

11-1-1996

## Native lung infection after single lung transplantation

Kittichai Luengtaviboon

Visith Udompanich

Pongspeera Suwannakul

Muthana Hamvanich

Follow this and additional works at: <https://digital.car.chula.ac.th/clmjjournal>



Part of the [Medicine and Health Sciences Commons](#)

---

### Recommended Citation

Luengtaviboon, Kittichai; Udompanich, Visith; Suwannakul, Pongspeera; and Hamvanich, Muthana (1996) "Native lung infection after single lung transplantation," *Chulalongkorn Medical Journal*: Vol. 40: Iss. 11, Article 5.

Available at: <https://digital.car.chula.ac.th/clmjjournal/vol40/iss11/5>

This Article is brought to you for free and open access by the Chulalongkorn Journal Online (CUJO) at Chula Digital Collections. It has been accepted for inclusion in Chulalongkorn Medical Journal by an authorized editor of Chula Digital Collections. For more information, please contact [ChulaDC@car.chula.ac.th](mailto:ChulaDC@car.chula.ac.th).

## Native lung infection after single lung transplantation

Kittichai Luengtaviboon\* Visith Udompanich\*\*

Pongspeera Suwannakul\*\*\* Muthana Harnvanich\*\*

Luengtaviboon K, Udompanich V, Suwannakul P, Harnvanich M. Native lung infection after single lung transplantation. *Chula Med J* 1996 Nov;40(11): 915-9

**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 transplantation 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 transplantation is recommended to improve the long-term outcome of lung transplantation.*

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

Reprint request : Luengtaviboon K, Department of Surgery, Faculty of Medicine, Chulalongkorn University, Bangkok 10330, Thailand.

Received for publication. October 10, 1996.

\*Department of Surgery, Faculty of Medicine, Chulalongkorn University.

\*\*Department of Internal Medicine, Faculty of Medicine, Chulalongkorn University.

\*\*\*Department of Pathology, Faculty of Medicine, Chulalongkorn University.

กิตติชัย เหลืองทวีบุญ, วิศิษฐ์ อุดมพานิชย์, พงษ์พีระ สุวรรณกุล, มัทนา หาญวนิชย์.  
การติดเชื้อของปอดเดิมภายหลังการผ่าตัดเปลี่ยนปอดข้างเดียว. จุฬาลงกรณ์เวชสาร 2539  
พ.ย; 40(11): 915-9

- วัตถุประสงค์** : เพื่อศึกษาถึงอุบัติการณ์และผลของการติดเชื้อของปอดเดิมในผู้ป่วยเปลี่ยน  
ปอดข้างเดียว
- รูปแบบการวิจัย** : การศึกษาแบบถอยหลัง
- สถานที่** : หน่วยศัลยศาสตร์ทรวงอก ภาควิชาศัลยศาสตร์ คณะแพทยศาสตร์  
จุฬาลงกรณ์มหาวิทยาลัย
- ผู้เข้าร่วมการศึกษา** : ผู้ป่วย 5 ราย ได้รับการผ่าตัดเปลี่ยนปอดข้างเดียว เนื่องจากเป็นโรคปอด  
ระยะสุดท้าย
- การวัดผล** : การติดเชื้อของปอดเดิมและผลที่ตามมา
- ผลการศึกษา** : ผู้ป่วย 3 ราย มีการติดเชื้อของปอดเดิม 2 ราย เกิดจากเชื้อแบคทีเรีย 1 ราย  
เกิดจากเชื้อราทั้ง 3 ราย เสียชีวิตที่ 3,8 และ 4 เดือน หลังการเปลี่ยนปอด
- วิจารณ์และสรุป** : ผู้ป่วยโรคปอดชนิดไม่ติดเชื้อระยะสุดท้ายที่ได้รับการผ่าตัดเปลี่ยนปอด  
ข้างเดียวมีโอกาสติดเชื้อปอดเดิมมาก ซึ่งมีอัตราตายสูงมาก แนะนำให้  
ตัดปอดเดิมออก หรือเปลี่ยนปอด 2 ข้าง เพื่อแก้ปัญหาการติดเชื้อของ  
ปอดเดิม

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<sup>(1)</sup> and pulmonary hypertension both primary and secondary.<sup>(2,3)</sup> But for septic lung diseases such as bronchiectasis, tuberculosis and cystic fibrosis, bilateral lung transplantation is a more suitable operation.<sup>(4)</sup> 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.<sup>(5)</sup> 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.<sup>(6)</sup> 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	rheumatoid 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.<sup>(7)</sup> 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 recommended. In Thailand, especially in Bangkok where the atmospheric 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.<sup>(8)</sup> 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 ischemic time of the second lung and more extensive operation. Another option is single lung transplant and contralateral pneumonectomy.<sup>(9)</sup> The disadvantage of this approach is the possibility of bronchopleural fistula 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.

## References

1. Brunsting LA, Lupinetti FM, Cascade PN, Becker FS, Daly BD, Marinez FJ, Lynch JP, Whyte RI, Bave EL, Bolling SF. Pulmonary function in single lung transplantation of chronic obstructive pulmonary disease. *J Thorac Cardiovasc Surg* 1994 May;107(5):1337-44
2. Kramer MR, Valentine HA, Marshall SE, Starnes VA, Theodore J. Recovery of right ventricle after single-lung transplantation in pulmonary hypertension. *Am J Cardiol* 1994 Mar 1;73(7):494-500
3. Lupinetti FM, Bolling SF, Bave EL, Brunsting LA 3<sup>rd</sup>, Crawley DC, Lynch JP, Orringer MB, Whyte RI, Deeb GM. Selective lung or heart lung transplantation for pulmonary hypertension associated with congenital cardiac anomalies. *Ann Thorac Surg* 1994 Jun;57(6):1545-9
4. Flume PA, Egan TM, Paradowski LJ, Detterbeck FC, Thompson JT, Yakaskas JR. Infectious complications of lung transplantation. Impact of cystic fibrosis. *Am J Respir Crit Care Med* 1994 Jun; 140(6): 1601-7
5. Horvath J, Dummer S, Loyd J, Walker B, Merrill WH, Frist WH. Infection in the transplanted and native lung after single lung transplantation. *Chest* 1993 Sep;104(3) 681-5
6. Calhoun JH, Grover FL, Gibbons WJ, Bryan CL, Levine SM, Bailey SR, Nichols L, Lum C, Trinkle JK. Single lung transplantation. Alternative indications and technique. *J Thorac Cardiovasc Surg* 1991 May;101(5): 816-24
7. Cooper JD, Patterson GA, Trulock EP Results of single and bilateral lung transplantation in 131 consecutive recipients, Washington University Lung Transplant Group. *J Thorac Cardiovasc Surg* 1994 Feb;107(2): 460-70
8. Colquhoun IW, Gascoigne AD, Gould K, Corris PA, Dark JH. Native pulmonary sepsis after single-lung transplantation. *Transplantation* 1991 Nov;52(5): 931-3
9. Forty J, Hasan A, Gould FK, Corris PA, Dark JH. Single lung transplantation with simultaneous contralateral pneumonectomy for cystic fibrosis. *J Heart Lung Transplant* 1994 Jul-Aug;13(4): 727-30