Journal of Regional Anesthesia & Pain Medicine

Case Report

doi: 10.39127/2021/JRAPM:1000109
Badawy SZA. J Reg Anes Pain Med: JRAPM-109

Unilateral Lingual Neuropraxia Following Placement of i-Gel™ Airway Device: A Case Report

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Citation: Crutsinger C, Zemmedhun G, Owolabi A (2021) Unilateral Lingual Neuropraxia Following Placement of i-Gel™ Airway Device: A Case Report. J Reg Anes Pain Med: JRAPM-110.

Received Date: 21 September, 2021; **Accepted Date:** 26 September, 2021; **Published Date:** 30 September, 2021

Abstract

Objective: *In this case report, we describe a case of unilateral lingual nerve neuropraxia following atraumatic placement of the i-Gel LMA device.*

Case Report: *We report the case of a 40-year-old woman who required arthroscopic repair of the anterior cruciate ligament and meniscectomy of her right knee. Her physical examination and airway evaluation on the day of her surgery were unremarkable. The patient underwent atraumatic placement of size 4 i-Gel LMA for the duration of the 80-minute procedure. The patient was extubated deep without complications. On postoperative day one, the anesthesia team was notified that the patient was experiencing left anterior tongue and gingival numbness. By the nineteenth post-operative day, the patient's symptoms had resolved by 80%.*

Conclusion: *Lingual nerve neuropraxia is a rare complication that ensues airway manipulation, including LMA placement. Nerve damage can occur from either nerve compression or stretching during the procedure. Patients can present with numbness and decreased taste at the anterior two-thirds of the tongue. Risk factors for the development of lingual nerve neuropraxia include over-inflation of the cuff, use of nitrous oxide or mal-positioning of the LMA. Though often distressing for the patient, neuropraxia has been shown to be self-limiting in most cases. Care providers and anesthetists should be aware of the risk, prognosis, and treatment of lingual neuropraxia following LMA placement.*

Keywords: *Lingual Neuropraxia, Unilateral, i-Gel ™ Airway Device, anterior, cruciate ligament, meniscectomy, nerve damage, compression, self-limiting.*

Introduction

Laryngeal mask airways, or LMAs, were first designed in 1981 by Dr. Archie Brain with the intention of a less traumatic airway than standard endotracheal intubation [1]. LMAs are associated with decreased incidence of sore throat, post-operative cough and bronchospasm [2,3]. Although often less traumatic and generally easier to place, LMAs do carry their own set of risks to patients including aspiration, vocal cord damage and cranial nerve damage [1]. The i-Gel airway (Intersurgical Ltd) is an LMA which was designed with thermoplastic elastomer to create a non-inflatable anatomical seal of the pharyngeal, laryngeal and peri-laryngeal structures. Compared efficacy of the i-Gel and LMA Supreme have shown comparable metrics like successful first insertion, time to first capnograph, and oropharyngeal leak pressure [4]. In this case report, we present a patient who developed lingual nerve injury following atraumatic placement of an i-Gel laryngeal mask airway.

Case Description

A 40-year-old, 81 kg ASA II female patient presented for a scheduled arthroscopic repair of the anterior cruciate ligament and meniscectomy of her right knee. The patient reported an active lifestyle with no significant past medical history. Preoperatively, her airway evaluation on the day of surgery showed Mallampati I, adequate mouth opening, thyromental distance greater than 5 cm, normal neck range of motion and normal dentition. In holding, the patient received a right adductor canal nerve block without complications. The patient was taken to the operating room and standard monitors were attached to the patient. After preoxygenation, the patient was induced with propofol. A well lubricated size 4 i-Gel was placed using a tongue depressor. On placement, no difficulty or resistance was noted. The patient remained in the supine position and head secured in an anatomically neutral position with a pillow. The patient was maintained on Sevoflurane for the duration of the 80-minute procedure. The patient was extubated deep at the end of the case with no blood noted in the i-Gel device. The patient remained hemodynamically

stable after extubation, and she was transported to post-anesthesia care unit (PACU) for post-anesthesia monitoring. The patient was discharged home on the same day of her surgery.

The anesthesia team was notified the day following her surgery that the patient had developed anterior tongue and gingival numbness on the left side. The patient was notified that lingual nerve neuropraxia is a rare complication of i-Gel placement and that resolution of symptoms may take from two weeks to six months. She was informed to report to the emergency room immediately if she experienced any difficulty swallowing or noticed increased drooling. She was given contact information for an ENT specialist for follow-up, if needed. Nineteen days postoperatively, the patient reported her symptoms had resolved by 80%. The care providers of the patient discussed with the patient the rarity of her complication and the need to report her case so that anesthetists and clinicians globally could learn from her experience. The anesthesia team obtained consent to publish her case.

Discussion

The lingual nerve is one of the branches from the mandibular division (V1) of the trigeminal nerve. It provides tactile sensory sensation to the anterior two-thirds of the tongue. The chorda tympani, a facial nerve branch, joins the lingual nerve at the lateral pterygoid muscle and provides taste sensation to the anterior two-thirds of the tongue as well [5]. The lateral rim of the tongue base and the medial aspect of the posterior mandible are areas where the nerve is at increased risk for pressure, stretch, or surgical trauma [6]. Lingual nerve injury after placement of LMAs is often attributed to excessive pressure from the cuff on the oropharyngeal mucosa or compression of the lingual nerve along the interior aspect of the mandible at the third molar [7]. The i-Gel device, with its non-inflatable cuff, may cause high pressure compression at the base of the tongue resulting in injury to the lingual nerve at the inferior aspect of the tongue [8].

Based upon a literature review, post-operative lingual nerve neuropraxia following airway instrumentation, including LMAs, is a rare condition with an overall incidence rate of 0.066% with younger and healthier patients being affected at higher rates [9]. In one case that was reported with a review of the literature, it was documented that: the estimated median age of patients who develop lingual nerve neuropathy was 38 years, the female to male ratio was 1.2:1 and the average surgical operating time was around 62.5 minutes [10]. Risk factors for lingual nerve neuropraxia include the use of an incorrectly sized LMA, nitrous oxide, excessive cuff inflation, failure to measure and adjust cuff pressure, mal-positioning of LMA, or traumatic insertion of LMA [11,12].

Patients with neuropraxia often present with sensory or motor dysfunction depending on the nerve, or nerves, that are involved. The onset of symptoms may be either acute or delayed, with symptoms beginning anywhere from hours to months. Typically, acute symptoms are attributed to direct damage to the nerve, while delayed symptoms are related to nerve inflammation and edema [13]. Generally, neuropraxia has a good prognosis. The symptoms of neuropraxia are self-limiting and on average resolve by around a month [10]. In prolonged neuropraxia, symptoms may be managed with steroids, antidepressants, and anticonvulsants. In severe cases, there is evidence that dexamethasone may be effective against the neuroinflammation and postoperative pain [14].

Conclusions

We present a case of lingual neuropraxia following atraumatic placement of the i-Gel device for an elective procedure. Patient positioning and size of the i-Gel were appropriately addressed for the procedure. In some cases, there is no explicit explanation for when or how cranial nerve injuries occur after placement of LMAs. Providers may reduce the risks of these injuries by limiting cuff pressure, proper sizing of LMAs, and practicing careful placement. As has been previously recommended, patients should be educated on neuropraxia and can be assured that the symptoms often resolve in around a month [10]. As the LMAs become more popular in usage, providers should be aware of the risks, prognosis, and treatment of neuropraxia.

Conflicts of Interest:
The authors declare no conflicts of interest.

Acknowledgement
We acknowledge the patient for granting us permission to report her case so that clinicians globally may be educated and made aware of such a rare type of complication so that when such a complication occurs it would not be a surprise.

Funding:
The authors have no sources of funding to declare for this manuscript.

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