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*Distant consequences of traumatic injuries to deciduous teeth –  
a case report*

The ever increasing number of injuries to deciduous teeth in children constitutes a serious problem in paedodontics. There are various causes of tooth traumas. The majority of accidents which damage the teeth happen at the “toddler” stage, i.e. when babies are between 1 and 2 years of age. Injuries occur when babies hit against a hard object. Between 4 and 5 years of age, babies are prone to accidents while playing. Injuries to permanent teeth are also reported among school children. They typically occur while playing outside, engaging in sports activities and even in fights. Injuries done to teeth can be accompanied by a damaged periodontium, injuries of soft tissues of both the mouth and the face. Among many factors that facilitate tooth injuries are malocclusions, and most specifically protrusions of upper incisors of Class II /1 according to Angle. An increased risk of traumas also occurs among physically unfit children and those with impaired motor coordination, e.g. cerebral palsy or epilepsy. The scale of damage done to deciduous teeth requires the development of effective methods of diagnosis and treatment (10, 11).

CASE DESCRIPTION

A 6-year-old girl (born on 5 June, 1997) that was referred to the Chair and Department of Paedodontics, Skubiszewski Medical University in Lublin was diagnosed for irregular development of permanent medial incisors.

The child was prematurely born (28<sup>th</sup> month). In 1997 the child was referred for cardiologic consultation to the Children’s Memorial Health Institute and a persisting Botall’s duct was reported. At the interview, the mother indicated that during the toddler stage, i.e. about the eighth month, the baby fell on the chin and had an injury of the upper incisors; however, she did not seek any consultation with a dental surgeon.

Clinical examination confirmed in the area of permanent medial incisors enamel development disorders in the form of surface hypoplasia, discoloration, and crown deformity of tooth No. 11 (an alveolar oriented twist) (Fig. 1 and 2). Tooth No. 12 with an atypical and fractured crown was rotated.



Fig. 1. A 6-year-old girl with irregular development of permanent medial incisors – vestibular view

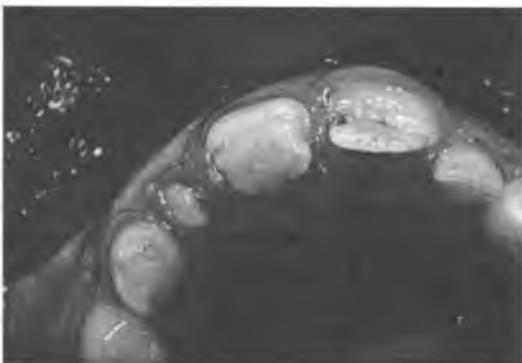


Fig. 2. The same patient – occlusal view

## DISCUSSION

The consequences of tooth injuries depend on various factors including the actual impact of the trauma, the direction of the impact, the shape of the object in contact with the jaws, its flexibility, child's age, and type of teeth (deciduous or permanent). The softer and more flexible the object with which a jaw is hit, the smaller the likelihood of a fractured crown but the greater the risk of traumatic dislocation of the tooth. The incidence of deciduous tooth dislocation or knocking out is higher because of the structure of the crown (shorter with respect to the crown of permanent teeth) and, secondly, the structure of roots which in time are subject to physiological resorption and, consequently, are no longer firmly rooted in the socket. The third factor relates to the structure of the parodontium whose fibres are thinner and the dental process less mineralised (5, 8). Permanent teeth tend to be more frequently fractured (in the crown or root areas). The incidence of tooth injuries is difficult to determine because children with minor defects do not visit dental surgeons at all. For this reason, epidemiological data are usually underrated. Studies conducted by some authors indicated that traumatic injuries to deciduous teeth occur in 30% of children while injuries to permanent teeth are reported in 22% of children. Interestingly, such injuries to permanent teeth are reported in boys twice as often as in girls (13). These observations do not hold true for deciduous teeth although the actual discrepancy is rather insignificant. The most common damage occurs in medial incisors. More specifically, a single tooth is

damaged though multiple injuries in a single child have also been reported. Numerous authors describe the following problems with permanent teeth resulting from deciduous tooth injuries that occurred during early childhood: hypoplasia, enamel pigmentation, deformed crowns of permanent tooth, bifurcated tooth roots, webbed roots of permanent teeth, inhibited permanent tooth root growth and problems with secondary dentition (1, 2, 4, 6). I s h i k a w a observed post-trauma problems in 126 deciduous teeth in 66 children. The consequences of these traumas were manifested in 72 permanent teeth as enamel discoloration, hypoplasia, delayed dentition, webbed roots and obliteration of the dental pulp (7). V o n A r x claims that 23% of permanent teeth reveal negative effects of milt tooth injuries. The most common are hypoplasia and enamel discoloration (12). The biggest risk of damage to the tooth bud occurs when the deciduous tooth is knocked into the gum (3, 13, 14, 15).

Relevant dental treatment depends on the age of the child, the scope of damage done to the tooth hard tissues, the degree of root resorption, direction of relocation in the case of pushing the deciduous tooth up into the gum, the level of oral hygiene as well as injuries of adjacent soft tissues and the bone of the dental process. (5, 8, 9)

Any treatment undertaken should aim to retain the function of the damaged tooth and to ensure the proper development of the permanent tooth bud.

### CONCLUSIONS

In view of the ongoing child development processes, medical check-ups following injuries to deciduous teeth should be undertaken once every two or three months. Since such injuries have an impact on the development of the masticatory organ, children should undergo medical inspection and observation immediately upon the completion of relevant post-trauma treatment. It is also essential to increase the awareness among parents of the exigency of an early visit to the dentist for treatment. A timely reaction will substantially reduce the number of complications that develop in permanent teeth as a result of traumas experienced in childhood.

### REFERENCES

1. A d a m s T. W.: An impacted primary lateral incisor as a cause of delayed eruption of a permanent tooth: case report. *Paed. Dent.*, 3/4, 1998.
2. B e n - B a s s a t Y. B r i n , Z i l b e r m a n Y.: Effects of trauma to the primary incisors on their permanent successors: multidisciplinary treatment. *ASDC J. Dent. Child.* 3/4, 56, 2, 112, 1989.
3. D i a b M. e l B a d r a w y H. E.: Intrusion injuries of primary incisors. Part II.: Sequellae affecting the intruded primary incisors. *Quintess. Int.* 5, 31, 5, 327, 2000.
4. F r i e d I., E r i c k s o n P.: Anterior tooth trauma in the primary dentition: incidence, classification, treatment methods, and sequelae: a review of the literature. *ASDC J. Dent. Child.* 7/8, 62, 256, 1995.
5. H a s h i m o t o M., K u b o S.: Clinical survey of the effect of traumatic injuries to deciduous teeth on their permanent successors. *Paed. Dent.* 12, 1996.
6. H o l a n G., T o p f J.: Effect of root canal infection and treatment of traumatized primary incisors on their permanent successors. *Endodont. Dent. Traumat.*, 8, 1, 12, 2, 1992.
7. I s h i k a w a M., S a t o h K.: A clinical study of traumatic injuries to deciduous teeth. The influence on their permanent successors. *Shoni Shikagaku Zasshi – Jap. J. Pedodont.* 28, 2, 397, 1990.

8. Mielnik-Błaszczak M., Puławska J.: Urazy zębów mlecznych i metody ich leczenia-referat. Zjazd Naukowy Sekcji Stomatologii Dziecięcej PTS, 27, Łódź 2002.
9. Nagatani S.: Partially arrested root formation in a permanent incisor subsequent to trauma to the primary dentition. *Austr. Dent. J.* 38, 1, 1, 2, 1993.
10. Puławska J.: Stany pourazowe zębów mlecznych i metody ich leczenia. Rozprawa doktorska, AM w Lublinie, 2003
11. Szymañska-Jachimczak E. J.: Ostre urazy mechaniczne zębów mlecznych, ich wpływ na zawiązki zębów stałych, postępowanie. *Czas. Stom.*, 25, 6, 537, 1972.
12. Von Arx T.: Developmental disturbances of permanent teeth following trauma to the primary dentition. *Austr. Dent. J.* 38, 1, 1, 2, 1993.
13. Wassef M. B., O. I. Cole, J. H. Nunn, R. R. Welbury: Trauma to the primary dentition – effects on permanent successors. *Int. J. Paed. Dent.*, 12, 5, 380, 8, 2002 .
14. Weber A., van Heerden W. F.: Injury to the permanent tooth germ following trauma to the deciduous predecessor. *J. Dent. Ass. South Africa*, 8, 1988.
15. Zilberman Y.: Effect of trauma to the primary incisors on root development of their permanent successors. *Paed. Dent.* 12, 1986.

#### SUMMARY

The ever increasing number of injuries to deciduous teeth in children constitutes a serious problem in paedodontics. Among many factors that facilitate tooth injuries are malocclusions, and most specifically protrusions of upper incisors of Class II /1 according to Angle. This is a case report of a 6-year-old girl with irregularities of upper permanent incisors due to traumatic injuries to deciduous teeth. In view of the ongoing child development processes, medical check-ups following injuries to deciduous teeth should be undertaken once every two or three months. Since such injuries have an impact on the development of the masticatory organ, children should undergo medical inspection and observation immediately upon the completion of relevant post-trauma treatment.

#### Odległe następstwa urazowych uszkodzeń zębów mlecznych – opis przypadku

Coraz częstsze przypadki urazowych uszkodzeń zębów mlecznych u dzieci stanowią poważny problem w stomatologii dziecięcej. Wśród wielu czynników sprzyjających urazom zębów należy wymienić wady zgryzu, zwłaszcza protruzję siekaczy górnych klasy II /1 wg Angle'a. W pracy został omówiony przypadek 6-letniej dziewczynki ze zmianami w obrębie stałych siekaczy szczęki, będącymi następstwem urazu siekaczy mlecznych. Ze względu na zachodzące ciągle u dzieci procesy wzrostowe badania kontrolne po urazach zębów mlecznych powinny odbywać się co kilka miesięcy. Mając na uwadze wpływ doznanego urazu na rozwój narządu żucia, dzieci powinny być poddawane kontroli lekarskiej i obserwacji nawet po zakończonym leczeniu stanów pourazowych zębów mlecznych.