



Case report

# Use of lighted stylets to facilitate insertion of double-lumen endobronchial tubes in patients with difficult airway anatomy

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**Abstract** Placement of double-lumen endobronchial tubes (DLTs) into the trachea can be difficult because of their size and configuration. For patients with abnormal airway anatomy and anticipated difficult tracheal intubation, DLT placement can be extremely challenging. We present our experience using lighted stylets to facilitate insertion of DLTs in a series of patients with difficult airway anatomy. © 2006 Elsevier Inc. All rights reserved.

## 1. Introduction

Placement of double-lumen endobronchial tubes (DLT) into the trachea can be difficult because of their size and configuration. For patients with abnormal airway anatomy and anticipated difficult tracheal intubations, DLT placement is even more challenging. Recommended solutions to the management of DLT placement in patients with a difficult airway include fiberoptic-assisted DLT placement [1,2], single-lumen endotracheal tube (ETT) placement and use of a bronchial blocker [3,4], single-lumen ETT placement followed by the use of an airway exchange catheter to guide replacement with a DLT [5], fiberoptic placement of a Univent tube 5, and endobronchial placement of a single-lumen ETT [6]. Use of a lighted stylet to

facilitate single-lumen ETT placement in patients with normal and abnormal airway anatomy has been extensively reported [7,8], and letters to the editor have also described the use of a lighted stylet to place a DLT [9,10]. We describe our experience with a lighted stylet for placement of a DLT in patients with both normal and abnormal airway anatomy and suggest this as an additional approach to the patient with a difficult airway who requires lung isolation with a DLT. After Institutional Review Board approval, data from the anesthesia records of 5 patients were reviewed. Two representative cases are first presented, and our experience with the three remaining patients is then described in Table 1.

## 2. Case reports

### 2.1. Case 1

A 65-year-old, 183 cm, 68 kg man presented for thoracoscopic drainage and debridement of a right empyema. Airway evaluation was notable for a Mallampati class

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**Table 1** Patient characteristics

Patient	Procedure	Age/Gender	Height/Weight	Mallampati score	Airway features	DLT type	Success/Attempts	Esophageal intubations
1	Thoracoscopy, empyema drainage	65/M	183 cm/68 kg	II	Small mouth, prominent dentition	39 Fr left	Yes/1	None
2	Thoracoscopy, pleural effusion drainage	45/M	170 cm/67 kg	III	Narrow high-arched palate	37 Fr left	Yes/2	None
3	Thoracoscopy, lung biopsy	64/F	168 cm/84 kg	II	Small mouth, short TMD, full dentition	37 Fr left	Yes/1	None
4	Esophago-gastrectomy	42/F	173 cm/66 kg	II	Severe overbite	37 Fr left	Yes/1	None
5	Thoracotomy, pericardial cyst resection	44/M	173 cm/105 kg	I	Obese, limited neck extension	39 Fr right	Yes/1	None

M indicates male; F, female; TMD, thyromental distance.

II airway, a small mouth opening, and prominent maxillary dentition. Induction of general anesthesia was achieved with propofol and paralysis with vecuronium, and because of anticipated difficulty with DLT placement, a malleable lighted stylet (Mercury Medical, Clearwater, FL) (Fig. 1) was used to guide successful tracheal placement of a 39-French (Fr) left-sided Mallinckrodt Bronch-Cath DLT (Mallinckrodt Medical, Inc, St. Louis, MO) on the first attempt. Before intubation, the operating room (OR) lights were dimmed to facilitate detection of the lighted stylet. The head was maintained in the neutral position for intubation.

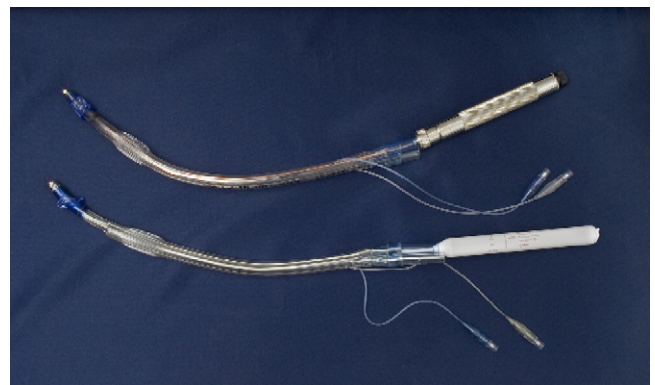
## 2.2. Case 2

A 44-year-old, 5 ft 8 in, 230-lb man presented for a right thoracotomy for resection of a pericardial cyst. Physical examination revealed an obese male with a Mallampati class I airway and somewhat restricted neck extension. General anesthesia was induced with thiopental and fentanyl, and muscle relaxation was obtained with vecuronium. After dimming of the OR lights, the trachea was successfully intubated on the first attempt with a right-sided 39-Fr Mallinckrodt Broncho-Cath DLT using a disposable lighted stylet (Surch-Lite Lighted Intubation Stylet, Aaron Medical, St. Petersburg, FL) (Fig. 1). The anterior chest wall was retracted downward to allow adequate visualization of the tip of the lighted stylet.

## 3. Discussion

Use of a lighted stylet to facilitate endotracheal intubation in patients with normal and abnormal airway anatomy has been extensively investigated and is often used as a rescue maneuver when direct laryngoscopy or other approaches have failed [8]. The principle of this approach is placement of the ETT containing the lighted stylet in the oropharynx

and advancement of the ETT over the stylet into the trachea when a bright red glow is detected in the central portion of the neck near the cricoid cartilage [7], the brightest illumination indicating position of the ETT either in the trachea or at the glottic opening. Double-lumen endobronchial tube placement can be challenging, even in patients with normal airway anatomy, because of their larger size and unique configuration, and can be especially difficult to place in patients with abnormal airways. One of the authors (TAO) has extensive experience using the lighted stylet to facilitate single-lumen ETT placement in over 3000 patients and has now successfully used the lighted stylet for DLT placement in several additional patients with normal and abnormal airways (unpublished personal experience). Double-lumen endobronchial tube placement was achieved in all cases on the first or second attempt, without any esophageal



**Fig. 1** Two-lighted stylets are illustrated in this figure. The first is a 37-Fr Bronch-cath DLT with a malleable lighted stylet (Mercury Medical, Clearwater, FL) within the bronchial lumen, with the bulb positioned at the tip of bronchial lumen. In the second DLT, a 39-Fr right-sided Bronch-cath DLT, a larger lighted stylet (Surch-Lite Lighted Intubation Stylet, Aaron Medical, St. Petersburg, FL) is present in the bronchial lumen, with the bulb of the stylet positioned as in the DLT above it.

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