

CORRESPONDENCE

AIRWAY MANAGEMENT

Equipment related critical incident in anesthesia: leaking HME filter**B. M. Munasinghe**

Acting Consultant Anesthetist, Department of Anesthesiology & Intensive Care, District General Hospital, Mannar, Sri Lanka.

Correspondence: B.M. Munasinghe, MBBS, MD, {ORCID: 0000-0001-8373-4752}; E-mail: malakafmp@gmail.com / mannaranaesthesia@gmail.com; Mobile: +94773645827; Work: +9423222261**Key words:** Critical incidents; HME filter; Leak**Citation:** Munasinghe BM. Equipment related critical incident in anesthesia: leaking HME filter. *Anaesth. pain intensive care* 2022;26(2):265–266; DOI: 10.35975/apic.v26i2.1830**Received:** January 10, 2022, **Reviewed:** January 17, 2022, **Accepted:** February 03, 2022**Acknowledgment:** Dr. Nishanthan Subramaniam, Medical Officer in Anesthesiology & Intensive Care, for his involvement during the patient management.

HME (heat and moist exchanger) filters are used ubiquitously in anesthesia and intensive care, especially during the current COVID-19 pandemic.¹ Inherent adverse events associated with HME filters such as blockade, disconnections, increased dead space and delayed gas induction have been described and discussed.²⁻³ Here, we describe a case of an intraoperative leak of an HME filter that was detected timely preventing desaturation or related sinister consequences. The significance of systematic check of anesthesia-related equipment and keeping an open mind during critical incidents are further reinforced by this brief, yet interesting report.

A 36-year-old, ASA I male underwent a lumbar laminectomy under general anesthesia. Five minutes after intubation of the trachea and turning the patient prone, the capnography trace disappeared, there was no movement of the ventilator bellows and the expiratory valve. Suspecting a leak, the surgeon was alerted, bag valve mask ventilation was commenced and anesthesia was deepened with intravenous propofol bolus. The initial check revealed no obvious audible leaks. During the subsequent, detailed check, the HME filter (*flexicare*®, ThermoShield™) at the expiratory limb was found to have an opened cap (Figure 1).

It was immediately closed and ventilation via anesthetic machine was recommenced and continued without further leaks. Despite regular checks, leak alarm in the anesthesia machine was found to be dysfunctional during the incident. Immediate repair resolved the matter. To prevent similar incidents, we decided to cover HME filter gas sampling ports with cannula stoppers. The incident was discussed with the operating room staff.

Some types of HME filters contain a side port for gas sampling. These can be Luer-lock safe or tethered caps.

The issue in the latter is that the disconnections are possible and might go unnoticed until detected with clinical deterioration of the patient. The risk cannot be neglected as such disconnections are not easily visible



Figure 1 a. Disconnection of HME filter in expiratory limb (E) not visible when inspected from above.



Figure 1 b. disconnection (red arrow) seen by a side.



Figure 2: Safe closure of gas sampling port of HME filter using a cannula stopper

and leaks might not be audible especially if one is not aware of this side-opening and the opening positioned in the 6' o'clock position. Thus, it is advisable to always

connect these HME filters with a gas sampling port keeping it at 12' o'clock position, so that it is clearly visible, accessible and audible in case of a disconnection. Cannula top is a cost-effective, efficient and safe option to close such ports (Figure 2).

References

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