

FREQUENCY OF PALATOGINGIVAL GROOVE IN MAXILLARY INCISORS

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ABSTRACT

Embryological hazards are frequently seen in the region of maxillary incisors. PGG is a growth defect of the tooth present on the palatal surface of maxillary anterior teeth. In this anomaly, a groove begins in the central fossa, extends across the cingulum, and extends gingivally with varying depths and distance. The aim of this study was to evaluate the frequency of PGG in the maxillary central and lateral incisors of the patients visiting Khyber College of Dentistry, Peshawar. A total of 250 patients were examined at Khyber College of Dentistry, Peshawar for the palatogingival groove visually. Palatogingival groove was present in 7.6% of central incisors and 13.4% of lateral incisors.

Key Word: Palatogingival groove, maxillary incisors.

INTRODUCTION

Embryological hazards are frequently seen in the region of maxillary incisors. Malformations like cleft palate, glubulomaxillary cyst, missing or peg shaped lateral incisors, supernumerary teeth and dens n dente occur in this region. Palatogingival groove (PGG) is another anatomical aberration occurring in the maxillary incisor area.^{1,2}

PGG is a growth defect of the tooth present on the palatal surface of maxillary anterior teeth. In this anomaly, a groove begins in the central fossa, extends across the cingulum, and extends gingivally with varying depths and distance.³

Other names given to this developmental aberration are cinguloradicular groove, radicular groove and radicular lingual groove.

Several etiologies have been presented for PGG;

- i. Consequence of an alteration in growth, such as an infolding of the inner enamel epithelium and

epithelial sheath of Hertwig

- ii. Variant of dens invaginatus
- iii. Alteration of a genetic mechanism
- iv. Attempt to form another root.³

Bacterial invasion occurs in PGG area, due to which increase in periodontal pocket depth occurs and as a result bone loss occur. Sometimes this bacterial invasion is often the cause of pulpal inflammation, pulpal necrosis or tooth loss.^{1,4}

Generally, the incidence of palatogingival grooves ranges from 2.8% to 8.5% in extracted maxillary lateral incisors.^{5,6} In clinical examination studies, the prevalence rate has been reported in range from 10% to 18.1%.^{1,7}

The aim of this study was to evaluate the frequency of palatogingival groove in the maxillary incisors of the patients visiting Khyber College of Dentistry, Peshawar.

METHODOLOGY

The study was conducted in the Operative Dentistry Department of Khyber College of Dentistry, Peshawar. Two Hundred fifty patients, of both genders, were randomly selected from the Operative Dentistry Department and were examined for the presence or absence of palatogingival groove in their maxillary incisors, both central and lateral. The data were collected between 1st January, 2018 and 30th June, 2018. The data collection was done by convenience sampling technique. The age range was from 10 years and above, as by the age of 10 years all the maxillary incisors are completely erupted in the oral cavity. Inclusion criteria was presence of complete set of maxillary incisors, i-e two central and

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two lateral incisors. Any patient with carious, crowned or missing lateral incisor was excluded from the study. Lateral incisors with aberrant anatomy were also excluded from the study.

All the maxillary incisors were carefully examined for the presence of PGG, using mouth mirror and dental explorer. Examination of teeth was done with the help of dental explorer tip on the palatal side of maxillary incisors when they were dried and under efficient light condition. The presence of groove was categorized by extension of groove on palatal side beyond cingulum either coronal or apical to cemento-enamel junction.

RESULTS

Total numbers of patients were 250, each containing

TABLE 1: AGE GROUPS

Age Groups (years)	Frequency	Percentage (%)
10-19	39	15.6
20-29	97	38.8
30-39	52	20.8
40-49	39	15.6
50-59	19	7.6
60 and above	4	1.6
Total	250	100

TABLE 3: FREQUENCY OF PGG ON RIGHT AND LEFT MAXILLARY INCISORS

	Central Incisor		Net Total	Lateral Incisor		Net Total
	Right	Left		Right	Left	
PGG present	19 (7.6%)	19 (7.6%)	38 (7.6%)	32 (12.8%)	35 (14%)	67 (13.4%)
PGG absent	231 (92.4%)	231 (92.4%)	462 (92.4%)	218 (87.2%)	215 (86%)	433 (86.6%)
Total	250	250	500	250	250	500

DISCUSSION

Many studies have been conducted to evaluate the frequency of Palatogingival groove. The frequency of PGG in maxillary central incisors in this study was 7.6% while Kogon et al. reported a frequency of 5.6%.⁸

The frequency of PGG in maxillary lateral incisors in this study was 13.4% which is higher than the prevalence rate evaluated by Everett et al (2.8%), Kogon et al (3.4%) and Iqbal et al (10%) while lower than the prevalence rate reported by Hou et al (18.1%).^{1,5,7,8}

This difference in frequencies in different studies could be due to different examination methodologies or by ethnic/racial differences.

The bilateralism of PGG on maxillary lateral incisor was found to be 67.5% which was in line with the findings by Iqbal et al.¹

one pair of maxillary central and lateral incisor, so it made 500 maxillary central incisors and 500 lateral incisors.

The mean age was 32.05 and standard deviation 11.766. The distributions of patients in different age groups and gender are given in table 1 and 2.

Out of 500 central incisors, 7.6% of teeth contained palatogingival groove while out of 500 lateral incisors, 13.4% of teeth contained palatogingival groove (table 3).

The frequency of PGG in right and left central incisors was 7.6% both while the frequency of PGG in right and left lateral incisors was 12.8% and 14% respectively.

Bilateralism was also calculated for the PGG on the maxillary central and lateral incisors and was found to be 65.2% and 67.5% respectively.

TABLE 2: GENDER DISTRIBUTION

Gender	Frequency	Percentage (%)
Male	101	40.4
Female	149	59.6
Total	250	100

CONCLUSION

Palatogingival groove is an anatomic aberration of maxillary incisors which can create problems due to bacterial invasion in both directions, periodontally and endodontically. Periodontally they can cause pocket formation and bone loss while endodontically they can cause pulpal inflammation and pulpal necrosis.

This study provides information about the frequency of PGG in the local population and the importance of early detection of Palatogingival groove.

REFERENCES

- Iqbal N, Tirmazi SM, Majeed HA, Munir MB. Prevalence of palato gingival groove in maxillary lateral incisors. *Pak Oral Dent J.* 2011;31:424-6.
- Sharma S, Deepak P, Vivek S, Ranjan Dutta S. Palatogingival groove: recognizing and managing the hidden tract in a maxillary incisor: a case report. *J Int Oral Health.* 2015;7:110-114.

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| 3 | Kim H, Choi Y, Yu M, Lee K, Min K. Recognition and management of palatogingival groove for tooth survival: a literature review. <i>Restor Dent Endod.</i> 2017;42(2):77-86. | 6 | Withers JA, Brunsvold MA, Killoy WJ, Rahe AJ. The relationship of palato-gingival grooves to localized periodontal disease. <i>J Periodontol.</i> 1981;52:41-4. |
| 4 | Simon JH, Glick DH, Frank AL. Predictable endodontic and periodontic failures as a result of radicular anomalies. <i>Oral Surg Oral Med Oral Pathol.</i> 1971;31:823-6. | 7 | Hou GL, Tsai CC. Relationship between palato-radicular grooves and localized periodontitis. <i>J Clin Periodontol.</i> 1993;20:678-82. |
| 5 | Everett FG, Kramer GM. The disto-lingual groove in the maxillary lateral incisor; a periodontal hazard. <i>J Periodontol.</i> 1972;43:352-61. | 8 | Kogon SL. The prevalence, location and confirmation of palato-radicular grooves in maxillary incisors. <i>J Periodontol.</i> 1986;57:231-4. |

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