

**Inhaled nitric oxide with a nasal cannula and use of phosphodiesterase inhibitor to facilitate weaning from inhaled nitric oxide for children after congenital cardiac surgery**

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Objective: After congenital cardiac surgery, pulmonary hypertension complicates the postoperative management. Inhaled nitric oxide is effective for critical pulmonary perfusion. After extubation, inhaled nitric oxide is usually discontinued and rebound pulmonary hypertension is the problem. The purpose of this study was to evaluate inhaled nitric oxide with a nasal cannula and use of phosphodiesterase inhibitor in facilitating its problem.

Methods: Inhaled nitric oxide (10 to 20 ppm) was administered in the case with critical pulmonary perfusion (central venous pressure >20mmHg or pulmonary hypertensive crisis) during the operation or in the early postoperative period. In seven cases, inhaled nitric oxide could not be discontinued before extubation. In these cases, inhaled nitric oxide with a nasal cannula was continued after extubation and phosphodiesterase inhibitor was also used. Patients ranged in age from 2 months to 2.5 years (median, 6 months) and weighed from 2.5kg to 12.7kg (median, 4.5kg). Three cases were after bidirectional Glenn anastomosis, two case were after total cavopulmonary connection and two cases were after patch closure of ventricular septal defect.

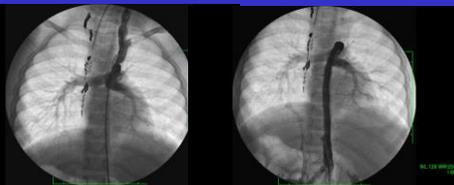
Results: There was no hospital death. No rebound pulmonary hypertension occurred upon inhaled nitric oxide withdrawal in any cases. The time to discontinuation of inhaled nitric oxide with a nasal cannula after extubation ranged from 2 days to 26 days (median, 3 days). In a case after total cavopulmonary connection, inhaled nitric oxide with a nasal cannula was continued for 26 days because of prolonged pleural effusion. The dose of inhaled nitric oxide ranged from 1 to 10 ppm (median, 3ppm). Phosphodiesterase inhibitor (sildenafil in four cases or tadalafil in three cases) was administered before or after extubation. The dose of sildenafil ranged 0.5mg/kg to 1.5mg/kg and the dose of tadalafil was 1mg/kg. All but one cases need oral phosphodiesterase inhibitor after discharge. No toxic side effect was observed in any cases.

**Case : 2 y female**

**Diagnosis : Polysplenia, Double outlet right ventricle, IVC interruption, PLSVC, post-TCPS operation**

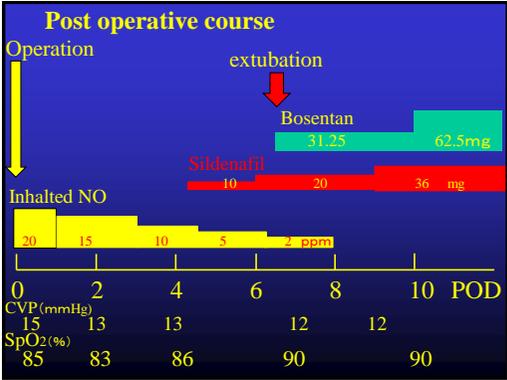
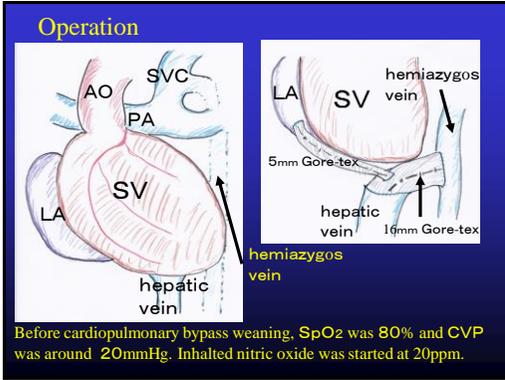
(Present illness) She underwent ASD creation and pulmonary artery banding at 3 months. PLSVC to pulmonary artery connection (TCPS operation ) and tricuspid annuloplasty were performed at 1years old. To complete TCPC operation, hepatic vein to hemiazygos vein connection was scheduled.

**Catheter examination**



**Pressure study (mmHg)**

Hemiazygos vein mean 10	SV 66/5
SVC mean 10	AO 66/37 mean 48
lt. PA mean 7	Rp=1.92 u·m <sup>2</sup>
lt. PCWP mean 4	SpO <sub>2</sub> =85%



### (References)

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**Conclusion:** Inhaled nitric oxide with a nasal cannula and use of phosphodiesterase inhibitor can facilitate weaning from inhaled nitric oxide for children after congenital cardiac surgery with critical pulmonary perfusion.