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CORRESPONDENCE

Gas leak due to a damaged GE Disposable Multi Absorber Canister used with an EZchange Module following its reinstallation during anesthesia

Hitomi Sano, MD · Takashi Suzuki, MD, PhD · Yuri Kaneda, MD

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To the Editor,

We recently experienced a major breathing circuit leak following reinstallation of a disposable plastic canister prefilled with carbon dioxide absorbent during anesthesia. A 31-yr-old female underwent interventional endoscopic treatment for esophageal achalasia under general anesthesia using an Aisys® anesthesia machine (GE Healthcare, Wauwatosa, WI, USA) equipped with an EZchange Module. Since significant carbon dioxide rebreathing was detected, we removed the canister containing exhausted absorbent and installed a new canister that was kept as a reserve in a built-in drawer of the anesthesia machine. . Both the initial and the replacement canister were GE Disposable Multi Absorber (DMA) products (GE Healthcare).

Although the canister slid smoothly along the guide rails into the designated holder and returned to the initial position, effective mechanical ventilation did not resume due to a probable gas leak, which was suspected by the collapsed bellows. Switching to manual ventilation also failed because of the collapsed reservoir bag. Suspecting problems related to the replacement canister, we removed the replacement and reinstalled the initial canister we had previously removed. This enabled both manual and mechanical ventilation once again. With removal of the new canister, the anesthesiologists found that the front end of the attached side rail had been broken off and was missing (Figure). Later inspection revealed a crack in the housing and localized surface flaking. Pulse oximetry did not show any desaturation during the incident. Another new canister was reinstalled for subsequent anesthesia, and the procedure proceeded uneventfully.

The EZchange Module used with the DMA and Advanced Breathing System (GE Healthcare) is designed with a self-sealing feature for easier canister installation. This enables the exchange of canisters without discontinuing ventilation. Nevertheless, there have been a number of reported problems with this apparatus. In one report where a significant gas leak occurred, the manufacturer's investigation determined the cause to be a damaged canister.[1] In addition, the Food and Drug Administration in the United States recalled the DMA in 2007[2] and in 2013[3] due to potential rebreathing and leak, respectively. The latter recall was categorized as Class 1 (i.e., a situation in which there is a reasonable probability that the use of or exposure to a violative product will cause serious adverse health consequences or death).

In our case, judging from the appearance of the canister, the damage seemed to have resulted from some external force, such as the impact of dropping, rather than due to a defective product per se, although the exact cause is unknown. In this instance, the primary anesthesiologist was not familiar with the Aisys® anesthesia machines that were newly introduced in our facilities and lacked the experience to reinstall a canister using an EZchange Module. In retrospect, this might be part of the reason that the apparent damage was overlooked.

A gas leak incident caused by unrecognized damage to a disposable plastic canister following its reinstallation during anesthesia was described in the German literature,[4] though the product manufacturer was different from the one in our case. The use of disposable plastic canisters with comparatively small capacity and low-flow anesthesia is becoming popular.

H. Sano, MD · T. Suzuki, MD, PhD (✉) · Y. Kaneda, MD
Department of Anesthesiology, Showa University Koto Toyosu Hospital, Tokyo, Japan
e-mail: tksuzuki@med.showa-u.ac.jp

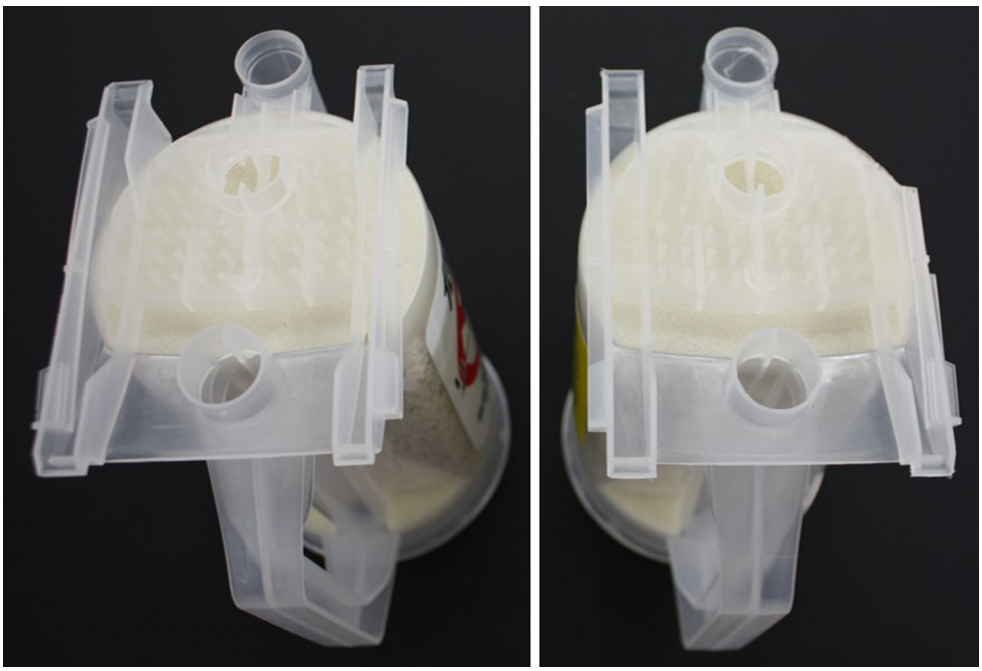

Figure The damaged GE Disposable Multi Absorber Canister (right) and the whole and intact product (left)

The self-sealing system designed for intraoperative canister exchange was also introduced. For adequately estimating the time to replace the absorbent, we speculate that use of capnometry to detect rebreathing has become more common than use of a scheduled period or noticing a colour change in the absorbent dye. These trends lead to more frequent replacement of absorbent, especially during anesthesia. Therefore, careful handling, proper storage, and visual checks of such canisters prior to each use are essential for safe anesthetic management.

Conflict of interest None declared.

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