Synchronous nasal metastasis from pulmonary squamous cell carcinoma

Liling Zhang, Junli Liu, Tao Wang, Gang Wu

ABSTRACT

Introduction: Squamous cell carcinoma spread from lung to the nasal cavity is extremely rare. Because of the identical appearance under light microscope, making a definitive diagnosis is a challenge when lesions are from both the nasal cavity and lung. Case report: We present a case of a 56-year-old patient with simultaneous malignancies in the lung and nasal cavity. On the basis of histologic analysis and radiographic features, a diagnosis of primary lung cancer with nasal metastasis was established. Since the histological appearance of the lung tumor and the nasal lesion is similar, the differential diagnosis between second primary and metastasis mainly depends on clinical criteria. However, the accuracy of this approach remains in question. Conclusion: It is a challenge to discern the true relationship of lung squamous cell carcinomas and nasal squamous cell carcinomas. The criteria currently employed in the distinction are mainly dependent on clinical, radiographic, and histologic grounds. Recent studies demonstrated that molecular genetic analysis can be a promising approach to solving this diagnosis dilemma.

Keywords: Squamous cell carcinoma, Lung cancer, Cancer of nasal cavity, Metastasis, Differential diagnosis

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INTRODUCTION

Nasal metastasis from primary lung cancer is extremely rare. The frequency of nasal metastasis in lung cancer has never been evaluated, since very few cases have been reported to date, and most common histologic subtype is adenocarcinoma [1]. The diagnosis of metastasis can be easily made when the patient had a history of previous malignancy, and the histologic features are distinctive and characterize the organ of the primary lesion as in renal cell carcinoma metastatic to the nasal cavity [2]. However, when nasal lesions simultaneously present with primary lung cancer, particularly both histologic types are squamous cell carcinomas, distinguishing metastasis from second primary will be a challenge. We present a case of a 56-year-old patient with simultaneous malignancies in the lung and nasal cavity. The diagnosis of primary lung cancer with nasal metastasis was established on the basis of histologic analysis and radiographic features. The difficulty encountered in differential diagnosis is discussed and approaches to solve this diagnostic dilemma are reviewed.
CASE REPORT

A 56-year-old male patient was presented with an enlarging mass on the left side of his nasal root, accompanied with occasional epistaxis, nasal obstruction and numbness over the left cheek for one and half month duration. Physical examination revealed a 2×3 cm firm, fixed mass on the left side of the nasal root. Paranasal sinuses CT scan showed a soft tissue mass surrounding the left frontal process, with irregular osteolysis of the frontal process and anterior wall of maxillary sinus (Figure 1A). The mass infiltrated the left nasal cavity, left maxillary sinus, alveolar process, and subcutaneous tissues overlying it. Biopsy of the mass demonstrated the nasal neoplasm was a squamous cell carcinoma (Figure 1B). To further evaluate the staging of the patient, a chest CT scan was performed. The result showed a lesion in the right middle lobe near the right hilum (Figure 2A). The lesion was sized 2×4 cm with uneven density, irregular shape and blurry margin. No hilar and mediastinal lymphadenopathy was observed. Fiberbronchoscopy revealed that a 2×3.5 cm cauliflower-like neoplasm located in the right middle lobar bronchus and biopsy of the lesion demonstrated a squamous cell carcinoma too (Figure 2B). Except serum CA19-9 was slightly increased, other auxiliary examinations of the patient were normal, which including abdominal CT, pelvic CT and bone scans. Thus, on the basis of combined analysis of histologic and radiographic features, the clinical diagnosis was established as primary lung cancer with nasal metastasis (stage IV).

The patient underwent two cycles of chemotherapy with gemcitabine (1000 mg/m², day 1 and 8) and cisplatin (75 mg/m², day 1), and the palpable mass on the left nasal root shrank. Further plans for four such cycles abandoned due to financial constraints. The patient occurred cough and dyspnea and died from respiratory failure six months after initial diagnosis.

DISCUSSION

Tumors arising in two different organs, such as lung and nose, can represent either a primary tumor with a metastasis or two primary tumors. Diagnosis of a metastatic disease may be easily made when the histologic features are distinctive and characterize the organ of the primary lesion. As reviewed by Huang et al. [1], among 16 reported cases to 2009, the most common histologic subtype of the lung is adenocarcinoma, which resulting in an easy definitive diagnosis, and only one case with squamous cell carcinoma [3] was included in the review. As in our case, when both nasal and pulmonary lesions are squamous cell histology, the differential diagnosis between metastasis and second primary tumor is extremely difficult. In such case, the differential diagnosis includes primary nasal tumor with lung metastasis, primary lung cancer with nasal metastasis, and synchronous nasal and lung cancer.

There is no gold standard in the differential diagnosis of metastasis versus second primary tumor in patients with a squamous cell carcinoma of the lung and a squamous cell lesion of the nasal cavity. The criteria currently employed in the distinction are mainly dependent on clinical, radiographic, and histologic grounds. Such parameters as tumor stage, time interval between two tumors detected, histologic grade, and radiographic presentation are frequently mentioned in literature [4]. Since both are squamous cell carcinomas and have identical features under light microscopy, histologic classification is of negligible help in this case, while radiographic features may be an important aid in the differential diagnosis.

The fundamental distinction between a lung metastasis and a primary lung cancer is usually straightforward on radiographic grounds [5, 6]. A smooth nodal margin can be regarded as an indication of a metastasis, which often peripherally located. However, a primary lesion often presents with irregular or blurry margin and can be peripherally or centrally located. Squamous cell carcinoma of lung is more often centrally located within the lung, whereas adenocarcinoma is typically peripherally located. CT features of this patient’s pulmonary lesion, including irregular shape, blurry margin and central location, suggested a primary cancer. Further fiber bronchoscope biopsy confirmed the diagnosis of primary lung cancer.

Although radiographic features of metastatic nasal lesions are similar to those of primary nasal neoplasms, localizing the epicenter of the tumor may aid in determining its origin [7]. In our case, the mass epicenter is located at the frontal process with invasion.
of nasal cavity and facial subcutis, but the histology is squamous cell carcinoma which is seldom seen in bone tumors. Therefore, the nasal mass was regarded as a metastatic lesion from lung squamous cell carcinoma.

Although we had made the diagnosis based on the currently employed clinical criteria, the accuracy of this approach remains in question. Since making correct diagnosis has great influence on patient prognosis and could rationally guide therapeutic strategies, some molecular genetic methods have been recently developed for discerning the true relationship of lung squamous cell carcinomas and head and neck malignancies.

Leong et al. [6] and Geurts et al. [4] performed loss of heterozygosity (LOH) analysis for paired tumors from head and neck squamous cell carcinoma and solitary lung nodules to assess the origin of the tumor. Those studies suggested that comparison of genetic alterations in the tumors can be very helpful in distinguish metastasis and second primary tumor. Moreover, the use of gene expression profiling has demonstrated the potential to resolve this diagnostic dilemma. Vachani et al. [8] identified a panel of 10 genes (CXCL13, COL6A2, SFTPBI, KRT14, TSPYL5, TMP3, KLK10, MMP1, GAS1, and MYH2) that accurately distinguished these two tumor types. This 10-gene classifier showed a high accuracy of 96% on the samples from the Talbot et al. study [9].

CONCLUSION

It is a challenge to discern the true relationship of lung squamous cell carcinomas and nasopharyngeal squamous cell carcinomas. They could be metastasis from either, or both are primary. The criteria currently employed in the distinction are mainly dependent on clinical, radiographic, and histologic grounds. As in our case, the final diagnosis was made on the basis of these criteria, although the accuracy of these criteria remains in question. Recent studies demonstrated that molecular genetic analysis, such as LOH and gene expression profiling, can be a promising approach to solving this diagnosis dilemma.

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Author Contributions

Liling Zhang – Conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Critical revision of the article, Final approval of the version to be published
Junli Liu – Acquisition of data, Critical revision of the article, Final approval of the version to be published
Tao Wang – Analysis and interpretation of data, Critical revision of the article, Final approval of the version to be published
Gang Wu – Analysis and interpretation of data, Critical revision of the article, Final approval of the version to be published

Guarantor

The corresponding author is the guarantor of submission.

Conflict of Interest

Authors declare no conflict of interest.

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REFERENCES