

Large aspergilloma cavity treated by Cavernostomy and omental, muscle flaps - A case report -

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=Abstract=

공동절개술과 유경성 대망이식술 및 근육 충진술을 이용한 거대 폐공동(폐국균증)의 치험 1례

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Pulmonary aspergilloma is potentially a life threatening disease resulting from the colonization of lung cavities by *Aspergillus fumigatus*.

A case is reported: a 43-year-old man with symptomatic cavitary aspergilloma presenting with severe productive coughing, hemoptysis, occasional fever, and chilling. On preoperative plain chest radiograph and CT scan, we could find a rounded irregular opacity in a large pulmonary cavity. He received 2 separate operations for therapeutic need. At the first operation, we performed cavernostomy and thoracoplasty because of severe pleural adhesions, tearing of cavity wall, and high risk of respiratory insufficiency. At the second operation, we performed myoplasty and omentoplasty for closure of remaining air space and complete wrapping of the BPF site.

All symptoms of dyspnea and hemoptysis have since resolved.

We believed that in the high risk patients who have severe respiratory symptoms, such as in aspergilloma and open cavity with a risk of respiratory insufficiency, cavernostomy followed by myoplasty or omentoplasty should be recommended.

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Key words : 1. Aspergillosis, lung
2. Omentoplasty
3. Surgical flap

CASE Presentation

A 43 year-old male presented to our hospital with severe productive cough aggravated during the recent 3 months, hemoptysis, occasional fever, and chilling.

He had marked kyphoscoliosis because of ankylosing spondylitis which developed 22 years ago by trauma during his work for military services. 17 years ago, he had antituberculous medication at the tuberculosis sanatorium for 1 year even though its activity remained unclear.

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Fig. 1. Chest X-ray showing hyperinflation, streaky infiltration of right lung and large cavity with mycetoma and atelectasis of left lung.

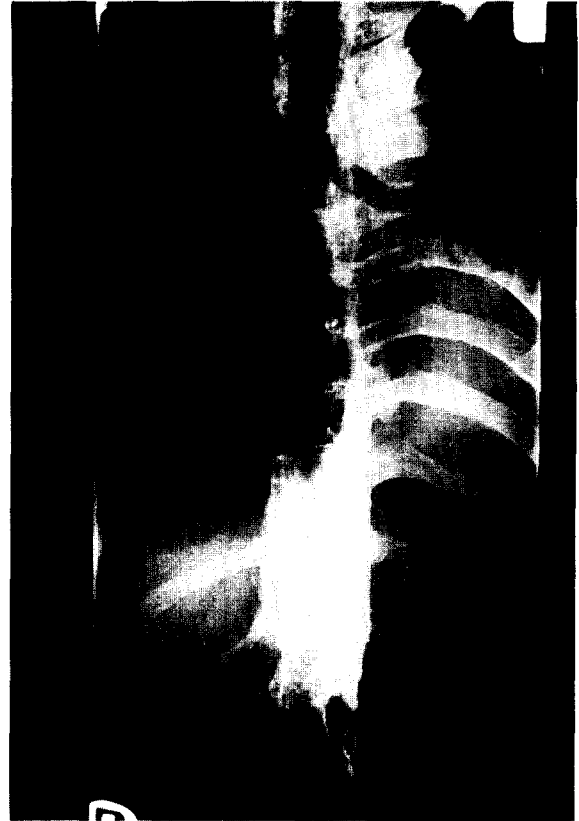


Fig. 2. Chest tomogram showing bronchial communication to cavity and air bronchogram of left lung and ankylosing spondylitis

On physical examination, he showed chronic ill appearance and marked emaciation, weighing only 41kg. he had pale conjunctiva and deformed trunk due to kyphoscoliosis.

Clear breathing sounds were appreciated on right lung field and bronchial breathing sounds and crackles in the left hemithorax.

Sputum culture were positive for *Staphylococcus epidermidis* and *Acinetobacter calcoaceticus* but AFB smear was negative. fungal hyphae were not checked.

The chest X-ray and tomogram on admission are shown in Fig. 1., Fig. 2. Pulmonary function test showed moderate restrictive dysfunction. Electrocardiogram and echocardiogram showed right bundle branch block and moderated left ventricular dysfunction. Two large bronchial communications were confirmed on bronchoscopy. There was also a large amount of yellowish green colored secretion extracted out from the cavity.

The first operation was performed at Aug. 9, 1993. Though left pleuropneumonectomy was planned initially, it seemed to be dangerous and even impossible because the intercostal space was so narrow that complete chest wall spreading could not be done. Besides the cavity wall was so

thin and pleural thickening was so severe that if pleuro-pneumonectomy had been performed, tearing might occurred at several points which may result in postpneumonectomy empyema. tailoring thoracoplasty was done with resection from the left second rib to the 5th rib. complete collapse of the cavity could not be obtained because of additional large size and deep convexity of the cavity. so standard postero-lateral thocotomy incision was made for myoplasty. serratus anterior muscle and latissimus dorsi muscle was used to fill and occlude the cavity and bronchial communication.

Thoracic catheter covered with sump drain was left in the cavity and penrose drain in the site of the myoplasty.

Patient's symptoms slightly improved after the first operation. Cavity space was still remained although it became smaller and collapsed. there was continuing air leakage from the tube drain.(Fig.3.)

The second operation was done on Sept. 6, 1993 about 1 month after the first operation.

Pedicled omental flap was used to repair the defect. The



Fig. 3. First postop. chest X-ray showing remained cavity space.

blood supply of the omentum was based on the right gastroepiploic arteries and veins. The omental flap was brought the defect site through anterior epigastric subcutaneous route.

Nearly complete obliteration of cavitory space could be possible with pedicled omental flap and segmental resection of the 6th rib.

Omental blood flow was excellent confirmed by doppler ultrasound. postoperative course was much smoother than the previous operation until two times of hemoptysis developed. Hemoptysis, probably due to erosion of an omental vessel, was controlled with external compression of the pedicle artery in the skin(Fig. 4).

There was reduced but sustained air leakage from the tube drain. one month later, he could be discharged from the hospital with the chest tube kept open. Chest X-ray showed only small apical air space over the left lung field(Fig. 5) productive cough was reduced allowing the patient to sleep more comfortably.

On Feb. 14, 1994 removal of the drain was done unevenly during his third admission.

On Aug. 9, 1994 he visited our OPD for follow up. Chest X-ray film showed complete obliteration of the apical space (Fig. 6, Fig. 7). His intractable ongoing productive coughing had completely disappeared. he had no dyspnea, compared with the

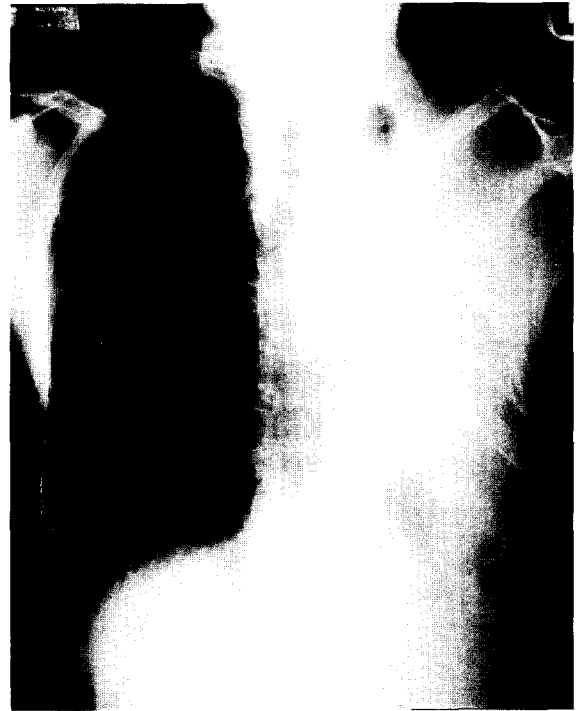


Fig. 4. Second postop. chest X-ray showing much reduced space size.

preoperative state, and was doing well.

Comment

There are many ways to treat cavitory lung disease. Recently medical antibiotic treatment is the main stay of treatment. Historically much surgical treatment was attempted such as thoracoplasty and cavernostomy on cavitory pulmonary tuberculosis. Monaldi cavernostomy in lung abscess, has been known to be as effective.

Nowdays these operative methods are used in specific conditions. Lung resection is the most prevalent and effective surgical method, but has untoward effects such as spread of disease and brochopleural fistulas.

Relatively large surgical trauma and respiratory insufficiency can be a burden to the chronic debilitated patient through this method.

Even though there is only amount of cavitory lung disease, a medically and surgically intractable condition can result. Pulmonary fungal disease may be one of them. pleuropneumonia, particularly the intracavitory type, is a potentially life-threatening disease because it can cause sudden and massive hemoptysis.¹⁻³⁾

Garvey and associates⁴⁾ reported that the extent of resection of intrapulmonary aspergilloma should depend on the severity of the underlying lung pathology as well as the aspergilloma itself.



Fig. 5. Eight months after second operation, chest X-ray showing still remained cavity space.



Fig. 6. Two years after second operation, chest X-ray showing complete obliteration of left upper cavity.



Fig. 7. MRI of chest showing complete filling with omental and muscle flap in cavity lung.

Shirakusa and associated⁵⁾ believed that because of the saphrophytic character of the organism, it was desirable to limit the resection as much as possible so as not to decrease lung function; also because the organism could invade the surrounding lung parenchyma, a segmental or wedge resection could sometimes be dangerous.

In the patient with cavitary aspergilloma who has insufficient pulmonary reserve for resection, cavernostomy has been proposed and used.^{5,6)}

Shirakusa and associates⁵⁾ used muscle and omental flap plombage after cavernostomy with daily gauze dressings and instillation of amphotericin B for 3 to 6 months prior to the flap procedure.

The patients presented above has a very particular condition, medically intractable fungal lung disease, respiratory insufficiency and risk of operative contamination of planned monectomy space. He also had technical difficulty during resection due to severe hilar adhesion and severe symptoms.

There are many needed complicated steps and specific techniques to obliterate the empyema sac and bronchopleural fistula; such as, the thoracostomy, open drainage, medical antibiotic treatment, local wound cleansing, free or pedicled muscle flap technique, bronchial stump dissection, and bronchial stump reinforcement with omental and muscle flaps.

We think that surgical trauma was not so severe and drainage in the empyema sac near the bronchial stump site usually did not cause erosion of tissue and feeding vessel of the transplanted flaps. On contrary, even more complicated problems can be faced during obliteration of open cavity lung.

The first problems we should consider are cavitory wall incision and the difficulty of local cleansing of the inner cavitory wall before or during the operation except for specific condition such as epithelialized healed cavities.

The second important problem is hemoptysis due to erosion of omental flap vessels that seems to occur seldom in muscle flaps. we have experienced 17 cases of omental flaps for the obliteration of empyema sac with bronchopleural fistula, and obliteration of cavitory lung or wrapping of anastomosis site. 2 of them had hemoptysis postoperatively and died of asphyxia due to erosion of omental vessel.

The last problem is drainage of the cavitory lesion filled with the omental flap. Compared to the empyema cavity, the intrapulmonary cavity wall is usually so thin that erosion of tissue or pulmonary vessels can occur.

We believe that in patients who have severe respiratory symptoms, such as in aspergilloma and open cavities which are large enough to fill 2/3 of the lung with moderate respiratory insufficiency and chronic debilitation, cavernostomy followed by a muscle flap or omental flap should be recommended. Because it is a relatively minor procedure with low morbidity and post-

perative pulmonary function may remain unchanged compared to the preoperative condition.

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=국문초록=

43세 남자 환자가 기침, 각혈 등의 심한 호흡기 증상을 주소로 내원하였다. 술전 단순 흉부 X-선 촬영과 단층 촬영에서 좌폐의 2/3를 차지하는 공동과 균종(mycetoma)을 발견할 수 있었다.

첫 수술에서 공동벽의 심한 유착과 박리증의 공동벽 파열, 술전 환자의 호흡 기능을 감안하여 공동 절개술(cavernostomy)과 흉곽 성형술(thoracoplasty)을 시행하였고 잔존하는 공간과 기관지 늑막류의 완전한 폐쇄를 흉벽 근육성형술(myoplasty)와 대망 충진술(omentoplasty)를 2차로 시행하여 추적 관찰중 좋은 결과를 보였다.

본 증례로 저자들은 심한 호흡 증상으로 전신 상태가 양호하지 못하고 만성쇠약에 빠진 좌폐의 2/3이상 차지 할 만큼 큰 공동을 가진 폐국균증의 경우 대망이나 근육을 이용한 공동 절개술(cavernostomy)를 충분히 고려해 볼만한 수술적 방법임을 알게 되었다.