approachable through the left ventriculotomy alone. Reiter et al also reported the findings in five patients with old myocardial infarctions who had sustained VT with LBBB morphology and showed that the origin of VT was in the interventricular septum in four of the five patients. Weiss et al and Lomuscio et al reported the findings in patients with right ventricular infarction who had VT, but these reports did not demonstrate the exact origin of the VT. Our patient, with right ventricular infarction, showed sustained monomorphic VT with LBBB morphology that originated in the inflow-inferior site of the right ventricular free wall.

REFERENCES

2 Reiter MJ, Smith WM, Gallagher JJ. Clinical spectrum of ventricular tachycardia with left bundle branch morphology. Am J Cardiol 1983; 51:113-21

Necrotizing Bronchial Aspergillosis in a Patient Receiving Neoadjuvant Chemotherapy for Non-Small Cell Lung Carcinoma*

Takao Niimi, M.D.; Masafumi Kajita, M.D.; and Hiroshi Saito, M.D., F.C.C.P.

We describe a case of necrotizing bronchial aspergillosis which developed after lobectomy following neoadjuvant chemotherapy in a 73-year-old woman with non-small cell lung cancer. The lesion was visualized and biopsied through FBS, which played a useful role for early diagnosis of this disease. Itraconazole therapy was effective and safe.

(Chest 1991; 100:277-79)

| FBS = fiberoptic bronchoscopy; IPA = invasive pulmonary aspergillosis |

*From the Department of Thoracic Surgery (Drs. Niimi and Kajita) and the Department of Internal Medicine (Dr. Saito), National Chubu Hospital, Ohbu, Aichi, Japan.
Reprint requests: Dr. Niimi, Department of Thoracic Surgery, National Chubu Hospital, 36-3 Genco, Morioaka-cho, Ohbu, Aichi 474, Japan.
The spectrum of pulmonary aspergillosis includes saprophytic colonization, mycetoma, hypersensitivity reaction and invasive infection. Necrotizing bronchial aspergillosis is a relatively uncommon manifestation of invasive aspergillosis.\(^1\)\(^4\) This type of infection develops in mildly immunocompromised patients and is characterized by limited invasiveness.\(^1\)\(^2\) During the past several years, there has been increasing interest in neoadjuvant chemotherapy (preoperative adjuvant chemotherapy) for stage III non-small cell lung cancer. To our knowledge there has been no prior report of necrotizing bronchial aspergillosis occurring after lobectomy following neoadjuvant chemotherapy for lung cancer.

**CASE REPORT**

In August 1988, a 73-year-old woman was referred to our hospital, the National Chubu Hospital, with a diagnosis of adenocarcinoma of the lung. The patient was staged with chest x-ray film, radioisotope scanning of the bones and CT scans of the chest, brain and upper abdomen. A routine chest x-ray film on admission revealed a coin lesion, \(32 \times 36\) mm in size, in the left upper field. Tracheobronchial lymph nodes greater than 2 cm in diameter were found on CT scan. We concluded that the patient had clinical T2N2MO non-small cell lung carcinoma. At the time of admission, the hematocrit value was 40.8 percent, the platelet count was 335,000/cu mm and the white blood cell count was 7,900/cu mm with 61 percent neutrophils, 5 percent monocytes and 27 percent lymphocytes.

Chemotherapy under protocol consisting of cisplatin (80 mg/m\(^2\)) and mitomycin C (8 mg/m\(^2\)), both administered intravenously on day 1 and vindesine (3 mg/m\(^2\)) administered intravenously on days 1 and 8 was started on September 1. Two courses were given at a three-week interval. The patient demonstrated a partial response which consisted of an 80 percent reduction of the product of the perpendicular diameters of the tumor for five weeks. The lowest leukocyte and platelet counts were 2,200/cu mm and 103,000/cu mm, respectively. On October 21, the left upper lobectomy with lymph node dissection was carried out two weeks after completion of the last cycle. The day before operation, the white blood cell count was 3,300/cu mm, with 24 percent neutrophils.

Two weeks after operation, the patient developed a slightly productive cough and a low-grade fever. The white blood cell count increased to 11,100/cu mm, with 81 percent neutrophils and 3 percent eosinophils. The chest x-ray film and CT scan were negative. *Aspergillus fumigatus* grew from multiple sputum cultures. The FBS revealed a well-defined membranous necrotizing lesion located at the bifurcation of left B\(^1\) and basal bronchus (Fig 1). Endobronchial biopsy specimens showed invasion of hyphal fungal elements into both the mucosa and the cartilage (Fig 2). *Aspergillus fumigatus* grew on culture of these specimens.

Treatment with itraconazole was begun at a dose of 100 mg/day orally on November 19. Five weeks later, the dose was increased to 200 mg/day because repeated FBS did not show definite improvement. The patient underwent another FBS on February 3, 1989, which revealed that mucosal ulceration was healed. An additional cycle of cancer chemotherapy was carried out on February 20. Itraconazole therapy was discontinued on March 18 because no symptoms and signs of recurrence of disease had been seen for a month after cancer chemotherapy. One year later the patient has no evidence of any relapse.

**DISCUSSION**

Necrotizing bronchial aspergillosis is found in about 10 percent of cases of IPA.\(^1\)\(^3\) This disease is limited principally to the larger airways, with little, if any, extension of organisms into surrounding pulmonary parenchyma or blood vessels.\(^1\)\(^4\) In our patient, the lesion was localized at a large bronchus of residual lung after lobectomy and was visualized through FBS. No evidence of associated parenchymal lung involvement was found in either the chest x-ray film or the CT scan.

Invasive pulmonary aspergillosis usually develops in patients who have granulocytopenia, who are receiving treatment for hematologic malignancy or who are receiving corticosteroid therapy or all three.\(^1\)\(^3\) Patients with solid...
tumors such as lung carcinoma are less susceptible, accounting for 2 to 13 percent of IPA cases. Meyer and associates have described that patients with solid tumors who had Aspergillus infections had at least two of the following features in common: corticosteroid treatment, cytotoxic therapy or leukopenia <4,000/cu mm. Patients with necrotizing bronchial aspergillosis are less severely compromised than those with other forms of IPA. Young and associates have reported that bronchial aspergillosis developed in patients with mild leukopenia, some of whom had been treated with corticosteroids or antineoplastic drugs. The patient reported here had mild leukopenia (3,300/cu mm) as the result of neoadjuvant chemotherapy at the time of operation; IPA is a rare complication after pulmonary surgery. In our patient, there may be some abnormalities in pulmonary defense mechanisms related to lung resection. Impairment of mucociliary function and tissue damage produced by surgical manipulation, particularly lymph node dissection, may have been the significant factors leading to endobronchial proliferation of Aspergillus in the early postoperative period. The development of bronchial aspergillosis in our patient also was probably facilitated by neoadjuvant chemotherapy in association with granulocytopenia; IPA should be noted as a pulmonary complication after surgery and neoadjuvant chemotherapy for lung carcinoma.

The clinical diagnosis of IPA is difficult because of the nonspecific nature of its symptoms and the lack of reliability of microbiologic, serologic, and radiographic findings. Sputum cultures are positive on more than one occasion in less than 10 percent of IPA cases. In our patient, the diagnosis of Aspergillus infection was suspected because repeated sputum examinations proved positive. This was confirmed by the biopsy specimens obtained during FBS; FBS played a useful role for early diagnosis. At the present time, amphotericin B is considered the treatment of choice for life-threatening IPA in an immunocompromised host. We used itraconazole, a new orally active triazole, to treat the less severely compromised patient for the limited invasive infection. It was effective and did not have significant side effects.

REFERENCES

7 Rosenberg BS, Crevelston SA, Schonfeld AJ. Invasive aspergillosis complicating resection of a pulmonary aspergilloma in a nonimmunocompromised host. Am Rev Respir Dis 1982; 126:1113-15

Adamantinomas of the Tibia with Pulmonary Metastases and Hypercalcemia

Jan X. Van Schoor, M.D.; Jurgen H. Vallaesys, M.D.; Guy F. Joos, M.D., Ph.D.; Hendrik J. Roels, M.D., Ph.D.; Romain A. Paucels, M.D., Ph.D., F.C.C.P.; and Marcel E. Van Der Straeten, M.D., Ph.D.

Adamantinomas of long bones are rare primary malignant bone tumors. A case of a woman who died of pulmonary metastases of an adamantinoma of the tibia is presented. A unique feature of this case is the association with hypercalcemia. The association of hypercalcemia, hypophosphatemia, decreased parathyroid hormone levels and increased urinary cAMP excretion suggests a humoral mediated hypercalcemia. Histologic and ultrastructural analysis of the pulmonary metastases demonstrated that the tumor was composed of a heterogeneous cell population with mesenchymal and epithelial differentiation.

(c) Chest 1991; 100:279-81

Figure 1. Chest radiograph showing multiple nodules in the parenchyma of both lungs and a pleural effusion on the right.

CAMP = cyclic adenosine 5'-monophosphate; GF = glomerular filtrate; PTH = parathyroid hormone

Adamantinomas are rare primary neoplasms of bone which account for about 0.3 to 0.5 percent of all malignant bone tumors. Up to 1989, about 265 cases had been reported. The tibia was involved in about 85 percent of the patients reported by Moon and Mori.

CASE REPORT

The patient was admitted to the hospital in 1959 when she was...