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Unusually intruded primary upper incisor: potential threat after 7 years of asymptomatic course. Diagnosis and treatment

ABSTRACT

Background *Misdiagnosis of traumatic injuries can lead to inadequate treatment and complications both in the short and in the long term. Diagnosis and treatment of a patient who underwent an unusual dental trauma to the primary teeth is described.*

Case report *A misdiagnosed deeply intruded primary upper central incisor caused massive bleeding after seven years of asymptomatic course. The adequate diagnosis and management of the intrusion and oronasal connection is described. Furthermore, the importance of a thorough dental examination is addressed in the discussion.*

Conclusion *The proper immediate diagnosis and knowledge regarding traumatised mixed dentition is important to reduce the extent of damage and late complications. That is why every child that undergoes head injury should be examined by a dental professional.*

Keywords *Dento-alveolar trauma; Diagnosis; Examination; Intrusion; Primary tooth; Treatment.*

Introduction

Traumatic injuries to primary dentition are common, their frequency varies from 4% to 30%, and the most affected teeth are the upper central incisors [de Amorim et al., 2011]. A fall is the most frequent cause of trauma and more than 40% of patients are less than 4 years of age [Carvalho et al., 2010; Soporowski et al., 1994; Andreasen and Ravn, 1972]. Total intrusion of primary incisors is the most frequent type of intrusive luxation [Carvalho et al., 2010; Holan and Ram, 1999].

Intrusion may cause malformations to permanent teeth, and deeply intruded primary incisors may even penetrate the nasal cavity and disrupt nasal mucosa [Da Silva et al., 2009; Altun et al., 2009]. Misdiagnosis of initial intrusion or lack of proper follow-up may lead to further complications such as inflammation, oronasal fistula or life-threatening severe bleeding [Diab and elBadrawy, 2000; Innes, 2009]. Unfortunately, some patients are misdiagnosed because no dental professional is present at the emergency units.

Case report

Case presentation

A nine-year-old female patient reported at the Oral Surgery Department at the Medical University of Warsaw for examination in June 2013. The girl was referred from the Paediatric Department of the University Hospital where she sought help because of massive bleeding from her nose (with no substantial reason). Haemostasis of the disrupted mucosa was achieved by means of a collagen sponge and nasal tamponade, and an extra-oral X-ray was taken (Fig. 1). The haematological parameters were within normal limits. The paediatrician's diagnosis based on anamnesis, clinical and radiological examination was a disruption of mucosa due to an incisor extending into the left nasal vestibule.

The patient's anamnesis revealed a former trauma several years before (at the age of two) when the girl hit her face against the floor. At that time (2005) she was admitted to the Emergency Unit at the City Paediatric Hospital and examined by a paediatrician.

FIG. 1 Lateral cephalometric X-ray revealing the tooth within the soft tissues of the nose.

The examination revealed a missing primary upper left central incisor and lower lip laceration that was sutured under local anaesthesia. Since there were no symptoms of brain concussion no radiological evaluation was performed. The paediatrician assumed that the missing incisor had been avulsed and did not advise a dental follow-up.

More than 7 years later (2013), at the University Paediatric Hospital and Oral Surgery Department the oral examination disclosed mixed dentition and a medially tilted and protruded permanent left central incisor (Fig. 2b). There was a root of the previously intruded (but not avulsed) primary incisor that disrupted the nasal mucosa and extended into the nose behind the line of the left nasal vestibule (Fig. 2a).

The CBCT performed beforehand to plan the surgical procedure confirmed the presence of the primary central incisor at the anterior wall of the left maxillae. The crown was located within the alveolar bone left to the anterior nasal spine with its incisal edge toward the root of the permanent left central incisor. The root of the intruded tooth was located above the lower edge of the pyriform aperture extending outside the cortical bone (Fig. 3).

FIG. 2 Clinical examination: The apex of the primary upper left central incisor detected in the left vestibule of the nose (a); intraoral view of the upper front teeth (b).

FIG. 3 Maximum Intensity Projections (MIP) from CBCT that visualise the position of the deeply intruded primary upper left central incisor in relation to surrounding structures; sagittal view (a) and coronal view (b)

Surgical procedure

It was decided to access the intruded tooth from the side of the oral cavity vestibule. The crown of the intruded incisor was located within the alveolar bone thus an osteotomy was required for less traumatic removal. The surgery was performed under local anaesthesia (2% lidocaine). A horizontal, intrasulcular incision was made along the gingival margins of central incisors, left lateral incisor and left primary canine. The vertical incision at the right maxillary central incisor allowed for a triangular full-thickness flap (Fig. 4a). Then, the labial cortical bone was demarcated to gain access to the intruded upper left primary incisor that was removed (Fig. 4b, 4c). The tooth was non-vital by its clinical appearance. The nasal part of the wound was sutured tension-free after elevation of the mucosa with coated Vicryl absorbable 4-0 sutures (Fig. 4d). The flap in the oral cavity was closed with single tab sutures (ePTFE non-absorbable monofilament 4-0).

After the surgery the patient was prescribed 500 mg of amoxicillin every 12 hours for one week and 250 mg of acetaminophen every 4 hours for two days (both drugs in oral suspension). The healing was uneventful, with no signs of oedema or inflammation.

Follow-up

The patient was examined 2 weeks (at suture removal) and 7 months after the surgery. The final examination included: an electric pulp sensitivity test, examination of probing depths, attachment level, gingival recession, mobility and the percussion test of adjacent permanent incisors. The examined teeth demonstrated features that

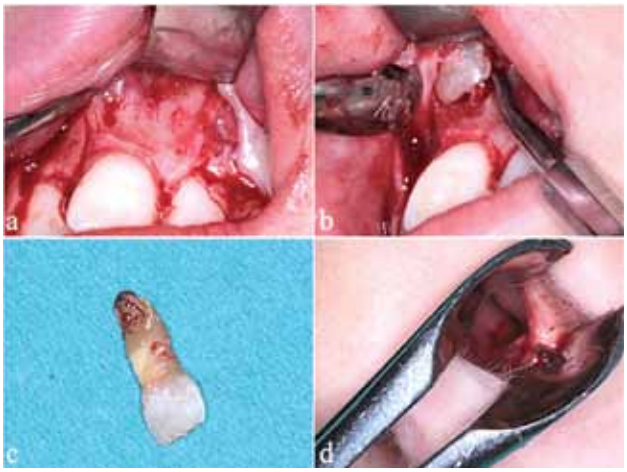

FIG. 4 The surgery: Flap design (a); the view of the intruded primary incisor after removal of buccal bone (b); removed upper left primary incisor (c); sutures in the nasal cavity (d).

were typical for normal teeth, i.e., response to electric stimuli within normal limits, healthy periodontal tissues (probing depths did not exceed 2.5 millimetres with no attachment loss), physiological mobility and low sound in percussion test (indicating absence of ankylosis). There was no oronasal fistula between the nasal and oral cavity. The oral and nasal mucosa healed without complications (Fig. 5a, 5b). A radiological examination (intraoral X-ray with a beam perpendicular to the long axis of the tooth root) did not reveal any pathology regarding upper incisors or surrounding bone (Fig. 5c).

Discussion

In the presented case, a misdiagnosis at the initial examination (2005) led to overlooking of a deeply intruded primary central incisor. This happened due to the lack of radiological examination but primarily because of the absence of dental professionals in the emergency unit and lack of dental follow-up. As a result, the patient and her family were not aware of the intruded tooth that behaved as a foreign body and eventually caused bleeding several years after trauma.

Diagnosis of traumatised primary dentition is usually challenging due to the early age, lack of cooperation, and limited communication with patients. Moreover, the circumstances of trauma are often difficult to establish. The literature discusses primarily potential complications of the intrusion of primary teeth in relation to the permanent dentition (malformations, dilacerations, eruption disturbances) and inhibited growth of alveolar bone [Da Silva et al., 2009; Altun et al., 2009; Diab and elBadrawy, 2000; Innes, 2009]. However, general complications (including later occurrence) such as bleeding due to mucosa disruption or odontogenic infection should be taken into consideration despite the lack of studies describing this correlation.

FIG. 5 The 7-months follow-up: Mucosa in the nasal cavity (a); intraoral X-ray of upper incisors (c); intraoral view of the upper dental arch (b).

It is very likely that a traumatised child will not allow having a proper intraoral examination (including X-rays) or treatment performed. For many reasons there is no agreement for routine use of CBCT in trauma cases especially in growing patients [Horner et al., 2009]. This is why the diagnostic value of extra-oral radiography cannot be overemphasised. In the presented case, lateral cephalometric and Water's projection radiographs provided sufficient data for diagnosis. However, more advanced techniques may be required to accomplish the treatment.

The presence of dental professionals at the initial examination in hospitals is of the utmost importance. Especially in cases of dental trauma in growing patients, meticulous examination and follow-up should be considered as a routine treatment. Not only the developing teeth but also the alveolar bone and soft tissues suffer the consequences of previous trauma and for that reason traumatised growing patients have to be followed. Teamwork and thorough interpretation of clinical and radiological findings may prevent or minimise the late complications of dental trauma.

Disclosure

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References

› de Amorim Lde F, da Costa LR, Estrela C. Retrospective study of traumatic dental injuries in primary teeth in a Brazilian specialized pediatric practice. Dent Traumatol 2011 Oct;27(5):368-73.
› Andreasen JO, Ravn JJ. Epidemiology of traumatic dental injuries to primary and permanent teeth in a Danish population sample. Int J Oral Surg.1972;1(5):235-9.
› Altun C, Cehreli ZC, Guven G, Acikel C. Traumatic intrusion of primary teeth and its effects on the permanent successors: a clinical follow-up study. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2009 Apr;107(4):493-8.
› Carvalho V, Jacomo DR, Campos V. Frequency of intrusive luxation in deciduous teeth and its effects. Dent Traumatol 2010 Aug;26(4):304-7.
› Diab M, elBadrawy HE. Intrusion injuries of primary incisors. Part III: Effects on the permanent successors. Quintessence Int 2000 Jun;31(6):377-84.
› Holan G, Ram D. Sequelae and prognosis of intruded primary incisors: a retrospective study. Pediatr Dent 1999 Jul-Aug;21(4):242-7.
› Horner K, Islam M, Flygare L, Tsiklakis K, Whaites E. Basic principles for use of dental cone beam computed tomography: consensus guidelines of the European Academy of Dental and Maxillofacial Radiology. Dentomaxillofac Radiol 2009 May;38(4):187-95.
› Innes NP. Traumatic intrusion of primary teeth and developmental defects in successor teeth. Evidence-based dentistry 2009;10(3):70-1.
› Da Silva Assuncao LR, Ferelle A, Iwakura ML, Cunha RF. Effects on permanent teeth after luxation injuries to the primary predecessors: a study in children assisted at an emergency service. Dent Traumatol 2009 Apr;25(2):165-70.
› Soporowski NJ, Allred EN, Needleman HL. Luxation injuries of primary anterior teeth-prognosis and related correlates. Pediatr Dent 1994 Mar-Apr;16(2):96-101.