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ORIGINAL ARTICLE

Proximal contact areas of maxillary anterior teeth and their influence on interdental papilla

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KEYWORDS

Interdental papilla;
Proximal contact;
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Abstract Objectives: Open gingival embrasures leading to appearance of black triangles which apart from being unesthetic contribute towards food retention, adversely affecting the health of the periodontium. Correction of such papillary deformities is extremely challenging, which requires an in depth knowledge about the interproximal geometry for the appropriate management of interdental papilla. So, the present study was aimed to determine the proximal contact areas of maxillary anterior teeth and their influence on the interdental papilla.

Materials and methods: In 200 periodontally healthy patients equally divided into 21–40 years (Group I) and 41–60 years (Group II) of age group amounting to a total of 1400 interdental papillae in maxillary anterior teeth were examined to compute the apicocoronal Proximal contact area (PCA), Proximal contact area proportion (PCAP), and dimensions between alveolar crest and apical contact point (D1) to assess their influence on presence or absence of interdental papilla.

Results: The PCA dimensions were maximum for Central incisor-Central incisor measuring about 3.90 ± 0.93 mm and 3.97 ± 0.90 mm for Group I males and females respectively and 3.86 ± 1.22 mm and 3.63 ± 1.14 mm for males and female patients in Group II respectively. There was a gradual reduction till Canine-Premolar. Similar trend was followed in PCAP and D1. Consistently more dimensions of D1 were observed in Group II as compared to Group I which influenced the presence of papilla which was predominantly found in Group I patients amongst both the sexes.

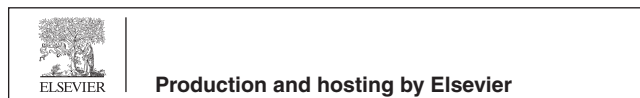
Conclusion: There was a gradual decrease in the PCA and PCAP in the distal direction anteroposteriorly from maxillary central incisors to first premolars on either sides. The younger age group of both the sexes exhibit greater presence of interdental papilla owing to the lesser D1 dimensions as compared to the older patients.

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1. Introduction

The presence of intact interdental papilla, one of the constituents of healthy gingiva, is of prime importance which needs to be considered for diagnosis and treatment of periodontal and restorative anomalies (Kolte et al., 2014; Murphy, 1996). The clinicians have been striving not only to restore the loss of function but also to achieve a pleasing esthetics especially in the anterior sextant which satisfies the aspiration of the patients to bear a beautiful smile.

Open gingival embrasures, leading to appearance of black triangle, are potentially attributed to multifactorial etiology. This includes dimensional changes in the interdental papilla during teeth alignment, alveolar bone destruction, gingival recession, length of embrasures, crown shapes and interproximal contact position (Cardaropoli and Re, 2005). Apart from being unesthetic the black triangles also contribute towards food retention, adversely affecting the health of the periodontium. Correction of such papillary deformities is extremely challenging, which requires profound knowledge of the interproximal geometry and an interdisciplinary team approach for an appropriate management of interdental papilla and gingival embrasure form. Several clinical and radiographic trials have elaborated on the influence of interproximal distance between roots (Cho et al., 2006) crown height and relative bone length (Kolte et al., 2016a, 2016b) distance of contact point to the crest of alveolar bone (Tarnow et al., 1992) and other such factors on the presence or absence of interdental papilla.

Current literature identifies the location of contact point in an apicoincisal direction for anterior maxillary teeth and the term contact point and contact area have been used interchangeably to describe the same (Ash, 1993; Krauss, 1991). The relevance of contact point lies in the fact that it defines the gingival embrasure and this is supposed to have an impact on the height of the interdental papilla (Martegani et al., 2007; Chu et al., 2009a, 2009b) and the incisal embrasure. True point contact needs to be differentiated from proximal contact areas as the former appear when contacting surfaces exhibit perfect curvatures and are commonly observed in young patients, while the latter appear in anterior dentition amongst the

adults. Periodontal and restorative procedures directed towards restoring the white and pink proportions in the anterior sextants need to identify contact points or areas with differing locations and dimensions. With the prevailing differences in perception of dental esthetics, efforts need to be made to establish common standards to guide the clinicians.

The concept of connector space or zone as defined by Morley and Eubank (2001) is a longer and broader area than a contact point or area usually 2 mm × 2 mm in dimensions. This concept was further elaborated in relationship to the connector zone for maxillary anterior teeth as a percentage of maxillary central incisor crown height referred to as the 50-40-30 rule (Morley, 2000) This rule is a preliminary effort in describing the visual perception of the contact area but lacks supporting quantitative research.

Considering the lack of understanding owing to limited investigations in the literature with regards to location and the apico-incisal dimensions of proximal contact areas, this study was planned to determine the proximal contact areas of maxillary anterior teeth and their influence on the interdental papilla.

2. Materials and methods

The study population comprised of 200 periodontally healthy patients, randomly selected from those visiting the Department of Periodontics and Implantology of our Institute. These patients were equally divided into two groups based on their age as:

Group I: Periodontally healthy patients with age range from 21 to 40 years and

Group II: Periodontally healthy patients with age range from 41 to 60 years.

The male and female patients were equal in numbers in both the groups and were recruited between June 2015 to August 2016. All the patients were informed about the nature of the study and their written consent was obtained. The study protocol was approved from the Institutional Ethics Committee and confirmed with the Helsinki Declaration. Inclusion criteria for the study population was patients with fully erupted maxillary anterior teeth possessing tight proximal contacts

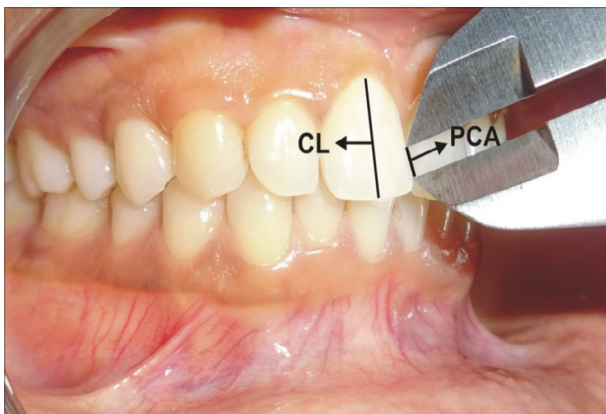


Fig. 1 Healthy gingiva having tight interproximal contacts between maxillary anterior teeth showing Proximal contact area (PCA), Crown length (CL).



Fig. 2 Clinical Measurement of Proximal contact area with the digital calliper Proximal contact area (PCA) Crown length (CL).

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