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LETTER TO THE EDITOR

An unusual case of facial burn in which a flammable, alcohol-free liquid barrier film caught fire probably from static electricity when a bispectral index sensor was applied to the patient

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To the Editor:

Bispectral index (BIS®, Aspect Medical Systems Inc., Natick, MA, USA) monitoring is useful for measuring the depth of anesthesia, but the sensor can cause skin lesions [1, 2]. In our hospital, an alcohol-free liquid barrier film (Cavilon™) is used for skin protection. We recently encountered a case in which this liniment caught fire probably due to static electricity upon BIS® sensor attachment.

A 76-year-old male patient (height 164 cm, weight 54 kg) was diagnosed with rectal cancer and was scheduled for rectal resection (Hartmann's procedure). He had complications of rheumatoid arthritis and interstitial pneumonia. Preoperative tests revealed slight anemia (hemoglobin 11.0 g/dl), restrictive ventilatory impairment (vital capacity was 55.3 %), and ground-glass opacity on a chest X-ray image. Other tests showed no abnormalities. After arrival at the operating room, administration of 6 l/min oxygen was started via a face mask, and the patient's forehead was wiped with an isopropanol pad. After alcohol evaporation, his forehead was smeared with a Cavilon™ stick. When we were about to attach a BIS® sensor to him, a fire suddenly flared up on his forehead. The fire burned his eyebrows and paper cap, and went out quickly. The skin of the forehead showed an erythematous change (Fig. 1). We applied a steroidal ointment to the erythematous lesion and started cooling. We explained the situation to the patient and his family and continued the anesthesia and operation without BIS® monitoring. Anesthesia was induced and maintained with propofol (target-controlled infusion 2.0–2.5 mcg/ml) and remifentanil (continuous infusion 0.6–1.0 mcg/kg/min) throughout the operation. The operation was completed uneventfully, and the patient awoke from the anesthesia without delay. Although his burn site developed blisters, the lesion was cured by conservative treatment about 30 days after surgery.

Fires in operating rooms are rare but preventable dangers. It is estimated that about 600 surgical fires occur in the USA annually. Fire consists of three components: an oxidizer, an ignition source, and a fuel [3]. It is reported that a common oxidizer contributing to many surgical fires during head and neck surgery is a high concentration of oxygen via a face mask [4], as in this case. Most ignition sources are electrosurgical or laser devices, defibrillators, and light sources. In this case, no ignition source was close to the patient, and the BIS® sensor was not connected to the power. Static electricity might have been generated between the patient and the BIS® sensor. Fuels are flammable prepping agents, disinfectants, and medical materials such as drapes and tubes. Cavilon™ is a skin barrier film used for skin protection. As it contains some flammable contents with a flash point of −6.7 °C, and as the lower flammability concentration is 0.7 %, the material safety data sheet states the precaution that all ignition sources such as heat, flames, or sparks should be removed.

In conclusion, to prevent fires in operating rooms, we should always consider the flammability of agents used on the face, head, and neck when the patient is receiving oxygen via a face mask.

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Fig. 1 The patient just after the fire. The upper half of his face is shown. The eyebrows and paper cap were burned, and the forehead skin showed an erythematous change

Conflict of interest None.

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