ISSN (Print) : 2394-6954
ISSN (Online) : 2394-9775
Karnataka Anaesthesia Journal *Vol 16(1), January - March 2018, p. 35-37* DOI: 10.4103/kaj/2018/v16i1/141976

Letter to Editor

Malfunctioning Bain Circuit

Dear Editor,

There are several published reports of malfunction of the inner tube of the Bain co-axial circuit, with potentially lethal complications for the patient[1-3]. Here, we report two cases, wherein we found out the difficulty in ventilating the patients due to malfunctioning of a Bain Circuit due to an altogether different kind of a defect, probably being reported for the first time.

A 23 year old male patient was posted for endoscopic polypectomy of left antrochoanal polyp in Operation Theatre (OT) No. 7. General Anaesthesia was planned and Bain circuit was utilised for induction and intubation. Once Succinylcholine was administrated, it was noticed that the inflated reservoir bag could not be compressed; neither the chest could be ventilated. It was noted that the Bain circuit was malfunctioning, and in a panic, another Bain circuit from the adjacent OT No. 8 was brought in and Anaesthesia was continued. Further course of Anaesthesia was totally uneventful. OT Nurse was instructed to send the Bain circuit to biomedical department for detecting/repairing the defect.

Another 60 years old male patient, a case of Ca stomach, was posted for feeding jejunostomy under General Anaesthesia in the adjacent OT (OT No. 8). Considering the high risk of aspiration, rapid sequence intubation was planned, avoiding Intermittent Positive Pressure Ventilation (IPPV) with bag mask, using Bain circuit. Endotracheal intubation was accomplished without any difficulty, but chest could not be ventilated; neither air was entering the chest nor was the chest expanding on IPPV. Again like previous case in OT No. 7, malfunctioning of Bain circuit was suspected. Emergency ventilation was carried out using Ambu bag, as there was no other Bain Circuit available even in the adjacent OT No. 7. Further course of anaesthesia with closed circuit was uneventful. The OT NURSE was instructed again to send the Bain circuit to biomedical department for finding out the defect.

On investigating the entire episode, it was found that, the OT Nurse of OT No. 7, had by mistake, handed over the functioning Bain Circuit of OT No. 8, to the Biomedical Engineer, thinking that it was the defective one from OT No.7 resulting in the defective Bain circuit of OT No. 7 being left in OT, which was promptly taken back by the OT Nurse of OT No. 8 for the next case in that OT.

After the case in OT No. 8 got over, both the Anaesthesiologists jointly carried out the inspection of the Bain circuit. The plastic connector at the patient end was found to be defective with an obstructing thin plastic membrane (Figure 1, 2 and 3) isolating the inspiratory (inner) and expiratory (outer corrugated) limbs of the circuit, thus not allowing the expired air to enter the outer corrugated tube making IPPV impossible. Both the Bain circuits used in above cases were from the manufacturer 'Anaesthetics' Mumbai, the defective circuit of OT No. 7 was opened for use for the first time on that day without undergoing prior check by anybody. The resident posted in OT No. 7 was on emergency night duty and was busy on previous night and he did not have time to check the machine nor the breathing circuits. The consultant in OT No. 7 thought that his resident had tested every anaesthesia gadget including the Bain Circuit. However the Bain circuit of OT No. 8 had undergone prior check in the morning and was already used for two cases before being pulled out to OT No. 7.

Figure 1. Photograph showing the normal connector showing patency for the inner (FGF) as well as patency for the expiratory (corrugated) tubing.

Figure 2. Photograph showing the defective connector with patency for the inner (FGF) and non patency for the outer (corrugated) tubing.

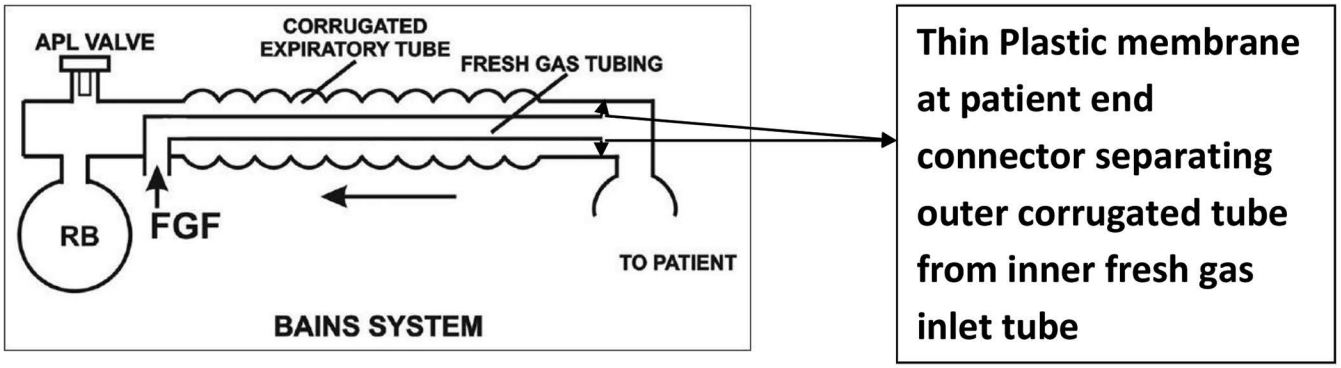

Figure 3. Schematic representation of Bain circuit.

Lessons Learnt

1. *Prior checking of the circuit and anaesthetic equipment by the concerned Anaesthesiologist is mandatory for every case that is to be anaesthetised*[4].
2. *Communication or dialogue amongst the anaesthesiologists at the earliest, about any difficulties faced in day to day working is quite essential.*
3. *Anaesthesiologist should be well versed with all the gadgets he/she uses.*
4. *Not to rely on OT Nurse or Biochemical Engineer for detection/repair of any minor defects in the gadgets.*
5. *The defect to be communicated to the manufacturer along with the photographs for immediate correction.*

Chaitanya A. Kamat[1*] and P. F. Kotur[2]

[1]Associate Professor, Department of Anaesthesiology, JNMC, KAHER, Belagavi - 590010, Karnataka, India; drchaitanya12@gmail.com

[2]Dean / Principal, Shri Sathya Sai Medical College and Research Institute, Kancheepuram, Nellikuppam - 603108 , Tamil Nadu, India

References

1. Garg R. Kinked inner tube of coaxial Bain circuit-need for corrugate dinner tube, J. Anesth. 2009; 23:306. https://doi.org/10.1007/s00540-008-0719-y. PMid: 19444580.

2. Gooch C, Peutrell J. A faulty Bain circuit, Anaesthesia. 2004; 59:618. https://doi.org/10.1111/j.1365-2044.2004.03814.x. PMid: 15144311.

3. Jellish WS, Nolan T, Kleinman B. Hypercapnia related to a faulty adult coaxial breathing circuit, Anesth Analg. 2001; 93:973–4. https://doi.org/10.1097/00000539-200110000-00034. PMid: 11574367.

4. Bain JA, Spoerel WE. A streamlined anaesthetic system, Can Anaesth Soc. J. 1972; 19:426–35. https://doi.org/10.1007/BF03005967.