นิพนธ์ต้นฉบับ

Native lung infection after single lung transplantation

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Objective : *To study the incidence and outcome of native lung infection single lung transplantation for nonseptic lung disease.*

Design : *Retrospective study.*

Setting : *Cardiothoracic surgical unit, Department of Surgery, Faculty of Medicine, Chulalongkorn University.*

Subjects : *Five end-stage, non-septic lung disease patients who underwent single lung tranplantation in our unit.*

Main outcome : *Incidence of infection of native lungs and outcome.*

Results : *Two patients developed bacterial infection of their native lung. One patient had fungal infection of a native lung. All died at 3, 8 and 4 months post-transplantation.*

Conclusion : *Even in nonseptic lung disease, native lung infection is common after lung transplantation in our unit. It is fatal in most patients. Either pneumonectomy of the native lung or bilateral lung tranplantation is recommended to improve the long-term outcome of lung tranplantation.*

Key words : *Single lung transplantation, Native lung infection.*

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วัตถุประสงค์ : *เพื่อศึกษาถึงอุบัติการและผลของการติดเชื้อของปอดเดิมในผู้ป่วยเปลี่ยนปอดข้างเดียว*

รูปแบบการวิจัย : *การศึกษาแบบถอยหลัง*

สถานที่ : *หน่วยศัลยศาสตร์ทรวงอก ภาควิชาศัลยศาสตร์ คณะแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย*

ผู้เข้าร่วมการศึกษา : *ผู้ป่วย 5 ราย ได้รับการผ่าตัดเปลี่ยนปอดข้างเดียว เนื่องจากเป็นโรคปอดระยะสุดท้าย*

การวัดผล : *การติดเชื้อของปอดเดิมและผลที่ตามมา*

ผลการศึกษา : *ผู้ป่วย 3 ราย มีการติดเชื้อของปอดเดิม 2 ราย เกิดจากเชื้อบักเตรี 1 ราย เกิดจากเชื้อราทั้ง 3 ราย เสียชีวิตที่ 3,8 และ 4 เดือน หลังการเปลี่ยนปอด*

วิจารณ์และสรุป : *ผู้ป่วยโรคปอดชนิดไม่ติดเชื้อระยะสุดท้ายที่ได้รับการผ่าตัดเปลี่ยนปอดข้างเดียวมีโอกาสติดเชื้อปอดเดิมมาก ซึ่งมีอัตราตายสูงมาก แนะนำให้ตัดปอดเดิมออก หรือเปลี่ยนปอด 2 ข้าง เพื่อแก้ปัญหาการติดเชื้อของปอดเดิม*

Since the first single lung transplant was performed by the Toronto Lung Transplant Group in 1983 for pulmonary fibrosis, the indications for single lung transplantation has broadened to cover other diseases such as emphysema[1] and pulmonary hypertension both primary and secondary.[2,3] But for septic lung diseases such as bronchiectasis, tuberculosis and cystic fibrosis, bilateral lung transplantation is a more suitable operation.[4] However, even in non-septic lung disease, infection of the contralateral lung is a common complication which may lead to morbidity and mortality of the recipients.[5] We reviewed our experiences in single lung transplantation at Chulalongkorn Hospital with emphasis on the problem of infection of the native, non-transplanted lung.

Material and method

Single lung transplantation was begun in our unit in October 1992, and there have been five cases. The indications were parenchymal lung disease or destroyed lung secondary to tuberculosis. There are several criteria for lung donation. The most important inclusive criteria are satisfactory arterial blood gases and a normal chest X-ray. We used modified Euro Collins solution with intravenous prostaglandin E-1 for lung preservation. Our technique of bronchial anastomoses followed the method reported by the San Antonios group, ie, the telescopic technique.[6] Immunosuppression includes cyclosporin A, azathioprine and steroid in low doses and starts from the beginning. Antithymocyte globulin is not used for fear of postoperative pneumonia. Cytomegalovirus prophylaxis is not used here. Flexible fiberoptic bronchoscopy with transbronchial biopsy is the standard method to rule out acute pulmonary rejection. It is routinely done even if the patient is asymptomatic.

Results

Information about the lung recipients is shown in Table 1

The time and incidence of postoperative lung infection is shown in Table 2.

Table 1.

Age	Sex	Underlying	Disease Side of Transplantation
62	male	emphysema	right
19	female	TB	corpulmonale left
40	female	rhematoid arthritis pulmonary fibrosis	right upper and middle lobes
35	male	emphysema	right
62	male	pneumoconiosis	right

Table 2.

Patient	Time of Native Lung Infection	Microorganism	Outcome	Cause of death
1	102 days	pneumococcus	expired	sepsis, resp failure
2	no infection	———— —	alive	
3	8 months	mixed bacteri	expired	sepsis
4	18 days	gram negative	expired	sepsis
5	4 months	aspergillus lung abscess	expired	unable to wean from ventilator

In our series, there were no complications related to bronchial anastomotic healing, or vascular suture line problems such as stenosis or thrombosis. Even ganciclovir prophylaxis was not given in single lung transplantation. There was no cytomegalovirus infection in our recipients. Except in patient 2, there was no history of lung infection before the lung transplant. In the second patient, we decided to do a single rather than a bilateral lung transplant due to the recipients body size which was much smaller than the donors body size. Antituberculous drugs, such as isoniazid and ethambutol, were given in the post-transplantation period, even if a complete course was given prior to transplantation. There was no infection in the transplanted lung, infection occurred only in native lungs.

Discussion

Single lung transplantation is now an accepted form of treatment for certain end-stage parenchymal lung disease.[7] Both pulmonary fibrosis and emphysema are the most common indications. For infective lung diseases such as bronchiectasis, cystic fibrosis or pulmonary tuberculosis, double or bilateral lung transplants are reccommended. In Thailand, especially in Bangkok where the at mospheric environment is heavily contaminated, the risk of infection of either the transplanted or the native lung is expected to be high, and this was confirmed in our series. It is interesting that infection does not occur in the transplanted side. However in patients with a diseased lung, bacterial colonization is quite common.[8] Even overt infection of the lung is uncommon in healthy, normal individuals, but in an immunocompromised host progression to severe infection of the native lung can occur. This is usually associated with high mortality despite proper antibiotic treatment. We think that a double or bilateral lung transplant should regularly be considered even in non-infective lung disease when lung transplantation is indicated. All of the diseased lungs are totally removed in this procedure so that the problem of infection of the native lung is eliminated. The disadvantages asso-

ciated with bilateral lung transplant are longer is chemic time of the second lung and more extensive operation. Another option is single lung transplant and contralateral pneumonectomy.[9] The disadvantage of this approach is the possibility of bronchopleural fistuba of the bronchial stump and postpneumonectomy empyema. However, if there is severe acute lung rejection, the situation is easier to handle if the contralateral native lung is not removed. In conclusion, from our small series of single lung transplants the most common cause of death was infection of the contralateral native lung. The etiology was bacterial or fungus. Removal of the contralateral lung, with or without lung transplantation, may be an answer. Otherwise, complications after single lung transplantation are not common.

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