

Difficult Intubation Are You Prepared for It

By Corina Balcom, R.N., B.N.

The perioperative nurse who supports the anaesthetist (often the circulating nurse) during surgical cases, requires advanced knowledge and skills to perform this function adequately. A duty of this person is to help the anaesthetist in airway management during all situations. One situation which can exist is that of difficult intubation.

Assessment

Difficult intubation results when the anaesthetist has difficulty, for any number of reasons, placing an endotracheal tube (ET). There are times when this situation can be anticipated. In the pre-operative assessment carried out by the anaesthetist, indications of trouble may be apparent. Examination of the patient can display some of the anatomical characteristics that can complicate intubation as described by Stoeling (1986), "A short muscular neck with a full set of teeth, a receding mandible, protruding maxillary incisor teeth, poor mandibular mobility and a high arched palate associated with a narrow mouth" (p. 524). These anatomic situations prevent poor alignment of the oral, pharyngeal, and laryngeal axis. Without this alignment, the glottis cannot be visualized adequately.

Abstract

The endotracheal intubation of a patient for surgery requires an anaesthetist who is aided by a skilled and experienced helper. This paper explores reasons why some patients are difficult to intubate. Some are predictable on pre-operative assessment and others are not. Suggestions are given on how the helper is useful to the anaesthetist in this potentially critical situation.

Other factors may include the size of the tongue, obesity, neck contractures, and prominent pharyngeal tonsils, adenoids), especially in children.

Pathology can also lead to the problem of difficult intubation. Some of these disorders include retropharyngeal masses, fixed neck and hoarseness due to rheumatoid arthritis laryngeal cancer, and mediastinal mass (Shorten, 1991). Decreased mouth opening may be caused by tempero-mandibular joint pathology.

If the patient has been intubated on a previous occasion, and difficulty was encountered, this should be recorded in his/her medical records. The patient should also be aware and has a responsibility to inform those persons who do pre-operative assessments.

When trouble is anticipated a plan for action can be formulated in collaboration with those personnel involved with the surgical procedure. This may include the surgeon, assistant to the surgeon and anaesthetist, scrub nurse and nursing supervisor. This alerts key people in the event that further help is required.

At times the indicators are evident, however, often a difficult intubation cannot be anticipated. For this reason the anaesthetist's helper must be prepared for this during each surgical procedure where endotracheal intubation is planned.

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Equipment

Equipment for endotracheal intubation varies and is dependant on the anaesthetist's choice. However, the following are always needed:

- proper sized endotracheal tubes,
- appropriate anaesthetic drugs and neuro-muscular blockers,
- functioning laryngoscope,
- functioning suction, and
- facilities to provide positive pressure ventilation.

Routine monitoring devices include blood pressure, temperature probe, EKG, pulse oximeter, end-tidal carbon dioxide analyzer, and nerve stimulator.

Difficult intubation will require equipment over and above what is routinely used. Most equipment should be available in each anesthetic machine. If this is not feasible a "Difficult Intubation" cart is recommended. The following is a list of additional equipment and their uses:

1. Various types and sizes of laryngoscope blades.

"The three basic types of blades are the curved (McIntosh), the straight blade (Jackson or Wisconsin), and the straight blade with curved tip (Miller). Advantages cited for the straight blade include a greater exposure of the glottic opening permitting observation of the tube as it passes through the glottic opening and less need for a stylet to direct the tube into the anterior larynx. Advantages cited for the curved blade include less trauma to teeth and more room for passage of the tracheal tube through the esophagus, less bruising of the epiglottis since the blade tip should not touch the structure and decreased incidence of coughing and laryngospasm" (Stoeling, 1986, pg. 536).

2. Stylets. These are flexible wires placed in the endotracheal tube to facilitate directing the tube anteriorly. Stoeling (1996) explains, "When properly shaped, the tracheal end of the tube should resemble a hockey stick" (pg.535).

3. Fiberoptic laryngoscope or bronchoscope. Cole (1993) tells us that, "Fiberoptic intubation is a valuable technique in management of the difficult airway" (pg. 469). This instrument is threaded onto an appropriate size ET and allows for visualization of the larynx. When the larynx is viewed, the fibroscope is passed through the vocal cords and the ET is advanced using the scope as a guide.

4. Oral Airway Intubator. "This is a plastic oropharyngeal airway with a cylindrical passage that permits passage of the tracheal tube containing the fibroscope" (Stoeling, 1986, pg.539)

5. The laryngeal mask. "The laryngeal mask airway is intermediate in design and function between an oropharyngeal airway and a tracheal tube" (Maltby, Loken, & Watson, 1990, pg. 509).

6. A special anaesthetic face mask. This mask has a port through which the fiberoptic laryngoscope can pass and the patient can be ventilated at the same time.

7. 14 gauge intercath or cryothyroidotomy kit.

8. McGill forceps. These are intubating forceps which are used to grasp the ET and direct it between the vocal cords.

Procedure

When equipment and personnel are in place the patient is readied for intubation. Baseline findings from the monitors, prior to the beginning of induction, are obtained and recorded. If the anaesthetist has elected to attempt an awake intubation, the patient's cooperation and permission are essential. Awake intubation is advantageous because the patient is able to help the anaesthetist by swallowing secretions, phonating or panting. The anaesthetist should spend time with the patient to explain the procedure and develop a trusting relationship. In collaboration with the anaesthetist, nursing personnel should include information on awake intubation during their pre-operative teaching.

Local anaesthetic and sedation will be the anaesthetists' choice but Cheng et al (1993), in their clinical study, relate the drugs used for awake intubation as, "premedication of glycopyrrolate (0.2 mg. IM), midazolam (15 ug/kg IV), and fentanyl (0.75 ug/kg IV)...topical anaesthetic with 10 ml of 4% lidocaine to the upper airway followed by transtracheal block of 2 ml. of 2% lidocaine" (pg.A29).

As intubation is attempted, additional help may be required. The surgeon and the scrub nurse may be required to do any of the following tasks:

1. Draw up and administer IV or local anaesthetic medication.

2. Position and reposition the head. Stoeling (1986) describes proper head position for intubation, "successful direct laryngoscopy requires aligning the oral, pharyngeal, and laryngeal axis such that the passage-way from incisor teeth to glottis is most nearly a straight line. Elevating the head about 10cm. with pads under the occiput (shoulders remain on the table) serves to align these axis...adjustment of the table to the level of the anesthesiologists xiphoid cartilage" (pg. 528).

3. Placement of a stylet in ET.

4. May be required to ventilate with special mask in place while the anaesthetist is placing fiberoptic scope.

5. Perform the "BURP" manoeuvre. Knill (1993) describes this, "My hypothesis was that in some cases of difficult laryngoscopy, the view of the glottis could be improved by manually displacing the larynx in three specific directions - i.e. (1) posteriorly against the cervical vertebrae, (2) superiorly as far as possible and (3) slightly laterally to the right.

This combination of displacements can be produced by exerting backward, upward, and rightward pressure on the thyroid cartilage. The components of the manoeuvre can be remembered by the acronym BURP". With all three displacements maintained, laryngoscopy is performed and the endotracheal tube placed in the trachea" (pg.279-280).

Failed Intubation

In the event of failed intubation, further measures are necessary. If the intubation has been an awake attempt, it is necessary to inform the patient of the situation. The surgery may be rescheduled with a further plan for airway maintenance during surgery. This may even include insertion of a tracheotomy tube under local anaesthetic.

If the patient has been induced with IV medication and relaxants, assisted ventilation will be required until the effects of such drugs have worn off and the patient is awake enough to breath spontaneously. One also must consider the patient who is suffering the effects of anaesthetic drugs whose airway is further compromised by an obstruction. If it is impossible to ventilate and respiratory collapse is imminent, "prolonged attempts at orotracheal or nasotracheal intubation should be avoided. If orotracheal intubation is not successful after one or two attempts, cricothyroidostomy should be done" (Holcott & Wisner, 1991 pg. 198). Donlan (1986) explains, "this technique enters the trachea directly thru an incision in the cricothyroid membrane at the third tracheal ring. Cricothyroidotomy is a safe, simple life-saving procedure whereby an airway can be established in 1 or 2 minutes in emergency situations" (pg. 1875).

To adequately assist the anaesthetist in any of the previous mentioned situations, the person who helps the anaesthetist must be familiar with the anatomy of the neck, be comfortable in positioning and repositioning structures that facilitate intubation and know where all additional equipment can be found. As

Abbott (1990) explains, "the perioperative nurse must be able to anticipate the potential for intraoperative emergencies to plan and intervene effectively" (pg. 479). In short it requires an individual with experience and advanced knowledge and skill about anaesthesia to be prepared to give the patient quality care in all situations.

Conclusion

Whenever the patient requires endotracheal intubation the potential for minor, major or life threatening complications of that procedure must be kept in mind. Having equipment available and experienced personnel to assist the anaesthetist will provide the support staff needed for a positive outcome.

References

- Abbott, C. (1990). Planning for expected outcomes. In Rothrock, J., *Perioperative nursing care planning* (pp. 476-495). Toronto: The C.V. Mosby Company.
- Cheng, C., Asokumar, B, Caballero, A., Wong, D., & Chung, F. (1993). Haemodynamic, electrocardiographic, and ventilatory change during awake fiberoptic intubation. *Canadian Journal of Anaesthesia*, 40, (5), A29.
- Cole, A. (1993). Fiberoptic Intubation. *Canadian Journal of Anaesthesia*. 40, (5), 469-470.
- Donlon, J. (1986). Anaesthesia for eye, ear, nose, and throat. In Miller, R. (Ed.), *Volume 3: Anesthesia* (2nd. ed) (pp.1837-1894). New York: Churchill Livingstone.
- Holcroft, J. & Wisner, D, (1991). Shock & acute pulmonary failure in surgical patients. In Way.L., (Ed.), *Current surgical diagnosis & treatment* (9th ed.) (pp. 186-212). Norwalk, Connecticut: Appleton & Lange.
- Knill, R. (1993). Anaesthesia techniques: difficult laryngoscopy made easy with "BURP". *Canadian Journal of Anaesthesia*. 40, (3), 270-282.
- Maltby, J., Loken, R., & Watson, N. (1990). The laryngeal mask airway: clinical appraisal in 250 patients. *Canadian Journal of Anaesthesia*. 37 (5), 509-513.
- Shorten, G. (1991). The prediction of difficult intubation. *Anesthesiology Clinics of North America*, 9, (1), 63-67.
- Stoeling, R. (1986). Endotracheal intubation. In Miller, R. (Ed.), *Volume 1 Anaesthesia* (2nd ed.), (pp, 523-552). New York: Churchill Livingstone.

Newfoundland/Labrador Celebrate 15th Anniversary

During this year's Newfoundland and Labrador Operating Room Nurses Conference held in Gander, Newfoundland, September 29th to October 1st, 1994, two events took place to mark the development and celebrate the history of the organization. The OR group celebrated their 15th anniversary and the membership was presented with an official flag.



Photo above: (left to right) An anniversary cake is cut by N&LORNG presidents. Current President Lil Budden, past presidents Anne Hughes and Sylvia Hiscock, and immediate past president Angela LeMoine.

Photo Left: (left to right) Lil Budden and Angela LeMoine present the membership with the new N&LORNG official flag.



Dates to remember.....

AORN Annual Congress
Atlanta, Georgia
March 5 - 10, 1995

ORNAC '95
14th National Conference
May 8-12, 1995
Vancouver, BC

World Conference of OR Nurses - IX
September 10-15, 1995
Sponsored by the AAORN
Hamburg, Germany

ORNAC '97
15th National Conference - Ontario

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