A Double Fistula, Broncho-cavitary-cutaneous Communication Caused by Cancer Invasion

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Abstract

Pulmonary infection with cavitation causes severe respiratory symptoms if the cavity has a communication with main bronchus, through which fluid flows out into trachea. In this report a young male with lung cancer invading an adjacent pre-existent fungus cavitary lesion is presented. Cancer invasion led to broncho-cavitary communication and caused massive intrabronchial aspiration. Subsequently, the cancer destroyed the thoracic wall, and a cavitary-cutaneous fistula developed which relieved symptoms as if treated with open drainage.

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Introduction

If pulmonary abscess develops a broncho-cavitary communication, aspiration of the contents of the cavitary lesion causes severe pulmonary distress. We present a case of broncho-cavitary-cutaneous fistula cased by cancer invasion. At first, cancer invasion developed a broncho-cavitary communication (first fistula), and then a cavitary-cutaneous communication (second fistula). This cavitary-cutaneous fistula worked similar to an external drainage procedure which enabled early dehospitalization. To our knowledge, this is the first such case ever reported.

Case Report

A 34-year-old man was diagnosed as large cell lung cancer by transbronchial biopsy in August 1998. The tumor located in the right-main bronchus caused severe airway obstruction and invaded the mediastinum. The patient then received 50 Gy over 5 weeks with cisplatin-based chemotherapy. He demonstrated a good partial response and airway obstruction in the right-main bronchus had almost disappeared. Shortly after the first course of chemotherapy he had a high fever and chest radiograph revealed right upper and middle lobe pneumonia with a cavitation. Encapsulated yeast was proved by sputum culture and diagnosed to be pulmonary cryptococcosis. He was treated with intravenous and transbronchial injection of amphotericin B. He recovered from the fever and the chest radiograph showed a marked decrease of infiltrates but a large cavity remained.

After the first hospitalization, he returned to work. In August 1999, he had chronic back pain and chest radiograph revealed a high fluid level in the cavity (Fig. 1). Contrast-enhanced helical CT scan demonstrated recurrence of the focal tumor invading along the cavity wall. The adjacent thoracic wall and ribs were destroyed. At that time his back pain was successfully controlled by orally administered sustained-release morphine. Then we followed him with close observation. On August 13, 1999, he suffered from a sudden series of severe coughing producing a large amount of serous discharge. A chest X-ray film revealed disappearance of the high air-fluid level in the right upper lobe cavity and CT scan demonstrated a broncho-cavitary fistula. In the discharge there was no yeast, but carcinoma cells were found. So we assumed that the carcinoma invasion developed a broncho-cavitary fistula and led to massive excretion of the contents of the cavity. From that time, every day in the morning, he suffered from aspiration of the fluid accumulated overnight in the cavity but the distress was not so severe that he did not need to be hospitalized. Late in September 1999, the respiratory distress gradually increased and began to lose appetite.

On October 13, 1999 he was hospitalized again, suffering from massive productive cough for a few days. His WBC count was 18,640 cell/µl and SpO₂ was 96%. A chest X-ray film revealed patchy infiltrations in both lung fields suggesting aspiration pneumonia. The patient was given cefazidime and clindamycin. Parenteral nutrition was provided via a central vein catheter. In spite of those treatments massive aspiration continued. Gradually he worsened clinically, and malnutrition went on. An external drainage procedure was considered, but we were not certain of the effect and afraid of complications.

On November 9, 1999, when he sat still on the bed, he felt a sudden flow of liquid pouring down along the chest wall with...
Case of Fistula Served as External Drainage

Figure 1. Chest radiograph showing a large cavity with a high fluid level and destroyed ribs.

Figure 2. A hole, cavitary-cutaneous fistula on the chest wall.

Figure 3. CT chest scan revealing a cavitary-cutaneous fistula.

a series of cough. Soon, he became able to breathe easily. On the chest wall, we found a small hole, cavitary-cutaneous fistula (Fig. 2), which CT scan demonstrated clearly (Fig. 3). Slightly bloody serous discharge leaked every time he had a weak cough. Since then the aspiration of the contents of the cavity decreased. He was greatly relieved from respiratory distress. His oral intake increased and he was able to be discharged from hospital on November 26, 1999 with a chest radiograph revealing improvement of infiltrations. On December 22, 4 weeks after discharge, he died of a sudden massive intrabronchial bleeding at home. We assume that the tumor invasion destroyed the great vessels, leading to his death.

Discussion

Aspiration of the contents of a cavitary lesion through the communication between the cavity and bronchus could occur in various conditions. This miserable situation could be fatal. A near death caused by massive intrabronchial aspiration of contents of pulmonary abscess after fiberoptic bronchoscopy was reported (1). In the present case the first massive aspiration caused by the broncho-cavitary fistula formation could have been fatal. He survived and it was certain that his young and intact gag-and-cough reflex played a significant role.

After this he suffered from continual intrabronchial aspiration. This is sometimes treated with external drainage procedures (2), internal closure (3) or transbronchial catheterization (4). Internal closure was not suitable for this case because the lesion was composed of progressing cancer. If we choose transbronchial catheterization, the catheter should be left night and day because he aspirated continually. Since the cavity was very close to the chest wall, percutaneous drainage was more successful and less stressful for him than transbronchial catheterization. However, we considered that the predicted effect of external drainage was not certain, because it would be difficult to find the exact location of the fluid, which varied depending on the patient’s posture and internal structure of the cavity. Further, uncontrollable bleeding and enlarging of the hole caused by a chest draining tube, possibly leading to the collapse of the lung due to a decrease of intrathoracic negative pressure, were speculated.

After the second fistula, cavitary-cutaneous communication opened and his respiratory distress was released. Neither bleed-
ing nor collapse of the lung happened. The hole maintained a size of about 5 mm in diameter and served as an external drainage much more effectively than a chest tube. It was easy for him to get rid of discharge in the cavity through the fistula by postural drainage lying prone with coughing. Every time he breathed, the air went in and out vigorously through the fistula pushing discharge out. Especially when he made a series of coughs on purpose, he could eliminate the fluid almost completely. So in a similar case with aspiration from a cavity, we consider that a small incision would work well as long as a cough would achieve a good pressure to push discharge out. Even if the fistula (incision) becomes too large to maintain negative intrathoracic pressure, it can be restored to some extent by attaching a piece of a sheet with a suitable hole for drainage on the chest wall over the defect of the skin.

In summary, we reported a case of massive intrabronchial aspiration caused by broncho-cavitary fistula. Cancer invasion cased the second fistula, a cavitary-cutaneous fistula, to develop which relieved his respiratory distress. To our knowledge, this is the only reported case of broncho-cavitary-cutaneous fistula.

References