# Endotracheal tube leak: What should we do?

Leakage around an endotracheal tube (ETT) is a common problem encountered in the operating room (OR) and the intensive care unit (ICU). The incidence of air leak has been reported to be as high as 11% in ICU.[1] The effects may vary from bubbling sound to inability to ventilate, life threatening hypoxemia, or atmospheric pollution with the leaked anesthetic mixture or a decreased delivery of anesthetic mixture resulting in an inadequate depth of anesthesia.[2] However, there are no standard guidelines for prevention and management of ETT leaks. ETT leaks may occur without any manufacturing defect. Many a time, it is due to defective inflation system (valve, pilot balloon or inflation line), damage in the ETT body/connector or defects in the cuff itself. Most of these defects occur due to wear and tear in the ETT cuff/inflation system, due to reuse or mishandling of single use ETT. In this issue, R. Sachdeva & N Bhatia,[3] have reported an interesting method (underwater testing of ETT after occluding its tip) to detect leaks due to unusual manufacturing defects in the ETT.

Preuse check of sterile single use ETT is controversial because opening a sterile ETT may contaminate the ETT and predispose the patient to subsequent ventilator-associated pneumonia. American Society of Anesthesiologists (ASA) House of Delegates in their statement has suggested that a single use ETT can be opened to check for any manufacturing defect and possible cuff leak.

A thorough preuse check should be done before using any ETT and include visual inspection to check the patency of its lumen and rule out any manufacturing defect. Also, one should check the cuff to ensure that it inflates symmetrically and is not damaged. Many a times, such a defect is missed in preuse check and the problem manifests intraoperatively during surgery.[4] At that time, it may be technically difficult (prone position, head, and neck surgery) and challenging to change the ETT, especially in cases of preexisting difficult airway. Some authors have suggested simple measures to reduce ETT leak like pharyngeal packing, continuous inflation through the inflation channel and inflating the pilot balloon with saline and lignocaine mixture have been tried with limited success. Most of these methods are temporary and have limitations, like inability to completely eliminate leak and risk of aspiration.[5] Despite the above mentioned methods, the ETT cuff leak may persist, and we may have to resort to exchange of the ETT during surgery.[6] Before attempting an exchange of ETT during surgery, the difficult airway cart should be arranged, and oxygen insufflation provided through nasal cannula or a catheter to reduce the chances of desaturation. It may be prudent to exchange the ETT over a conduit (airway exchange catheter, fiberoptic bronchoscope) to prevent loss of a secure airway and increase the chances of successful re-intubation.

In conclusion, it is important to check the ETT cuff and inflation tubing prior to its use. We should be vigilant and have a systematic plan to identify the cause and manage it, in case of inadequate ventilation intraoperatively.

**Nishkarsh Gupta**
Department of Anesthesiology, Dr. BRAIRCH, AIIMS, New Delhi, India

**Address for correspondence:** Dr. Nishkarsh Gupta, Department of Anesthesiology, Dr. BRAIRCH, AIIMS, New Delhi, India.
E-mail: drnishkarsh@rediffmail.com

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