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TRAUMATSKA INTRUZIJA MLEČNOG ZUBA-PRIKAZ SLUČAJA

TRAUMATIC INTRUSION OF PRIMARY TOOTH: A CASE REPORT

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Sažetak

Uvod: Prednji zubi su od velikog značaja za žvakanje, govor i izgled. Stoga, svaka traumatska povreda zuba ima psihološki nepoželjne efekte na decu i njihove roditelje. Ova studija prikazala je slučaj traumatske povrede zuba izazvane padom sa stolice i upućivanje pacijenta na hitnu pomoć, kao i mere preduzete za rekonstrukciju zuba i poboljšanje stanja pacijenta.

Prikaz slučaja: Roditelji su doveli trogodišnju devojčicu na Kliniku zadržuju i preventivnu stomatologiju Univerzitetske stomatološke klinike Centar "Sveti Panteleimon", Skoplje, sa povredama lica i oralnih struktura, nastalih usled pada deteta sa stolice. Ekstraoralnim pregledom utvrđena je razderotina na submentalnoj površini kože i povreda gornje usne. Dete je pregledano i ustanovljeno je da je levi, centralni, mlečni sekutić maksile komprimiran u alveoli. Okolno meko tkivo je povređeno. Intraoralno, prednji segment maksile pokazao je povredu izazvanu traumom tupe sile male brzine, uključujući nekoliko laceracija tkiva gingive. Pacijentov gornji, levi, centralni sekutić bio je utisnut u čašicu.

Zaključak: Prognoza mnogih slučajeva povreda zuba zavisi od vremena proteklog od nastanka povrede. Utisnuće zuba može imati posledice i treba uzeti u obzir mogućnost da je zub potpuno utisnut. Upotreba radiografskog snimka od velikog je značaja za ispravnu dijagnozu utisnuća mlečnih zuba.

Cljučne reči: utisnuti zubi; mlečni sekutić; povreda

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Abstract

Introduction: Anterior teeth are of utmost importance with regard to chewing, speaking, and beauty. Therefore, any traumatic dental injury has psychologically undesirable effects on children and their parents. The present study reported a case of a traumatic dental injury induced by falling off a chair and referral to an emergency department as well as measures taken for dental reconstruction and patient's improvement.

Case Report: Parents with a 3-year-old girl came to the Clinic for Pediatric and Preventive Dentistry at University Dental Clinic Center "St. Panteleimon", Skopje with injuries to her face and oral structures resulting from a fall from a chair. The extraoral examination revealed a laceration on the submental skin surface and an injury to the upper lip. The child was examined and it was found that the maxillary left primary central incisor was compressed in the alveoli. The surrounding soft tissue was injured. Intraorally, the anterior segment of the maxilla showed injury consistent with low-velocity blunt-force trauma, including several lacerations of the gingival tissues. The patient's maxillary left central incisor was intruded from the socket.

Conclusion: The prognosis of many cases of dental injuries is time-dependent. The intrusion of a tooth can have ramifications and the possibility that it has been fully intruded should be considered. The use of a radiograph is of great importance for the correct diagnosis of deciduous tooth intrusion.

Keywords: intruded teeth, primary incisor, trauma.

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Uvod

Utisnuće i avulzija zuba najteže su povrede zuba. Povrede oralnih tvrdih i mekih tkiva najčešće se javljaju kod dece. Među svim povredama lica, povrede zuba su kod dece daleko najčešće. Čak 18% svih povreda kod dece do 6 godina starosti javlja se u oralnoj regiji¹. Povrede u mlečnoj denticiji česte su i javljaju se sa znatno većom godišnjom incidencijom, u odnosu na povrede zuba u stalnoj denticiji^{2,3,4}. Traumatska dislokacija zuba uobičajena je povreda kod dece i adolescenata. Iako je ponekad teško dijagnostikovati, utisnuće zuba, aspiracija i gutanje mogu dovesti do ozbiljnih komplikacija.

Utisnuće i izbijanje zuba najteže supovrede koje utiču na razvoj klica zuba kod dece, od novorođenčeta do 2 godine starosti^{5,6} što odgovara vremenu kalcifikacije incizalne i srednje trećine gleđnog matriksa^{7,8}. Traumatsko pomeranje korenova mlečnih zuba može uticati na razvoj klica stalnih zuba promenom sekrecijske faze amelogeneze, rezultirajući defektom poznatim kao kružna hipoplazija gleđi. Rizik od razvojnih smetnji na stalnom zubu, nakon povrede njegovog mlečnog prethodnika, proizlazi iz bliske veze između vrha mlečnog zuba i njegovog stalnog sledbenika u razvoju^{9,10}.

Utisnuće zuba definiše se kao pomak zuba dublje u alveolarnu kost. Ova povreda uzrokovana je silom u aksijalnom smeru, koja dovodi do pomeranja zuba unutar njegove čašice^{10,11}. Utisnuće mlečnog zuba može rezultirati raznim patološkim promenama na stalnim zubima, uključujući hipoplaziju, dilaceraciju krune, angulaciju i dilaceraciju korena, delomično ili potpuno zaustavljanje stvaranje korena, sekvstraciju klice stalnog zuba i poremećaje u nicanju. Od ovih, hipoplazija (uključujući promenu boje gleđi i/ili defekte gleđi) je najčešća posledica.

Deca predškolskog uzrasta sklonija supadu ikao rezultat togai zbog nedostatka neuromišićne koordinacije, suočavaju se sa povredama i traumama¹². Većinupovreda u mlečnoj denticiji čini utisnuće zuba, kao luksaciona povreda uzrokovana udarcem u predeo lica¹³. Gondim i dr.¹⁴ pratili su u svojoj studiji 16 pacijenata sa utisnućem mlečnih zuba. Otkrili su toda je 56,25% pacijenata, koji su patili od karijesa bili muškarci, a u 91% slučajeva gornji centralni sekutići bili su najugroženiji zubi. Autori su zaključili da su prednji zubi, a najviše maksilarni centralni sekutići, pogođeni zbog njihove anatomske lokacije, jer su direktno izloženi bilo kakvoj fizičkoj traumi.

Introduction

Intrusion and avulsion are the most severe injuries. Trauma to the oral hard and soft tissues is commonly seen in children. Among all facial injuries, dental injuries are the most common in children. As much as 18% of all injuries in children up to 6 years of age are seen in the oral region¹. Injuries to the primary dentition are common, occurring with a significantly higher annual incidence than in the permanent dentition^{2,3,4}. Traumatic tooth displacement is a common injury affecting children and adolescents. Although sometimes challenging to diagnose, tooth intrusion, aspiration, and ingestion may lead to serious complications.

Intrusion and avulsion are the most severe injuries that affect the developing tooth germ in children 0-2 years of age^{5,6}, which corresponds to the time of calcification of the incisal and middle thirds of the enamel matrix^{7,8}. The traumatic displacement of primary teeth roots may affect the development of permanent tooth germs by altering the secretory phase of ameloblasts, resulting in a defect known as circular enamel hypoplasia. The risk of developmental disturbances in a permanent tooth following intrusive injury of its primary predecessor stems from the close relationship between the apex of the primary tooth and the developing permanent successor^{9,10}.

Tooth intrusion is defined as the displacement of a tooth farther into the alveolar bone. An intrusive injury is caused by a force in an axial direction that results in displacement of the tooth within its socket^{10,11}. Primary tooth intrusion may result in a variety of pathologic alterations to permanent teeth, including hypoplasia, crown dilaceration, root angulation or dilaceration, partial or complete arrest of root formation, sequestration of the permanent tooth germ, and disturbances in eruption. Of these, hypoplasia (including enamel discoloration and/or enamel defects) is the most common sequela.

Preschool children, are much more vulnerable to fall; as a result, they face injuries and traumas due to lack of their neuromuscular coordination¹². Most of the injuries in deciduous dentition are an intrusive luxation caused by face impact¹³. Gondim et al.¹⁴ in their study followed 16 patients with primary tooth intrusion. They found that 56.25% of patients suffering from tooth decay were men and in 91%, the upper central incisors were the most affected teeth.

Kada dođe do pomeranja zuba, najgora prognoza povezana je sa utisnutim dislociranim zubima. Moguće komplikacije kod utisnuća zuba su nekroza pulpe, obliteracija pulpe, resorpcija korena, ankiloza i gubitak marginalne potpore. Za utisnute zube sa zatvorenim vrhovima, učestalost pulpne nekroze je 100%, dok je kod utisnutih zuba sa otvorenim vrhovima učestalost pulpne nekroze 63%¹⁵. Eksterna resorpcija korena prijavljena je kao komplikacija utisnuća zuba u 58% slučajeva zuba sa nezavršenim rastom korena i u 70% slučajeva zuba sa potpunim formiranjem korena¹⁶.

Andreasen i Vestergaard-Pedersen¹⁷ prijavili su učestalost ankiloze nakon teškog utisnuća zuba u 24% slučajeva, a takođe su otkrili to da je do marginalnog gubitka kosti došlo u čak 31% slučajeva utisnuća. Potencijalno najozbiljnije komplikacije mogu nastati kada se zub pomakne u drugi deo tela ili kada zub otvori komunikaciju iz usne šupljine u anatomski prostor.

Ova studija opisuje slučaj koji uključuje traumatsko utisnuće zuba kod deteta.

Prikaz slučaja

Roditelji su doveli trogodišnju devojčicu na Kliniku za dečju i preventivnu stomatologiju Univerzitetske stomatološke Klinike "Sveti Pantelejmon", Skoplje, sa povredama lica i oralnih struktura, nastalih usled pada sa stolice. Ekstraoralni pregled otkrio je razderotinu kože submentalnegije i povredu gornje usne. Dete je pregledano i utvrđeno je da je gornji, levi, mlečni, centralni sekutić utisnut u alveolu. Okolno meko tkivo je povređeno. Devojčica i njeni roditelji bili su vidno uznemireni, zbog čega nismo uspeli da napravimo početni rendgen snimak.

Intraoralno, prednji segment premaksile pokazao je povredu izazvanu traumom tupe sile male brzine, uključujući nekoliko laceracija tkiva gingive. Pacijentkinjin maksilarni, levi, centralni, mlečni sekutić u potpunosti je upao u alveolu. Nedostajala je slika pri prvom pregledu.

Roditeljima je trebalo dati neke preporuke, poput održavanja unosa tečnosti kod deteta i savete o mekoj ishrani u trajanju od nekoliko dana nakon povrede. Traumatizovano područje očišćeno je brisanjem povređenih zuba i mekih tkiva upotrebom fiziološkog rastvora.

Za sledeći dan zakazan je pregled. Nakon mesec dana, roditelji su poslali sliku ponovnog nicanja zuba (Slika 1). Nakon tri meseca, maksilarni levi centralni sekutić bio je prisutan (Slika 2).

The authors have concluded that the front teeth, and most of the maxillary central incisors, are affected by their anatomical location, where they are directly exposed to any kind of physical trauma.

When tooth displacement occurs, the poorest prognosis is associated with intrusively displaced teeth. Possible complications of intrusive tooth are pulp necrosis, pulp obliteration, root resorption, ankylosis, and loss of marginal support. For intruded teeth with closed apices, the incidence of pulpal necrosis is 100%, whereas in intruded teeth with open apices, the incidence of pulpal necrosis is 63%¹⁵. External root resorption has been reported as a complication of intrusive injuries in 58% of teeth with immature root formation and in 70% of teeth with complete root formation¹⁶.

Andreasen and Vestergaard-Pedersen¹⁷ reported a 24% incidence of ankylosis following severe intrusion and also found that marginal bone loss occurred in as many as 31% of cases of intrusive luxation. The potentially most serious complications can occur when a tooth is displaced into another part of the body or when the tooth opens a communication from the oral cavity into an anatomical space.

This study describes a case involving traumatic tooth intrusion in a child.

Case report

Parents with a 3-year-old girl came to the Clinic for Pediatric and Preventive Dentistry at University Dental Clinic Center "St. Panteleimon", Skopje with injuries to her face and oral structures resulting from a fall from a chair. The extraoral examination revealed a laceration on the submental skin surface and an injury to the upper lip. The child was examined and the upper left primary central incisor was found to be compressed in the alveoli. The surrounding soft tissue was injured. The child and her parents were visibly upset and we were not able to do an X-ray.

Intraorally, the anterior segment of the premaxilla showed injury consistent with a low-velocity blunt-force trauma, including several lacerations of the gingival tissues. The patient's maxillary left central primary incisor was total ly intruded from the socket. An image was missing from the first examination.

Some recommendations should be given to parents, such as maintaining fluid intake in the child and a soft diet for a few days after the injury. The traumatized area can be cleaned by wiping the injured teeth and soft tissues with a swab dipped in physiological solution.

Zub je skoro dostigao svoju veličinu u nicanju, nakon šest meseci (Slika 3). Roditelji su doveli dete na redovne preglede, ali su sami pravili snimke zuba svog deteta, jer devojčica nije dozvolila da se slika u ordinaciji.

Praćenje utisnuća mlečnih zuba veoma je važno. Učestalost i obim poseta zavise od vrste i težine povrede. Pregledi bi otkrili sve komplikacije u vezi sa zahvaćenim zubom, što bi, zauzvrat, moglo prouzrokovati trajno oštećenje zuba u razvoju. Potrebne su redovne kontrole nakon povrede, koje bi trebalo sprovesti najpre 7 dana nakon povrede, zatim svake 2 nedelje tokom prvog meseca, potom svakog meseca prvih 5 meseci, a nakon toga svakih 6 meseci. Potreban je kompletan pregled, kako bi se utvrdilo prisustvo bilo kakvih neuobičajenih simptoma, kao što su spontani bol, malaksalost, groznica, znaci apscesa, fistule i otoka gingive i okolnih mekih tkiva.



Slika 1: Utisnuće maksilarnog, mlečnog, levog, centralnog sekutića mesec dana nakon povrede (Fotografija iz arhive autora rada – Efka Zabokova Bilbilova)

Figure 1: Intrusive injured maxillary primary left central incisor one month later (Photo from the archive of the author of the paper – Efka Zabokova Bilbilova)

A check-up was scheduled for the next day. After a month the parents sent a picture of a re-erupted tooth (Figure 1). After three months the maxillary left central incisor was present (Figure 2).

The tooth almost reached its size in eruption after six months (Figure 3). The parents took the child to regular check-ups, but they made images of their child teeth themselves because the girl would not allow the doctor to make images of her teeth in the office.

Monitoring intrusive injuries to primary teeth is very important. The frequency of visits depends on the type and severity of the injury. Examinations would reveal any complications related to the seized tooth, which in turn could cause permanent damage to the developing tooth. Regular post-injury check-ups are required, which should be 7 days later. Then every 2 weeks during the first month, then every month for the first 5 months, and then every 6 months. A complete examination is needed to determine the presence of any unusual symptoms, such as spontaneous pain, malaise, fever, signs of an abscess such as fistula and swelling of the gingiva and surrounding soft tissues.



Slika 2: Utisnuće povređenog zuba tri meseca kasnije (Fotografija iz arhive autora rada – Efka Zabokova Bilbilova)

Figure 2: Intrusive injury three months later (Photo from the archive of the author of the paper – Efka Zabokova Bilbilova)



Slika 3: Ponovna erupcija maksilarnog, mlečnog, levog, centralnog sekutića šest meseci kasnije
(Fotografija iz arhive autora rada – Efka Zabokova Bilbilova)

Figure 3: Re-eruption of the maxillary primary left central incisor after six months (Photo from the archive of the author of the paper – Efka Zabokova Bilbilova)

Diskusija

Traumatska povreda zuba je povreda koja ima uticaja na zube, druga tvrda i meka tkiva unutar i oko usta i usne šupljine. Obično je iznenadna i često zahteva hitnu pomoć. Povrede tipa utisnuća predstavljaju veliki rizik za oštećenje razvoja stalnog zuba u alveolarnoj kosti. Prema tome, mogućnosti lečenja zavise od odnosa između korena mlečnog zuba i krune stalnog zuba u razvoju. Rendgen je neophodan, kako bi se utvrdio ovaj odnos. Ako nema dokaza o mogućem uticaju na razvoja stalnog zuba, mlečni zub se može ostaviti da spontano ponovo izbije. Međutim, zub treba izvaditi, ako nije ponovo izbio u roku od šest meseci.

Ako ima izgleda da je utisnuti zub ugrozio zub u razvoju, treba ga odmah pažljivo izvaditi, kako bi se izbeglo dalje oštećenje.

Kod bilo koje vrste dislokacije zuba, dugotrajno kliničko i radiografsko posmatranje od suštinskog je značaja za praćenje vitalnosti ovih zuba i kako bi se osiguralo toda ne dođe do prolongirane infekcije korena, koja može oštetiti nastanak trajnog utisnuća zuba. Prati ga kompresija parodontalnog ligamenta, poremećaj neurovaskularnog snabdevanja pulpe, kontuzija cementa i prelom alveolarne čašice. Kod težih povreda, zub može biti zarobljen u kost. Klinički nalazi otkrivaju zub koji može izgledati skraćeno ili čak zub koji nedostaje. Kod mlečnih zuba, vrh zuba obično se pomera labijalno prema koštanoj lameli ili kroz labijalnu koštanu lamelu. Kod stalnih zuba, zub je pomaknut u alveolarnu kost. Nema pokretljivosti zuba, niti osetljivosti na dodir.

Discussion

A traumatic dental injury is an impact injury to the teeth, other hard and soft tissues within and around the vicinity of the mouth and oral cavity. It is usually sudden and often requires emergency care. Intrusion injuries present a high risk of damage to the development of permanent tooth in the alveolar bone. Therefore, the treatment options depend on the relationship between the root of the primary tooth and the crown of the developing permanent tooth. X-rays are necessary to determine this relationship. If there is no evidence of a compromise to the developing permanent tooth, the primary tooth may be left to spontaneously re-erupt. However, the tooth should be extracted if it has not re-erupted within six months.

If the intruded tooth appears to have compromised the developing tooth, it should be carefully extracted immediately, to avoid any further damage.

With any type of displacement, a long-term clinical and radiographic follow-up is essential to monitor the vitality of these teeth and to ensure that there is no delayed infection of the root which can damage the developing permanent tooth intrusion. It is accompanied by compression of the periodontal ligament, disruption of the neurovascular supply to the pulp, contusion of the cementum and crushing fracture of the alveolar socket. In severe injuries the tooth may be locked into the bone. Clinical findings reveal a tooth that may appear shortened or even missing.

Radiografski nalazi otkrivaju da je zub apikalno pomaknut i gubitak kontinuiteta periodontalnog prostora. Određivanje položaja mlečnog zuba u odnosu na stalni zub u razvoju može se odrediti lateralnom radiografijom. Alternativno, ako se vrh pomeri labijalno, apikalni vrh može se videti radiografski, a zub izgleda kraće od kontralateralnog. Ako je vrh korena zuba pomeran palatinalno, prema stalnom zubu u razvoju, apikalni vrh ne se može videti radiografski i zub izgleda izduženo.

Kod mlečnih zuba, moguće je spontano nicanjeutisnutog zuba, osim ako radiografski snimci ukažu na utisnuće u stalni zub u razvoju. U prikazanom slučaju izmerena je količina zuba izloženog izvan gingivalnog ruba. Ako je došlo do ponovne erupcije, drugo merenje vrši se četiri nedelje kasnije. Ovo se ponavlja sve dok zub potpuno ne izbije (čak i sa kontralateralnim zubom). Ako zub ne pokazuje dokaze o ponovnom nicanju, nakon perioda od četiri sedmice, preporučuje se vađenje zuba, kako bi se izbegli ankiloza i moguća povreda stalnog zuba u razvoju.

Zaključak

Utisnuće zuba može imati posledice i treba uzeti u obzir mogućnost da je zub potpuno utisnut. Za dijagnostikovanje utisnuća zuba upotreba radiograma može biti od pomoći.

In primary teeth, the tooth apex is usually displaced labially toward or through the labial bone plate. In permanent teeth the displacement is into the alveolar bone. There is no tooth mobility or tenderness to touch. Radiographic findings reveal the tooth is displaced apically and the periodontal ligament space is not continuous. Determination of the position of the primary tooth in relationship to the developing permanent tooth may be determined by a lateral radiograph. Alternatively, if the apex is displaced labially, the apical tip can be seen radiographically with the tooth appearing shorter than contralateral. If the apex is displaced palatally towards the developing permanent tooth, the apical tip cannot be seen radiographically and the tooth appears elongated.

Primaryteeth: Allow the intruded tooth to spontaneously erupt unless radiographs indicate intrusion into the developing tooth. In the presented case the amount of tooth exposed beyond the gingival margin was measured. If any re-eruption has occurred, another measurement is taken four weeks later. This is repeated until the tooth is fully re-erupted (even with the contralateral tooth). If the tooth exhibits no evidence of re-eruption after a four-week period, extraction of the tooth is recommended to avoid ankylosis and possible injury to the developing permanent tooth.

Conclusion

The intrusion of a tooth can have ramifications and the possibility that it has been fully intruded should be considered. For diagnosing intruded teeth, the use of radiographs can be helpful.

LITERATURA /REFERENCES

1. Andreasen J, Andreasen J. Dental traumatology. *Endo Dent Traumatol* 1990; 6:78.
2. Andreasen JO, Ravn JJ. Epidemiology of traumatic dental injuries to primary and permanent teeth in a Danish population sample. *Int J Oral Surg* 1972; 1:235-239.
3. Flores MT. Traumatic injuries in the primary dentition. *Dent Traumatol* 2002;18:287-98.
4. Gupta M. Intrusive luxation in primary teeth—Review of literature and report of a case. *Saudi Dent J* 2011; 23(4):167-176.
5. Diab M, el Badrawy HE. Intrusion injuries of primary incisors. Part III: Effects on the permanent successors. *Quintessence Int* 2000; 31:377-84.
6. Lenzi MM, da Silva Fidalgo TK, Luiz RR, Maia LC. Trauma in primary teeth and its effect on the development of permanent successors: a controlled study. *Acta Odontol Scand* 2018; 22:1.
7. Borum MK, Andreasen JO. Sequelae of trauma to primary maxillary incisors. I. Complications in the primary dentition. *Endod Dent Traumatol* 1998; 14:31-44.
8. Orders ML, Koch G. Developmental disturbances in permanent successors after injuries to maxillary primary incisors. *Eur J Pediatr Dent* 2001; 2:165-72.
9. Holan G, Ram D, Fuks AB. The diagnostic value of lateral extraoral radiography for intruded maxillary primary incisors. *Pediatr Dent* 2002; 24:38-42.
10. Altun C et al. 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; 107(4):493-498.
11. Carvalho V, Jacomo DR, Campos V. Frequency of intrusive luxation in deciduous teeth and its effects. *Dent Traumatol* 2010;26:304-7.
12. Diab M, elBadrawy HE. Intrusion injuries of primary incisors. Part I: Review and management. *Quintessence Int* 2000;31:327-34.
13. Altay N, Güngör HC. A retrospective study of dento-alveolar injuries of children in Ankara, Turkey. *Dent Traumatol* 2001;17:201-4.
14. Gondim JO, Moreira Neto JJ. Evaluation of intruded primary incisors. *Dent Traumatol* 2005;21:131-3.
15. Sarkar PA and Anand S. Management of traumatic intrusive luxation of incisors in a patient with Down's syndrome. *Case Reports* 2011 Dec 20; 2011 bcr1020114887.
16. Bastone EB. et al. "Epidemiology of Dental Trauma: A Review of the Literature". *Australian Dent J* 2000; 45(1):2-9.
17. Andreasen FM, Pedersen BV. Prognosis of luxated permanent teeth the development of pulp necrosis. *Endod Dent Traumatol* 1985; 1:207-220.