Nasion Swelling as the Presenting Symptom of Lung Adenocarcinoma

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Abstract: Metastasis to the paranasal sinuses from lung cancer is extremely rare. Here, we reported a patient of lung adenocarcinoma presenting with nasion swelling because of metastasis to the paranasal sinuses. A review of the literature from 1966 to 2008 yielded another 15 patients. Adenocarcinoma was the most commonly encountered histologic subtype, and modern combination chemotherapy was probably the most effective treatment modality. Headache, visual disturbance, facial mass, and facial pain were the symptoms frequently associated with paranasal sinus metastasis; however, all of them were nonspecific for a metastatic tumor. A thorough history taking, ear, nose, and throat examination, and laboratory investigations are of paramount importance to achieve a correct diagnosis.

Key Words: Chemotherapy, Lung cancer, Metastasis, Paranasal sinus neoplasms.

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Lung cancer has a propensity to metastasize widely. However, metastasis to the paranasal sinuses is rare and only few cases have been reported. We presented here an unusual case of nasion swelling because of extensive metastasis to the paranasal sinuses as the presenting symptom of lung adenocarcinoma. We also reviewed the published literature and summarized the clinical features of lung cancer patients with paranasal sinus metastasis (Table 1).

CASE REPORT

The 59-year-old lady, a housewife and nonsmoker, visited our hospital for nasion swelling, which had been enlarging slowly for 3 months. She also had mild nasal stuffiness and numbness over the right infraorbital region. Physical examination revealed the bulged nasion (Figure 1*A*) and slightly impaired superficial sensation in the territory of the second division of the right trigeminal nerve. A computed tomography (CT) scan showed a large ill-defined tumor with involvement of the frontal, ethmoid, sphenoid, and maxillary sinuses (Figure 2*A*). The tumor also invaded the orbits, intracranial cavity, nasal cavity, and skull base. Under the impression of sinonasal cancer, the patient underwent an endoscopic biopsy of the ethmoid sinus. Unexpectedly, the histologic findings showed an adenocarcinoma, and the cancer cells were immunohistochemically positive for thyroid transcription factor-1 and cytokeratin 7, but negative for thyroglobulin and cytokeratin 20. A CT scan of the chest demonstrated a lung tumor measured 32 mm in diameter over the lingual segment of the left upper lobe, and a bronchoscopic biopsy of the lingual bronchus also revealed a thyroid transcription factor-1 expressing adenocarcinoma. The final diagnosis was a stage IV lung adenocarcinoma of the left upper lobe with extensive paranasal sinus metastasis. After three courses of combination chemotherapy with gemcitabine and cisplatin, the nasion swelling almost resolved (Figure 1*B*) and her nasal stuffiness and right facial numbness also subsided. The follow-up CT scan revealed nearly complete resolution of the sinonasal tumor (Figure 2*B*). At the time of writing, the sixth cycle of combination chemotherapy is being commenced.

DISCUSSION

A review of the world literature between 1966 and 2008 yielded only 16 cases of lung cancer with metastasis to the paranasal sinuses.[1–13] Adenocarcinoma (nine cases) was the most commonly reported histology, followed by small cell carcinoma (four cases). Of the 16 patients, the presenting symptoms were headache in seven, visual disturbance in five, facial mass in three, and facial pain in three. Involvement of the cranial nerves II, III, IV, and VI was the leading cause of visual impairment and occurred exclusively in patients with metastasis to the sphenoid sinus.[5,7,9,11] The proximity of the sphenoid sinus to these vulnerable nervous structures forms the basis of the ophthalmologic abnormalities. Paralysis of the abducens nerve was more common than any of the others innervating the extraocular muscles.[5,7,9,11] In the majority of the cases (14 of 16 cases), the metastatic tumor involved only one of the paranasal sinuses: the sphenoid sinus in five, maxillary sinus in five, frontal sinus in three, and ethmoid sinus in one. Headache and visual disturbance were the most

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TABLE 1. Reported Cases of Lung Cancer with Paranasal Sinus Metastasis, 1966–2008

Year	Author	Age/Sex	Involved Sinus	Symptom of Paranasal Sinus Metastasis	Cranial Nerve Involvement	Method of Treatment	Treatment Effect	Outcome (survival or follow-up period after presence of paranasal metastasis)	Histological Subtype
1966	Bernstein et al.[1]	48/F	Frontal	Pain and swelling over left eye[a]	—	XRT	NR	NR	Adenocarcinoma
1968	Morgenstein et al.[2]	65/M	Maxillary	Epistaxis, periorbital pain, exophthalmos[a]	—	XRT	No effect	Died (5 mo)	Squamous cell carcinoma
						C/T	No effect		
1971	Jortay et al.[3]	NR	Ethmoid	NR	NR	NR	NR	NR	Adenocarcinoma
1972	Carruth et al.[4]	66/F	Maxillary	Proptosis, loss of vision[a]	—	XRT	No effect	Died (3 mo)	Small cell carcinoma
1973	Van Wart et al.[5]	NR/F	Sphenoid	Headache[a]	VI	XRT	Symptom improved	Died (1 yr)	adenocarcinoma
1974	Inalsingh et al.[6]	67/M	Maxillary	Cheek pain	—	XRT	Lesion resolved	NR (7 mo)	Small cell carcinoma
1979	Barrs et al.[7]	61/M	Sphenoid	Diplopia, headache[a]	III, IV, VI	—	—	Died (1 wk)	Small cell carcinoma
1985	Kent et al.[8]	81/M	Maxillary	Cheek swelling, mouth bleeding[a]	—	XRT	NR	Died (19 mo)	Small cell carcinoma
1990	Mickel et al.[9]	51/F	Sphenoid, ethmoid	Ophthalmoplegia, ptosis	II, III, IV, VI	—	—	Died (1 wk)	Poorly differentiated carcinoma
		71/F	Sphenoid	Headache, diplopia, decreased visual acuity[a]	II, VI	—	—	Died (5.5 mo)	Adenocarcinoma
		47/M	Sphenoid	Headache, facial pain[a]	III, IV, VI	XRT	Symptom improved	Died (7 mo)	Adenocarcinoma
1992	Ii et al.[10]	36/M	Maxillary	Epistaxia, nasal obstruction		C/T	No effect		
1998	Xu et al.[11]	NR	Sphenoid	Headache, visual loss[a]	—	C/T	No effect	Died (3 mo)	Adenocarcinoma
2002	Clarkson et al.[12]	79/F	Frontal	Frontal mass, headache, blurred vision, nasal discharge[a]	II, III, IV, V, VI	Surgery	No effect	Died (2 mo)	NR
2005	Rombaux et al.[13]	71/M	Frontal	Frontal mass, headache[a]	—	XRT	NR	NR	Adenocarcinoma
2008	Huang et al. (present report)	59/F	Frontal, ethmoid, sphenoid, maxillary	Nasion swelling, nasal stuffiness, facial numbness[a]	—	C/T	Tumor volume decreased	Alive (9 mo)	Adenocarcinoma
					V	C/T	Symptom improved	Alive	Adenocarcinoma

[a] The symptoms of paranasal sinusmetastasis were the presenting symptoms of lung cancer.
F, female; M, male; NR, not reported; XRT, radiotherapy; C/T, chemotherapy.

common symptoms associated with sphenoid sinus involvement and metastasis to the frontal sinus frequently presented with a mass in the frontal area. Maxillary sinus metastasis might present with epistaxis, facial pain, and proptosis. There were only two patients with involvement of two or more of the paranasal sinuses, including the case presented here, in whom extensive infiltration of all four sinuses by the malignancy was observed. Symptoms referable to the

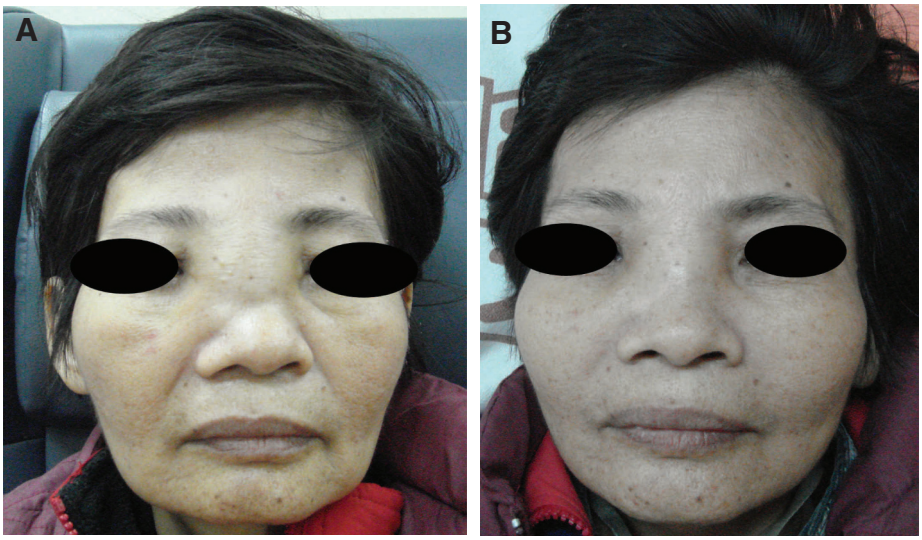

FIGURE 1. *A,* At first examination, the photograph revealed a swelling at the nasion. *B*, After three cycles of chemotherapy, the photograph showed nearly complete resolution of the swelling.

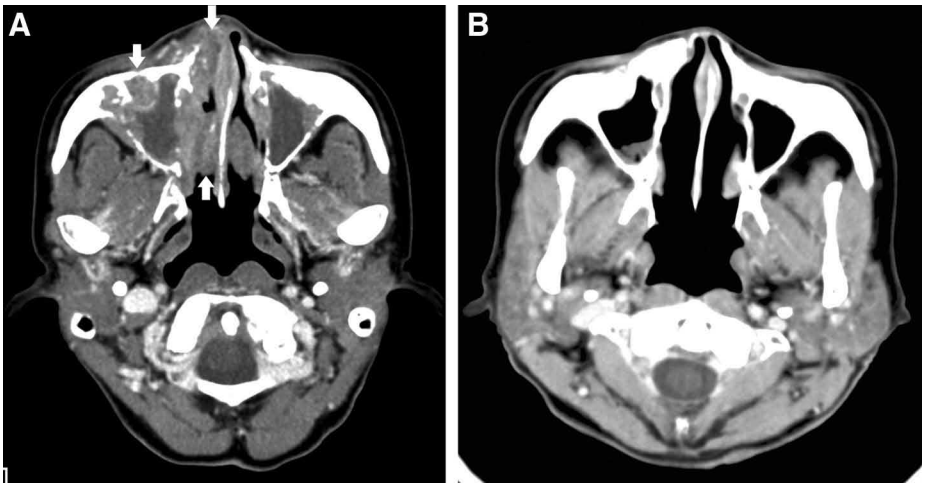

FIGURE 2. *A,* The axial section of head computed tomography before treatment for lung cancer showed that a large ill-defined mass (arrows) involves the paranasal sinuses. *B*, After three cycles of chemotherapy, the sinonasal mass almost disappeared.

paranasal sinus lesions were the presenting symptoms of lung cancer in most of the patients.[1,2,4,5,7–9,11–13]

Eight of the 16 patients underwent radiotherapy to the paranasal sinuses,[1,2,4–6,8,9,12] and improvement of associated symptoms or decrease of the tumor volume was reported in three.[5,6,9] Five patients received chemotherapy, which was effective only in one adenocarcinoma patient[13] and ours, and both patients were treated with modern combination chemotherapy (gemcitabine and cisplatin). The mean survival time after the presence of paranasal sinus metastasis was 5.7 months (range, 1 week to 19 months), and death was always associated with widespread malignancy.

In summary, adenocarcinoma is the most common histologic subtype of lung cancer with metastasis to the paranasal sinuses. There are no clinical or radiologic features that are characteristic in differentiating metastatic tumors from primary malignancy of the sinuses. For encountering the tumors at these sites, a thorough clinical and laboratory investigation should be performed for other primary malignancies, particularly the lung.

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ERRATUM

In the article "Detection and Localization of Intraepithelial Neoplasia and Invasive Carcinoma Using Fluorescence-Reflectance Bronchoscopy: An International, Multicenter Clinical Trial," which appeared in volume 4 of *Journal of Thoracic Oncology* on pages 49–54, an author's name was inadvertently omitted. Dr Adi Gazdar served as the reference pathologist for interpretation of the bronchial biopsies and his name should have been included in the author line. In addition, Table 2 of the same article contained errors. The corrected table is below. The errors have been noted in the online version of the article, which is available at www.jto.org.

TABLE 2. Pathology Coding

Pathology Classification	Description
Negative	Normal
	Hyperplasia
	Metaplasia
	Dysplasia, mild
Positive	Dysplasia, moderate
	Dysplasia, severe
	Carcinoma in situ
	Carcinoma, microinvasive
	Carcinoma, invasive
Not evaluable	Incomplete, fragmented or scant epithelium, or specimen missing

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Edell E, Lam S, Pass H, Miller YE, Sutedja T, Kennedy T, Loewen G, Keith RL. Detection and localization of intraepithelial neoplasia and invasive carcinoma using fluorescence-reflectance bronchoscopy: an international, multicenter clinical trial. *J Thorac Oncol*. 2009;4:49–54.