

Harlequin Color Change in an Infant during Anesthesia

To the Editor:—An unusual cutaneous phenomenon has been observed in premature, newborn, and young infants. This phenomenon consists of episodes during which a sharp, midline demarcation in color occurs, bisecting the child into pale and plethoric halves. In 1952, Neligan and Strang¹ described this color change in 22 newborn infants and labeled it the "Harlequin Color Change." Although in the usual sense, harlequin means variegated or mottled, in the described condition there is a strict boundary between pale and plethoric halves. To our knowledge, such a change never has been reported to occur under anesthesia. We recently anesthetized an infant with complex congenital heart disease who exhibited "harlequin-like" color changes during anesthesia.

A 9½-month-old, 6-kg boy was scheduled for Nissen fundoplication and gastrostomy because of recurrent bouts of aspiration pneumonia. Significant history included birth one month prematurely and complex congenital heart anomalies, including double outlet right ventricle, coarctation of the aorta, a small pulmonary outflow tract, atrial septal defect (ASD), ventricular septal defect (VSD), and a hypoplastic mitral valve. Previous surgery included coarctation repair, pulmonary artery banding, a Blalock-Hanlon atrial septectomy, a right Blalock-Tausig shunt, main pulmonary artery ligation, and tracheostomy. On the day of surgery, we administered oxygen and gave atropine, 100 µg. Anesthesia was induced with ketamine, 15 mg, followed by pancuronium, 1 mg. Maintenance drugs included fentanyl 8 µg/kg, pancuronium, and oxygen. Twenty minutes after induction, we noted plethora of the right side of the child's face and head, which was highly demarcated

and precisely in the midline, running from the base of the neck anteriorly to posteriorly. The lips and tongue were not involved. Vital signs were normal and remained stable. PaO₂, PaCO₂, and pH_a were 83 mmHg, 47 mmHg, and 7.33, respectively. The color change persisted for 1 h and resolved spontaneously. Other intraoperative and postoperative events were unremarkable, and no other color changes occurred.

To our knowledge, this case is the first "harlequin-like" phenomenon reported in the operating room. The changes described are alarming when seen and are not widely known among anesthesiologists. To date, the harlequin color change remains a clinical curiosity associated with no other apparent autonomic phenomenon.^{1,2} No associated morbidity has yet been described, although hypoxemia has been implicated as a possible triggering agent.³

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Assessing Inspiratory Force—An Indicator

To the Editor:—The assessment of neuromuscular function prior to extubation includes nerve stimulation, observation of ability to sustain head lift, and measurement of vital capacity and inspiratory force.

Inspiratory force is a measure of respiratory reserve, which corresponds to the maximal negative pressure in centimeters of water that can be generated at inspiration.¹ The measurement procedure does not depend on patient cooperation, and it can be applied advantageously

in semiconscious patients. Evaluation of inspiratory force prior to extubation is of importance in clinical conditions, which increase the work of breathing, as well as in hypoxemia and low cardiac output states.²

The procedure requires a manometer capable of registering subatmospheric pressure. Such manometers can be expensive and are not always at hand. A simple device for indicating a predetermined inspiratory pressure has been developed in cooperation with Dameca

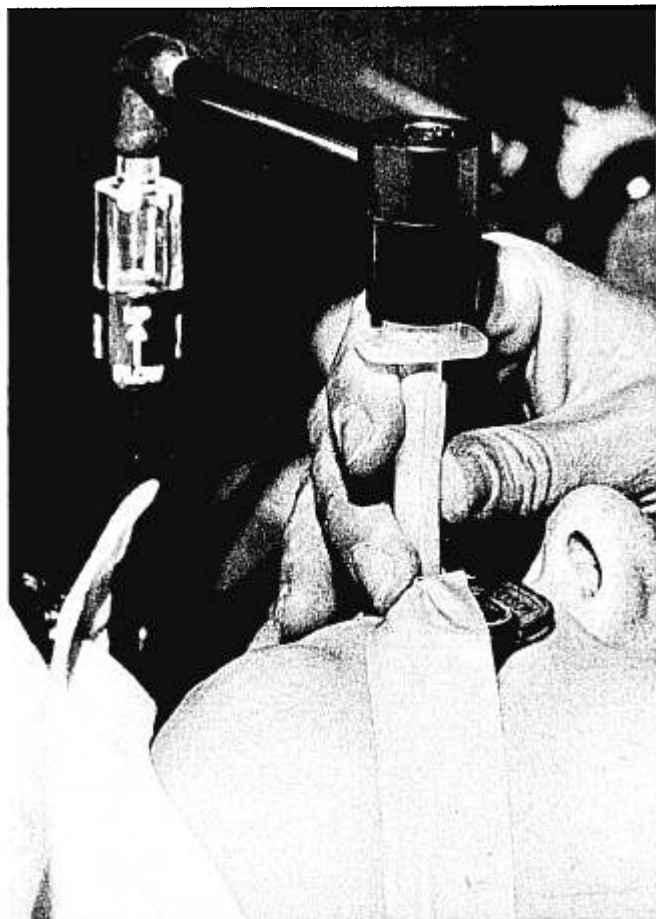


FIG. 1. The inspiratory force indicator attached on endotracheal tube.

A/S, Denmark. It consists of an open airway connector, a tubular resistor, an elbow connector, and a transparent chamber containing an indicator-ball (fig. 1). The tubular

resistor and ball were calibrated to result in upward movement of the ball at a pressure of $-18 \text{ cmH}_2\text{O}$ or lower, when the airway connector is attached on the endotracheal tube and occluded at the end of expiration. The calibration was performed at an airflow of 15 l/min .

The inspiratory force indicator does not measure the inspiratory pressure but only indicates whether the patient is able to generate an inspiratory pressure below $-18 \text{ cmH}_2\text{O}$ or not. The value of $-18 \text{ cmH}_2\text{O}$ was chosen arbitrarily as the guideline for extubation of patients after general anesthesia. A lower inspiratory pressure should be required as one of the guidelines for discontinuation of mechanical ventilation in patients with pulmonary insufficiency.³

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Alteration of Double-lumen Endobronchial Tube Position by Flexion and Extension of the Neck

To The Editor:—Several problems concerning the clinical use of a double-lumen endobronchial tube (DLEBT) have been discussed in recent issues of ANESTHESIOLOGY.^{1,2} Since it is well known that flexion and extension of the neck in intubated patients can cause considerable movement of an endotracheal tube³ and since the distance from carina to the right or left upper lobe bronchus is short, movement of the DLEBT, if any, could be crucial.^{1,2,4,5} Therefore, we examined the alteration of the DLEBT position accompanying flexion and extension of the neck.

Thirteen patients (table 1) undergoing lobectomy or pneumonectomy were studied before surgery. For all patients, a DLEBT (NCC Broncho-Cath® Left, Fr #37 or 39) was inserted into the trachea under general anesthesia. Correct position of the DLEBT was determined by auscultation while clamping each lumen with the patient, supine and the head in a neutral position. We also used a bronchoscope (BF 3C3, 4.5 mm in O.D Olympus), inserted through the tracheal port of the DLEBT, to observe the location of the right main bronchus, and to confirm the position of the radioopaque