

SHORT REPORT

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# Multiple Tooth Fractures in Posterior Teeth Diagnosed Following Emergency Intubation

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## Abstract

**Background:** This report presents a case of a patient with multiple tooth fractures in posterior teeth that were diagnosed several months following an emergency intubation.

**Findings:** A 68-year-old woman, with a history of an emergency intubation during ascending aorta dissection repair performed 7 months ago, presented with a complaint of long lasting pain in the right side of her face, and a recent pain evoked by mastication and cold stimuli, located in her right mandibular area. Upon clinical examination, the 1st mandibular molar was diagnosed with chronic apical abscess associated with a vertical root fracture (VRF); the 2nd mandibular molar was diagnosed with extensive cracks across the floor of the pulp chamber, extending apically deep into the distal root. Both teeth were extracted, and the symptoms were resolved.

**Conclusions:** Multiple posterior teeth may fracture as a result of emergency intubation procedure and the diagnosis of such fractures may be delayed and complicated. A thorough dental evaluation and follow-up after the emergency procedures is indicated. Additional clinical studies are warranted in order to shed light on this complication.

**Keywords:** Tooth fracture, Intubation, Complications

## Background

Dental injury has been associated with endotracheal intubation (de Sousa and Mourao 2015; Warner et al. 1999; Vogel et al. 2009). The reported incidence of this complication is up to 12% (de Sousa and Mourao 2015; Warner et al. 1999). Most studies reported that dental injuries may occur during intubation for elective surgery (de Sousa and Mourao 2015; Adolphs et al. 2011). However, some studies indicate that emergency surgical procedures are associated with an increased risk of dental injuries (de Sousa and Mourao 2015; Feltracco et al. 2011). Usually only one tooth is injured, however simultaneous injuries of two or more teeth were already described (de Sousa and Mourao 2015; Burton and Baker 1987). The upper incisors are the most commonly injured teeth (de Sousa and Mourao 2015; Vogel et al. 2009; Bernasinski et al. 2012; Laidooowoo et al. 2012; Mourao et al. 2011). Different types of dental injuries

were inconsistently reported across studies, including luxation injuries, avulsion and fractures of natural teeth or prosthetic restorations (de Sousa and Mourao 2015; Vogel et al. 2009; Gaudio et al. 2010; Jordana et al. 2009).

This report presents a case of a patient with multiple tooth fractures in posterior teeth that were diagnosed several months following emergency intubation.

## Findings

A 68-year-old woman, with a history of an emergency intubation during ascending aorta dissection repair performed 7 months ago, presented with a complaint of long lasting pain in the right side of her face that started during her hospitalization, immediately after she gained her conscious following the emergency surgery. The patient also reported that more recently the pain was evoked by mastication and cold stimuli, and that the pain was located in her right mandibular area.

The radiographic examination revealed a radiolucent area surrounding the mesial root and furcation area of the 1st right mandibular molar. The 2nd right mandibular

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molar was presented with intact coronal restoration and without radiographic signs of pathology (Fig. 1).

Findings of the clinical examination of the 1st mandibular molar included: a coronally located buccal sinus tract, deep periodontal pockets and pain to palpation. The tooth was diagnosed with chronic apical abscess associated with a vertical root fracture (VRF) (Tamse et al. 2015; AAE Colleagues for Excellence 2008; Tsisis et al. 2010). The findings of the 2nd mandibular molar included: sharp pain evoked during mastication and cold stimuli, and a fracture line extending across the distal aspect of the tooth, that was associated with a deep periodontal pocket. After the coronal restoration was removed, the 2nd right mandibular molar was diagnosed as a cracked tooth with extensive cracks extending across the floor of the pulp chamber and apically deep into the distal root, and with irreversible pulpitis (Cameron 1976; Kang et al. 2016). The other right mandibular and maxillary teeth were asymptomatic.

Both the 1st and the 2nd right mandibular molars were scheduled for an immediate extraction. In the days following the extractions the healing was uneventful and the patient reported that her previous symptoms disappeared.

## Discussion

This report presents a case of a patient with multiple tooth fractures in posterior teeth that were diagnosed several months following emergency intubation.

Although it is probably not a rare complication of general anesthesia, with a reported incidence that ranges from less than 1% to more than 12% of cases, its presented characteristics extremely varies among studies



**Fig. 1** A radiographic examination of the right posterior mandibular area: a radiolucent area surrounds the mesial root and furcation area of the 1st mandibular molar. The 2nd mandibular molar is with intact coronal restoration and without radiographic signs of pathology

(de Sousa and Mourao 2015; Vogel et al. 2009; Adolphs et al. 2011; Burton and Baker 1987).

It had been reported that generally the incidence of tooth injuries caused by intubation increases with age. In addition it had been reported that elderly patients suffer more from tooth luxation or avulsion due to age related chronic marginal periodontitis and attachment loss, and in contrast, younger patients primarily suffer from tooth fractures (Vogel et al. 2009). However, in the current case an elderly patient suffered from multiple tooth fractures without any evident luxation injuries.

Ascending aorta dissection is a tear in the inner lining of the aorta that allows blood to flow through the walls of the aorta. The tear usually initiates in the ascending aorta and progresses throughout the vessel. When occurs it is an emergency medical condition that requires immediate surgery to prevent death from bleeding and other complications such as stroke, heart attack or congestive heart failure (David et al. 1999; Elefteriades 2002; Meszaros et al. 2000).

The possibility that emergency intubation might be a risk factor for tooth injury is a matter for debate, where some claim it may be a significant risk factor (Ghabash et al. 1997) and others reject this assumption (Vogel et al. 2009). In the current case, the patient suffered from a life-threatening condition that required an emergency intubation. Although dental injuries were reported also in cases where the intubation was performed during elective general anesthesia (de Sousa and Mourao 2015), it may be conceivable to assume that the emergency nature of the current procedure may have been a contributing factor to the ensuing injury to multiple teeth.

Most commonly, only one tooth is injured, which is primarily a maxillary anterior tooth. However, posterior teeth may also be injured, primarily on the right side (de Sousa and Mourao 2015; Vogel et al. 2009). This could be explained by the fact that usually the fixation of an endotracheal tube is on the right side (de Sousa and Mourao 2015; Vogel et al. 2009). In addition, the movement of the tip of the laryngoscope to the right when positioning the tube, may contribute to the risk of tooth fractures in right molar teeth (Vogel et al. 2009), as may occurred in the current case.

For elective general anesthesia, an evaluation of the patient dental status prior to the intubation was recommended in order to identify possible risks to ensuing dental injuries, such as poor oral health and significant prosthetic reconstructions (Vogel et al. 2009). However, in case of emergency intubation, pre-operative dental evaluation is impractical, stressing the need for a thorough dental evaluation and follow-up after the emergency procedures. In the current case the patient complained on pain in the right side of her face, that started following the emergency intubation and surgery. Initially she was

examined by medical practitioners that could not locate the source of her symptoms. Only several months later, when the patient's symptoms became more dental specific, and she also complained on pain during mastication and cold stimuli, she was examined by dentists. Only then, after a thorough dental examination her long-lasting symptoms were finally correlated with fractures of multiple posterior teeth.

The final diagnosis of a fractured tooth may be complicated since the tooth may be asymptomatic or associated with non-specific pulpal and periapical symptoms, and the tooth structure may appear normal in the radiographic evaluation (Cameron 1976; Cameron 1964). In addition, the confirmation of the fracture may be complex and require visual examination by magnification and illumination devices, and even removal of coronal restorations for direct observation and staining of the crown, using suitable staining materials (Kang et al. 2016).

In the current case the 1st and the 2nd mandibular molars were diagnosed with VRF and extensive cracks (respectively) that were associated with deep probing depths. Teeth with such fractures and associated pathology have poor prognosis (Cameron 1976; Kang et al. 2016), and therefore were scheduled for extraction. The disappearance of symptoms shortly after the extractions confirmed the initial diagnosis.

## Conclusions

Multiple posterior teeth may fracture during emergency intubation procedure and the diagnosis of such fractures may be delayed and complicated. In case of emergency intubation, pre-operative dental evaluation is impractical, stressing the need for a thorough dental evaluation and follow-up after the emergency procedures. Additional clinical studies are warranted in order to shed light on this complication.

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## Competing interests

The author declares that they have no competing interests.

## Consent for publication

The study was approved by the Tel-aviv university ethics committee. The patient gave her consent to use and publish the relevant data, radiograph and clinical photos of the present case.

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