Abstract: We report herein the case of a woman with bronchopleural fistulas treated with the endobronchial placement of vascular embolization coils. She was referred to our hospital to undergo lavage of a postoperative empyema. She had undergone an air plombage operation for pulmonary tuberculosis 9 years previously. However, bronchopleural fistulas occurred postoperatively and she had to continue the use of a chest drainage tube since then. Lavage of her empyema space with 5 kE of OK-432 (Picibanil: Chugai) plus 100 mg minocycline was performed once every 2 weeks for 3 months, and the purulent discharge from the empyema remarkably decreased. Thereafter, the bronchopleural fistulas were occluded endobronchially by the placement of vascular embolization coils. Soon after the procedure, air leakage from the fistulas was stopped and the drainage tube was removed 2 days later. The patient remains well without any additional treatment at 20 months after this treatment. As treatment for empyema with bronchopleural fistulas, it would be worth trying to lavage the empyema space with OK-432 until it is cleaned out and to plug the fistulas by the endobronchial placement of embolization coils, before such radical operations as thoracoplasty and space-filling of the empyema are considered.

Key Words: bronchopleural fistula, empyema, vascular embolization coil, OK-432

Introduction

A spontaneous cure for empyema with bronchopleural fistulas is rarely possible. As a result, surgical treatment is considered to be indispensable for achieving a complete cure in such cases. Interventional radiology (IVR) has recently made great advances and in some cases, surgical techniques have even been replaced by this new field.

We report herein on a postoperative empyema patient who was treated by lavaging with OK-432 and the endobronchial placement of vascular embolization coils without any surgical intervention. Details of this technique and the course of this case are also discussed.

Case Report

A 63-year-old woman presented at our hospital in May 1995 with a 9-year history of lavaging for her postoperative empyema space by means of a 16 French drain inserted in her thorax. She was diagnosed to have pulmonary tuberculosis on a healthy examination at 15 years of age and underwent an operation for artificial pneumothorax 2 years later. Thirty-four years later, at the age of 51, she started to complain of fever and hemoptysis and was treated with tuberculostats. In 1986, she underwent air plombage treatment for a cavernous lesion of the right upper lobe. After this operation, however, bronchopleural fistulas occurred soon after the treatment. She thereafter suffered from uncontrollable empyema, which had been lavaged twice a month with a saline solution containing 100 mg minocycline. She also had to change the gauze spoiled by the discharge from the empyema twice a day. When she was referred to our hospital, she complained of continual low-grade fevers and also had a thoracocutaneous fistula from which purulent fluid discharged with air leakage. Her chest X-ray film showed an empyema space occupying one-third of the right thorax (Fig. 1). A computed tomography scan revealed a destroyed upper lobe in her right lung, but it did not suggest a fistula (Fig. 2). A bacteriological examination did not show any bacteria in the purulent discharge from the empyema. Our
first treatment was to lavage her empyema in the same manner. However, the purulent discharge and air leakage from the fistula continued. As a new trial, we added 5 kE of OK-432 to the irrigating solution to cause local tissue inflammation in the empyema space with the intention of closing the fistula. At first the purulent discharge from the empyema space temporarily increased, but it then remarkably decreased within 30 days after the addition of OK-432 despite the persistent air leakage. Three months later the fever disappeared. On June 12, 1996, an attempt to close bronchopleural fistulas was performed. Under general anesthesia, an angiography catheter was inserted through the Mini-Track (Portex, Kent, UK) and then was pushed through to the cervical trachea. Bronchography with Omnipaque 300 (Daiichi, Tokyo, Japan) was then performed to search for bronchopleural fistulas. Two bronchopleural fistulas in the upper lobe identified by the bronchography were plugged by placing endobronchially 3-mm vascular embolization coils (Gianturco 0.035-4-3) which had been soaked in Lipiodol (Kodama, Tokyo, Japan) (Fig. 3). It took 1.5 h to finish the entire procedure. Soon after the treatment, the air leakage from the empyema stopped and the drainage tube could thus be removed 2 days later. The patient remained hospitalized for 4 days, and was able to take a bath for the first time in 10 years. On July 25th, she expectorated a coil, but a chest X-ray taken in July 1997 demonstrated no fluid retention in the empyema space (Fig. 4). She had no symptoms, and there was no recurrence of the fistula at the 20-month follow-up.

Discussion

Since the omentum has both bacteriocidal and volume effects, filling an empyema cavity with an omental pedicle flap has been frequently used in the past to cure empyema. The procedure was successful in 82% of the patients who had empyema with bronchial fistulas.