

Correlation between Anterior Crowding and Attrition in Young Adults

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ABSTRACT

Introduction: Dental crowding is associated with a difference between the existing space and the necessary space of the teeth on the arches, this being a possible symptom of skeletal malocclusions. The clinical forms of crowding are mild, moderate or severe depending on their manifestation. Attrition is described as the condition resulting mainly from tooth to tooth contact without any foreign substance intervention. It is also described as the physiological wearing off of teeth.

Aim: To evaluate if there is any correlation between Anterior Crowding and Attrition in Young Adults.

Materials and Method: A total of 100 individuals were assessed for Crowding and Attrited teeth. To assess the status of Crowding and Attrition, Clinical examinations along with intraoral photographs were taken. The data obtained was tabulated and using the SPSS Software, a Non Parametric Correlation Coefficient was calculated using Spearman's method.

Results: In the 100 anterior crowded individuals that were studied, 63 showed attrited teeth and 37 did not show attrited teeth. The Spearman correlation coefficient p value of 0.46 was obtained.

Conclusion: The study revealed a positive correlation between anterior crowded teeth and Attrition in the population studied.

Key Words: Anterior Crowding, Attrition, Correlation, Bruxism, Dental Crowding

I. INTRODUCTION:

Dental crowding is associated with a difference between the existing space and the necessary space of the teeth on the arches, this being a possible symptom of skeletal malocclusions. The clinical forms of crowding are mild, moderate or severe depending on their manifestation, in anterior, intermediary, lateral or posterior position. (Zegan *et al.*, 2015) Dental crowding is reported to have general functional or local causes, including

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crossed heredity or dis-endocrinopathies. (Howe, McNamara and O'Connor, 1983) The frequency of this anomaly is quite high among people, ranging from 5-80% (Normando, de Almeida Santos and Quintão, 2016)

Tooth wear is a generalised term that describes the loss of dental hard tissues from tooth surfaces that is caused by factors other than dental caries, trauma and developmental disorders. Attrition, erosion, and abrasion usually cause alterations of the surface and manifest as tooth wear. (Normando, de Almeida Santos and Quintão, 2016) Attrition is described as the condition resulting mainly from tooth to tooth contact without any foreign substance intervention. It is also described as the physiological wearing off of teeth. (Hellwig and Lussi, 2006)

Attrition is mainly a result from contact between opposing teeth and wear facets that have already been well defined. The main causal factors of attrition are mainly parafunctional habits including bruxism, clenching, coarse diet, developmental defects and natural teeth opposing porcelain. (Salonen, Axell and Hellden, 1990) It is also caused by a Class III Incisal relationship and lack of posterior support. Attrition occurs almost entirely on occlusal and incisal surfaces, although it can also affect the buccal and palatal sides of the maxillary and mandibular anterior teeth in deep vertical overlap occlusal relationships. (Addy and Shellis, 2006)

Indications of attrition can include Loss of Tooth anatomy like rounding or sharpening of incisal edges (Wazani *et al.*, 2012), loss of cusps and fracturing of teeth; Pain or Sensitivity factors like dentin hypersensitivity secondary to the loss of the enamel layer (Nadiger, Lekha and Meshramkar, 2012), or tenderness of the periodontal ligament that is caused by occlusal trauma (Yadav, 2011); Tooth Discolouration factors like a yellow appearance of the surface of tooth due to enamel being worn away, exposing the underlying dark dentin (Khan *et al.*, 1999); Altered Occlusion due to decreasing vertical height or occlusal vertical dimension; Compromised Periodontal Support resulting in tooth mobility and drifting of teeth; Loss in Posterior Occlusal Stability; Mechanical Failure of Restorations etc (Davies, Gray and Qualtrough, 2002)

This study aims to find and establish a correlation between Anterior Crowding and Attrition in Young Adults.

II. MATERIALS AND METHOD

A total of 100 individuals were assessed for Crowding and Attrited teeth. To assess the status of Crowding and Attrition, Clinical examinations along with intraoral photographs were taken.

Inclusion Criteria include Individuals with Anterior Crowding from the age group 18-45 years

Exclusion Criteria excludes Individuals with missing anteriors and Individuals with Periodontitis

Intraoral Photographs were preserved for documentation purposes. The data obtained was tabulated and using the SPSS Software, a Non Parametric Correlation Coefficient was calculated using Spearman's method.

III. RESULTS

In the 100 anterior crowded individuals that were studied, 63 showed attrited teeth and 37 did not show attrited teeth. The Spearman correlation coefficient p value of 0.46 was obtained. [TABLE: 1]

Table 1: Distribution of Attrition in Anterior Crowded Individuals

Number of Individuals with Anterior Crowding	Individuals with Attrited teeth	Individuals with Non-Attrited teeth	Spearman Correlation Coefficient p
n= 100	63	37	0.46

IV. DISCUSSION:

Previous studies have stated that the prevalence of dental crowding was the highest in the anterior region, some studies stating that the prevalence of anterior crowding being 96% (Southard, Behrents and Tolley, 1990), some stated that it was more than 58%. (Thilander, 2000) Some investigations have claimed that the dental crowding appeared and increased in the anterior region by aging. (Laine-Alava *et al.*, 2016)

The main factors that influence dental crowding at the stage of eruption of the permanent dentition include the position of the tooth germs, the timing of the loss of deciduous teeth and the eruption of the permanent teeth, and the order of replacement of the dentition from deciduous to permanent, the soft tissue pressure and the position of opposite teeth. (Baydaş *et al.*, 2004) The main factors affecting anterior crowding also include the linguoversion of the lateral incisor germ, lip pressure, lack of space for the eruption of the lateral incisor and tongue pressure. (Mochizuki, Hasegawa and Machida, 1998)

It is known that Bruxism and other parafunctional habits like tongue thrusting play a major role in attrition, and recent studies have revealed that they may also play a role in dental crowding.

Though there are many causative factors for Dental Attrition, one of the major underlying causes is related to the temporomandibular joint as the dysfunction or the disruption of the joint can result in compromised function and can raise complications such as bruxism and jaw clenching. (Meyers, 2012)

The etiology of dental attrition is multifactorial, the most common cause being bruxism and use of various entactogenic drugs. In some cases, dental erosion is also associated with attrition. (Sato, Hotta and Pedrazzi, 2000) Dental erosion is defined as the loss of tooth surface caused by extrinsic and intrinsic forms of acid. Erosion softens the dental hard tissues, making them more susceptible to attrition. (Mack *et al.*, 2004) Tooth wear is typically seen in the elderly and is hence normally known as a natural aging process. It can be pathological or physiological. Attrition occurs in 1 in 3 adolescents. (Loomans and Opdam, 2018)

Occlusal factors play a major role in attrition in young adults. In addition to occlusal factors, many independent variables such as male gender, loss of molar occlusal contact, edge to edge relation of incisors, unilateral buccolingual cusp to cusp relation, etc, have also been known to cause occlusal wear. Similarly, anterior crossbite, unilateral posterior crossbite and anterior crowding have been found to be factors that are causative of high occlusal wear levels. (Spijker *et al.*, 2007)

Since, Anterior crowding can create a disruption in the dispersion of occlusal forces and masticatory forces, it is possible that the forces are dispersed to the respective tooth on the opposite arch disproportionately. This can lead to weakening of the hard tissues of the teeth receiving more pressure compared to those receiving

less pressure. If this phenomenon is observed for long periods of time, even years, can cause attrition of the tooth structure or loss of tooth structure. Hence, it is highly possible that Anterior Crowded teeth can lead to Attrited teeth and Vice Versa.

V. CONCLUSION:

The study revealed that 63% of the individuals with Anterior Crowding are subjected to Attrition of teeth, thereby establishing a correlation between Anterior Crowding and Attrition. This should be considered in predicting the prognosis of dental health in patients.

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