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Squamous Cell Carcinoma of Lung with Skull Metastasis: A Case Report

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Abstract

Background: Squamous cell carcinoma lung presents about 30 percent of all non small cell lung carcinoma. It almost always associated with smoking and usually spreads to brain, bones, liver, adrenal glands and small intestine. But, spreading to skull bones is a rare event.

Case Presentation: We here present a case of a 43 year old smoker with squamous cell carcinoma of lung where patient admitted with huge skull lesion invading through both inner and outer table and brain also. Previously, patient underwent lobectomy and three cycles of chemotherapy. This time, patient received palliative radiation to skull at our institute.

Conclusion: There is only single case report worldwide similar to this case and proved the unusual presentation of this rare occurrence. It also raises questions about the appropriate management of patients with intracranial metastasis with invasion of skull.

Keywords: Squamous cell carcinoma; Skull mets; Carcinoma lung; Post lobectomy

Introduction

Throughout the world, lung cancer accounts for 13% (1.6 million) of the total cases of cancer and 18% (1.4 million) of the cancer-related deaths based on 2008 estimates [1]. Squamous cell carcinoma (SCC) of the lung represents 30% of all non-small cell lung carcinomas (NSCLC) [2]. It is a type of non-small cell lung cancer formed from round cells that replaced injured or damaged cells in the lining of the bronchi, the lung's major airways. Squamous cell carcinoma usually spread to bones, adrenal glands, the liver, small intestine, or brain [3]. This type of cancer is almost always caused by smoking [3]. SCC of lung metastasizing to skull bones is rare. There is only one case report worldwide which showed similar type of disease presentation [4].

The case report demonstrates an unusual disease presentation with a rare intracranial metastasis invading through the skull.

Case Presentation

A 43-year-old chronic smoker (>30 years) presented to our hospital with huge fungating lesion protruding from skull (Figure 1). There was no hepatosplenomegaly or lymphadenopathy on systemic examinations. Local examination showed huge fungating mass fixed with skull, pus and bleeding dribbling from the mass. There were no focal neurological deficits. His blood investigations were normal.

According to the patient, he was initially admitted in local hospital with productive cough, hemoptysis, and irregular fever for two months associated with loss of weight and appetite. His past medical history was unremarkable. Computed tomography (CT) scan of Thorax (plain and contrast) showed soft tissue density lesion in right lobe of lung. Underlying ribs were normal. No mediastinal lymph nodes were seen in paratracheal, pre-tracheal and sub-carinal regions (Figure 2). He underwent lobectomy with systematic nodal dissection. After that he received 3 cycles of chemotherapy (Gemcitabine and Cisplatin based). During the course he developed a scalp lesion that was increased in size and became a fungating mass.

He had underwent PET -CT (Positron emission tomographycomputed tomography) scan of whole body (Figure 3) which revealed post upper lobectomy with no evidence of residual disease, gross osteolytic metastatic lesion destroying skull both inner and outer table of right frontal and parietal bones with hypermetabolic large soft tissue component infiltrating the adjacent fronto parietal cerebral neuroparenchyma with significant perilesional edema and mass effect. Immunohistochemistry of lung lesion showed membranous positivity of CK 5/6 (Figure 4) and nuclear positivity of P63 (Figure 5). A punch biopsy done from the skull lesion and Immunohistochemistry (IHC) revealed positivity of CK 5/6 (Figure 6) and P63 (Figure 7).

According to the decision of the tumor board of our institution he underwent urgent palliative radiation therapy to skull lesion (20 Gy in 5 Fractions) and advised to take further three cycle of same schedule of chemotherapy at 21 days interval. But due to his personal problem he did not continue treatment and kept on supportive care.

Discussion

Carcinoma of lung with skull metastasis is rare presentation. Skull metastasis occurs by hematological spread from breast, lung, thyroid, kidney neoplasms, malignant melanomas and neuroblastomas. There is preponderance for female gender (male: female ratio: 3:7). Breast (55%) is the first leading source followed by lung (14%) is the second most common source of metastasis to skull [5]. Non-small cell lung cancer (NSCLC) is the main pathology detected in metastases to skull (74%) [6].

This case represents a rare occurrence of an intracranial metastatic SCC producing destruction of the parietal bone to invade beyond the skull and into the extracranial soft tissue. It also highlights an unusual presentation of lung cancer. It is extremely rare for intracranial metastases from lung carcinomas to produce destruction of skull bone. The authors able to find only single published case of this occurring from a SCC in the literature [4]. There are some reports of skull involvement from lung cancer but not specifically SCC type [5-9]. One

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Figure 1: Huge fungating lesion protruding from skull.



Figure 2: Computed tomography (CT) scan of Thorax (plain and contrast) showed soft tissue density lesion in right lobe of lung. Underlying ribs were normal. No mediastinal lymph nodes were seen in paratracheal, pre-tracheal and sub-carinal regions.



scan showing huge mass lesion involving underlying brain, inner table and outer table of skull bone.

case report also documented solitary scalp metastasis from pulmonary SCC Seen on FDG PET/CT [10]. The most common presentation is circumscribed intraosseous calvarial lesion (27%). They usually progress without any symptoms; but sometimes they are detected with



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Figure 4: Immunohistochemistry of lung showing positivity of CK5/6.



Figure 5: Immunohistochemistry of lung showing positivity of P63.



Figure 6: Immunohistochemistry of skull based lesion showing positivity of CK5/6.



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pain and cranial nerve palsies [10]. The first ever case of destructive skull metastasis from a lung adenocarcinoma was reported by Foco et al. in 2011 [11]. The mechanism of invasion of bone tissue from metastatic lesions has not been fully described. Bone tissue is highly resistant to destruction and most of the information regarding bone destruction is derived from studies focusing on breast cancer, multiple myeloma and prostate cancer, which metastasize to the bone rather than directly invade it [12]. A recent model by Roato et al. concluded that NSCLC bone-invading cells produce IL-7, which is known to promote osteolytic lesions [13]. The prognosis of patients with stage four SCC is extremely poor with a median survival of four months [14]. Patients with asymptomatic skull metastases without brain lesion can be followed up regularly or treated with radiation therapy with or without chemotherapies (biophosphonates, denosumab, 89SR, antibody for receptor activator of NF-kappa B). But, in case of mass effect over brain parenchyma or symptomatic cases, surgery is the first line treatment in resectable lesions. Average survival time is 5 months from lung cancer metastasis to skull bone [6]. As a result, treatment in this population should be focused primarily on palliation.

Conclusion

The authors find this to be an interesting and unique case due to the rare phenomenon of an intracranial metastasis from a SCC invading through the skull and into the extracranial soft tissues, which has not previously been described in the literature. It also highlights an unusual presentation of SCC and raises questions over the most appropriate course of management of patients with intracranial metastases that invade through the skull.

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