

Tongue Ulceration and Swelling Following Peri-operative Airway Management with I-Gel

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Abstract

Introduction: Tongue swelling is one of the most common complications of endotracheal tube intubation associated with these devices. We present a rare complication of macroglossia following the use of an i-gel device.

History: A 25-year-old male patient was admitted following a motorcycle accident resulting in a left sided tibia-fibula fracture. He underwent a reduction with an intra-medullary nail fixation. General anaesthesia time was approximately three hours and the airway was maintained with a size 5 i-gel device. Following extubation a large ulcer was noted on the dorsum of the tongue with an associated significant swelling causing dysphagia. It was noted that the patient was drooling and had dysphonia. Naso-endoscopy revealed vocal cord oedema. Concerns were raised of the safety of the airway as he was admitted to ITU. The patient responded well to nebulised adrenaline and dexamethasone infusions over the next 48 hours and did not require re-intubation. His swelling and symptoms resolved fully and was discharged from hospital after 6 days.

Discussion: Tongue swelling secondary to i-gel is not currently well documented when compared to other airway devices. Tongue swellings can be secondary to trauma, as well as compression of the venous drainage of the tongue. Patients may require HDU/ITU treatment. Conservative treatment with adrenaline and dexamethasone may provide a good outcome.

Keywords: Anaesthesia • Tongue • Swelling • Macroglossia • Trauma • Surgery

Introduction

Post-operative macroglossia is a well-documented and potentially serious complication of airway intubation. Studies postulate compression of the tongue by the endotracheal tube as a key factor [1], leading to the blockage of venous drainage of the tongue, particularly in prolonged procedures [2]. However, other airway devices such as nerve conducting endotracheal tubes [3], laryngeal mask airways [4-6] and transoesophageal echocardiography probes [7] have also been attributed to tongue compression and subsequent swelling.

The consequences of airway device induced macroglossia include a risk of re-intubation and prolonged ITU [8-9] admissions, lingual paraesthesia [2], cosmetic deformity and dysarthria [10]. The NAP4 report [11] indicated that 25% of the airway events reported were related to supraglottic airway devices (SADs). Out of 100 anaesthetic complications, 38 cases resulted in unplanned ICU admissions for management of airway compromise, with 16 of these events occurring in recovery.

There are descriptions in the literature of two cases of post-operative lingual paraesthesia with i-gels due to traumatic insertion techniques [12]. In this, they also describe a third patient who had an uncomplicated insertion, but still had a sore tongue and apical hypoaesthesia. The presence of blood on removal of the device can indicate minor trauma associated with insertion. The incidence of blood on removal of an i-gel is between 4-13% [13].

Within this report we describe the case of traumatic ulceration of the dorsum of the tongue and subsequent swelling, following the use of an i-gel during an urgent surgical procedure.

Case report

A 25-year-old male patient presented with a closed fracture of his left tibia

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and fibula, sustained during a road traffic collision, requiring urgent surgical fixation under general anaesthesia. He had a background of stable Crohn's disease not currently requiring medication and had previously undergone an uncomplicated bowel resection in 2013. He was a non-smoker and had no known allergies. His weight was 74kg with a body mass index (BMI) of 24. On examination, he had a Mallampati Grade 2 airway. Induction was with 1mg of Alfentanil and 400mg of Propofol and maintenance with Sevoflurane MAC 1.4. A size 5 i-gel was successfully inserted on the first attempt. The surgical procedure proceeded unremarkably with a total general anaesthesia time of approximately three hours. His intraoperative oxygen saturations were stable and above 97% on an FiO₂ of 0.3. The i-gel airway was removed in recovery without any noted complication at the time.

Approximately 20 minutes after the removal of the i-gel, recovery staff noted a 2x4 cm ulcer on the left side dorsum of the tongue. The tongue was severely swollen causing dysphagia, dysphonia and significant drooling. The patient reported no difficulty in breathing and was maintaining his saturations above 98% on room air. Bedside nasoendoscopy revealed oedema of the vocal cords. There was no obvious erythema or collection in the oral cavity or oropharynx.

On assessment by the anaesthetic team, he was deemed not to be at risk of immediate deterioration and so a decision was taken not to re-intubate. He was started on medical therapy with 2-hourly nebulized adrenaline 1:1000 (1ml in 4 ml of 0.9% Sodium Chloride solution) and 8mg Dexamethasone TDS. He was transferred to a monitored bed in the Adult Critical Care Unit where medical management continued for 48 hours.

The patient responded well. His tongue swelling and associated symptoms fully resolved during this period, his dexamethasone infusions were weaned and he was safely stepped down to the general surgical ward. He was discharged on day 6 without further complications.

Discussion

The most common causes of post-operative macroglossia occur after prolonged procedures or procedures requiring neck flexion. Current literature reveals it is far less common for patients to suffer with tongue swelling after short orthopaedic procedures where patients were positioned supine.

Whilst ETT and LMAs have been shown to cause tongue swelling, no cases were attributed to i-gels. The patient sustained a traumatic ulcer on the

tongue, which may be a cause for the swelling. His Crohn's disease may have exacerbated the ulcer and swelling, however the patient reported being in remission since his bowel resection.

Using a SAD (supraglottic device) is relatively contraindicated in patients having urgent surgery due to the risk of aspiration. However, we used an SAD in this patient as he was starved for more than 6 hours, had a BMI of 25 and had no history of oesophageal reflux.

Previous treatments for tongue swellings have ranged from active monitoring, to steroids to intubation. This patient was treated with adrenaline nebulisers and dexamethasone infusions in a high dependency unit setting to good effect. Nebulised adrenaline acts on the alpha-adrenergic receptors in vascular smooth muscle cells, leading to vasoconstriction while steroids reduce the capillary permeability to inflammatory mediators.

Early detection by the recovery staff, prompt nasoendoscopy and timely intervention were the key factors in avoiding re-intubation

Conclusion

Although i-gels are a relatively safe device with a low risk profile since their introduction to clinical practice in 2007, they can still cause potentially significant postoperative airway morbidity. Anesthetists should be mindful of this because early detection leads to early intervention and can avoid the need for re-intubation.

Atraumatic insertion and optimal positioning is necessary, even in short cases, to reduce the risk of lingual swelling with i-gels. Treatment of tongue swelling with adrenaline and steroids may be considered in an appropriate setting and with clinical experience.

The tongue ulceration may have been caused by his underlying Crohn's disease thereby leading to swelling and must be considered as a risk factor for swelling.

Contributions

AS: Data collection and draft write up; RG: Redrafting and proofreading

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