metastasize to distant skin locations⁶. Lung cancer often involves the chest, abdomen, and head/neck regions^{10,14}. Less common sites include the shoulder, flanks, lower extremities, and upper extremities^{10,15}. Rare sites include the gums, scrotum, perianal skin, lips, nose, burn scars,

fingers, and toes¹⁴. In some cases, skin metastases can also arise at surgical incision sites.

Cutaneous metastases from lung cancer lack distinct features. However, they are often described as nodular, mobile or fixed, firm or soft, solitary or multiple, and painless. In one study of 126 patients, the color ranged from red, pink, purple, to bluish-black. In the same study, lesion sizes varied from 2 mm to 6 cm in diameter. Less commonly, these lesions can present as papules, plaques, ulcers, vascular lesions, zosteriform lesions, erysipeloid plaques, or alopecic scarring on the scalp^{10, 17-22}.

Skin metastases from the lung are usually moderately or poorly differentiated^{9,16}. They frequently invade the lymphatic vessels and are typically confined to the dermis and subcutaneous layer²³. The most common type is adenocarcinoma (ACC), followed by squamous cell carcinoma or small cell carcinoma, and finally, large cell carcinoma (LCC)^{8,10,14,16,23}. Some studies show that adenocarcinoma has the highest incidence, while LCC has the lowest^{10, 21}. Lung ACC metastases are often moderately differentiated⁵. They may exhibit well-differentiated glandular or mucinous structures⁴. In such cases, primary diseases of the gastrointestinal tract, ovaries, kidneys, and breasts should be ruled out³. Squamous cell carcinoma metastasizing from the lung is typically moderately or poorly differentiated⁴.

Immunohistochemistry (IHC) can be useful when the primary tumor site is unidentified and there is a need to narrow down the differential diagnosis²³. Although not extensively studied in lung-related skin metastases, helpful markers in these cases include thyroid transcription factor (TTF) and CK7/20. Anti-TTF is both sensitive and specific for primary adenocarcinoma, bronchoalveolar carcinoma, and small cell

carcinoma when excluding thyroid origin²⁵. The CK7+/20- pattern is sensitive but not specific for primary adenocarcinoma and bronchoalveolar carcinoma^{27,28}. Based on this data, IHC staining for detecting lung-derived skin metastasis may be less sensitive and is often reserved for unclear clinical and histological cases²⁶.

Diagnosis typically relies on clinical and histopathological information. If the histopathology of the primary and metastatic lesions is the same, the diagnosis is confirmed²⁹. If the primary site is undetermined, the physician must decide whether the lesion is primary or secondary²⁹. Additionally, histological subtyping should be used to narrow the differential diagnosis^{3,24}. The primary site is determined through the patient's history, physical examination, and various screening methods, including blood tests, chest X-ray, mammography, ultrasound, CT, and MRI²⁹.

Treatment of solitary cutaneous metastasis generally involves surgery alone or in combination with chemotherapy and/or radiation. In one study, Ambrogi et al. treated two patients with surgery and chemotherapy. One patient survived for 74 months, while the other died after 8 months³¹. It was suggested that surgery might increase survival in this patient group.

For patients with multiple skin lesions or visceral metastasis, chemotherapy is the primary option²². During chemotherapy, these lesions can be used to monitor the tumor's response¹⁰. Unfortunately, studies have shown a survival rate of only 6.5 to 8 months after chemotherapy^{8,9,11}. This may be partly due to the low blood perfusion in the skin¹⁶. Specific agents used include cisplatin, cyclophosphamide, adriamycin, mitomycin, interferon-B, etoposide, vindesine, and carboplatin⁸.



Radiation therapy is used alone or in combination with chemotherapy and/or surgery. In one study by Coslett et al., one patient survived only 2 months after being diagnosed with cutaneous metastasis and was treated with chest radiation alone, while three other patients lived an average of 1.8 months with chemotherapy⁹. Hidaka et al. irradiated skin lesions in two patients, with one surviving 5 months and the other 1 year and 7 months⁸. Thus, radiation therapy is generally ineffective, except in rare cases. However, radiation to metastatic lesions may provide relief if the lesions cause pain or bleeding¹⁶.

Cutaneous metastases from the lung and their primary site are generally incurable and suggest a poor prognosis⁶. Poor prognostic factors include inoperable primary tumors or small cell carcinoma, multiple skin metastases, or other distant metastases. In fact, skin metastasis is often accompanied by other internal metastases^{8,9}. Patients with initial skin metastasis live approximately 3 - 4 months less than those who develop skin metastasis later in their disease course^{11,23}. The median survival time is typically around 5 - 6 months after the diagnosis of cutaneous metastasis, although some patients may live longer than a year^{8,9}.

4. CONCLUSIONS

Cutaneous metastasis from lung cancer, while uncommon, is a very real concern for patients. In men and women with suspicious skin lesions, particularly those with a history of smoking or lung cancer, cutaneous metastasis from the lungs should be considered in the differential diagnosis. These lesions often appear as nodules on the chest wall, abdomen, or head/neck, but they can present in various forms and on any skin surface. Diagnosis can typically be made through clinical

information and histology from a skin biopsy, though immunohistochemistry may be required. Unfortunately, cutaneous metastasis from lung cancer usually indicates a poor prognosis. However, in some cases, treatment can be provided with palliative intent to improve patient comfort.

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