Anterior Interdental Papillary Loss among Young Adults of Bhubaneswar: A Cross Sectional Survey

Bhagyashree Lenka[1], Rinkee Mohanty[2], Anurag Satpathy[3], Rashmita Nayak[3], Abhaya Chandra Das[4], Sourav Panda[4], Gatha Mohanty[5]

[1]Post Graduate Student, [2]Professor and Head, [3]Professor, [4]Reader, [5]Lecturer, Department of Periodontics and Oral Implantology, Institute of Dental Sciences, Siksha 'O' Anusandhan (Deemed to be University), Bhubaneswar, Odisha

Introduction

Background: Presence of intact interdental papilla is considered as an essential component of health and esthetics. Interdental papilla loss or "black triangles" results in food retention, phonetic problems and unaesthetic appearance especially in maxillary anterior regions but there are very few studies reporting the prevalence of this condition.

Aim: To assess the prevalence of anterior interdental papillary loss among young adults in Bhubaneswar.

Materials and Method: A total of 483 patients were screened and 157 patients met the inclusion and were assessed for papilla loss parameters (Norland & Tarnow and Jemt Classification).All these patients underwent oral prophylaxis and then clinical photographs were taken.

Results: High frequency of papillary loss was seen in males (62.4%) compared to females (37.6%). Papillary loss was commonly seen in midline (51.0%) than in laterals(49.0%). Jemt Grade 2 (43.3%)and Nordland and Tarnow Class I(43.3%) papillary recession was more commonly seen.

Conclusion: There is higher prevalence of papilla loss in the midline region of maxillary anteriors presenting half or more of the height of the papilla

Keywords: *Interdental papilla, black triangle, classification, prevalence.*

Introduction

A smile reflects the happiness that one has in life[1]. The consonance of the smile is determined by the shape, the position and the color of the teeth but the existence of interdental papillae and healthy gingiva is also one of the important esthetic aspects that need to be considered[2]. Loss of interdental papilla (IDP) results in papillary recession, an un-esthetic gap known as "the blacktriangle"that draws an unpleasant individual attention.

Often the loss of papilla is either an outcome of periodontal disease or trauma. Loss of papilla may also be a result of post-surgical recession due to soft tissue contraction seen in the healing period[3,4]. The development and severity of the interdental papilla recession presents considerable differences in the population at large and young adults in particular[5]. There is no reported study on prevalence of papillary recession. Such information is necessary to gauge the burden of this type of condition in the public at large[6]. Hence, the aim of the present study was to assess the prevalence of anterior interdental papillary loss among young adults.

Corresponding Author:
Prof. Anurag Satpathy
Professor, Department of Periodontics and Oral Implantology, Institute of Dental Sciences, Siksha 'O' Anusandhan (Deemed to be University), Bhubaneswar, Odisha
e-mail: drasatpathy@gmail.com

Materials and Method

Study design and study population: A cross-sectional epidemiological survey was conducted from January 2019 – October 2019 among the young adults aged 18–30 years visiting in department of Periodontics at Institute of Dental Sciences, Bhubaneswar, Odisha. The study was approved by the Institutional Review Board. All willing subjects were included in the study after obtaining a written consent. Subjects with absence of anterior interdental contact point, presence of restoration and prosthesis in the maxillary anterior region were excluded. Data was collected by carrying out dental examination. Each subject was examined in a dental chair by a single, trained and calibrated examiner using dental chair light, mouth mirror, and explorer. They were checked for papilla loss parameters as per classification put forth by Norland & Tarnow et al[7] and Jemt et al [8]. All subjects underwent oral prophylaxis and clinical photographs of the selected site (black triangle) were taken. These photographs were standardized, by setting a grid over the camera screen, while clicking them. The photographs are taken such that the black triangle, adjacent teeth, and the papilla between them was clearly visible. Magnification of the photographs was standardized to 25%.

Statistical Analysis: Data analysis was done with SPSS Statistics version 20. Summary and test of significance was done with Chi-squared test. A value of P of ≤ 0.05 was considered to be statistically significant.

Results

A total of 483 patients of both genders were screened out of which 157 met the selection criteria. In age group upto 35 years, the papillary recession was 32.5% ($n = 51$); age group 35–50 years, it was 41.4% ($n = 65$); age group above 50 years, it was 26.1% ($n = 41$). The frequency of interdental papillary loss was found to be highest among adults within age group of 36-50 years. It was revealed that there was higher prevalence of papillary loss with higher age. Males were mostly affected by papillary recession 62.4% (n=98) compared to females 37.6% (n=59) which was of statistical significance. Papillary loss was commonly seen in midline 51.0%(n=80) than in laterals 49.0% (n=77). The most commonly seen was Nordland & Tarnow et al class I type of papillary recession 43.3% (n=68) followed by class II 33.8%(n=53), class III 22.9%(n=36) and according to Jemt et al classification,the most common was grade 2 type of papillary recession 43.3% (n=68) followed by grade 1 33.8%(n=53),grade 0 22.9%(n=36),grade 3 0.0%(n=0). (Table 1).

Table 2 and Table 3 shows distribution of anterior papillary recession as per Jemt et al and Nordland et al classification, in which there was no statistically significant difference between the males and females (p=0.19) as well as no significant difference were found when age groups were compared(p =0.07) but there was statistically significant more papillary recession in midline as compared to laterals (p=0.00) as per both the classification system.

Table 1. Distribution of anterior papillary recession as per Gender, age group, Papilla Location, Jemt et al and Norland & Tarnow et al classification (N= 157)

		N	N%	Chi	P value*
Gender	Male	98	62.4%	9.69	0.00
	Female	59	37.6%		
Age Group	Upto 35 years	51	32.5%	5.55	0.06
	36 - 50 Years	65	41.4%		
	Above 50 Years	41	26.1%		
Papilla Location	Lateral	77	49.0%	0.06	0.81
	Midline	80	51.0%		
Jemt et al	Grade 0	36	22.9%	9.80	0.01
	Grade 1	53	33.8%		
	Grade 2	68	43.3%		
	Grade 3	0	0.0%		

		N	N%	Chi	P value*
Norland & Tarnow et al	Class I	68	43.3%	9.80	0.01
	Class II	53	33.8%		
	Class III	36	22.9%		

N = No of subjects; *Chi Squared Test, $p \leq 0.05$

Table 2. Distribution of anterior papillary recession as per Jemt et al classification

		Grade 0		Grade 1		Grade 2		Chi	P value*
		N	N%	N	N%	N	N%		
Gender	Male	24	24.5%	37	37.8%	37	37.8%	3.37	0.19
	Female	12	20.3%	16	27.1%	31	52.5%		
Age Group	Upto 35 years	15	29.4%	22	43.1%	14	27.5%	8.76	0.07
	36 - 50 Years	15	23.1%	18	27.7%	32	49.2%		
	Above 50 Years	6	14.6%	13	31.7%	22	53.7%		
Papilla Location	Lateral	32	41.6%	31	40.3%	14	18.2%	46.80	0.00
	Midline	4	5.0%	22	27.5%	54	67.5%		

N = No of subjects; *Chi Squared Test, $p \leq 0.05$

Table 3. Distribution of anterior papillary recession as per Norland & Tarnow et al classification

		Class I		Class II		Class III		Chi	P value*
		N	N%	N	N%	N	N%		
Gender	Male	37	37.8%	37	37.8%	24	24.5%	3.37	0.19
	Female	31	52.5%	16	27.1%	12	20.3%		
Age Group	Upto 35 years	14	27.5%	22	43.1%	15	29.4%	8.76	0.07
	36 - 50 Years	32	49.2%	18	27.7%	15	23.1%		
	Above 50 Years	22	53.7%	13	31.7%	6	14.6%		
Papilla Location	Lateral	14	18.2%	31	40.3%	32	41.6%	46.80	0.00
	Midline	54	67.5%	22	27.5%	4	5.0%		

N=No of subjects; * Chi Squared Test, $p \leq 0.05$

Discussion

Anterior papillary recession is an unpleasant and unwanted condition, concerning mostly individuals of middle age groups throughout the world. Presence of a visible black triangle on smiling is often disturbing since it poses an esthetic, psychological and functional malady. However, according to the literature few studies have investigated the epidemiology of gingival recession, but no studies have been carried out was to assess the prevalence of anterior interdental papillary loss among young adults in India.

The present study showed that the prevalence of papillary recession was overall 62.4% in males and 37.6% in females, findings that were in agreement with studies that reported gingival recession prevalence ranged from 50.0% to higher percentages[9-11]. Kozlowska et al[12] reported 31.7% of females and 24.3% of males showed gingival recession. Our results were in contrast to these findings probably due to the fact that factors concerning papillary recession may are not similar to that of gingival recession[13].

The frequency of papillary recession was found to be more in middle aged group (36-50 years). This observation appears to be in usual and on expected

lines due to longer period of exposure to factors that are associated with periodontal disease and gingival recession exhibiting a cumulative effect. In our study, maxillary central incisors (n=80) had the highest prevalence of papillary loss when compared to lateral incisors due to the presence of midline raphe, midline frenum and developmental fusion of plates. These findings were in corroboration with the previous studies[14-20] as gingival biotype is thin in teeth that are prominently positioned.

To the best of our knowledge, this is the first of its kind survey that assesses the prevalence of anterior papillary loss in young adults. Prevalence studies are important for public health as they reflect the burden of disease in a specific population and help in the formulation of treatment strategies and policies[21]. A cross-sectional study has an inherent limitation of being specified to a single point which applies to the current study as well[22,23]. Nevertheless, within the limitations of our study, it may be concluded that there exists a high prevalence of anterior papillary loss among young adults and is significantly associated with age and location. Future studies may be carried out to understand the distribution of this condition better.

Funding Statement: None

Conflict of Interest: None

Ethical Permission: Approved

References

1. Mohanty G, Das AC, Satpathy A, Panda S, Mohanty R. Minimal Invasive Surgical Approach for Treatment of Excessive Gingival Display: A Case Report. Indian Journal of Public Health Research & Development. 2019;10(9):1593.
2. Bhuvaneswaran M. Principles of smile design. Journal of conservative dentistry : JCD. 2010;13(4):225-32.
3. Kaushik A, Pk P, Jhamb K, Chopra D, Chaurasia VR, Masamatti VS, et al. Clinical evaluation of papilla reconstruction using subepithelial connective tissue graft. Journal of clinical and diagnostic research : JCDR. 2014;8(9):ZC77-81.
4. Singh VP, Uppoor AS, Nayak DG, Shah D. Black triangle dilemma and its management in esthetic dentistry. Dental research journal. 2013;10(3):296-301.
5. Tanwar N, Narula SC, Sharma RK, Tewari S. Papillary Height and its Relation with Interproximal Distances and Cementoenamel Junction in Subjects with Chronic Periodontitis. A Cross-Sectional Study. Journal of clinical and diagnostic research : JCDR. 2016;10(4):ZC53-6.
6. Panda S, Del Fabbro M, Satpathy A, Das AC. Pedicled buccal fat pad graft for root coverage in severe gingival recession defect. Journal of Indian Society of Periodontology. 2016;20(2):216-9.
7. Nordland WP, Tarnow DP. A classification system for loss of papillary height. Journal of periodontology. 1998;69(10):1124-6.
8. Jemt T. Regeneration of gingival papillae after single-implant treatment. The International journal of periodontics & restorative dentistry. 1997;17(4):326-33.
9. Susin C, Haas AN, Oppermann RV, Haugejorden O, Albandar JM. Gingival recession: epidemiology and risk indicators in a representative urban Brazilian population. Journal of periodontology. 2004;75(10):1377-86.
10. Toker H, Ozdemir H. Gingival recession: epidemiology and risk indicators in a university dental hospital in Turkey. International journal of dental hygiene. 2009;7(2):115-20.
11. Chrysanthakopoulos NA. Prevalence and associated factors of gingival recession in Greek adults. Journal of investigative and clinical dentistry. 2013;4(3):178-85.
12. Kozlowska M, Wawrzyn-Sobczak K, Karczewski JK, Stokowska W. The oral cavity hygiene as the basic element of the gingival recession prophylaxis. Roczniki Akademii Medycznej w Bialymstoku. 2005;50 Suppl 1:234-7.
13. Mumghamba EG, Honkala S, Honkala E, Manji KP. Gingival recession, oral hygiene and associated factors among Tanzanian women. East African medical journal. 2009;86(3):125-32.
14. Almeida AL, Madeira LC, Freitas KC, Greghi SL, Pegoraro LF. Cross-sectional evaluation of the presence of gingival recession in individuals with cleft lip and palate. Journal of periodontology. 2007;78(1):29-36.
15. Gorman WJ. Prevalence and etiology of gingival recession. Journal of periodontology. 1967;38(4):316-22.
16. Vehkalahti M. Occurrence of gingival recession in adults. Journal of periodontology. 1989;60(11):599-603.

17. Manchala SR, Vandana KL, Mandalapu NB, Mannem S, Dwarakanath CD. Epidemiology of gingival recession and risk indicators in dental hospital population of Bhimavaram. Journal of International Society of Preventive & Community Dentistry. 2012;2(2):69-74.
18. Akpata ES, Jackson D. The prevalence and distribution of gingivitis and gingival recession in children and young adults in Lagos, Nigeria. Journal of periodontology. 1979;50(2):79-83.
19. O'Leary TJ, Drake RB, Jividen GJ, Allen MF. The incidence of recession in young males: relationship to gingival and plaque scores. SAM-TR-67-97. [Technical report] SAM-TR USAF School of Aerospace Medicine. 1967:1-4.
20. Mythri S, Arunkumar SM, Hegde S, Rajesh SK, Munaz M, Ashwin D. Etiology and occurrence of gingival recession - An epidemiological study. Journal of Indian Society of Periodontology. 2015;19(6):671-5.
21. Baishya B, Satpathy A, Nayak R, Mohanty R. Oral hygiene status, oral hygiene practices and periodontal health of brick kiln workers of Odisha. Journal of Indian Society of Periodontology. 2019;23(2):163-7.
22. Satpathy A, Ravindra S, Porwal A, Das AC, Kumar M, Mukhopadhyay I. Effect of alcohol consumption status and alcohol concentration on oral pain induced by alcohol-containing mouthwash. Journal of oral science. 2013;55(2):99-105.
23. Porwal A, Satpathy A, Jain P, Ponnanna AA. Association of Neutral Zone Position with Age, Gender, and Period of Edentulism. Journal of prosthodontics: official journal of the American College of Prosthodontists. 2016.