



Selected dental anomalies in Ramadi population (Clinical and radiographic survey)

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Abstract

The form, size, shade and time of eruption of teeth in humans show very wide variation among different population and some times within the same population. Anomalies like Dilaceration, Taurodontism and recently Talon cusp were a subject for a large number of studies, Studies related to such anomalies in our community are very little and for this reason, this current research is carried out to provide a quick view on the prevalence of these anomalies in our community. The sample of this research composed of 1908 teeth from them the prevalence of the selected dental anomalies were recorded. The results showed that the prevalence of these anomalies where found to be 7.52 % in the maxillary teeth and 7.35% in the mandibular teeth and these anomalies were more frequent in molars and lateral incisors than other teeth.

Key words: dental anomalies, Dilaceration, Taurodontism and Talon cusp

Introduction

The form, size, shade and time of eruption of teeth in humans show very wide variation among different population and some times within the same population.⁽¹⁾

Dilaceration as an important example is a deviation, or bend, in the linear relationship of a crown of a tooth to its root; it is an angulation or sharp curve in the root or the crown of a developed tooth. The etiology of Dilacerations was considered to be due to mechanical trauma to the calcified portion of the tooth during its formation.^(2, 3) However, current studies support the view that Dilaceration may be a true developmental anomaly that is not related to a history of trauma⁽⁴⁻⁷⁾. Dilaceration of a crown can be visually observed in the mouth; however, radiographic examination is required to diagnose Dilacerations in the root. Diagnosing a dilaceration is important

during root canal treatment⁽⁸⁾, extraction⁽⁹⁾ and orthodontic movement⁽¹⁰⁾.

Other tooth anomaly is Taurodontism which can be defined as a change in tooth shape caused by the failure of Hertwig's epithelial sheath diaphragm to invaginate at the proper horizontal level. An enlarged pulp chamber, apical displacement of the pulpal floor, and no constriction at the level of the cemento-enamel junction are the characteristic features. Although permanent molar teeth are most commonly affected, this change can also be seen in both the permanent and deciduous dentition, unilaterally or bilaterally, and in any combination of teeth or quadrants. Whilst it appears most frequently as an isolated anomaly, its association with several syndromes and abnormalities has also been reported.⁽¹¹⁾

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Clinically, a taurodont appears as a normal tooth. In fact, because the body and roots of a taurodont tooth lie below the alveolar margin, its distinguishing features cannot be recognized clinically^(12, 13). Therefore, the diagnosis of taurodontism is usually a subjective determination made from diagnostic radiographs⁽¹⁴⁾.

Another rare tooth anomaly that draws great attention in recent literature is Talon cusp which is an anomalous structure composed of normal enamel and dentin containing varying extension of pulp tissue. The first recorded case of talon cusp was in 1892, when Mitchell⁽¹⁵⁾ described an accessory cusp on the lingual surface of an upper central incisor as 'a process of horn like shape curving from the base downward to the cutting edge' in a female patient. Mellor and Ripa⁽¹⁶⁾ named the accessory cusp as talon cusp because of its resemblance in shape to an eagle's talon. Shulze⁽¹⁷⁾ referred to the anomaly as a very high accessory cusp, which may connect with the incisal edge to produce a T-form or, if more cervical, a Y-shaped crown contour. Other names include dens evaginatus, interstitial cusp, tuberculated premolar, odontoma of the axial core type, evaginated odontoma, occlusal enamel pearl, occlusal anomalous tubercle and supernumerary cusp⁽¹⁸⁾. The prevalence of talon cusp is low, with estimates ranging from less than 1%⁽¹⁹⁾ to approximately 8% of the population⁽²⁰⁾. A review of the literature suggests that 75% of talon cusps are in the permanent dentition and 25% are in the primary dentition, males show a higher frequency than females, and that the anomaly shows a greater predilection for the maxilla. Ninety-two per cent of cases affect the maxilla and the mandible accounts for only 8% of the cases. With regard to tooth affinity, only central incisors are

involved in the primary dentition, and the maxillary lateral incisor is most often affected in the permanent dentition (67%), followed by the central incisor (24%) and canine (9%). The shape, size, structure, location and the site of origin of talon cusp varies widely. The anomaly is commonly unilateral, but one-fifth of the cases are bilateral in occurrence⁽²¹⁾.

Agensis of teeth (other terms used include "aplasia of teeth" and "hypodontia") may be a common dental anomaly in a healthy population, and its prevalence reportedly ranges from 2.8% to 10%.^(22, 23) Both genetic and environmental factors may result in tooth agensis. In most individuals, hypodontia has a genetic background, as shown in family studies^(24, 25) or by identifying the gene mutations involved⁽²⁶⁻²⁸⁾. In addition to some environmental factors, such as multi agent chemotherapy and radiotherapy, which are known to cause tooth agensis when used in pediatric anticancer therapy.

Studies related to tooth anomalies in our community are very little and for this reason the primary aim of this research is to provide a quick view on the prevalence of selected dental anomalies in our community namely Dilaceration, Taurodontism and Talon cusp.

Material and method

The subjects of this study consist of A total of 1908 teeth from patients who attended the dental clinics of the College of Dentistry, Al-Anbar University, Ramadi Province, between 2004 and 2006. The age range of patients was (22 – 63 years), comprising 1103 (57.8%) males and 805 (42.2%) females were included (Table 1). The fully erupted permanent teeth have been examined and an assessment of developmental

disturbances was made. Tooth surfaces were examined with a dental mirror on a standard dental light and chair. Radiographic examination was done by taking a periapical view of the offending tooth and a suitable dental viewer was used to read these radiographs. After that a quantitative analysis of clinical manifestations and intraoral radiographs was performed in order to detect the selected anomalies.

Results

According to the results of this research the prevalence of the selected dental anomalies (Dilaceration, Taurodontism and Talon cusp) was found to be 7.52 % in the maxillary teeth and 7.35% in the mandibular teeth. In general these anomalies were found to be more frequent in molars and lateral incisors than other teeth. And this is true for both Dilaceration and Taurodontism while for the talon cusp the figure is quietly different, where it found that this anomaly is very rare and found in central incisors only with a very low prevalence (4%).

In more details; the prevalence of Dilacerations in maxillary teeth were found to be 13.08 % in the second molars, 7.48 % in the first molars, 6.36% in the second premolars and 4% in the lateral incisors. In the mandibular teeth, however the Dilaceration gives a similar figure for the molar teeth, but it seems to affect third molars (20.58%) more than the second molars (9.83%) and first molars (6.87%). In the premolar region the prevalence of Dilaceration may give a similar picture to that of maxillary teeth (4.51% for second premolars and 5.77% for first premolars). For the anterior teeth the prevalence of the Dilaceration in lateral incisors is (0.9%) which is smaller compared to that recorded for maxillary lateral incisors.

Regarding the prevalence of the Taurodontism, it was found that this anomaly prevalent in comparable percentages in both maxillary (8.41%) and mandibular (8.19%) second molars, but it is slightly more prevalent in maxillary first molar (9.19%) than the mandibular first molar (8.39%). This anomaly was not recorded for other dentition in both arches. Detailed results have been listed in (table 1), (table 2) and (table 3).

Discussion

The importance of this research came from that it may be one of a very few studies that investigate the prevalence of these selected dental anomalies in our community. Moreover it may be the pilot study in this subject in the western area of Iraq.

Studying the dental anomalies in general has its known importance because their presence must be considered in various dental treatments. As an example, taurodontism may produce challenge in various aspects of endodontic treatment⁽²⁹⁾.

In other example the tooth extraction can be complicated by presence of dilaceration especially in the apical third of roots. In contrast, it has also been hypothesized that because of its large body, a little surface area of a taurodont tooth is embedded in the alveolus. This feature would make extraction less difficult as long as the roots are not widely divergent⁽³⁰⁾.

It also should be noted that in cases of hyper taurodontism (where the pulp chamber nearly reaches the apex and then breaks up into two or four channels) vital pulpotomy instead of routine pulpectomy may be considered as the treatment of choice .

Finally and from a periodontal standpoint, taurodont teeth may, in

specific cases, offer a favorable prognosis, where periodontal pocketing or gingival recession occurs, the chances of furcation involvement are considerably less than those in normal teeth because taurodont teeth have to demonstrate significant periodontal destruction before furcation involvement occurs^(31, 14).

Findings related to the prevalence of dilaceration of permanent teeth in this study which constitutes (6.27%) in mandibular teeth and (3.96%) in maxillary and other findings shown in (table 2, 3), came in agreement with the study of Malčić A et al., 2006.⁽³²⁾

On the other hand with regard to the prevalence of the Taurodontism, the finding that this anomaly prevalent in comparable percentages in both maxillary (8.41%) and mandibular (8.19%) second molars, but it is slightly more prevalent in maxillary first molar (9.19%) than the mandibular first molar (8.39%), came in disagreement with the study of Darwzeh et al (1998)⁽³³⁾ in which they found that maxillary second molar was the most commonly affected tooth.

At last the finding that the prevalence of talon cusp in maxillary incisors was only (1.01%) and most commonly in maxillary lateral incisor (6%) (table 2) came in agreement with the findings of Rusmah and Meon, 1991.⁽³⁴⁾

In conclusion dilaceration, taurodontism and talon cusp are not so common in our community, but their presence should be taken in consideration as a thorough knowledge of these important dental anomalies may facilitate endodontic, orthodontic, periodontic and surgical dental treatment.

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Table 1. The population sample

Teeth	No. of teeth	%
Female teeth	805	42.2
Male teeth	1103	57.8
Total	1908	100

Table 2. Dilaceration, Taurodontism and Talons cusps in maxillary teeth

Tooth	No (%)	Dilaceration		Taurodontism		Talons cusp		Total	
		No	(%)*	No	(%)*	No	(%)*	No	(%)*
Central incisor	131 (13.313)	0	(0)	0	(0)	4	(3.053)	4	(3.053)
Lateral incisor	100 (10.162)	4	(4)	0	(0)	6	(6)	10	(10)
Canine	194 (19.715)	0	(0)	0	(0)	0	(0)	0	(0)
First premolar	98 (9.959)	1	(1.02)	0	(0)	0	(0)	1	(1.02)
Second premolar	110 (11.178)	7	(6.36)	0	(0)	0	(0)	7	(6.36)
First molar	174 (17.682)	11	(7.48)	16	(9.195)	0	(0)	27	(16.675)
Second molar	107 (10.873)	14	(13.08)	9	(8.411)	0	(0)	23	(21.491)
Third molar	70 (7.113)	2	(2.857)	0	(0)	0	(0)	2	(2.857)
Total	984 (100)	39	(3.963)**	25	(2.54)**	10	(1.016)**	74	(7.52)**

* Percentage of the anomaly per tooth type. ** Percentage of the anomaly per total teeth

Table 3. Dilaceration, Taurodontism and Talons cusp in mandibular teeth

Tooth	No (%)	Dilaceration		Taurodontism		Talons cusp		Total	
		No	(%)*	No	(%)*	No	(%)*	No	(%)*
Central incisor	97 (10.497)	0	(0)	0	(0)	0	(0)	0	(0)
Lateral incisor	111 (12.012)	1	(0.9)	0	(0)	0	(0)	1	(0.9)
Canine	80 (8.658)	1	(1.25)	0	(0)	0	(0)	1	(1.25)
First premolar	104 (11.255)	6	(5.77)	0	(0)	0	(0)	6	(5.77)
Second premolar	177 (19.155)	8	(4.519)	0	(0)	0	(0)	8	(4.519)
First molar	131 (14.177)	9	(6.87)	11	(8.396)	0	(0)	20	(15.266)
Second molar	122 (13.203)	12	(9.836)	10	(8.196)	0	(0)	22	(18.032)
Third molar	102 (11.038)	21	(20.588)	0	(0)	0	(0)	21	(20.588)
Total	924 (100)	58	(6.277)**	21	(2.272)**	0	(0)	79	(7.359)**

* Percentage of the anomaly per tooth type. ** Percentage of the anomaly per total teeth