Alternative Use of an Oral Endotracheal Tube Fastener in a Patient with Junctional Epidermolysis Bullosa

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This case report describes the alternative use of an oral endotracheal tube fastener in a pediatric patient with junctional epidermolysis bullosa. The patient underwent dental treatment in the operating room under general anesthesia and had a medical history of junctional epidermolysis bullosa, prior secondary anemia, clubbed feet, and past methicillin-resistant Staphylococcus aureus infection secondary to blistering. The oral endotracheal tube fastener was used in a nontraditional manner to avoid contact of the oral tube and tape with the epidermis and thus prevent blistering. Lubricated gauze was applied to the patient’s eyes for protection, and lubricant was applied to the lips and perioral skin before intubation and during dental treatment. Postoperatively the patient exhibited minimal blistering secondary to intubation and dental treatment.

Keywords: Epidermolysis bullosa, intubation, oral endotracheal tube fastener.

Junctional epidermolysis bullosa (EB) is a genetic condition leading to blistering and fragile skin and mucous membranes.1 Junctional EB is 1 of 3 subtypes of EB, which are differentiated based on the level at which blisters form.2 In junctional EB, the separation occurs in the lamina lucida of the basal lamina.3 Blisters form secondary to friction, which includes minor trauma.1,2 The incidence of this condition is 2 per million live births in the United States.3 Clinical presentation of junctional EB includes clubbing of the feet, infections and anemia secondary to blistering, pitting of the enamel in teeth, oropharyngeal mucosal erosions, and tracheal obstruction.3 In some patients, the severity of the condition decreases with age.2,3 Treatment of junctional EB is primarily supportive and includes the prevention of trauma and secondary infection.3

Case Summary
A 4-year, 11-month-old boy presented for dental treatment to be performed in the operating room using general anesthesia. The patient presented with junctional EB, a history of secondary anemia, an innocent heart murmur, clubbed feet, a history of methicillin-resistant Staphylococcus aureus infection, and severe dental caries. Medications included acyclovir, hydroxyzine, iron supplements, and polyethylene glycol 3350 (MiraLAX). The patient had an American Society of Anesthesiologists class 3 physical status because of his history of junctional EB and risks secondary to blistering.

Consultation between the anesthesia, dermatology, dental, and respiratory therapy teams occurred before treatment. The patient was brought to the operating room, and induction of anesthesia was performed with sevoflurane via mask. The pulse oximeter was placed on the left earlobe following application of lubricant. The pulse oximeter was not placed on the fingers or toes because of scarring. Lubricated gauze was placed over the patient's eyes.

It was elected to perform oral intubation over nasal intubation, which is generally preferred for dental procedures, to minimize blistering of the mucous membranes. Lubricant was applied to the lips and perioral skin before intubation. Care was taken during intubation to avoid excessive contact with the skin and oral mucosa. Following intubation, the tube was secured using an oral endotracheal tube fastener in a nontraditional manner at the suggestion of a respiratory therapist. The AnchorFast Oral Endotracheal Tube Fastener (Hollister Inc, Libertyville, Illinois) was used. The fastener was placed beneath the patient's neck, and the padded surfaces rested on the patient's mandible with minimal applied pressure (Figure). Comprehensive dental treatment, including extractions and dental restorations, was performed with frequent application of lubricant to the lips and perioral skin. Caution was again exercised during extubation to minimize contact with the skin and mucous membranes.

Immediately postoperatively, minimal blistering was noted. At a 12-day postoperative examination in the dental clinic, the patient's mother reported that the boy had minimal discomfort following the procedure. The patient complained of a slight sore throat. The patient
presented with normal intraoral healing and perioral blistering consistent with junctional EB, with larger blistering on the posterior aspect of the neck, likely due to the position of the strap of the oral endotracheal tube fastener.

Discussion
Security of the airway is imperative to safe treatment in the operating room. However, fastening of the oral endotracheal tube traditionally involves placement of tape on the face, which would have likely caused severe blistering in this patient. Thus, the endotracheal tube was secured by the nontraditional use of an endotracheal tube fastener. It is the belief of the dental and anesthesia teams that this fastening method resulted in less blistering than if traditional placement had been used. It is believed that this method resulted in less applied pressure to the epidermis.

This method of anchoring the endotracheal tube resulted in a secure airway. The dental procedure was performed in less than 1 hour, and although intraoral manipulation was necessary, the endotracheal tube remained stable throughout this procedure. There was no fear of dislodgement during treatment. However, in procedures in which more movement of the patient’s body is necessary, dislodgement could become a concern. Furthermore, this patient was supine for the duration of the procedure. In procedures that require the patient to be in a prone or lateral position, this method of fastening may not result in stable endotracheal tube anchorage.

In other case reports, padding and lubrication of the patient’s chin before intubation have been suggested.4 Lubricant was applied to this patient’s face before both intubation and extubation. It has also been recommended that gauze moistened in hydrocortisone cream be placed under all monitors and objects that will rest on the patient’s skin to minimize blistering in patients with EB.4 Furthermore, the avoidance of medical tape and all adhesives has been encouraged.4 In this case, lubricated gauze was placed under all monitors and was also used to protect the eyes.

The primary anesthetic concern in patients with EB is blistering and subsequent anemia, dehydration, and infection.3,4 Blistering also may occur when the surgical team secures the intravenous catheter, administers oxygen postoperatively, and by patient movement during emergence from anesthesia.4 Previous blistering around the eyes may result in the inability of the patient to close his or her eyes, putting the patient at greater risk of corneal abrasion.4 In patients with periocular blisters, it is absolutely imperative to ensure that the lubricated gauze fully covers the eyes.4 Postoperative nausea and vomiting are also a concern, as this may cause esophageal bleeding.4 Prophylactic antiemetics may be beneficial to reduce this risk.4

In this case, collaboration between the anesthesiologist, the dentist, and a respiratory therapist resulted in the careful placement of gauze over the eyes and beneath monitors as well as the nontraditional use of an oral endotracheal tube fastener to minimize contact with the skin. These efforts resulted in safe and effective delivery of dental care using general anesthesia, with minimal skin and mucous membrane blistering in this patient with junctional EB.

REFERENCES


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DISCLOSURES
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