

# PREVALENCE OF STILLMAN'S CLEFTS AMONG ALBANIAN YOUNG ADULTS

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## ABSTRACT

Stillman's clefts are among the least studied mucogingival defects that might compromise the esthetic and periodontal health of the affected teeth. The aim of the present study is to collect data on the prevalence of this defect among young adults in Albania. Participants were dental school students recruited for oral examination and detection of Stillman's clefts, with the use of discoloring solution for shallow initial clefts. One single operator performed the examination. All participants filled out a questionnaire to gather information on oral hygiene and local traumatic factors associated with Stillman's cleft. One hundred thirty dental students (77 females and 53 males) with an average age of  $22.5 (21-28) \pm 1.5$  years participated in the survey. Stillman's clefts were identified as 9.2% of them. A higher association was observed with the use of a medium toothbrush. No similar association was observed with the traumatic use of interdental floss. None of the participants with the defect presented symptoms. Overall, a prevalence of 9.2% was observed among young adults, with a slight tendency to be associated with medium toothbrush use.

**KEYWORDS:** *Stillman's cleft, prevalence, oral hygiene*

## INTRODUCTION

Stillman's cleft is a mucogingival triangular-shaped defect found as a single or multiple defect mainly located on the buccal surface of a root. It was first described as a recession-related occlusal trauma (1); however, no studies are confirming this association. Until now, the etiology and pathogenesis of these defects remain uncertain. Hypotheses exist on chronic factors that ulcerate the epithelium and heal through the anastomosis of the external and internal epithelium in the gingival sulcus, creating a triangular defect (2). Based on the study mentioned above, when the anastomosis is not complete, the cleft is distinguished as a red cleft, and when epithelization is complete, the cleft is recognized as a white cleft.

Possible etiological factors are assumed to be inflammation (3), traumatic tooth-brushing, and the incorrect use of interdental floss (4). A higher incidence of gingival fissures was observed when medium-hard toothbrushes were used, and the occurrence increased with time (5).

Independent on the cause, if the fissure is red, patients are recommended to interrupt mechanical plaque removal and use CHX for at least 2 weeks, followed by proper instructions on oral hygiene measures after mouth rinse interruption (6). On the other hand, when treating the so-called white cleft, a surgical procedure aiming at transforming the cleft in a

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regular gingival recession and subsequently applying the same techniques as in this later lesion is needed (6). Among surgical techniques, the laterally moved, coronally advanced flap has been described as predictive in 5 years of follow-up (7).

Few evidence is available on this type of defect, mainly focused on their treatment. A histopathologic study has recently been conducted to better understand the nature of the clefts (8). Thus, the aim of the present study is to provide preliminary data on the prevalence of Stillman's defects among young adults.

## MATERIALS AND METHODS

This study was approved by the Institutional Review Board (Ethic Committee) of Albanian University (protocol code 83 and date of approval 19 February 2016).

Participants were students from the dental university background examined after being informed of the purpose of data collection, without any specific inclusion/exclusion criteria from May 2016 and October 2016. Informed consent was obtained from all subjects involved in the study. A single experienced operator performed the clinical examination of the students. Before being examined, each student completed a specific questionnaire to collect general information and data on oral hygiene instruments and self-reported performance (Fig. 1).

### Stillman's cleft chart

1. Age: \_\_\_\_\_
2. Gender: F / M
3. Cleft presence: YES / NO
4. Have the patient noticed the cleft? YES / NO
5. Tooth location: \_\_\_\_\_
6. Type: red / white/ mixed
7. Number: single/ more than one cleft
8. Association with gingival recession? YES/ NO
9. Type of toothpaste used: Soft/Medium/Hard (Have you changed the type?)
10. Movement used when toothbrushing: vertical/horizontal/rotating/roll  
technique from gingiva to tooth (Have you changed over  
time? \_\_\_\_\_)
11. Force used when toothbrushing: Hard/Medium/Soft (Have you changed  
over time? \_\_\_\_\_)
12. Use of interdental floss? YES/NO (Have you changed over  
time? \_\_\_\_\_)
13. Bleeding after interdental floss use? YES/ NO
14. Papilla edema after interdental flossing? YES/NO

**Fig. 1.** Questionnaire for oral hygiene measures and risk factors for Stillman's cleft.

Clinical inspection was performed and aided by local discoloring solution (Lugol's solution) in case of doubts on diagnosis, particularly of small red clefts. Descriptive analysis was performed, and data was expressed as percentages.

## RESULTS

In total, 130 students (77 females and 53 males) with an average age of 22.5 (21-28) participated in the study (Table I).

Table I. Population characteristics and oral hygiene measurements distribution.

Age	22.5 (21-28)				
Gender	Female		Male		
	77		53		
Type of toothbrush	Hard		Medium	Soft	
	2		99	29	
	Hard		Medium	Soft	
Type of toothbrushing movement	4		114	11	
	Vertical	Horizontal	Circular	Roll*	Mixed
Use of interdental floss	7	6	59	13	45
Bleeding on flossing	84%				
Interdental papilla edema after flossing	38%				
Stillman's cleft presence	4%				
	9.2%				

\*Modified Bass technique.

The Stillman's cleft was found in 9.2% of participants, equally distributed among females and males (Fig. 2). Half of them reported having been aware of the presence of a defect at the gingival level, some of which related its presence to bad habits or previous local surgery.



Fig. 2. Stillman's clefts of one of the participants.

All clefts were located buccally, mainly at the upper jaw (74%) and anterior region (53%), compared to the lower jaw and posterior region, respectively. The defect was present on a single tooth in 75% of cases. Among the 19 clefts, the majority were mixed clefts (47%), while 37% were red clefts, and the rest were present as white clefts, with only 5 being associated with gingival recession.

Overall, 76% of the participants used a medium toothbrush. Only 2 out of 130 students still used hard toothbrushes, but they were not associated with cleft formation. Participants with Stillman's cleft reported using soft (58%) and medium (42%) toothbrushes, with 71% of soft toothbrushes being former hard toothbrush users. The toothbrush was used with moderate force in 88% of the cases, according to individual perceptions of the force used. Only 3 out of 12 Stillman's cleft participants brushed hard, with one reporting to have changed to moderate force.

Interdental spaces were cleaned with interdental instruments by 84% of participants, prevalently being the interdental floss (99%). The trauma associated with the use of interdental instruments was retrospectively investigated with the reporting of bleeding or edema of the gingival papilla after instrument use. Among users, 41% reported either

bleeding or edema, or both of them. Among Stillman's cleft participants, 75% used interdental instruments, but only 44% reported associated bleeding.

All participants with Stillman's defect were asymptomatic and were reluctant when treatment was proposed, except for the oral hygiene instruction.

## DISCUSSION

In fulfilling the aim of the study, data revealed a 9.2% prevalence of Stillman's fissure among young adults, with a similar distribution among genders. Unfortunately, the present data cannot be compared with other studies as no evidence was published previously. A higher association was observed with medium toothbrushes, but as a small population represents a limit of the study, these results should be interpreted cautiously. Similar results of association with medium brush were observed by Greggianin et al. 2013 (5). A factor that could have influenced the prevalence of gingival fissures is the fact that all participants were dental students in their third or fourth year. The information on oral hygiene instructions could have improved their self-performance of dental hygiene concerning the type of instruments and the correct use. The majority of participants using soft toothbrushes reported to have been former users of hard toothbrushes. If considering that a reversible (red) experimentally induced cleft takes almost 10 days to recover (5), a higher prevalence might have been expected if oral hygiene measures were not changed.

Interestingly, none of the participants wanted to treat the defect apart from receiving the appropriate prevention instruction. The authors assumed this could be related to a lack of symptoms. The reluctance to surgical treatment emphasizes the importance of preventing and treating reversible forms of the cleft. Zucchelli has proposed a systematic and rigid protocol of chemical plaque control with 0.12% CHX while suspending toothbrushes and interdental floss (6). For the first 15 days, CHX is used 3 times a day, after which a super-soft toothbrush with the roll technique is introduced; mouth rinsing is reduced to 2 times daily for the next 15 days. After the first month, the patient continues the mouth rinse once daily for another month in association with a soft toothbrush. Only after two months can the patient start using the medium toothbrush and the interdental floss.

Classifying gingival fissures among mucogingival defects, the treatment indication is assumed to follow the same rationale, particularly for white clefts: esthetics, hypersensitivity, recurrent plaque retention, and root caries/abrasion (6). In the case of clefts, being treated as a narrow deep recession, plaque retention might be considered as the main cause of treatment. From a preliminary histological study, cleft from healthy periodontal tissues showed histological features of acute with predominantly T small lymphocytes in correspondence of the cleft and of mild gingivitis with few plasma cells around the cleft in apparent clinically healthy gingival (8). From the same study, periodontal disease-treated associated cleft showed histological features similar to chronic gingivitis or mild periodontitis with a predominantly B cells response with only a few plasma cells and chronic scarring of lamina propria (8). Accordingly, clefts that are clinically healthy in patients having no complaints should be reconsidered for treatment, particularly when recurrent retention of plaque and subsequent further progression of the fissure toward the oral mucosa is noticed.

One of the students reported the creation of the defect after the healing of surgery extended to the anterior area. Iatrogenic causes of this type of defect have not been reported previously, although following the pathogenesis of cleft formation through epithelization, it might be possible that during the healing of the incision if both flaps are not properly positioned, epithelization might occur prior to connective tissue formation.

To the author's knowledge, no previous studies have been conducted on the prevalence of Stillman's cleft. Within the limits of sample size and sample selection, the data suggest further studies could be useful on the burden this cleft presents to the patients. No conclusion could be stated on the association of toothbrushes and traumatic use of interdental floss with Stillman's cleft, but the authors suggest further studies could be useful.

## CONCLUSIONS

In conclusion, Stillman's cleft presented a prevalence of 9.2% in a population when proper oral hygiene is assumed to have been corrected. A higher association was noticed with a medium brush, but none of the participants reported symptoms or complaints regarding the defect.

### *Informed Consent Statement*

Informed consent was obtained from all subjects involved in the study.

*Conflicts of Interest*

The authors declare no conflicts of interest.

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