Indian Journal of Clinical Anaesthesia 2025;12(1):164–165

Content available at: https://www.ipinnovative.com/open-access-journals

Indian Journal of Clinical Anaesthesia

Journal homepage: www.ijca.in

Letter to Editor

Troubleshooting anesthesia equipment: A focus on L connector

Jakkireddy Sravani[1], Pradeep Khobragade[1], Swati Vijapurkar[1]*, Ishan Verma[1], Gade Sandeep[1]

[1]*Dept. of Anaesthesiology, All India Institute of Medical Sciences, Raipur, Chhattisgarh, India*

ARTICLE INFO

Article history:
Received 27-06-2024
Accepted 19-10-2024
Available online 20-01-2025

Dear Editor,

We would like to bring to your notice the possibility of a defect in the L connector which could go unnoticed during the leak test but cause a significant impairment in the ventilatory parameters intraoperatively.

Circuit leaks are one of the most common and serious problems with anaesthesia delivery equipment.[1] These leaks can injure patients by causing hypoxia, hypoventilation, and insufficient administration of anesthetic gases, which increases the patient's risk of consciousness.[2] Routine machine checkout is necessary to avoid such complications. We experienced a case in which despite minimal leak on the machine check, a leak was present which was then found to be caused by a break in the L connector of the circuit.

A 4-year-old child weighing 15 kg, belonging to the American Society of Anesthesiologists (ASA) physical status Grade 1 was planned for left orchidopexy under general anaesthesia. After pre-oxygenation, anaesthesia was induced using an injection of fentanyl 25 mcg and an injection of propofol 25 mg. Bag and mask ventilation was performed and an i-gel of size 2 was inserted and connected to the anaesthesia workstation (Dräger Primus SW 4.5n Lübeck Germany and the circuit Flexicare parallel circuit India) which had safely passed the machine check. Adequate tidal volume was delivered during manual bag and mask ventilation without any leak with high flows and the APL valve closed to 15 to 20 cm H_2O. There was a leak of around 60-70% on conversion into volume-controlled mode. The air entry was grossly diminished. A fall in end-tidal carbon dioxide concentration ($EtCO_2$) from 30 to 11 (mmHg) was noted. The set tidal volume was not attained. The mode was immediately changed back to manual mode and the desired tidal volume was delivered. There was an audible leak near the patient's end despite maintaining flows at 1L/min which ruled out leak due to high flow. Despite the change in size and supraglottic airway device change, the leak persisted. The circuit, bag, and machine were rechecked for any leaks. The repeat leak test did not reveal any leaks (Figure 1). Finally, endotracheal intubation was performed to secure a definitive airway since the patient was not getting ventilated by any supraglottic airway device. Unfortunately, the leak persisted. After a thorough examination from the patient end to the machine end, a break in the inner circle of the L connector (Figure 2) was found which caused the leak. On replacing the L connector there was no leak and adequate tidal volume was delivered in volume-controlled mode of ventilation. The surgery was completed uneventfully, and the child was extubated after adequate reversal of neuromuscular block and complete awakening.

Complications and hazards related to the equipment of the anaesthesia machine are crucial to the anaesthesiologist.[3] Regular machine checkouts typically

* *Corresponding author*.
E-mail address: swativijapurkar24@gmail.com (S. Vijapurkar).

https://doi.org/10.18231/j.ijca.2025.026

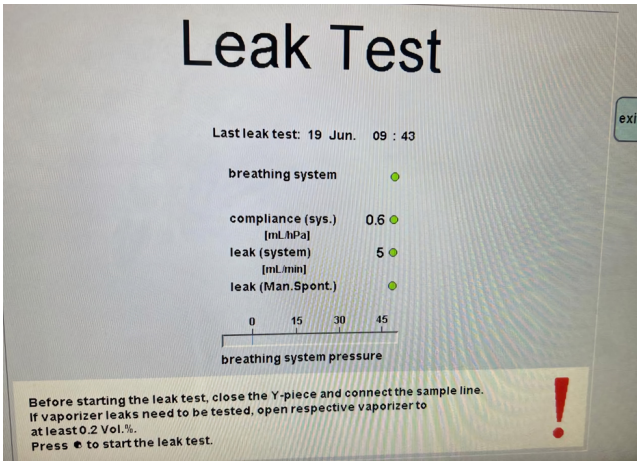

Figure 1: Standard leak test showing minimal leak (Drager Primus)

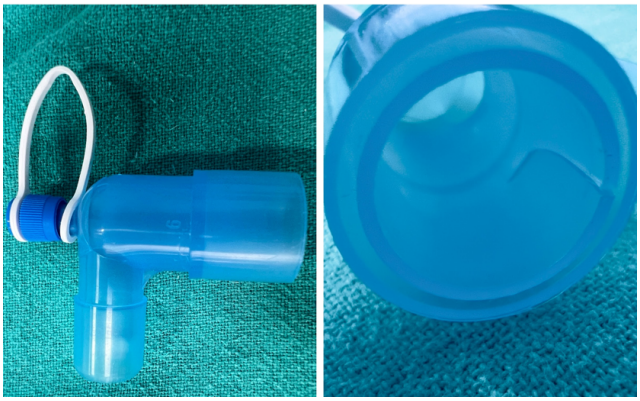

Figure 2: A cracked inner sleeve of the L connector

reveal leaks in the circuit, which are a common occurrence. With the advent of disposable circuits that are usually made of non-reusable material, they tend to break and cause leaks leading to improper tidal volume delivery.[4] All connectors should be included along with circuit in routine machine and circuit check.

In our case, a disposable tubing with a plastic L connector was used. The routine standard machine checkout revealed a system leak of 5 milliliters/minute which is considered acceptable. The leak was evident only when the circuit with the L connector was connected to the patient on a volume-controlled mode of ventilation. Complete regular machine checks do not always ensure the detection of significant leaks that would interfere with ventilation.[5] Even though we adhered to the normal protocol, which entails pressurising the breathing system to 30 cm H_2O against a closed relief valve and an occluded patient port, we were unable to observe any substantial hazards.

Any leaks, obstructions, misalignment, material degradation, or poor fit should be properly checked daily before starting the case. L connector has the port for EtCO2 monitoring and the port should be blocked for checking the connector.

Any defective connectors should be promptly replaced to maintain the safety and efficacy of the anaesthesia delivery system. In a similar report by Vinod Malhotra et al.[6] the broken inner sleeve of a Y-connector caused a leak post intubation, but the anaesthesia circuit had been tested and passed the machine check without any leaks prior to administration of anaesthesia.

1. Conclusion

Such instances make checking for cracks in the inner circle/sleeve of connectors necessary and to be added as a part of routine machine checkout. This would prevent disastrous complications to the patient. Presence of a leak despite a passed machine check should lead us to suspicion of broken or cracked connectors and must be promptly changed and discarded to prevent reuse.

2. Conflict of Interest

None.

References

1. Loeb R. Anesthesia machines: Prevention, diagnosis, and management of malfunctions. Available from: https://www.uptodate.com/contents/anesthesia-machines-prevention-diagnosis-and-management-of-malfunctions/print.
2. Mark D. An unusual anesthesia machine leak. *J Clin Anesth*. 2000;12(1):87.
3. Spooner RB, Kirby RR. Equipment-related anesthetic incidents. *Int Anesthesiol Clin*. 1984;22(2):133–47.
4. Alian AA, Shelley KH. Understanding Anesthesia Equipment, 5th Edition. *Anesthesiology*. 2008;109(4):754–5.
5. Goneppanavar U, Prabhu M. Anaesthesia machine: checklist, hazards, scavenging. *Indian J Anaesth*. 2013;57(5):533–40.
6. Malhotra V, Bradley E. Broken inner sleeve of a Y-connector: course of a circuit leak and a potential foreign body aspiration. *Anesth Analg*. 1993;76(5):1169–70.

Author's biography

Jakkireddy Sravani, Junior Resident

Pradeep Khobragade, Assistant Professor

Swati Vijapurkar, Senior Resident https://orcid.org/0000-0003-0065-0639

Ishan Verma, Senior Resident, PDCC Onco-Anaesthesia

Gade Sandeep, DM Cardiac Anaesthesiology https://orcid.org/0000-0001-7472-9580

Cite this article: Sravani J, Khobragade P, Vijapurkar S, Verma I, Sandeep G. Troubleshooting anesthesia equipment: A focus on L connector. *Indian J Clin Anaesth* 2025;12(1):164-165.