resistant organism (i.e., MDR-TB) apparently led to nosocomial infection with two other drug-resistant organisms (vancomycin-resistant enterococcus and multidrug-resistant Acinetobacter). As one commentator has stated, "multiple resistance . . . is the therapeutic anathema of the present decade."10

ACKNOWLEDGMENTS. We thank Paul Bellman, MD, and José Giron, MD, for providing information on the source-patient.

REFERENCES
5 Centers for Disease Control and Prevention. Management of persons exposed to multidrug resistant tuberculosis. MMWR 1992; 41(RR-11):61-71
10 Levy SB. Confronting multidrug resistance: a role for each of us. JAMA 1993; 269:1840-42

Bronchioalveolar Carcinoma Accompanied by Severe Bronchorrhea*

Noriko Hidaka, MD; and Koichi Nagao, MD

We report an unusual case of bronchioalveolar carcinoma characterized by production of a large quantity of sputum accompanied by drastic electrolyte and fluid loss. The sputum contained a high level of gastrointestinal cancer-associated antigen (CA19-9) and carcinoembryonic antigen (CEA). An immunohistochemical study of tumor cells showed the specific distribution of gastrointestinal cancer-associated antigen and carci-

*From the Department of Internal Medicine (Dr. Hidaka) and the Department of Surgical Pathology (Dr. Nagao), Teikyo University School of Medicine, Ichihara, Japan. Manuscript received September 9, 1995; revision accepted December 6. Reprint requests: Dr. Hidaka, Third Department of Internal Medicine, Teikyo University School of Medicine, 3426-3 Anesaki, Ichihara, Chiba 299-01, Japan

noembryonic stains, which were localized in the apical region of tumor cells. (CHEST 1996; 110:281-82)

Key words: bronchioalveolar carcinoma (BAC); bronchorrhea; carcinoembryonic antigen (CEA); gastrointestinal cancer-associated antigen (CA19-9)

Abbreviations: BAC=bronchioalveolar cell carcinoma; CEA=carcinoembryonic antigen

A striking feature of bronchioalveolar carcinoma (BAC) is the production of large quantities of sputum. Recently, biochemical constituents of the sputum have been studied;1-3 however, few reports are available concerning the levels of tumor markers. We studied the carcinoembryonic antigen (CEA) and the gastrointestinal cancer-associated antigen (CA19-9) levels in the sputum produced by a patient with BAC suffering from severe bronchorrhea. The sputum contained significantly higher levels of these tumor markers than the serum.

CASE REPORT

A 49-year-old woman developed a cough accompanied by clear watery sputum of 300 to 400 mL/d. A chest radiograph showed diffuse lesions in both lungs. At bronchoscopy, a large amount of watery fluid was observed in the bronchus of the lower lobe of the left lung. The diagnosis of BAC was made based on the histologic examination of specimens obtained through transbronchial lung biopsy. All sputum expectorated was collected and measured. The analysis of the sputum revealed that CEA and CA19-9 were present at high levels (CEA, 612.7 ng/mL; CA19-9, 33,057 U/mL). Despite these findings, serum levels of these tumor markers were not significantly elevated (CEA, 0.5 ng/mL [normal range, <5 ng/mL]; CA19-9, 9.15 unit/mL [normal range, <35 unit/mL]). Measurement of electrolytes in the sputum were as follows: sodium, 134 mEq/L; chloride, 116 mEq/L; potassium, 7.4 mEq/L. Corticosteroids, atropine sulfate, and cytotoxic drugs failed to reduce the sputum volume. Several months later, the amount of sputum increased to the maximum of 9 L daily. The patient always had to bend forward to expectorate the sputum. Approximately 10 L fluids were administered daily to restore serum electrolyte levels and water balance. Soon after, her condition deteriorated and she died of severe respiratory failure. The autopsy revealed that the primary site was the lower lobe of the left lung. Both lungs revealed an extensive presence of tumor cells. Microscopic examination showed that the tumor cells were tall and columnar containing periodic acid-Schiff-positive and Alcian blue-negative substances. Immunohistochemical evaluation showed that tumor cells were strongly stained by CEA and CA19-9 antibodies (Fig 1).

DISCUSSION

Production of large amounts of sputum is one of the unique features of BAC.1 This patient produced an extremely large volume of sputum, much greater than in other cases reported.1,3 Because the sputum of the patient contained almost the same concentration of electrolytes as the serum, loss of an

CHEST / 110 / 1 / JULY, 1996 281
enormous amount of water and electrolytes through the lungs occurred. In general, it is speculated that active secretion of tumor cells of BAC growing along the alveolar walls produces the sputum.³

CA 19-9 antigen has been detected in tumor cells of BAC as well as in normal bronchial glands.⁴ One of the characteristic findings of the present case was that the levels of tumor markers in the sputum were significantly higher than those in the serum. The CA19-9 and CEA immunohistochemical staining of tumor cells revealed that the secretory surface stained stronger than the cytoplasm. These findings suggest that the tumor cells produced these tumor markers and secrete them predominantly into the alveolar spaces. BAC cells are known to grow along the alveolar lining without disrupting the underlying basement membrane.⁵ This could partially explain the higher levels of tumor markers in the sputum as opposed to the levels in the serum.

Based on this study and a review of the literature,⁶ BAC cells may in certain cases have a strong tendency to produce CA19-9 and CEA and to secrete them into the sputum. Therefore, the examination of the level of CA 19-9 and CEA in sputum can be useful in suggesting a diagnosis of BAC; however, further investigations are necessary before the clinical implications of these findings become clear.

REFERENCES

Primary Systemic Amyloidosis Complicated by Massive Thrombosis*

Frank J. Cools, MD; Marc M. Kockx, MD, PhD;
Guy E. Boeckxstaens, MD, PhD;
Paul Van den Heuvel, MD; and
Jean-Jacques Cuykens, MD

We present a case of primary systemic amyloidosis complicated by multiple thrombotic events and initially presenting with a massive thrombosis of the inferior vena cava. Widespread infiltration of the vascular tree by amyloid was found at the time of autopsy. In addition, we report successful treatment of the massive inferior vena cava thrombosis with systemic thrombolysis.

CHEST 1996; 110:282-84

Key words: amyloidosis; inferior vena cava; thrombolysis; thrombosis

Abbreviations: APTT=activated partial thromboplastin time

Primary systemic amyloidosis, complicated by multiple thrombotic events, was first evidenced in a patient who had massive thrombosis of the inferior vena cava. Systemic thrombolysis was successfully used to treat the massive thrombosis of the vena cava; however, the patient died of a small-bowel infarction.

CASE REPORT

A 64-year-old white man with a medical history of a normal coronary angiogram 2 years earlier and no other medical problems was admitted to the hospital because of transient episodes of swelling

*From the Department of Internal Medicine (Drs. Cools, Boeckxstaens, and Cuykens), Pathology (Dr. Kockx), and Cardiology (Dr. Van den Heuvel), Middelheim Hospital, Antwerp, Belgium. Manuscript received May 11, 1995; revision accepted December 28.
Reprint requests: Dr. Cuykens, AZ Middelheim (5D), Lindendreef
B-2020 Antwerp, Belgium

Downloaded From: http://journal.publications.chestnet.org/pdfaccess.ashx?url=/data/journals/chest/21734/ on 04/20/2017