

A Lethal Apparatus: Life Saver Converted Deadly

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Dear Editor,

In an emergency involving airway management, equipment malfunction can lead to a worse or even fatal outcome. This is particularly true in the setting of a pediatric air way and ventilatory emergency. We report a “near miss” due to an incorrectly assembled Mapleson F breathing system, which was immediately recognized and corrected.

The anaesthetist was called to resuscitate and intubate a 4-year-old, 15kg child in the paediatric ward. The child was managed as having severe pneumonia with rapidly worsening hypoxia and severe respiratory distress despite high flow nasal oxygen therapy. Over time, he had developed type 2 respiratory failure needing assisted ventilation with Bag and mask. By the time the anaesthetist arrived, child’s peripheral saturation was 74% with high flow Oxygen (10L/min) with a respiratory rate of 50 per minute. As ventilation using bag and mask were ineffective at resuscitation and the child’s oxygen saturation was declining, the decision was made intubate the trachea and assist ventilation using a Mapleson F breathing system. The system was brought down from the operating theatre. The child was bradycardic (36 per minute) at this point.

Ventilation with the breathing system was initiated and intravenous atropine (0.1mg) was administered. Immediately after, the bag in the system was noticed to distend. The open tailed bag had been replaced by a closed-ended bag (Figure 1) It was immediately disconnected and the end was cut and utilized again for positive pressure ventilation. A peripheral saturation of 97% was attained and child was intubated without further haemodynamic instability. There was no pneumothorax. Subsequently, he was gradually weaned off, extubated and discharged home.

A review revealed that following cleaning after use, the Mapleson F system and bags were kept separately in the theatre. In this particular case, there had been an erroneous connection of a closed-ended bag which is routinely used as the reservoir in theatre ventilators for paediatric surgeries (Figure 2). This was similar in shape, size and morphology to the open-ended bag. All the theatre staff were updated and educated regarding this critical incident and immediate reattachment of Mapleson F systems after cleaning was implemented. All the breathing systems were to be checked for configuration and proper functioning before use specially during emergencies and further near misses or critical incidents were avoided

Out of the critical incidents which occur during the anaesthesia, 17 to 34% were associated with airway handling.^{1,2} When associated with paediatric anaesthesia, the outcome could be disastrous due to inherent changes in physiology and higher risk of cardiac events. Thus, it is vital to anticipate these prior and be vigilant.

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Figure 1. Erroneous configuration of Mapleson F system. A: Closed-ended reservoir bag (Top) and open-tail bag of the Mapleson F system (see the similarity between the two bags), B, C: erroneous connection using a connector

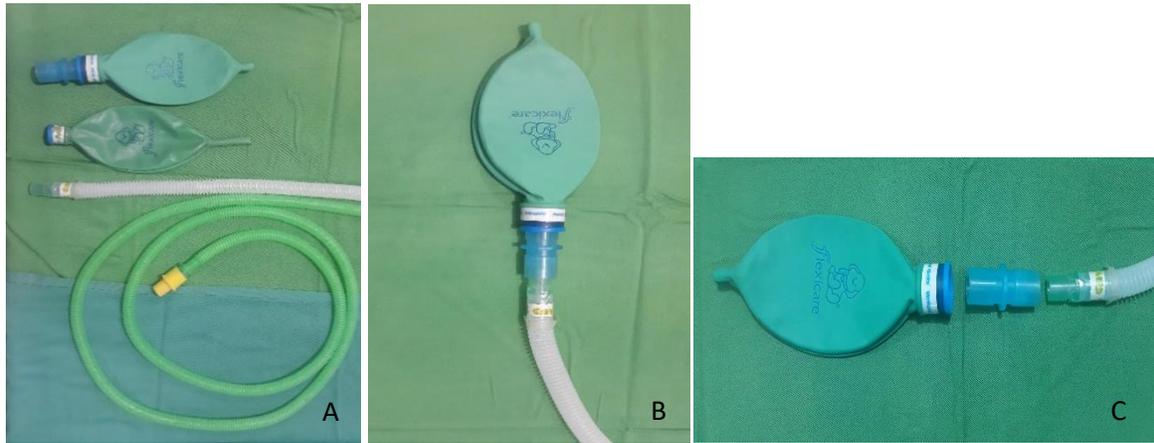


Figure 2. Comparison of Mapleson F and the ventilator paediatric reservoir bags. F: Mapleson F bag with open-tail, R: Paediatric reservoir bag in theater ventilators, C-F: cross-section of connecting port of Mapleson F bag, C-R: cross-section of Reservoir bag, C-R-E: cross section of the erroneous connector of reservoir bag which fits the Mapleson F system



The equipment related critical incidents play a crucial role, where nearly one third had been attributed to breathing systems in a study by Fasting et al.³ The checklists, reviewing and reporting of critical incidents has led to a dramatic decline in these avoidable errors. Local protocols, auditing and encouragement to report these events should be implemented.

Conflicts of interest

None declared by the authors

Informed consent

Obtained from the parents for documentation of patient details.

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