

Case report: Awake insertion of the intubating laryngeal mask airway using dexmedetomidine sedation

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Introduction

An awake endotracheal intubation is an integral part of the American Society of Anesthesiologists (ASA) difficult airway algorithm.¹ In patients with a history of difficult tracheal intubations and/or mask ventilation, or in patients whose physical characteristics suggest such difficulties, awake management of the airway is recommended.² Adequate sedation, topical analgesia, and/or regional nerve blockade are required for successful, safe, efficient, and comfortable intubation. Careful titration of sedatives can avoid respiratory depression with resultant hypoxia, and hypercarbia.

A variety of devices can be used to allow endotracheal tube placement. The intubating laryngeal mask airway (ILMA) has an established role in the management of the difficult airway.³ The ILMA has been used for awake intubation in instances of failed fiberoptic guidance or as a primary technique.^{4,5}

Dexmedetomidine (DMED) is an alpha-2 agonist that has sedative, analgesic, and MAC-sparing properties. Despite deep sedation, patients receiving dexmedetomidine show minimal evidence of respiratory depression, and will awaken with verbal or physical stimulation.^{6,7} As an alpha-2 agonist it also has sympatholytic properties.⁸

In this report, we describe two cases of awake intubation using the ILMA in conjunction with administration dexmedetomidine.

Case 1

A 59 year-old female presented for laparoscopic resection of an adrenal adenoma. The patient was 156 cm in height and weighed 150 kg (Body Mass Index (BMI) = 65 kg/m²). Other co-morbid conditions included sleep apnea. Airway evaluation was significant for Mallampatti class I, a thyromental dis-

tance of 6 cm, a short neck, and a full set of dentition. Baseline vital signs included an oxygen saturation of 100 percent (3 L/min nasal cannula), blood pressure (BP) 140/70 mmHg, heart rate (HR) 90 bpm, respiratory rate 16/min, and end-tidal CO₂ 40mmHg. Prior to anesthetizing the airway the patient was sedated with fentanyl (1.6 mcg/kg) and midazolam (0.01 mg/kg).

Case 2

A 41 year-old male presented for a diverting colostomy. The patient was 158 cm in height and weighed 130kg (BMI = 52 kg/m²). Airway evaluation was significant for Mallampatti class IV, a thyromental distance of 6 cm, and a full set of dentition. Baseline vital signs included an oxygen saturation of 100 percent (3 liters/min nasal cannula), BP 140/63 mmHg, HR 123 bpm, respiratory rate 18/min, and end-tidal CO₂ 32 mmHg. The patient was initially sedated with fentanyl (0.77 mcg/kg) and midazolam (0.015 mg/kg).

Technique

Both patients consented to awake intubation. They were alert, and oriented with mild initial anxiety. The patients breathed oxygen at 3L/min through a nasal cannula during preparation. A CO₂ sampling line was connected to the nasal cannula. A 1mcg/kg-loading dose of dexmedetomidine was given over 10 minutes (Harvard Apparatus). As the loading dose of dexmedetomidine was infused, the oropharynx was topicalized with a mixture of lidocaine and benzocaine (Cetocaine®). A transtracheal block and bilateral superior laryngeal blocks were each done with 2ml of 4 percent lidocaine. The adequacy of the topicalization was tested by the patients' ability to tolerate a Guedel oral airway. After the loading dose was infused, the dexmedetomidine was continued at a rate of 0.2mcg/kg/hr. The patients remained alert, cooperative and were able to follow commands. Vital signs during sedation are noted in Table 1. In both patients size 5 intubating laryngeal mask airways (ILMA) were introduced. The patients did not cough or gag during or after placement of the device. The

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patients were intubated on a single attempt through the ILMA. General anesthesia was subsequently induced for the scheduled surgical procedures.

Discussion

In clinical practice, the most common reasons for a planned awake intubation are physical characteristics suggestive of a "difficult airway" or a previously established difficult intubation. Morbidly obese patients, defined as a body mass index (BMI) of greater than 40 kg/m², are not necessarily difficult to intubate.⁹ The patients in this report both had previous general anesthetics and were not, on history, difficult intubations. However, their physical characteristics had changed since their previous surgeries. The patient described in Case 1 had developed Cushing's disease and sleep apnea and was maintained on nasal CPAP (continuous positive airway pressure). The patient in Case 2 had gained a significant amount of weight since his previous procedure. They were determined to be ideal candidates for awake airway management.

In this report dexmedetomidine was successfully used for awake intubations with the ILMA. One of the most challenging aspects of awake airway instrumentation is ensuring patient comfort. Devices such as the ILMA, Wu scope®, and the Bullard scope® are bulky and require skill in awake placement. Proper topicalization and regional nerve blocks are essential, but placement of a laryngoscope, fiberoptic bronchoscope, lighted stylet or ILMA may still induce gagging and coughing. Inability to tolerate awake placement of an ILMA may be related to its bulk and/or the high pressures exerted against the pharyngeal mucosa.¹⁰ Coughing, gagging and desaturation may interrupt the intubation process and require maneuvers to support airway patency. Sedation with narcotics, benzodiazepines and/or propofol may cause a decline in oxygen saturation. This is especially true in obese patients who are prone to obstructive sleep apnea.¹¹ In addition, blood pressure and heart rate can increase with prolonged instrumentation of the airway. Providing sedation that allays anxiety without compromising oxygenation requires skill.

Dexmedetomidine (DMED) provides deep sedation with minimal respiratory depression.^{6,7} The manufacturer recommends a loading dose of 1mcg/kg infused over 10 minutes followed by a maintenance infusion of 0.2 - 0.7 mcg/kg/hr. In the cases presented here, the loading dose of dexmedetomidine was sufficient to sedate the patients and allow them to tolerate placement of the ILMA. Sedation with narcotics and/or ben-

zodiazepines is often required because the peak sedative effect of DMED is often not appreciated until 10-15 minutes after the infusion is started. No additional narcotic or benzodiazepine supplementation was required beyond the doses given initially. Hemodynamic and respiratory parameters remained stable during the sedation and intubation process (Table 1). Dexmedetomidine had minimal effects on the oxygen saturation or end-tidal CO₂. The patients remained cooperative and accepted the ILMA. At no point were the procedures interrupted for interventions such as a chin lift or jaw thrust to re-establish patency of the airway.

The success of the intubations presented here may be attributed simply to topicalization and adequate nerve blocks, but awake placement and acceptance of a bulky device is often difficult. This preliminary report indicates that DMED may be useful as a sedative during awake intubations. Tolerance to awake ILMA placement may be improved with DMED. In addition, the sympatholytic effect of DMED may attenuate increases in blood pressure and heart rate during awake intubation. Further large-scale investigations are needed to establish the role of dexmedetomidine during awake manipulation of the airway.

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Table 1: VITAL SIGNS

Patient	Parameter	Baseline	10 minute Sedation Average
1	SpO ₂	100	100
2		100	100
1	ETCO ₂	40	35 (range 30-40)
2		30	32 (range 27-32)
1	Respiratory rate	16	12 (range 10-16)
2		18	14 (range 12-20)
1	MAP	93	92
2		88	83
1	Heart Rate	90	80
2		123	90