Another case of obstruction to an anaesthetic circuit

Editor—There have recently been several anaesthetic mishaps, caused by the obstruction of anaesthetic circuits, reported in the press. The improved design of medical equipment and the development of guidelines should help to reduce the risks of such occurrences. We would like to report an incident where poor equipment design nearly contributed to an adverse event.

A patient on the intensive care unit with severe pneumonia required tracheal intubation and ventilation. With the patient’s oxygen saturation at 75%, she was preoxygenated using a standard Boyle’s machine, a Bain circuit and a Laerdal mask. This is the standard equipment used for intubation in our unit, and had been checked and used 30 min earlier for another patient without any problems. The mask and filter had subsequently been changed. During preoxygenation, it was noticed that the patient’s saturation levels were falling further, that the reservoir bag was significantly distended, but that it was impossible to hand ventilate the patient. Oxygen 100% was administered via a non-rebreathing mask and the oxygen saturation improved with spontaneous ventilation.

Fig 1 The occlusive cap fits onto the Laerdal mask and the angle piece.

Fig 2 The normal use of a safety cap on the angle piece. The safety cap has a flange, making it impossible to connect the circuit to the Laerdal mask.
On further inspection, it was noticed that a cap had been placed between the angle piece and the Laerdal mask, thereby completely obstructing the tube (Fig. 1). This light blue semi-transparent cap is provided with the Fisher and Paykel ‘3-in-1 Ventilator Circuit’, and is routinely used to keep ventilator circuits clean before use. The Laerdal mask has a latex seal and fitted over the occlusive cap with relative ease. The Bain circuits are normally capped with opaque red Intersurgical 22 mm safety caps that incorporate a flange, making such an attachment impossible (Fig. 2). On identifying the problem, preoxygenation and intubation proceeded uneventfully.

Following an internal incident report and investigation, it was apparent that this was attributable to human error. No harm had come to the patient. We have adjusted our practice accordingly, and discard the translucent caps immediately upon opening the ‘3-in-1’ packs. We have contacted Fisher and Paykel suggesting that these caps are changed to be more visible and to incorporate a flange, in order to prevent this problem occurring at all.

This event again demonstrates that if there is potential for a mishap, it is likely to happen. Reporting such events will hopefully prevent them occurring again, and may lead to improvements in equipment design. We must re-emphasize the importance of checking all pieces of equipment before use, however urgent a situation might be.

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1 Hall C. Staff error, not sabotage, to blame for boy’s death. Daily Telegraph, July 23, 2002
2 Meikle J. Third patient at risk from ‘oxygen block’. Guardian, August 10, 2002

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