CASE REPORT

Cutaneous metastasis: a rare herald of a silent cancer

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SUMMARY

A 59-year-old previously healthy man with a 50-pack-year smoking history presented with rib pain 1 month after a mechanical fall. Physical examination revealed a 1.5 cm right cervical lymph node and a 0.9×0.9 cm scalp nodule. The patient had only noticed the scalp lesion a month prior to presentation. Chest X-ray revealed a 5.8×5.0 cm left infrahilar mass. CT angiography demonstrated extensive metastatic mediastinal and right hilar adenopathy as well as hepatic, right adrenal and brain lesions. Pathology from fine-needle aspiration of cervical lymph nodes and punch biopsy of the scalp lesion were consistent with non-small cell lung cancer (NSCLC) metastasis. The patient underwent brain stereotactic radiosurgery and palliative radiation therapy. Unfortunately, he passed away 4 months after diagnosis. Malignancy (primary or secondary) should be considered by clinicians in the work up of patients with new skin lesions, particularly in those at high risk of cancer.

BACKGROUND

We report this case to emphasise that careful physical examination can provide valuable clues to an otherwise asymptomatic internal malignancy, and prevent delay in diagnosis and treatment of the underlying malignancy. Furthermore, cutaneous lesions can also provide safe and easily accessible tissue for biopsy, and aid in timely diagnosis, appropriate staging and estimation of prognosis.

CASE PRESENTATION

A 59-year-old previously healthy man with a 50-pack-year smoking history presented with bilateral rib and back pain 1 month after a mechanical fall. He denied shortness of breath, chest pain and haemoptysis, but endorsed night sweats and an unintentional 15 lbs weight loss, which he had been attributing to a new electronic cigarette. He also reported a small mass in his right neck and another on top of his head, which had developed within the past month. Physical examination revealed a healthy-appearing man with normal vital signs. The patient had tenderness to palpation bilaterally over the 10–11th ribs, a 1.5 cm firm right cervical lymph node and a 0.9×0.9 cm non-tender, circular, firm, erythematous, hairless, vascularised, non-fluctuant nodule within the anterior midline scalp (figure 1). The overlying skin was not ulcerated.

INVESTIGATIONS

Initial laboratory results were remarkable for sodium of 131 mmol/L (reference range=136–

145 mmol/L), chloride of 93 mmol/L (reference range=98–107 mmol/L), haemoglobin of 12.3 g/dL (reference range=13.0–16.5 g/dL) and platelet count of 465 000/mm³ (reference range=150 000–450 000/mm³). Posteroanterior and lateral chest X-ray demonstrated a 5.8×5.0 cm left infrahilar mass and fullness of the right paratracheal region concerning for adenopathy. CT angiography of the chest revealed encasement and occlusion of the left lower lobe segmental artery by the hilar mass, extensive metastatic adenopathy in the mediastinum and right hilum, and metastatic involvement of the liver and right adrenal gland. Punch biopsy of the scalp lesion was performed, and pathology revealed undifferentiated large cell carcinoma (figures 2 and 3), consistent with non-small cell lung cancer (NSCLC), later found by fine-needle aspiration of cervical lymph nodes.

Brain MRI demonstrated multiple haemorrhagic metastases in the cerebellum and the subcortical region of the right occipital lobe. Nuclear medicine bone scan revealed a small focal area of increased activity in the anterolateral eighth right rib and increased activity, either in or overlying the lower right sacrum. Positron emission tomography scan showed a 4.5 cm mass in the superior segment of the left lower lobe, near the hilum, with widespread metastatic disease to the mediastinum, right lung, brain, liver, right adrenal gland, coeliac lymph nodes and sacrum.

DIFFERENTIAL DIAGNOSIS

While our initial differential diagnosis of the scalp lesion included primary basal and squamous cell cancer of the skin, we expanded our differential to cutaneous metastasis based on the patient's significant tobacco history, night sweats and unintentional

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Figure 1 Photograph of scalp lesion, taken on the day of admission.

Figure 2 Nodular aggregates of tumour cells are present in the dermis (H&E stain, $\times 100$ magnification).

weight loss, as well as radiographic suggestion of metastatic disease. Biopsy results ruled out primary carcinoma of skin and confirmed the diagnosis of cutaneous metastasis.

TREATMENT

Our patient was evaluated by oncology for new diagnosis of stage IV NSCLC. The patient decided not to pursue palliative chemotherapy with carboplatin-gemcitabine in view of his prognosis. He underwent palliative radiation therapy, with a total of 40 Gy, to the right adrenal gland and stereotactic radiosurgery for brain metastases with a total dose of 20 Gy.

OUTCOME AND FOLLOW-UP

The patient followed up with his primary care physician, oncologist, radiation oncologist and neurosurgeon after his initial diagnosis. Unfortunately, he passed away 4 months after his initial diagnosis.

DISCUSSION

Lung cancer is the second most common malignancy in the USA.¹ The most frequent sites of metastasis include the liver, adrenal glands, brain and bone. The skin is rarely affected, with rates of cutaneous metastases varying from 1% to 12% in various studies.^{2–6} Common sites include chest, back, head and neck. Lesions are usually painless and solitary, but may also be

multiple.^{6,7} It is much more likely, however, that a primary lung malignancy will remain a single primary lesion rather than involving multiple sites. Widespread lesions occur in approximately 5% of lung malignancies.⁸ The underlying pathogenesis is thought to be lymphovascular invasion.⁷ The most common histology is adenocarcinoma, then squamous/small cell, followed by large cell carcinoma.^{6,7} Poor differentiation and upper lobe tumours increase the risk of cutaneous metastasis. Interestingly, cutaneous metastasis can present with or before the discovery of the primary malignancy in 20–60% of cases.⁷

While treatment modalities include surgery, chemotherapy and radiotherapy, treatment varies based on prognosis and symptoms.⁹ Cytotoxic systemic therapy via combination chemotherapy comprised of a platinum agent (cisplatin or carboplatin) plus gemcitabine is the first-line treatment in patients with advanced NSCLC without a mutation-specific marker such as epidermal growth factor receptor (EGFR) mutation or anaplastic lymphoma kinase (ALK) translocation.¹⁰ Owing to its cytotoxicity, the systemic chemotherapy is limited to four to six rounds. For individuals with driver-specific mutations (such as EGFR or ALK translocation), recent advances have allowed for a more targeted approach to treatment. In those with a positive EGFR mutation, an EGFR tyrosine kinase inhibitor, such as gefitinib or erlotinib, is the treatment of choice. In those with a positive ALK mutation, an ALK tyrosine kinase inhibitor, such as crizotinib or ceritinib, is the treatment of choice.¹¹ Regardless of mutation, those with NSCLC and skin lesions who undergo either surgical resection of the primary tumour or systemic chemotherapy, have not shown significant improvement in survival or resolution of skin lesions. Most studies have reported average survival of <6 months.^{6,7,12–14} In our patient, genotyping for both, EGFR and ALK translocation mutations, were negative, thus systemic chemotherapy with gemcitabine and a platinum agent would have been the treatment of choice if the patient were to have undergone treatment.

Our case of an asymptomatic patient who presented with only lymphadenopathy and a solitary scalp nodule as the initial manifestation of underlying lung malignancy encourages a thorough evaluation of new skin findings in patients with significant smoking history, even when they are otherwise asymptomatic. Cutaneous metastasis can provide further information regarding the underlying disease via radiological and histological examination. This unusual clinical presentation is a reminder that a detailed history and physical examination can be the key to expeditious detection of life-threatening disease.

Figure 3 The tumour cells are noted to have indistinct cell borders with prominent nucleoli and frequent mitotic figures (H&E stain, $\times 400$ magnification).

Patient's perspective

Written by the patient's daughter:

- The nodule on his head appeared without any other symptoms—no pain, itching, bleeding or oozing. Two days before he passed away he asked my sister and me to look at it because it was bothering him. The nodule had reappeared and was nearly the diameter of a quarter—much larger than it was when it was removed. The biopsy wound was completely healed, but the new growth looked the same as the original nodule. Again, no oozing, bleeding, itching or pain with the new growth.
- Based on the way my dad passed, I believe the cancer may have breached an artery, as he died within a minute or two of coughing up a good bit of blood. Both luckily and unfortunately, I was present when he died.

Learning points

- ▶ Malignant disease can metastasise to unusual locations.
- ▶ Recognise the importance of thorough evaluation of new skin findings in patients with significant smoking history, even if asymptomatic.
- ▶ Consider cutaneous metastasis in patients with new skin lesions, particularly in those with known cancer or those at high risk of cancer.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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