

# Living Donor Single Lobe Lung Transplantation for Bronchiolitis Obliterans in 4 Years Old Child

Takeshi SHIRAIISHI<sup>1)</sup>, Masafumi HIRATSUKA<sup>1)</sup>, Mitsuteru MUNAKATA<sup>1)</sup>,  
Takao HIGUCHI<sup>1)</sup>, Jun YANAGISAWA<sup>1)</sup>, Satoshi MAKIHATA<sup>1)</sup>,  
Yasuteru YOSHINAGA<sup>1)</sup>, Satoshi YAMAMOTO<sup>1)</sup>, Akinori IWASAKI<sup>1)</sup>,  
Youichiro OKA<sup>1)</sup>, Koushi ASABE<sup>1)</sup>, Yasushi YAMAUCHI<sup>2)</sup>,  
Kouji MIKAMI<sup>2)</sup>, Tomoaki NORITOMI<sup>2)</sup>, Yuichi YAMASHITA<sup>2)</sup>,  
Katsunobu KAWAHARA<sup>3)</sup>, Kan OKABAYASHI<sup>4)</sup>, Ichiro YOSHINO<sup>5)</sup>,  
Aiko SUMINOE<sup>6)</sup>, Takashige KURAKI<sup>7)</sup>, Kentaro WATANABE<sup>7)</sup>,  
Yukako YOSHIKANE<sup>8)</sup>, Yuko TOMONOU<sup>8)</sup>, Shin-ichi HIROSE<sup>8)</sup>,  
Hideto SAKOU<sup>9)</sup>, Hiroaki NISHIKAWA<sup>9)</sup>, Keijiro SAKU<sup>9)</sup>,  
Yasushi TAKAMATSU<sup>10)</sup>, Kazuo TAMURA<sup>10)</sup>, Masanobu YASUMOTO<sup>11)</sup>,  
Takamitsu HAMADA<sup>11)</sup>, Shigenori IWAKIRI<sup>11)</sup>, Kazuo HIGA<sup>11)</sup>,  
Kouji OGOMORI<sup>12)</sup>, Eita TONAI<sup>12)</sup>, Ryouji NISHIMURA<sup>12)</sup>,  
Mami SAKAMOTO<sup>13)</sup>, Hisako TERADA<sup>13)</sup>, Noritsugu MORISHIGE<sup>14)</sup>,  
Hidehiko IWAHASHI<sup>14)</sup>, Tadashi TASHIRO<sup>14)</sup>, Hiroshi YASUNAGA<sup>15)</sup>,  
Masaki KUBOTA<sup>16)</sup>, Takao IWASAKI<sup>16)</sup>, Kazuki NABESHIMA<sup>17)</sup>,  
Manami TAKAISHI<sup>18)</sup> and Takayuki SHIRAKUSA<sup>1)</sup>

<sup>1)</sup> Lung Transplantation Service at the Department of Thoracic, Endocrine and Pediatric Surgery, Fukuoka University Hospital, Fukuoka, Japan

<sup>2)</sup> Department of Gastroenterological Surgery, Fukuoka University Hospital

<sup>3)</sup> Department of Surgery, Oita University Hospital, Oita, Japan

<sup>4)</sup> National Fukuoka-Higashi Medical Center, Koga-city, Fukuoka, Japan

<sup>5)</sup> Department of Surgery and Science, Graduate School of Medical Science, Kyushu University, Fukuoka, Japan

<sup>6)</sup> Department of Pediatrics, Graduate School of Medical Science, Kyushu University, Fukuoka, Japan

<sup>7)</sup> Department of Respiratory Medicine, Fukuoka University Hospital

<sup>8)</sup> Department of Pediatrics, Fukuoka University Hospital

<sup>9)</sup> Department of Cardiology, Fukuoka University Hospital

<sup>10)</sup> 1st Department of Internal Medicine, Fukuoka University Hospital

<sup>11)</sup> Department of Anesthesiology, Fukuoka University Hospital

<sup>12)</sup> Department of Psychiatry, Fukuoka University Hospital

<sup>13)</sup> Fukuoka University Hospital Nursing Service

<sup>14)</sup> Department of Cardiovascular Surgery, Fukuoka University Hospital

<sup>15)</sup> Department of Cardiovascular Surgery, Saint Mary Hospital, Kurume city, Fukuoka, Japan

<sup>16)</sup> Department of Rehabilitation, Fukuoka University Hospital

<sup>17)</sup> Department of Pathology, Fukuoka University Hospital

<sup>18)</sup> Transplant Co-ordinator, Fukuoka University Hospital

**Abstract :** A left lower lobe lung transplantation from a living related donor was performed for a 4 y 11 m old boy with bronchiolitis obliterans. The patient received peripheral blood stem cell transplantation (PBST) from an HLA 2 mismatched donor (mother) for his juvenile myelomonocytic leukemia at 1 y 3 m of age. He developed bronchiolitis obliterans as a complication around 100 days after PBST and his respiratory condition progressively deteriorated thereafter. Finally, mechanical ventilation had to be instituted because of the onset of CO<sub>2</sub> narcosis with an increased PaCO<sub>2</sub> level of up to 200 mmHg. Three weeks after mechanical ventilation was started, the patient was transferred to Fukuoka University Hospital to prepare for the possibility of undergoing a living-donor lung transplantation. The height and weight were 98

cm and 13 kg for the recipient and 159 cm and 58 kg for the donor. Transplantation was successfully performed under a partial cardiopulmonary bypass by means of a “clam-shell” bilateral thoraco-sternotomy. The patient was successfully weaned from the ventilator 10 days after surgery. A 3 dimensional CT scan taken on day 44 after transplantation indicated the lung graft volume to be 427 ml in comparison to 906 ml before transplantation. This finding may suggest that an oversized lung graft can work adequately in spite of severe compression resulting in the graft size being compressed to only 47% of its original size. The patient recovered uneventfully and returned home on his 53<sup>rd</sup> day after transplantation. To our knowledge, this is the youngest recipient of a living related lobar transplantation ever reported.

Key words : Lung transplantation, Living related donor, Bronchiolitis obliterans, GVHD, Pediatric Transplantation