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Intrabronchial misplacement of a thermal probe in a patient with a tracheal tube

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To the editor: Body temperature monitoring is routinely conducted in modern anesthesia practice. The aggressive control of body temperature during anesthesia has become a current trend. This monitoring procedure is usually considered uncomplicated and is relatively non-invasive. We recently experienced the intrabronchial misplacement of a thermal probe, inserted for monitoring esophageal temperature, in a patient with a tracheal tube.

A 62-year-old man underwent low anterior resection for rectal cancer under sevoflurane-fentanyl anesthesia combined with epidural anesthesia. After tracheal intubation, facilitated with the use of vecuronium, and tracheal tube cuff inflation with air, a 10-Fr, 45-cm-long thermal probe (model no. 5-15610 general-purpose esophageal/rectal probe; Novamed, Rye, NY, USA) lubricated with aqueous jelly was inserted through the coaxial bore within a bite-block and blindly advanced for approximately 35 cm into the "esophagus". Changes in airway pressure were not observed after probe insertion. And no tracheal tube cuff leakage was seen; the temperature obtained with the probe at the beginning of monitoring was 34.4°C. Despite vigorous attempts at warming the patient, using warmed infusion fluids, a heat and moisture exchanger, a forced-air warming system, a circulating-water mattress, and low fresh-gas flows, the temperature recorded with the probe failed to increase above 36.2°C during the surgery, which lasted 3 h and 20 min. Before emergence from anesthesia, a chest X-ray, taken as part of routine practice, revealed the probe tip to be malpositioned in the left main bronchus (Fig. 1).

In the present patient, the obtained "esophageal" temperature was considerably lower than expected, right from the onset of monitoring. In retrospect, our thermoregulatory management during the surgery was inappropriate, for several reasons. First, we should have checked the core temperature at other monitoring sites (e.g., tympanic membrane or nasopharynx) when we encountered the unexpectedly low esophageal temperature. If the "esophageal" values had been significantly lower than those measured at other sites, we would likely have considered the possibilities of thermal probe misplacement, thermometer malfunction, or real but unusual values as probable causes for this. Second, tracking of the probe tip under direct vision, using a laryngoscope, would have unveiled the misplacement at the beginning of the procedure. Third, when the esophageal temperature is selected for

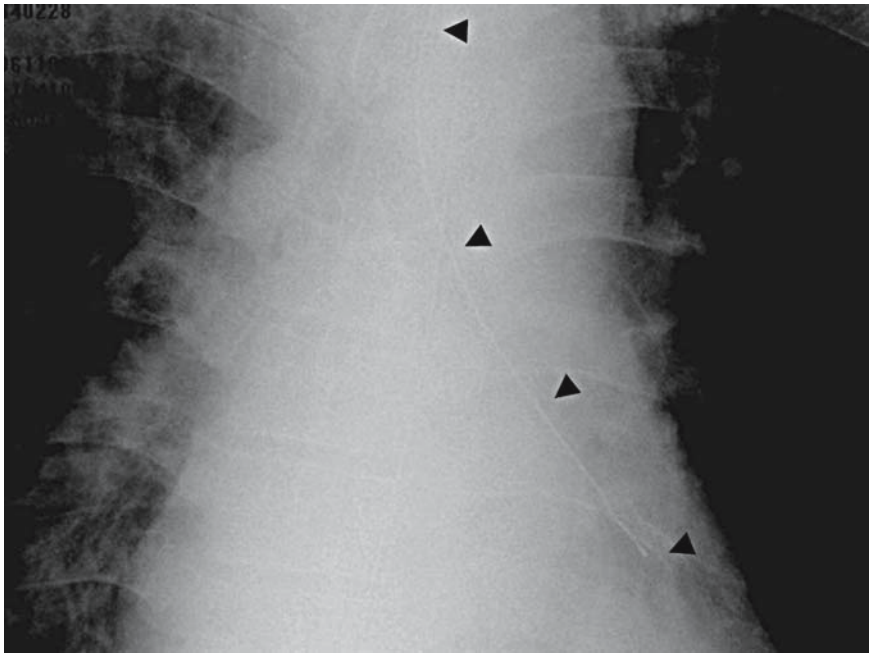

Fig. 1. Chest X-ray, showing the misplaced thermal probe tip (*black arrowheads*) in the left main bronchus

core temperature monitoring, the use of disposable thermal probes incorporated into esophageal stethoscopes is strongly recommended, the recommendation being that the probe must be positioned at the point of maximal heart sounds, or even more distally, to provide accurate readings as reflected by blood temperature [1,2]. The routine use of these disposable thermal probes, which are expensive could, however, be somewhat costly for common practice. For routine anesthesia practice, nasopharyngeal temperature monitoring is probably a more acceptable and suitable alternative.

Matsukawa et al. [3] demonstrated that tracheal temperature measurements consistently underestimated core temperature, by 0.7 ± 0.3°C (mean ± SD) and by 0.9 ± 0.4°C in ventilated patients with high and low fresh-gas flows, respectively. These results lead to the speculation that redundant warming, presumably based on underestimated core temperature values, might have been conducted in our patient.

In conclusion, anesthesiologists should not disregard the possibility of the misplacement of an esophageal thermal probe. Furthermore, monitoring sites for intraoperative core temperature evaluation should be selected by considering the relative strengths and limitations of each individual site.

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