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Biting of ProSeal™ laryngeal mask complicated with hypoxia in a child

To the Editor:

Unintended biting of laryngeal mask airways (LMA) occurs quite commonly,¹ and secondary luminal obstruction can occur, even with reinforced LMAs.^{2,3} The ProSeal™ LMA (PLMA; LMA North America, San Diego, CA, USA) is modified with a built-in bite block, and a wire reinforced airway tube, which is more resistant to compression from biting.⁴ However, biting of the airway tube is still a problem, even in children. We recently observed an unusual incident involving a PLMA, where biting resulted in severe hypoxia and LMA wire distortion, in a three-year old child.

The child, weighing 19.5 kg, was scheduled for a hernioplasty. General anesthesia was induced with O₂/N₂O/sevoflurane, using a face mask, and a size 2.5 PLMA was placed smoothly, without a separate bite block. The patient was allowed to breath spontaneously during anesthesia, which proceeded uneventfully until emergence, when the child became agitated. He pulled off the tube's adhesive tape, and bit the PLMA vigorously. The lumen of the PLMA became completely obstructed, with disappearance of end-tidal CO₂ on the capnograph. Cyanosis ensued, and arterial oxygen saturation decreased to 50%. After administration of propofol 20 mg *iv* and succinylcholine 20 mg, the PLMA was removed. The child's breathing was assisted with a bag-mask ventilation, and his oxygen saturation increased to 100%. The child awakened, without sequelae.

Examination of the PLMA revealed a severely deformed airway tube, with quite a remarkable indentation (Figure, bottom). Other reusable PLMAs may show distinct wire distortions, as well as size 2 and 2.5 LMAs (Figure, black arrow). In some instances, a pitting mark around the bite block may become evident (Figure, dotted arrow). Two size 1.5 LMAs were intact without wire distortion (Figure, top).

There are few reports which describe the biting of PLMAs in children. The PLMA is 'bite-proof', only when the bite block is placed between the teeth. The wire-reinforced airway tube is designed to prevent

FIGURE Upper: Two size 1.5 laryngeal mask airways are shown, intact, without wire distortion; Dotted arrow: a pitting mark around the bite block; Black arrow: wire distortion in two other, sizes 2 and 2.5, laryngeal mask airways.

kinking, not biting. Therefore, it is important to choose the correct size of PLMA, and to position it correctly. For proper positioning, it is recommended that at least 50% of the bite block is advanced beyond the tip of the upper incisors.⁴ For patients with either a large tongue or a small chin, it may be difficult to position the bite block directly between the teeth. Other strategies to minimize biting should be considered, such as insertion of a separate bite block, or removal of PLMA while the patient is deeply anesthetized. Finally, bearing in mind that the PLMA is composed of silicone, and is safe to autoclave for up to 40 uses, it is recommended that tube patency, and integrity of the reinforcing wire, be confirmed prior to each use.

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Preoperative smoking cessation and smoke-free policy in a university hospital in Japan

To the Editor:

In recent years, implementation of smoke-free policies has increased in Japanese hospitals (none in 2002, but 37% in 2006; survey by the Japanese Circulation Society). This shift has provided an opportunity to encourage smoking cessation amongst patients presenting for surgery, and those who are otherwise hospitalized. In our university hospital, smoking has been prohibited in all indoor areas, as well as all hospital property, since 2005.

Smoking status affects both perioperative risk and outcome; indeed, the physiologic changes produced by abstinence from cigarettes may have clinically relevant effects on anesthetic management and perioperative outcome.^{1,2} We previously reported that the implementation of a smoke-free policy in a university hospital led to significant decreases in carboxyhemoglobin levels in inpatients undergoing surgery.³ However, the factors affecting compliance with smoke-free policies among preoperative smokers are not completely understood. Hence, we conducted the present study to examine both the smoking status of surgical patients, and the factors relating to preoperative abstinence from cigarettes. Ethical approval for the study protocol was obtained from the University Research Ethics Board of Gifu University.

We evaluated, at preoperative interview, 2,011 patients who were greater than eighteen years of age, scheduled for elective surgery between April 2006 and March 2007. Forty three subjects could not respond directly to the interview, due to a mental disorder or dementia, and were excluded. Anesthesiologists interviewed all patients using a standardized questionnaire that examined the following: medical history, smoking history [cessation time, reason for smoking cessation, cessation method, and employment or non-employment of nicotine replacement therapy (NRT)], awareness of the risks of perioperative smoking, intention to continue abstaining from smoking after discharge,

and awareness of the smoke-free policy of the hospital. A total of 1968 patients (100%) completed the questionnaire. Data were analyzed for 928 males [59 ± 18 (18–96) yr], and 1,040 females [55 ± 17 (18–95) yr] and classified into five smoking categories: non-smoker, ex-smoker (at least 24 hr abstinence from cigarettes at the time of premedication by anesthesiologist; abstinence within the two weeks before the operation (< two weeks), between two weeks to three months (two weeks to three months), and three months or more (> three months), and current smokers (Table). A Chi-square test was used to compare dichotomous variables between groups.

There were 992 non-smokers (52%), 836 ex-smokers (41%), and 140 smokers (7%). Only 32 (4%) of the ex-smokers had used NRT. The reasons given for quitting smoking included not only doctors' advice (199 ex-smokers), but also nurses' advice (15 ex-smokers; especially useful for abstinence within the two weeks before the operation), and a hospitalization/operation (80 ex-smokers). Among the 311 ex-smokers who had quit smoking within the previous three months, 101 answered that the smoke-free hospital policy was a factor in their quitting smoking; there was a significant relationship in abstinence within the previous two weeks (39%) ($P = 0.002$; ex-smoker (< two weeks) *vs* two weeks to three months). It was more difficult to quit smoking preoperatively for female patients ($P = 0.043$) and those with benign disease ($P = 0.047$) [smoker plus ex-smoker (< two weeks) *vs* ex-smoker (two weeks to three months)]. An awareness of the perioperative risk of smoking was admitted by 56% of ex-smokers and 51% of smokers. However, a critical issue in this regard was that about one-half of the smokers did not have information regarding the perioperative risk of smoking. Even though preoperative abstinence was not achieved by all informants, 45% of smokers had a stated intention to stop smoking after surgery.

Mandatory smoke-free policies could contribute to some period of abstinence after surgery, and to a greater likelihood of spontaneous quitting. In addition, since nicotine withdrawal symptoms have been reported to be minimal in the postoperative period, surgery could represent an excellent opportunity for smokers to attempt sustained abstinence, to their long-term benefit.⁴ Even if preoperative abstinence is not achieved, postoperative abstinence would be expected to have benefits for most, if not all, surgical patients. Many of the surgical patients in the present study denied having information about the perioperative risks due to smoking, so clearly, medical staff need to be made aware of the importance of informing patients that preoperative abstinence from