Tight reservoir bag after induction – a rare cause unearthed

Dear Editor:

The use of coaxial Bain [1] circuit remains very common in routine anaesthesia practice all over our country and one should be aware of the possible havoc a circuit malfunction can create if subtle defects are not detected on time. There are a lot of well-known tests [2] to detect a leak or a disconnection and in spite of these, instances exist where a test is forgotten or missed which can give rise to unforeseen complications [3].

We would like to bring to the notice of our readers an incident where a small manufacturing defect in the patient end of the Bain circuit caused undue anxiety. On a routine elective day a case was posted for partial thyroidectomy under general anaesthesia. The patient was a fifty four year old gentleman with no comorbidities. Anaesthesia was induced with propofol 2mg/kg and fentanyl 1 mcg/ kg and patient intubated after relaxation using Succinylcholine 2mg/kg with an 8.0 size Portex® endotracheal tube. After intubation bilateral air entry was checked, ET Co2 curve confirmed and endotracheal tube connected to a Bain circuit and manually ventilated. It was noticed that the reservoir bag was unusually tight [4] and required more pressure to ventilate. It was initially thought that patient is inadequately relaxed and an initial dose of vecuronium bromide 0.1 mg per kg pushed intravenous and in spite of this, the tightness of the reservoir bag did not resolve.

As all these maneuvers were being done, the last thing remaining was a change of the circuit. We decided to change the circuit and once it was done, the airway pressures returned to normal and ventilation was easier with normal bag compliance. After finding out the culprit a thorough search revealed a rare manufacturing defect in the patient end of the
Bain circuit as shown in the photograph. There were plastic membranes partially blocking the vents in the circuit near the patient's end causing partial obstruction to ventilation from the reservoir bag as well as obstructing expiratory flow from the endotracheal tube. This defect, though small and undetectable by routine examination has caused undue anxiety and stress by mimicking an obstructed airway.

In conclusion regular tests prescribed are not to be missed and are very important for patient safety. In this case we acknowledge that even though the Pethick test was done prior to the induction of anesthesia the undue slow deflation of the reservoir bag on flushing oxygen was ignored. Hence a great lesson was learnt that even small variations in the tests [6] give a lot of information about the condition of the circuits [7] which cannot be ignored. We would also recommend the routine inspection of the patient end of the Bain circuit to look for plastic mold defects in the form of thin membranes covering the vents surrounding the inner tube of the coaxial circuit.

References


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