A Defect Tunnel Induced Air Leakage in a Double-Lumen Tube

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To the Editor,

Adhikary and Krishnan,1 Chen et al.,2 and Campbell et al.3 described that manufacturing defects resulting in obstruction of double-lumen endotracheal tubes (DLT). Here, we encountered an unusual defect in a DLT, detected by air leakage in a 69-year-old female patient (with a height of 160 cm and weight 54 kg) receiving left upper lobe lung mass resection. Global inspection of our left-sided, 32 Fr. DLT (Shiley™, Covidien, Dublin, Ireland) before anesthesia did not reveal any defect. After anesthetic induction, we intubated this DLT using real-time video laryngoscopy and wireless video fiberoptic bronchoscopy in one attempt, without difficulty.4 Chest auscultation revealed equal breath sounds. We confirmed proper placement by clamping each lumen and confirming one-lung ventilation (OLV) by auscultation. However, air leakage with less than 300 mL of gases could be delivered with 30 cm H2O plateau airway pressure was found at the mechanical ventilation during pressure-controlled OLV through the both lumens of tracheal and tracheobronchial before surgery. Thus, the breathing circuit was rechecked but no abnormality was found. The patient’s hemodynamics were stable and pulse oximetry saturation showed 100% with 100% FiO2 throughout this period. Accordingly, a manufacturing defect in the DLT was highly suspected, therefore, we removed this DLT and reintubated with another left-sided, 32 Fr. DLT. The problem of air leakage was resolved with a careful approach, and there were no serious consequences. After surgery, we rechecked this DLT and found that there was a defect tunnel between the tracheobronchial and tracheal lumen (Fig. 1).

Though many ventilation problems concerning air leakage or obstruction have been reported because of malfunction of ventilation equipment, or a manufacturing defect of an endotracheal tube, most problems could be easily detected by either the mechanical alarm for gas leakage or the use of a suction tube or fiberoptic bronchoscope.2 In this case, the defect was difficult to localize and identify in either the pre-use checkout or during the event because of its obscure localization. Finally, we should keep in mind that unusual air leakage might result from manufacturing defect of the DLT during OLV.

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References


Fig. 1. A. The outlet of the defect tunnel from tracheobronchial lumen to tracheal lumen (view from the tracheobronchial lumen). B. The outlet of the defect tunnel from tracheal lumen to tracheobronchial lumen (view from the tracheal lumen).