CASE REPORT

Lung carcinoma presenting as a solitary, painless frontal bone lump

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SUMMARY

A 50-year-old patient, a smoker, was admitted to the hospital, with a solitary scalp lump. Subcutaneous lumps of the scalp are common but usually benign; however, the painless lump in our patient turned out to be a malignant osteolytic lesion of the skull. Frontal bone was involved, and the disease had spread to the dura. Neuroimaging showed osteolytic lesions involving the axial skeleton, skull and several vertebrae. MRI showed the involvement of the second cervical vertebra, which prompted us to start treatment with dexamethasone. Since the spinal cord was not involved, Oncologists decided not to start radiotherapy treatment until we had reached the final diagnosis. A frontal bone biopsy confirmed the diagnosis of lung carcinoma. Chest X-ray did not identify the pulmonary nodule, but CT scan revealed a 1 cm peripheral, spiculated, pulmonary nodule within a pathological parenchyma (severe diffuse pulmonary emphysema).

BACKGROUND

Primary lung cancers most commonly metastasise to the brain, bones, liver and adrenal glands. About 30% of lung cancers are squamous-cell carcinoma. They typically occur close to large airways, unlike the case reported here. Although lung cancer may not produce any noticeable symptoms in the early stages, in about 35–40%, the diagnosis may be made in an advanced stage of the disease. Even though the patient had been a smoker for over 30 years, he had no respiratory or systemic symptoms, such as coughing, wheezing, weight loss or fatigue. He only reported sporadic neck pain, but he thought it was muscle strain or tension. Bone pain or headache are frequent when metastasis spreads to the skull, the vertebrae or the brain. However, our patient only noticed a swelling lump on his head but did not ask for medical advice, because it was painless.

This report discusses a 53-year-old patient who presented with an advanced stage of lung cancer, except for the fact that he presented with a lump on the frontal bone of the skull, which turned out to be a metastasis.

CASE PRESENTATION

A 53-year-old man was admitted to our hospital, presenting with an intermittent cervical ache. He said he had been taking high doses of painkillers. The lump had appeared several weeks before, but he was not concerned enough to ask for medical help.

He denied any further symptoms: he had no coughing, fever, weight loss or fatigue. Physical examination revealed a painless lump on his head (4 cm in diameter). It was firm, not movable, and smooth and hard in consistency. No skin changes were observed. The rest of the clinical examination was normal.

INVESTIGATIONS

Routine blood test was normal, including measurement of serum calcium, liver enzymes and alkaline phosphatase. Chest X-ray was normal, as well. Since we did not suspect a tumour, neuroimaging was performed to assess the lump and the neck pain. CT scan of the head showed two osteolytic lesions, one on the frontal bone (3.6 cm) and the other on the left parietal bone (4.1 cm) (figure 1). There was extensive bony erosion with dural thickening. However, the brain was not involved (figure 2). MRI also showed a lytic lesion in the second cervical vertebra (axis), hypointense in T1 and T2. The odontoid process was not involved, and cord compression could be ruled out. According to MRI, these three lytic lesions showed features suggesting aggressiveness, and were therefore regarded as metastasis.

A CT scan of the whole body showed severe diffuse pulmonary emphysema, with massive apical bullae and several smaller bullae seen throughout the right and left lungs. There was a solitary lesion (2 cm in diameter) with spiculated borders and contrast enhancement in the right upper lobe of the lung (figure 3). Besides, several vertebrae were affected (D4, D6, D12 and L2) with lytic lesions suggesting metastasis.

DIFFERENTIAL DIAGNOSIS

Although tumours of the skull are uncommon (1–4% of all bone tumours), up to 80% can be malignant.[1] They present as an enlarging soft or hard mass over the skull, and the differential diagnosis is broad, as it includes benign and malignant lesions: inclusion cyst, fibrous dysplasia, haemangioma, osteomyelitis, plasmacytoma and granuloma. Metastatic lesions include breast, lung, kidney and prostate. Radiological features of the lytic lesions and the finding of a suspicious pulmonary nodule led us to believe the most likely diagnosis was lung cancer.

None of the imaging findings could be considered diagnostic, therefore a biopsy was required to confirm the diagnosis and to rule out other conditions.

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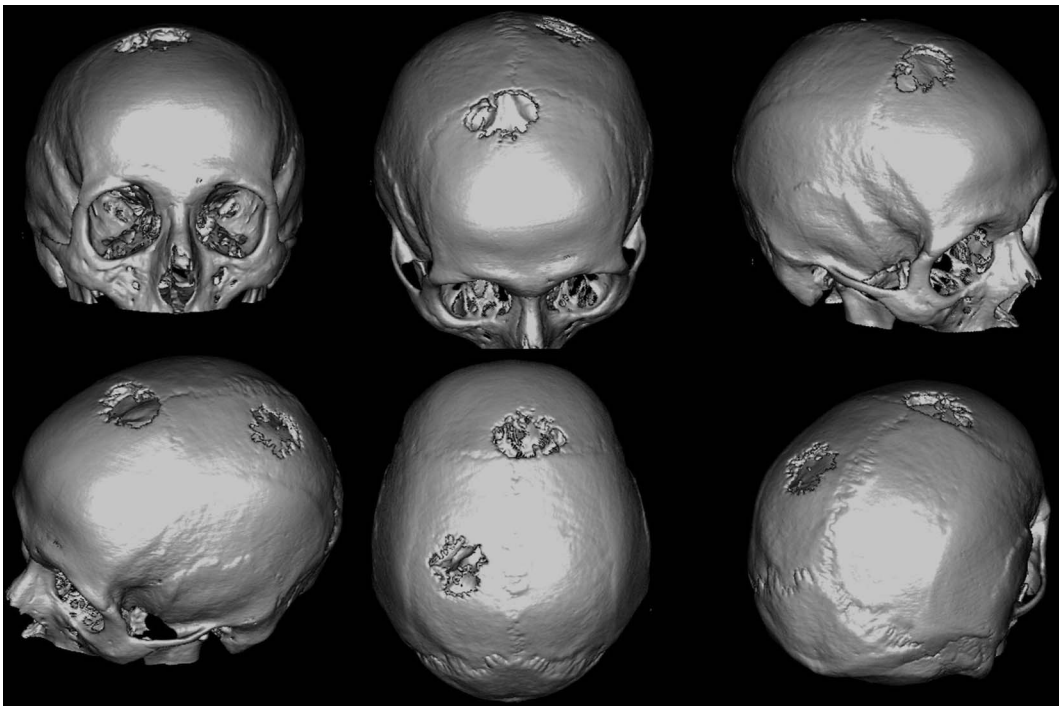

Figure 1 Three-dimensional CT reconstruction depicting two osteolytic lesions: frontal bone and parietal bone.

CT-guided core needle biopsy of the frontal bone was performed and showed squamous cell carcinoma. Immunohistochemistry staining was negative for thyroid transcription factor-1 and positive for p63, which confirmed the diagnosis.

TREATMENT, OUTCOME AND FOLLOW-UP

The patient underwent combination chemotherapy treatment with carboplatin-vinorelbine. To assess radiotherapeutic treatment for bone metastases, the patient was referred to radiotherapy Oncologists, where he was given radiotherapeutic treatment. His condition improved as a result of this treatment. However, 3 weeks after the first cycle of chemotherapy, the patient got worse, he was presenting with dyspnoea, persistent vomiting and neck pain. Chest X-ray revealed a large lung tumour mass and a massive pleural effusion. The patient was given palliative treatment and died on day 8 after admission.

DISCUSSION

Bone metastases are frequent during the natural history of some malignant diseases.[2] Moreover, lung cancer is the most frequently diagnosed cancer worldwide, and the first cause of cancer deaths.[3] Most cases are diagnosed in an advanced stage of the disease (over two-thirds of the patients). Therefore, skeletal metastatic disease is present in up to 36% of patients. The spinal cord is often involved when bone metastases are present, which highlights the advanced stage and implies a high mortality.[4] Vertebrae, pelvis, ribs and skull are the most common locations for bone metastasis.[5] It is not frequent to find acrometastasis, such as in the hands or feet.[6] However, isolated skull metastasis are rarely found in patients with cancer, and they are not often the presenting signs of an unknown primary. However, some examples of temporal[7 8] or calvarial[9–11] metastases are found in the medical literature, or even metastases to the femora[12] or the phalanges,[6 13 14] as the inaugural presentation of a lung cancer.

Bone metastases are usually lytic, but symptomatic, with a significant decrease in quality of life.[2]

When managing bone metastases, the main focus is on reducing the pain, to improve functionality and to avoid complications. Frequent complications are pathological fractures and compression of the spinal cord.[15] Management of these metastases can often be complex and demands a multidisciplinary approach: analgaesic, surgical and radiotherapy treatment.[11] In many patients, current treatment is palliative and not curative.

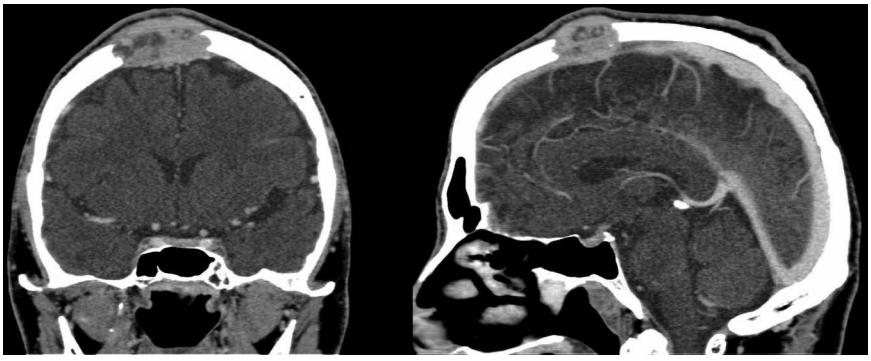

Figure 2 Osteolytic skull metastasis with dural involvement.

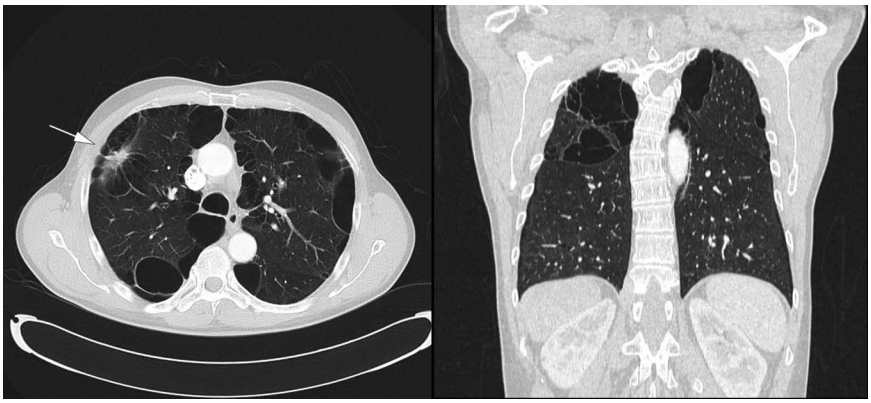

Figure 3 Spiculated, solitary pulmonary nodule in the right upper lobe. The surrounding parenchyma was pathological: severe diffuse pulmonary emphysema, showing massive apical bullae and several smaller bullae throughout both lungs.

Some of the indications for radiotherapy are the presence of pain, instability or neurological symptoms due to the compression of the spinal cord. Our patient was given an orthopaedic cervical collar and encouraged to take bisphosphonates. He was referred to a Radiation Oncologist. Notwithstanding, the patient ended up with a bad outcome.

Learning points

- Lung cancer may be very advanced with minimal symptoms when a definitive diagnosis is performed. Isolated skull metastases are a rare condition in these patients and they are an uncommon initial presentation.
- The axial skeleton is often involved at diagnosis, in the form of painful bone metastasis.
- Pain is frequent when bone metastases are present, and can impair the mobility and hence the patient's quality of life. Bone fractures and compression of the spinal cord must lead to the initiation of treatment to improve the patient's quality of life.
- Bisphosphonates, calcitonin or radiotherapy, can be useful for the palliation of these lesions. Palliative radiotherapy is one of the most important management tools in these patients.

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