

# An unusual cause of hypercapnia

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## Abstract

To the Editor,

SIR- An 11 year old, 30 kg, ASA grade 1, male child was booked for inguinal hernia repair at Lok Nayak Hospital, New Delhi, India. History and physical examination were normal and hematological investigations were within normal limits. In the operating room, Electrocardiogram (ECG), Pulse oximeter (SPO<sub>2</sub>) and Non-Invasive Blood Pressure (NIBP) monitors were attached. Intravenous access was established using a 20 G cannula and fentanyl 60 mic was given i.v. Anesthesia was induced using propofol 80 mg and rocuronium bromide 30 mg i.v was given to facilitate muscle relaxation. After mask ventilation using Bain's circuit, trachea was intubated with cuffed endotracheal tube size 6.5. Anesthesia was maintained using O<sub>2</sub>, N<sub>2</sub>O and isoflurane in closed circuit. The surgery was started thereafter. End tidal carbon-dioxide (ETCO<sub>2</sub>) levels were monitored in addition to ECG, SPO<sub>2</sub> and NIBP.

After few minutes of manual ventilation we noticed that ETCO<sub>2</sub> levels were rising. We checked the gas flows, reconfirmed the tracheal tube position by bilateral auscultation but ETCO<sub>2</sub> continued to rise. We were not able to decrease it despite hyperventilation. ETCO<sub>2</sub> became 55 mm Hg. Not able to find any remedy; we started positive pressure ventilation using a ventilator and its circuit. Within few minutes ETCO<sub>2</sub> became normal. Ventilation was continued using the ventilator and its circuit for the hour long surgery. The ETCO<sub>2</sub> and other parameters remained stable thereafter.

It is a usual practice at our institute to remove the ventilator and its circuit at the time of neuromuscular reversal and use our normal Bain's circuit. Therefore the Bain's circuit was reconnected. The ETCO<sub>2</sub> levels began to rise again. We got suspicious and checked the circuit; to our surprise, the positions of bag and mask were found to be interchanged, the bag was wrongly connected to the fresh gas flow and the

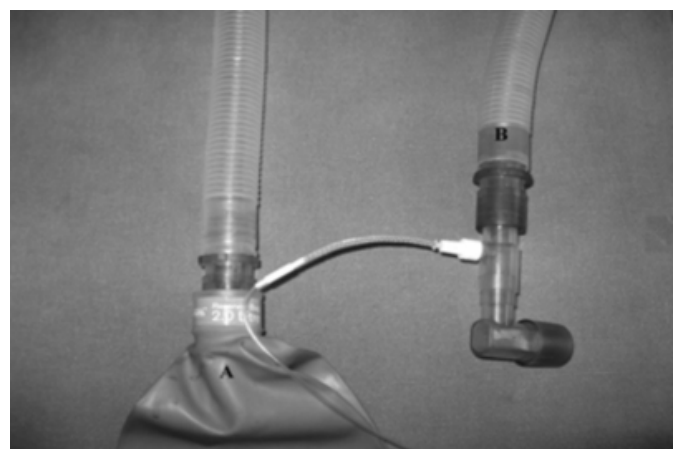
mask was connected to the expiratory limb of the circuit (Figure 1). The connection was corrected and thereafter ETCO<sub>2</sub> became normal. Tracheal extubation was done uneventfully and the patient remained stable.

We had checked the circuit preoperatively and it was correctly assembled but it seemed that our assistant interchanged the position of the bag and mask while cleaning and rearranging the equipment on our trolley. As a result, the fresh gas flow was delivered to the reservoir bag instead of being delivered to the patient and significant rebreathing occurred at the patient's end leading to increase in ETCO<sub>2</sub> levels.

Thus we stress on careful inspection of breathing circuit before use even if checked preoperatively and also an observation that interchanged positions of bag and mask can lead to increase ETCO<sub>2</sub> levels

## Figure 1

Figure 1: The reservoir bag was wrongly connected to the fresh gas flow end (A) of the Bain's circuit and the ETT was connected at the expiratory limb (B) of the circuit leading to raised ETCO levels.



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**References**

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