

PREVALENCE OF PALATO GINGIVAL GROOVE IN MAXILLARY LATERAL INCISORS

¹NAVEED IQBAL, BDS (Sindh)

¹SOBIA MASOOD TIRMAZI, BDS (Pb)

¹HANNA ABDUL MAJEED, BDS (Pb)

²MUHAMMAD BADER MUNIR, BDS (Pb), MCPS, FCPS (Pak)

ABSTRACT

Palato gingival grooves, also called palatoradicular grooves or radicular lingual grooves are developmental anomalies in which an infolding of the inner enamel epithelium and Hertwig's epithelial root sheath create a groove that passes from the cingulum and extend varying distances apically on to the root. The purpose of this study was to determine the prevalence of palato gingival groove in maxillary lateral incisors, and prevalence of caries in the groove. 200 patients of age ranged between 15-40 years, attending the Punjab Dental Hospital, Lahore were randomly selected for examination. Patients with missing or crowned lateral incisors were excluded from the study. All lateral incisors were carefully examined for the presence, extension of palato gingival and caries development in groove. The prevalence of palato gingival groove was 10%. They were found to be 6.75% as coronal groove and 3.25% as an apical groove. Bilateralism was found to be 57.5%, 63% for coronal and 46.15% for apical grooves. In male patients the prevalence was 65% and in female patients 35%. Caries prevalence was 35%, 18.5% for coronal groove and 69% for apical groove. It was concluded that prevalence of palato gingival groove is high in this community and show increased caries incidence.

Key words: Palato gingival groove (PGG), Maxillary lateral incisors

INTRODUCTION

The area of maxillary lateral incisor is an area of embryological hazards. A great number of major and minor malformations occur in this area, for instance cleft palate, the glubulomaxillary cyst and missing or supernummary and peg shaped lateral incisors. The dens in dente are also found more frequently in this area than anywhere else in the dentition. Another mild anomaly or variant occurring in this region is the Palatogingival groove.¹

Palato gingival groove is also termed as palatal radicular groove, radicular anomaly, distolingual groove and radicular lingual groove. Majority of palato gingival grooves affect maxillary lateral incisors and may result from an infolding of the enamel organ and Hertwig's epithelial root sheath (HERS).^{2,3}

Developmental infoldings may result in defects that can provide a pathway for pulpal pathology.⁴

In such cases of malformations bacterial invasion and hence bacterial infection of the pulp is often the cause of pulpal inflammation or tooth loss. In 1958, Oehlers described for the first time a radicular invagination of an upper lateral incisor in a Chinese female. At this time, the idiom "groove" was not in common in the dental literature. Later Lee et al formulated the term "groove" when presenting a case report concerning palatal grooves in maxillary laterals.⁵

PGG is not a rare condition, mostly occurring on the palatal aspect of maxillary lateral incisors with no history of dental caries or trauma, but which makes the tooth non vital and causes loss of attachment.^{6,7,8}

¹ FCPS Resident, Department of Operative Dentistry, Punjab Dental Hospital/de, Montmorency College of Dentistry, Lahore

² Assistant Professor, Department of Operative Dentistry, de, Montmorency College of Dentistry, Lahore

Correspondence: Dr Naveed Iqbal Bangash. Email: naveedbangash@yahoo.com Cell: 0333925846

METHODOLOGY

This study was carried out on 200 adult patients (400 maxillary lateral incisors) of both genders aged 15-40 years, recruited from Operative Department, Punjab Dental Hospital Lahore. Any patient with crowned or missing maxillary lateral incisors was excluded from the study.

Both right and left maxillary lateral incisors were carefully examined for the presence and extension of PGGs and the presence of caries in the grooves, using a mouth mirror and dental explorer. The groove extension was categorized into coronal grooves (coronal to cement enamel junction), and apical grooves (extended to the root, beyond the cement enamel junction).

Teeth were dried and under efficient light condition, caries presence was examined with the help of dental explorer tip over the grooves looking for stickness, avoiding apically directed forces.

RESULTS

The prevalence of PGG was 10 %, 6.75 % for coronal groove and 3.25% for apical grooves. (Table 1)

Bilateralism of the PGGs was calculated and was found to be 57.5%, 63% for coronal groove and 46.15% for apical groove. (Table 2)

In male patients the prevalence was 65% and in female patients was 35% regardless of the type of grooves. Caries prevalence was 35%, 18.5% for coronal groove and 69% for apical groove. (Table 3)

TABLE 1: PREVALENCE OF PALATO GINGIVAL GROOVES

	Frequency (n=400)	Percent- age%	Total
No Groove	360	90	90%
Coronal Groove	27	6.75	10%
Apical Groove	13	3.25	

TABLE 2: BILATERALISM OF PALATO GINGIVAL GROOVE

Groove	Frequency	Bilater- alism%	Total
Coronal (n=27)	17	63	57.5%
Apical (n=13)	6	46.15	

TABLE 3: PREVALENCE OF CARIES IN PALATO GINGIVAL GROOVE

Groove	Frequency	Caries%	Total
Coronal (n=27)	5	118.5	35%
Apical (n=13)	9	69.2	

DISCUSSION

Palato gingival grooves, also called palatoradicular grooves or radicular lingual grooves, are developmental anomalies in which an infolding of the inner enamel epithelium and Hertwig's epithelial root sheath create a groove that passes from the cingulam and extend varying distances apically on to the root.

PGG is not a rare condition, mostly occurring on the palatal aspect of maxillary lateral incisors with no history of dental caries or trauma, but which makes the tooth non vital and causes loss of attachment.^{6, 7, 8}

The predominance of PGG in the lateral incisor^{9, 10} can be due to the undesirable position of the tooth during the growth of maxilla. While it is still a tooth germ, it becomes trapped between the central incisor, canine and first premolar, that are in a more advanced phase of dental development.

Many studies have been conducted evaluating the prevalence of PGGs. The prevalence of this study was almost equal to the study done by Albaricci et al and in his study the prevalence was 11.1%¹¹ and the study done by Abdulaziz Al Rasheed¹², the prevalence of PGG was 10.3%.

The result of this study was high compared to the results reported by Kogan. He stained teeth with methylene blue inspected them microscopically and reported PGG in 5.6% in lateral incisors.¹⁰ This high difference could be attributed to different methodology used, as they conducted their research on extracted teeth.

The occurrence of coronal and apical groove in this study was not equal. The number of coronal grooves (6.75%) was almost twice to the number of apical groove (3.25%). This is different from what Evertt and Kramer¹³ reported and according to their study the prevalence of PGG was less than 2%, and only 0.5% extended to the apical area.

Gao et al 1989¹⁴ found that the deepest part of the groove is usually in the cervical region by using scanning electron microscope. In the deepest groove, the remaining dentin thickness was only 360 micro meter. 1 to 3 accessory foramina, 15 micro meters to 200 micro meters in diameter, were found at the base or in the lateral wall of the groove in most teeth. Corresponding foramina were observed on the pulpal side and occurred above or below the level of the epithelial attachment. The author speculates that bacterial penetration through these accessory canals is the primary etiological path of pulpal disease in teeth with simple form of PGGs.

Bilateralism occurs in this study at moderate level. This may indicate that, during tooth development, the events that have occurred on one side did not occur on the other side when it is unilateral, which may cause this uneven distribution of the groove expression between the right and left sides.

Caries prevalence was moderate in this study, 35%, low in coronal groove (18.5%) but high in apical grooves (69.2%) indicating that groove may facilitate plaque growth by providing surface areas sheltered from cleaning efforts as well as host defense mechanism. It's not necessary that every PGG can develop carious lesion.

CONCLUSION

Although the prevalence of palato gingival groove is only 10% in this study, we should have an eye to recognize them early and diagnose their extent, caries extension (if present) and pulpal involvement in order to prevent the patient from periodontal destruction.

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