



Case Report

Dental Avulsion During Endotracheal Intubation in a Pediatric Patient: A Case Report

Agwu Nnanna Uchechuku^{*} , Adejumo Abiola Mosunmade

Department of Anaesthesia, University of Abuja Teaching Hospital, Gwagwalada, Nigeria

Abstract

Dental injury is a recognized complication of general anaesthesia, particularly during endotracheal intubation, with the maxillary incisors being most frequently affected. In paediatric patients, a dislodged tooth may result in serious complications such as airway obstruction, aspiration pneumonitis, or lung collapse if aspirated. We report the case of a 6-year-old girl with bilateral Blount's disease who underwent corrective osteotomy under general anaesthesia. Preoperative assessment did not document any dental abnormality. Following induction, tracheal intubation was performed by a first-year resident using an inappropriately sized laryngoscope blade. Immediately after intubation, a missing upper left incisor was identified. A thorough intraoperative search of the oral cavity and nares failed to locate the tooth, and the surgical procedure proceeded uneventfully. Postoperatively, the patient remained clinically stable with no signs of respiratory distress up to 24 hours after surgery. Radiologic evaluation revealed no evidence of aspiration, and in the absence of clinical or radiologic findings, the tooth was presumed to have been swallowed. This case underscores the importance of careful preoperative dental assessment, appropriate equipment selection, and adequate supervision of trainees during paediatric airway management to minimize preventable dental trauma and its potentially serious consequences.

Keywords

Dental Trauma, Endotracheal Intubation, Paediatric Anaesthesia, Macintosh Blade, Airway Management

1. Introduction

It is the primary responsibility of the anaesthetists to ensure a safe airway management throughout the perioperative period. [1] Consequently, any trauma to the airway during this period is considered the responsibility of the anaesthetist. [2] Dental injury following endotracheal intubation is a frequent complication, especially when utilizing classic laryngoscopy. [3] The incidence of such injuries is estimated to range from 0.06% to 12% [3].

While typically only one tooth is affected, simultaneous trauma can involve up to four teeth. The upper maxillary incisors,

particularly the left central incisor, are at the highest risk [3]. Such injuries carry significant risks, including life-threatening airway obstruction, aspiration pneumonitis, or lung collapse if a tooth enters the trachea [4]. Furthermore, dental trauma often leads to litigation, patient distress, and long-term functional or aesthetic concerns [5]. Major risk factors include difficult intubation, poor pre-existing dental status, and the use of the teeth as a fulcrum by inexperienced practitioners [6]. The significant contribution of this case report is the paediatric context, combined with failure of supervision by a senior, which distinguishes it

^{*}Correspondence: Agwu Nnanna Uchechuku (agwunnanna@gmail.com)

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from the only comparable local case series (Afolabi et al), which reported adult patients.

The aim of this case report is to show that intubation can lead to tooth avulsion especially in school aged children, while highlighting the need to use the appropriate equipment during the conduct of anaesthesia and the need to adequately supervise our junior colleagues while carrying out a procedure.

2. Case Report

A 6-year-old girl (30 kg, 111 cm) with bilateral Blount's disease presented for a corrective osteotomy. She had a 5-year history of bowlegs and a 4-month history of leg pain, with no prior anaesthetic exposure. Preoperative vitals were stable, and lab results were within normal limits, resulting in an American Society of Anesthesiologists Physical Status classification (ASA-PS 1) assessment. Airway assessment revealed a Mallampati I status, though the patient had a gap tooth and a shaking left upper maxillary incisor (Millers Mobility Index Scale Class 1). The parents were counseled on the risks of dental avulsion during induction or extubation, and informed consent was obtained.

3. Perioperative Management

Following standard workstation and equipment checks, the patient was induced with 60 mg intravenous (IV) propofol. Intubation was facilitated with 50 mg suxamethonium IV. The procedure was performed by a first-year resident doctor who used an inappropriately large size 4 Macintosh blade instead of the recommended size 2. Cormack-Lehane laryngoscopy grade 1 was recorded. Following the successful placement of a 5 mm endotracheal tube (ETT), it was noted that the patient's left upper incisor was missing, with active bleeding at the site.

A senior anaesthetist performed a gentle laryngoscopy and suctioned the oral cavity and nares (including passing a catheter to the posterior pharynx), but the tooth was not found. Surgery proceeded for 90 minutes under isoflurane 1-2% maintenance and neuromuscular blockade with IV pancuronium 4mg, and analgesics IV fentanyl 2mcg/kg at hourly intervals, IV paracetamol 15mg/kg, and IV ketorolac 1mg/kg. She received a total of 1L of 0.9% saline. Estimated blood loss was about 300mls. Patient's heart rate (HR), blood pressure (BP), peripheral oxygen saturation (SpO₂), electrocardiogram (ECG) and temperature was monitored intraoperatively using a multiparameter monitor. Duration of surgery was about 1hr 30mins. At the end of the surgery, residual neuromuscular blockade was reversed.

4. Outcome

A second search for the tooth was unsuccessful. The patient

was suctioned, extubated and monitored in the Post-Anesthesia Care Unit (PACU) for signs of respiratory distress; none was observed. The parents were reassured that the primary (milk) tooth would eventually be replaced by permanent dentition. They were instructed to monitor the child's stool for the tooth and watch for features of respiratory distress. A follow-up X-ray of the head, neck, and chest was done to rule out a foreign body in the airway, but nothing suggestive of a foreign body was seen.

5. Discussion

This case involves a school-aged girl who had a mobile tooth, scheduled for an orthopaedic surgery under general anaesthesia. Intubation was done by a first year resident doctor with an inappropriately sized laryngoscope without adequate supervision resulting in avulsion and loss of the left upper incisor. Despite immediate and repeated intraoperative searches of the oral cavity, nasal passages, and posterior pharynx, the tooth was not recovered. Postoperative imaging excluded aspiration, and the patient remained clinically stable.

Poor intubating techniques such as applying excessive force at intubation can cause trauma to the tooth. Some anaesthetist use the incisor as a fulcrum to lift the tongue to clear the airway during laryngoscopy [7]. Neto et al [8], reports that factors such as poor dental condition and excessive pressure during intubation contribute to dental damage with the central maxillary incisors affected. This is demonstrated in this index case where a mobile left upper incisor exists already combined with the use of an inappropriately large size of laryngoscope. Afolabi AO et al [9], reported avulsion of the central maxillary tooth in two patients during laryngoscopy. However these were in adults unlike ours that occurred in a school aged child. In paediatric patients, specifically those aged 6–8 years, the prevalence of immature roots and loose primary teeth increases the risk of dislocation during intubation [10]. The study conducted by Ruetzler K et al [11] showed that video laryngoscopy decreased the number of attempts needed to achieve endotracheal intubation compared with direct laryngoscopy further reducing the likelihood of a dental trauma. Some reports have stated operator experience as a contributor to dental injury at intubation [12]. This may be contributory as the lack of experience of the first-year resident may have contributed to poor judgment or technique. Therefore every measure necessary should be used to prevent dental trauma at intubation.

While appropriate postoperative monitoring and imaging were performed, this event highlights preventable system and training-related factors. Preoperative dental risk was recognized and documented; however, additional preventive strategies—such as securing the loose tooth, modifying intubation technique, or ensuring senior supervision—were not implemented. The incident also reflects the importance of structured supervision for junior trainees, particularly during paediatric

airway management. The traditional method of medical education for airway management uses experiential learning during patient care, with or without supervision. This method allows trainees to learn in real-time without disrupting clinical care and continues to be the most common form of clinical education. However, evidence suggests that a significant period of supervision is required for learning key practical skills in airway management, such as tracheal intubation. [13] Although no long-term harm occurred, the event carried the potential for serious morbidity and medico-legal consequences.

The aspiration of a tooth is a severe complication that can lead to atelectasis, lung abscess, or cardiac arrest. [14] While the incidence of tooth aspiration is low (approximately 0.4%), it must be excluded if a tooth is lost. [15] Clinical signs such as coughing, wheezing, or decreased unilateral breath sounds are highly indicative of aspiration. [16] Because this patient remained asymptomatic post-extubation and postoperative radiological investigation did not reveal any aspirated object in the respiratory tract, ingestion (swallowing) was deemed more likely than aspiration.

6. Limitations

- 1) *Single-case nature* - This report describes a single clinical event; therefore, the findings cannot be generalized to all paediatric intubations or anesthetic practices. Causal relationships between blade size, operator experience, and dental injury can be suggested but not definitively established.
- 2) *Inability to confirm final location of the tooth* - Despite thorough searches and postoperative radiographic evaluation, the tooth was not recovered. Radiolucent properties of primary teeth limit the sensitivity of plain radiography, making it impossible to definitively confirm ingestion versus undetected aspiration.
- 3) *Lack of preventive intervention comparison* - The case does not allow comparison between different preventive strategies (e.g., dental guards, securing loose teeth, video laryngoscopy, or alternative blade sizes). Therefore, the relative effectiveness of these measures cannot be assessed.
- 4) *Operator-dependent variables* - Factors such as force applied during laryngoscopy, hand positioning, and exact technique were not objectively measured or recorded. These subjective elements may have contributed to the injury but cannot be reliably analyzed.
- 5) *Limited follow-up duration* - Postoperative follow-up was short and focused on immediate respiratory complications. Long-term outcomes, including delayed pulmonary sequelae or psychological impact on the patient and family, were not evaluated.

7. Conclusion

Dental trauma remains a significant concern in paediatric

anaesthesia. This case underscores the necessity of a thorough preoperative dental assessment and parental counselling, the use of appropriately sized airway equipment, close supervision of junior trainees to prevent technical errors and a high index of suspicion for aspiration when dental trauma occurs, necessitating clinical and radiological follow-up.

8. Recommendations

To reduce the risk of dental trauma during pediatric intubation, we recommend the following:

- 1) *Thorough preoperative dental assessment* with clear documentation of loose or vulnerable teeth.
- 2) *Appropriate equipment selection*, including correct laryngoscope blade size for age.
- 3) *Enhanced supervision of junior trainees*, particularly during airway instrumentation in children.
- 4) *Atraumatic intubation techniques*, avoiding use of teeth as a fulcrum.
- 5) *Consideration of preventive measures* such as dental guards, securing loose primary teeth, or alternative airway devices when risk is high.
- 6) *Prompt recognition and systematic evaluation* of missing teeth to rule out aspiration or airway obstruction.

Abbreviations

ASA-PS	American Society of Anesthesiologists Physical Status
BP	Blood Pressure
ECG	Electrocardiogram
ETT	Endotracheal Tube
HR	Heart Rate
IV	Intravenous
PACU	Post Anaesthesia Care Unit
SPO ₂	Peripheral Oxygen Saturation

Author Contributions

Agwu Nnanna Uchechuku: Conceptualization, Data Curation, Writing – Original Draft, Writing – Review & Editing

Adejumo Abiola Mosunmade: Writing – Original Draft, Writing – Review & editing

Conflicts of Interest

The authors declare no conflicts of interest.

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