

# Continuous education in sedation: Laryngospasm and management of the airway

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## INTRODUCTION

The goals of procedural sedation (PSA) stretch far beyond providing just sedation and analgesia. Practices need to strive to treat adults and children with dignity, decreasing their anxiety levels, providing adequate pain control, preventing adverse events, while maintaining proper cardio-respiratory function.<sup>1</sup> Safety is crucial.

Protection of the airway is vital to ensure patient safety. In dental sedation, the airway is usually shared by the sedation practitioner and the dentist. Understanding the importance of the airway and a basic knowledge of the anatomy are necessary. Protecting the patient against hypoxia is crucial.

This article will review critical aspects of laryngospasm (a form of airway obstruction), which may threaten patient safety, and will discuss how to rescue the patient during dental sedation.

**Keywords:** Laryngospasm, procedural sedation, airway

## DISCUSSION

PSA has been proven to be a safe and effective alternative to general anaesthesia for anxious patients (adults and children) who are undergoing certain surgical procedures outside the in-hospital environment. PSA refers to a technique of administering sedatives or dissociative agents, with or without analgesics, that allows patients to tolerate unpleasant procedures while cardio-respiratory function is fully maintained.<sup>2</sup> Behavioural management is an extremely important component of PSA.

According to Campbell *et al*, the risks related to office-based procedural sedation can be divided into three groups: inadequate sedation, over sedation/adverse response to sedatives or failed sedation.<sup>3</sup>

Patient safety begins with patient assessment and preparation. This includes a detailed medical history, clinical assessment and a focused airway evaluation before the sedation. The patient must meet the requirements for safe practice, as only ASA 1 and 2 patients can receive treatment outside the operating theatre.

There are various tools available to establish whether the airway will be safe under sedation.<sup>1</sup> This article will give practical information by defining laryngospasm, the risk factors for its development and the treatment thereof.

Laryngospasm remains an important cause of airway obstruction. It can be responsible for significant morbidity and even mortality, especially in the paediatric population.<sup>4</sup> Risk factors for the development of laryngospasm can be divided into patient related factors, and procedure and sedation-related factors. Patient factors include age (young children are especially at risk), the reactive airway e.g. after a common cold, upper respiratory tract infections or exposure to smoking, and, patients undergoing procedures to the larynx or pharynx. Sedation risk factors include any stimulation of the larynx, for example using suction catheters, or the influx of blood, mucus or other secretions.

Laryngospasm is a reflex closure of the upper airway as a result of stimulation of the superior laryngeal nerve, resulting in muscle spasm. This protective reflex prevents foreign material entering the trachea-bronchial tree but can cause hypoxia. It can be partial, allowing some air through, (and causing inspiratory stridor), or complete, with total absence of breath sounds.<sup>5</sup>

Laryngospasm can be self-limiting, but if it persists and is left untreated, life-threatening complications can ensue.<sup>6</sup>

The best management is prevention. This is done by identifying patients at risk as well as careful airway management during the sedation.<sup>4</sup> Secretions or blood

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from the patient's mouth as well as dental devices that make use of water sprays need to be monitored at all times.

Prompt identification is the key to successful treatment and the sedation practitioner needs to be on the lookout for signs and symptoms suggestive of laryngospasm, such as: inspiratory stridor, usage of accessory respiratory or abdominal muscles, absence of breath and ultimately symptoms of hypoxia and cyanosis. Common complications of laryngospasm include: oxygen desaturation, bradycardia, pulmonary aspiration, and even cardiac arrest.<sup>5</sup>

Airway manoeuvres can alleviate early laryngospasm. Perform a head tilt and jaw thrust while providing 100% oxygen with a positive pressure mask e.g. the Ambu-bag. Pharmacologic agents such as propofol or muscle relaxants should be used only in the hands of experienced sedation practitioners, comfortable in providing a secure airway.<sup>7</sup>

The management of laryngospasm requires application of knowledge, skills and teamwork. Simulation-based education, especially focused on airway management, is an area of significant benefit for the practitioner, who of course must undergo continuous professional education.<sup>4</sup>

The sedation practitioner's best preparation is anticipation, recognition, and readiness to respond to an adverse event. This is the reason why we advise sedation practitioners to seek training in PSA and see that they get airway certification. Basic manoeuvres e.g. jaw thrust, are usually sufficient to rescue the airway, but administration of supplemental oxygen can be important with airway obstruction.

Progressive management may be necessary and would include repositioning of the patient's airway by various opening manoeuvres, the placement of an airway tube to relieve upper airway obstruction or providing positive pressure ventilation.<sup>8</sup>

Patients with serious medical emergencies can deteriorate quickly and urgent support of the airway, breathing and circulation are essential.<sup>9</sup> Providers need to guide their treatment with the most recent resuscitation guidelines and must be certified in airway management.<sup>8</sup>

## CONCLUSION

Protocols, guidelines and training are the essential cornerstones of out-of-theatre procedural sedation.<sup>10</sup> Sedation practitioners must be trained and well-practiced in the art of providing safe sedation and resuscitation. They must be able to rescue a patient from a potential serious medical emergency and provide appropriate care until help arrives.

The 2015 SASA Guidelines on Procedural Sedation can be used as guidance for safe sedation practice.

Our next article will address ways to protect the airway during sedation.

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