Extubation in the Operating Room Following Pediatric Heart Transplantation: A Mini Case Series

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Abstract

Introduction

Fast-tracking and early extubation including extubation in the operating room (OR) following surgery for congenital heart disease (CHD) has been described. Potential benefits include fewer complications associated with mechanical ventilation, shorter intensive care unit (ICU) and hospital length of stay (LOS), and possibly reduced costs. While the feasibility of fast-tracking CHD patients has been shown, controversy about such an approach still persists among many practitioners. Oftentimes, fast-tracking and early extubation including immediate extubation in the OR, remains described in the literature as being successful and safe in pediatric heart transplantation. However, the degree of pulmonary hypertension (PHT) is typically excluded from such an approach.

Methods

4 pediatric patients were extubated in the OR following heart transplantation at Mount Sinai Medical Center between July 2006 and October 2012. Inclusion criteria: Age 1 month - 18 years, and not intubated preoperatively. General anesthesia was induced with fentanyl and propofol. Neuromuscular blockade was reversed with neostigmine. Additional lines and monitoring: Standard ASA monitoring, transesophageal echocardiography, near infrared spectroscopy (cerebral oxygenity) and arterial blood gases after admission to the ICU and was tolerated well without complications. Transplantation at the time of surgery patients were between 2 and 16 years-of-age.

Results

• Four patients were extubated in the OR.
• The average ICU LOS was 5.75 days (range 4-7 days), and average total postoperative hospital LOS was 12.75 days (range 7-20 days).
• None of the four patients required reintubation.
• The pre-transplant PVRi ranged from 1.46 WU/m² to 8.9 WU/m², and improved postoperatively to near normal values within 2 weeks postoperatively. No patient had evidence of right ventricular failure or pulmonary hypertension complications.

Discussion

In our small case series, four pediatric patients undergoing orthotopic heart transplantation were extubated in the OR. At least two patients had evidence of preoperative PHT; one patient even had severe PHT. Extubation was tolerated well by all patients and there were no reintubations in the OR, or at any time during the postoperative course. Three of the patients had normalized values within 2 weeks postoperatively. No patient had evidence of right ventricular failure or pulmonary hypertension complications.

Potential advantages of early extubation have been described as being associated with decreased risk complications associated with mechanical ventilation (pulmonary infections, barotrauma), reduced sedation requirements often associated with decreased inotropic drug requirements, earlier ICU discharge , decreased hospital LOS, and possibly reduced costs.

Conclusions

• Immediate postoperative extubation following pediatric heart transplantation is feasible, even in patients with pre-existing PHT, and was not associated with complications in the observed 4 patients.
• To draw further conclusions more experience is needed.