Lighted Stylet Intubation

15

Benjamin M. Mahon and Lars K. Beattie

Indications

- Difficult/impossible direct laryngoscopy [1, 2]
  - Congenital abnormalities of airway
  - High Mallampati grade [3]
  - Dental appliances
- Failed direct laryngoscopy

Contraindications

- Absolute
  - Morbid obesity
  - Airway foreign body
  - Expanding neck mass
- Relative
  - Abnormal airway anatomy
  - Airway lesions (e.g., abscess, mass, epiglottitis) that change oropharyngeal anatomy
  - Acute care where concomitant resuscitation requires a well-lit room
  - Lack of familiarity or experience with procedure
  - "Can't oxygenate, can't ventilate" situation

Materials and Medications

- Intravenous (IV) access, O_2, monitor
- Ambu bag with supplemental oxygen
- Suction (Yankauer and tubing)
- Lighted stylet (LS)
- Endotracheal tube (ETT) 2.5-mm larger than LS with 10-cc syringe
- Surgilube
- Intubation medications (this procedure may be performed as an awake or a rapid sequence intubation)

Methods

1. Preoxygenate.
2. Positioning:
   (a) Sniffing position, pinna at the level of the sternal notch (Fig. 15.1).
   (b) Skip sniffing position if cervical spine injury is suspected.
3. LS-ETT unit preparation:
   (a) Insert the wire stylet into the device.
   (b) Check the LS light.
   (c) Lubricate the LS with K-Y Jelly.
   (d) Position the LS just distal to the Murphy eye.
   (e) Curve the LS to user preference at the line labeled "bend here."

Fig. 15.1 Sniffing position, pinna at the level of the sternal notch

B. M. Mahon
Poinciana Medical Center, Kissimmee, FL, USA

L. K. Beattie (✉)
Department of Emergency Medicine, University of Florida, Gainesville, FL, USA
e-mail: lars.beattie@ufl.edu

L. Ganti (ed.), *Atlas of Emergency Medicine Procedures*, https://doi.org/10.1007/978-3-030-85047-0_15

4. Administer intubation medications.
5. Have an assistant apply cricoid pressure.
6. Grasp and elevate the patient's jaw near the corner of the mouth with the operator's thumb, index, and middle fingers, elevating the tongue and epiglottis along with it.
7. Using the free hand, insert the LS-ETT unit into the oropharynx and advance (Fig. 15.2).
8. Use the midline glow in the neck to guide insertion of the LS-ETT (Fig. 15.3).
9. Bright light *below* the thyroid prominence indicates correct placement of the ETT tip.
10. Dim or blurred light or light at the thyroid prominence suggests incorrect positioning (Fig. 15.4).
11. If the transilluminated light is dim, off center, or not seen, esophageal positioning must be considered:
    (a) Withdraw the LS-ETT unit approximately 2–5 cm.
    (b) Reposition the patient's head and neck.
    (c) Reattempt according to steps 5–8.
12. Placement of the ETT (Fig. 15.5):
    (a) Hold the LS-ETT unit steady with one hand.
    (b) Check the depth of the ETT and adjust accordingly.
    (c) Release the LS latch that holds the ETT to the LS.
    (d) While holding the ETT in position, gently slide the LS out from the ETT.
    (e) Inflate the ETT balloon.

Fig. 15.2 Grasp and elevate the patient's jaw near the corner of the mouth with the operator's thumb, index, and middle fingers, elevating the tongue and epiglottis along with it. Using the free hand, insert the LS-ETT unit into the oropharynx and advance

13. Confirm ETT placement (continuous end-tidal CO_2 [$EtCO_2$], colorimetric capnometry).
14. Secure the ETT.

Pearls and Pitfalls

- Pearls
  - LS-ETT complex: Typically the classic "hockey-stick" shape with the 90° curve just proximal to the cuff is recommended [2].
  - Dimming the room lights will enhance transillumination.
  - Pulling the wire stylet out from the LS-ETT unit will make it more pliable and may facilitate its placement in the trachea and removal of the LS.
  - Some LS devices may start to blink after 30 seconds to prevent bulb overheating.
  - The LS may be used with nasotracheal intubation, intubation through a laryngeal mask airway (LMA), or conventional laryngoscopy to enhance success.
- Pitfalls
  - LS intubation should not be used as an emergency airway alternative by a proceduralist unfamiliar with the technique:
    It is technically complicated and more challenging than many other airway adjuncts in the standard difficult airway algorithm.
    One study compared the use of four rescue airway devices in the difficult airway algorithm. A success rate of only 20% was achieved with the Trachlight™ lighted stylet on the first attempt when in the hands of the novice physician when used as a rescue device in their difficult airway algorithm [4].
  - In very thin patients, transillumination may be visualized quite well even when the LS-ETT unit is in the esophagus:
    When the unit is in the esophagus, typically the light will be more diffused.
    When the unit is in the trachea, the transilluminated area will be well circumscribed.
  - In obese patients or patients with significant neck tissue, the transilluminated light from the LS-ETT unit may be dim despite correct positioning in the trachea.

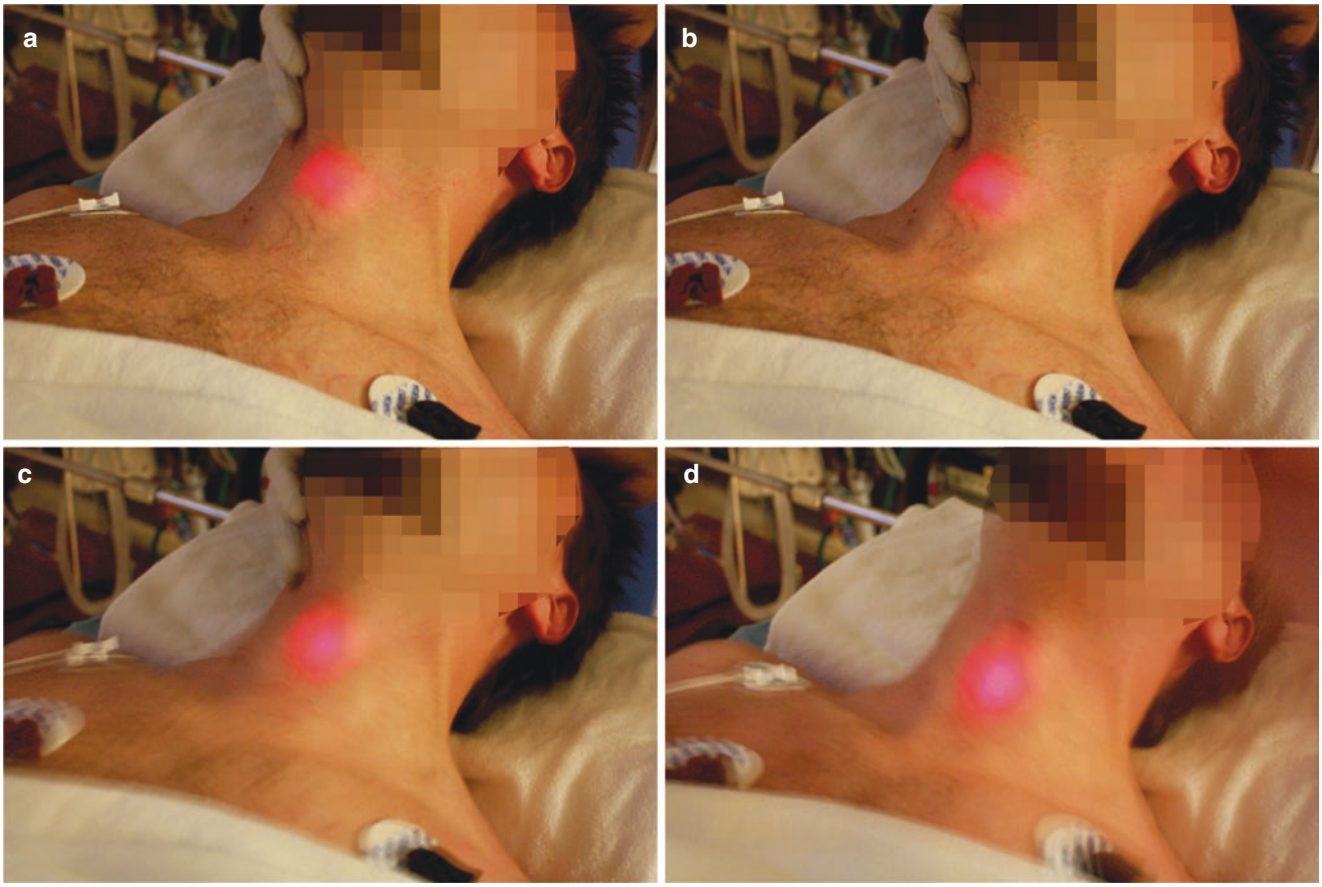

Fig. 15.3 (**a**–**c**) Use the midline glow in the neck to guide insertion of the LS-ETT. (**d**) Bright light *below* the thyroid prominence indicates correct placement of the ETT tip

Fig. 15.4 Dim or blurred light or light at the Laryngeal prominence suggests incorrect positioning

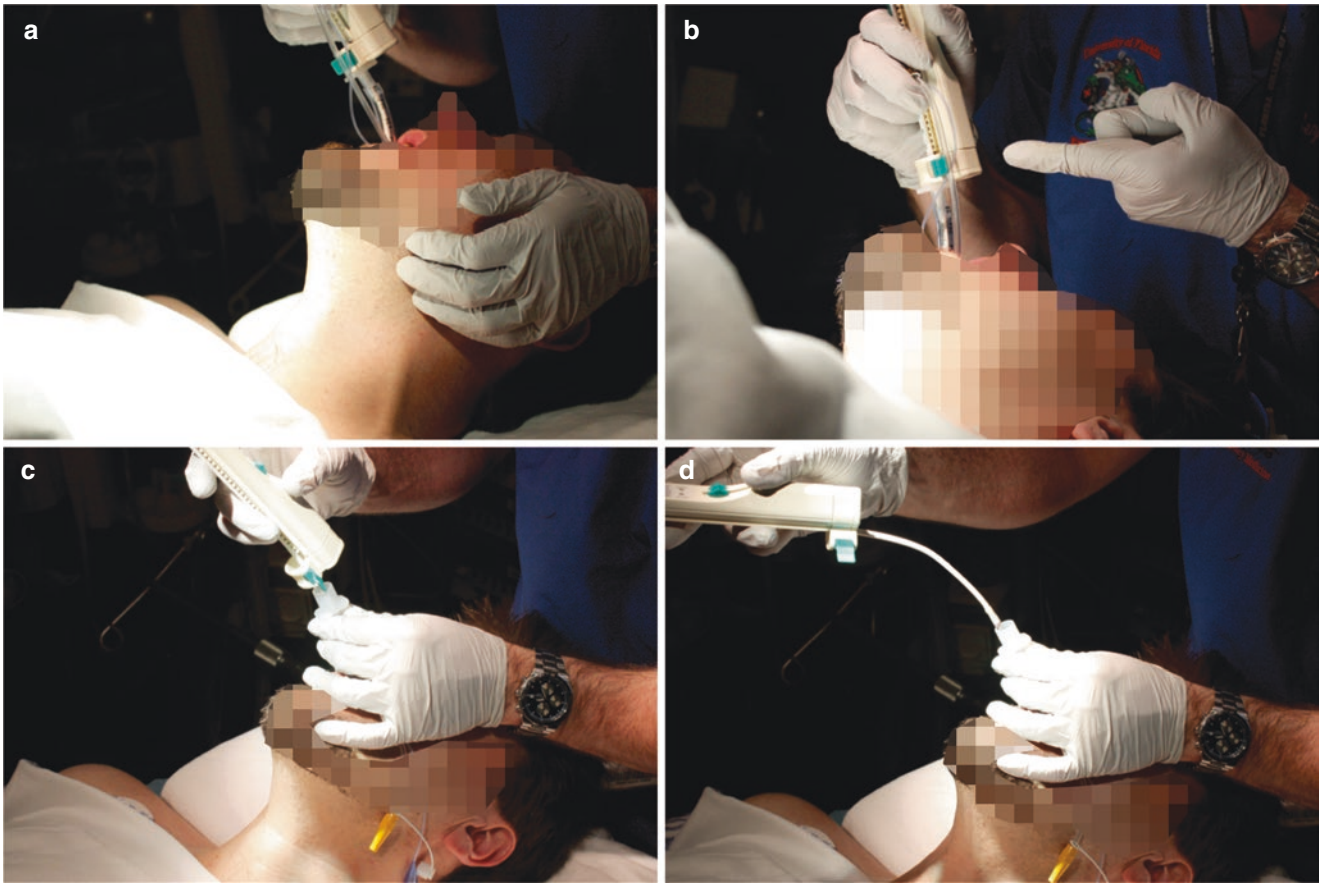

Fig. 15.5 (**a**) Hold the LS-ETT unit steady with one hand. (**b**) Check the depth of the ETT and adjust accordingly. (**c**) Release the LS latch that holds the ETT to the LS. (**d**) While holding the ETT in position, gently slide the LS out from the ETT

References

1. Agro F, Hung OR, Cataldo R, Carassiti M, Gherardi S. Lightwand intubation using the Trachlight: a brief review of current knowledge. Can J Anaesth. 2001;48:592–9.
2. Davis L, Cook-Sather SD, Schreiner MS. Lighted stylet tracheal intubation: a review. Anesth Analg. 2000;90:745–56.
3. Rhee KY, Lee JR, Kim J, Park S, Kwon WK, Han S. A comparison of lighted stylet (Surch-Lite) and direct laryngoscopic intubation in patients with high Mallampati scores. Anesth Analg. 2009;108:1215–9.2.
4. Aikins NL, Ganesh R, Springmann KE, Lunn JJ, Solis-Keus J. Difficult airway management and the novice physician. J Emerg Trauma Shock. 2010;3:9–12.

Suggested Reading

Langeron O, Birenbaum A, Amour J. Airway management in trauma. Minerva Anestesiol. 2009;75:307–11.
Walls RM, Murphy MF. Manual of emergency airway management. 3rd ed. Philadelphia: Lippincott Williams & Wilkins; 2008: Chap. 11.