

Influence of lateral decubitus positioning on one-lung ventilation optimisation despite adequate choice of double-lumen tube

A case report

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Background & Objective

The selection of adequate double-lumen endotracheal tube (DLT) size is critical for effective one-lung ventilation (OLV) and optimal surgical exposure. However, conventional selection criteria, based on patient's gender, weight and height, lack of precision, leading to challenges in tube placement and ventilation management.

Here, we report the case of an obese female patient undergoing two consecutive bilateral thoracic surgeries, for whom we encountered difficulties with the placement of the DLT during only one of the two procedures.

Despite adequate choice of DLT size according to conventional criteria, we aimed to highlight the **influence of patient's positioning on OLV optimisation**.

Case-report

An **obese 52-year-old female** underwent two consecutive thoracic surgeries for bilateral metastases from knee sarcoma.

For both surgeries, a 37-French left-sided DLT (Covidien®, Dublin, Ireland) was selected, **based on patient's gender, weight (107 kg) and height (162 cm)**.

For the first surgery, the patient was positioned **in left lateral decubitus** after easy tracheal intubation. The fiberoptic bronchoscopy revealed a **significant mismatch between DLT and left main bronchus length**. A correct DLT positioning was finally obtained after multiple manipulations of the tube.

Four weeks later, the patient underwent a contralateral surgery (on **right lateral decubitus**). A similar 37-French left-sided DLT (Covidien®, Dublin, Ireland) was chosen again, after verification of adequation between main left bronchus (CT-scan) and DLT left extremity lengths (Fig. 1). This time, **no mismatch** was encountered

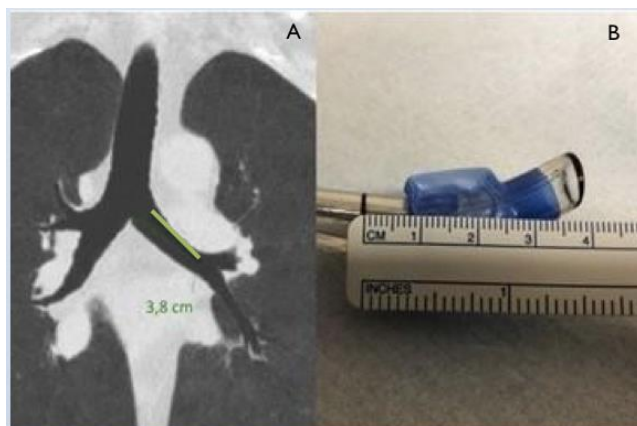


Figure 1 – Measure of the left main bronchus on CT-scan reconstruction (A) and direct measure of DLT extremity length (B)

Discussion & learning points

In this case, we faced important DLT positioning difficulties during one of the two surgeries, due to length mismatch between the DLT and the patient's anatomy. We then investigated **potential causes**.

- (1) In the literature, the **diameter mismatch** between the respiratory tract and the tube is the more frequently reported cause, but we excluded it.
- (2) We investigated a potential **within-brand difference in DLT lengths** of the same size. We confirmed that both tubes came from the same batch, which was constituted of at least 15 37-French DLT of the same length.
- (3) Hence, **patient's lateral decubitus positioning** and the subsequent **relative shifting of the mediastinum** were the only parameters that varied significantly between the two surgeries and could explain the disparities in airway management.

In conclusion, adequate choice of DLT size remains challenging to provide an optimal thoracic surgical exposure. **Conventional criteria** and other tools (e.g. **preoperative CT-scan imaging**) have been described to guide the anaesthesiologists' choice, but they are **not perfect**. Our case highlights that practical aspects, such as the **patient's morphology and lateral positioning** need to be taken into account to anticipate patient-tube mismatch and failure in OLV.