

A Comparative Clinical and Histopathological Examination of Hemangioma and Chronic Inflammatory Enlargement of Gingiva

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Abstract: Chronic inflammatory gingival enlargement (CIGE) occasionally exhibits some similarities with hemangioma (Hm) by means of the clinical and histopathological features of gingiva. When compared with hemangioma, CIGE is more frequently encountered by the dental profession. However, Hm is rarely seen on gingiva and it has a non-inflammatory nature and mostly congenital origin.

The present paper reports the clinic and histopathologic features of CIGE and Hm of gingiva in patients referred to our clinic suffering primarily from gingival overgrowth. Twenty-one patients were diagnosed as having CIGE (in a 4-month period) and 10 patients were diagnosed as having Hm (in a

12-month period) via clinical examination based on both the history and clinical appearance of the lesions, as well as the patients' complaints, and, via histopathological examination of the biopsy specimens.

Since attempts to eliminate Hm lesions following an inadequate differential diagnosis have the potential of leading to serious medical problems such as excess bleeding and recurrency of the lesion, in the present report emphasis is placed upon the correct differentiation of CIGE and Hm of gingiva.

Key Words: Gingiva, Hemangioma, Chronic inflammatory gingival enlargement, Gingival overgrowth/enlargement

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Introduction

Gingival enlargement can be defined as a pathology that is characterized by the overgrowth of the gingiva and it mainly occurs as: (i) inflammatory processes (CIGE, pyogenic granuloma, various types of giant-cell lesions); (ii) non-inflammatory (fibrotic) processes (drug-induced overgrowth related with the use of Cyclosporin-A, Phenytoin, Ca channel blockers); and (iii) mixed type. Due to the effects of some systemic conditions such as blood disorders, endocrine disorders, pregnancy and Crohn's disease on the gingiva, gingival enlargement can occur as a secondary complication, which is called "conditioned type gingival enlargement" in the dental literature (1, 2, 3).

CIGE (also termed chronic hyperplastic gingivitis) is seen as a result of chronic inflammation of the gingiva due to the existing local factors. Essentially this factor involves the presence of microbial dental plaque. However, other local factors such as trauma from

occlusion/mastication may also be involved. Parafunctional habits such as mouth breathing and pressing the tongue against the gingiva are the commonly encountered predisposing factors (4, 5). CIGE may clinically and histopathologically mimic other benign or malign lesions, particularly when a combination of etiologic and predisposing factors is evident (5, 6, 7).

Hms are the lesions characterized by the proliferation of blood vessels. They are mostly congenital and benign. Some authors classify the congenital form of Hm as a hamartoma rather than a neoplasma. Hms generally occur at birth or early ages and have a higher incidence in females (65%) than in males (35%) (1, 8, 9).

Hms of the oral cavity, especially involving soft tissues and/or gingiva, are relatively rare. When present periodontally, they often appear to arise from the interdental gingiva and spread laterally to involve adjacent teeth. The lesions of Hm may have some features similar to those of

other conditions such as epulis, varicocell, talengetasia and even squamous cell carcinoma in clinical and microscopic nature (10, 11).

The objective of this report is to compare the histopathological and clinical characteristics of Hm and CIGE, which can help in overcoming difficulties in diagnosis so as to prevent the complications that can be faced during the management of the lesions.

Materials and Methods

Of the patients referred primarily for gingival overgrowths with occasional bleeding to our clinic in 1999, 31 cases were diagnosed as having CIGE (21 patients in a 4-month period) and Hm (10 patients in a 12-month period). In the differential diagnosis, mainly the patients' complaints, clinical appearance and nature of the lesions and histopathology were considered. Although dental radiographs were taken for each patient, the radiographic findings did not show any pathology in the bone structure. Therefore, the radiographic interpretations were not included in the study. Patients were classified according to age, sex and localization. In order to facilitate the monitoring of the lesion in a stable form and maintenance of the treatment, stone castings were carried out in every patient.

The specimens taken from the lesions by a punch biopsy were stained with hematoxylin-eosin (H&E) and examined under light microscopy at high magnifications. The histopathologic analysis was mainly based on the alterations of the epithelium and connective tissue components in the diseased gingiva. The nature and amount of vascularization, existence and specificity of the inflammatory infiltrate and fibroblastic activity within the connective tissue were assessed, as well as the edematous and hyperplastic nature of the epithelium.

We tried to pre-diagnose all the lesions via both the history of the patients and clinical appearance before histopathological examination.

Results

Distribution of the patients

The CIGE group consisted of 16 female (76.2%) and 5 male (23.8%) patients. Of these 21 patients, the age of 18 patients (85.7%) was over 20 years and 3 patients (14.3%) were at/under 20 years. Eleven (52.4%) of the gingival enlargements were seen in the maxilla and 10 (47.6%) were detected to be in the mandibula. Of the enlargements, 16 (76.2%) cases were seen on the vestibular gingiva, 3 (14.2%) were both on the vestibular and lingual gingiva, and 2 (9.5%) were on the lingual and/or palatinal gingiva. The Hm group consisted of 7 (70%) females and 3 males (30%). Of these patients, 7 (70%) were under 30 years old and 3 (30%) were over 30 years old. Five (50%) of the hemangiomas were in the maxilla and 5 (50%) were in the mandibula. Only 2 hemangiomas (20%) were seen on the lingual gingiva, whereas the other 8 (80%) cases were on the vestibular gingiva (Table).

In the CIGE group, 14 clinically pre-diagnosed cases were also confirmed by histopathology, whereas 7 cases did not match the histopathology of the lesions. These 7 cases were noted as the lesions under excess trauma resulted from both occlusion and mastication. In the Hm group, all of the clinically pre-diagnosed lesions were also confirmed by histopathological examination.

Clinical differential diagnosis

CIGE: The primary complaints of the patients were the presence of overgrowths on the gingiva and esthetic considerations with occasional bleeding and pain. Although lesions were of different colors ranging from

Table . Distribution of the lesions.

Groups	AGE	SEX		LOCALIZATION				
		Male	Female	Max	Man	Vest	Ling/Pal	Both
CIGE (n=21)	85.7%(n=18)>20 14.3%(n=3)≤20	%23.80 (n=5)	%76.20 (n=16)	%52.40 (n=11)	%47.60 (n=10)	%76.20 (n=16)	%9.50 (n=2)	%14.30 (n=3)
Hm (n=10)	70%(n=10)<30 30%(n=3)>30	%30 (n=3)	%70 (n=7)	%50 (n=5)	%50 (n=5)	%80 (n=8)	%20 (n=2)	-

n: number of patients, Man: mandibular gingiva, Max: maxillar gingiva, Ling: lingual gingiva, Vest: vestibular gingiva, Pal: palatinal gingiva

pink to red, traumatic lesions were dark reddish (Figure 1a). Localization of the lesions was primarily the sites under a dense plaque accumulation (Figure 1b). They mostly involved one or two, or in some cases, all the vestibular gingival papillas (Figure 1c). The lesions were sessile at some sites while pedunculated at the other sites.



Figure 1a. A CIGE lesion displaying a darker nature due to trauma from mastication.

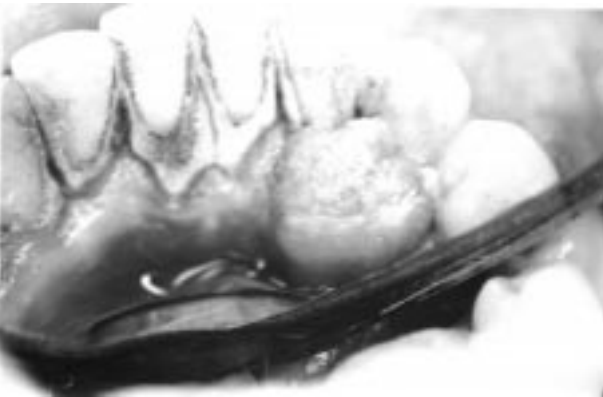


Figure 1b. Localization of CIGE under a dense plaque accumulation.



Figure 1c. A diffuse CIGE covering both marginal and vestibular papillar gingiva. The major predisposing factor in this case is mouth-breathing due to malocclusion.

Hm: All the patients mainly suffered from a gingival overgrowth with bleeding and the secondary consideration was esthetic. Lesions were mostly dense red, but at some sites were dark reddish (Figure 2a). Color change due to local pressure and returning to original color by relaxing, and sounding fluctuation were the most common findings (Figure 2b). The lesions were either sessile or pedunculated.



Figure 2a. A Hm lesion displaying a dense color in a dark reddish nature.



Figure 2b. A Hm displaying color change due to pressure and sounding fluctuation.

Histopathological differential diagnosis

CIGE group: All of the cases revealed dense inflammatory infiltrate, mostly mononuclear cells, covered with a stratified squamous epithelium which was densely acanthotic and keratotic (Figure 3a). Some lesions of CIGE also displayed capillary formations with opened or obliterated lumens surrounded by a dense inflammatory process and fibroblastic proliferation (Figure 3b).

Hm group: Biopsies of Hm specimens mainly revealed stratified squamous epithelium overlying on uncapsulated

tumors composed of many small and large thin-walled blood vessels (Figure 4).

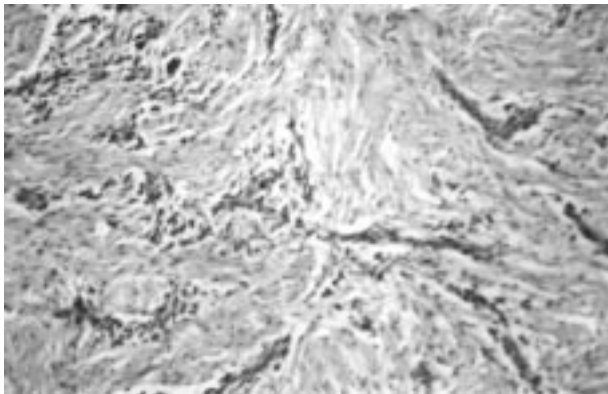


Figure 3a. A CIGE specimen revealing dense inflammatory infiltrate, mostly mononuclear cells (H&E, x55).

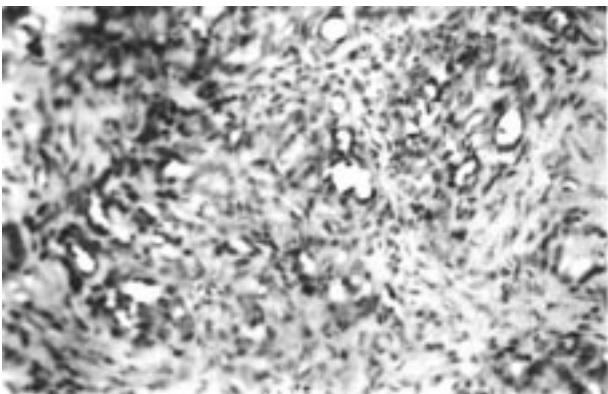


Figure 3b. A CIGE specimen revealing capillary formations with opened or obliterated lumens surrounded by a dense inflammatory process and fibroblastic proliferation (H&E, x 100).

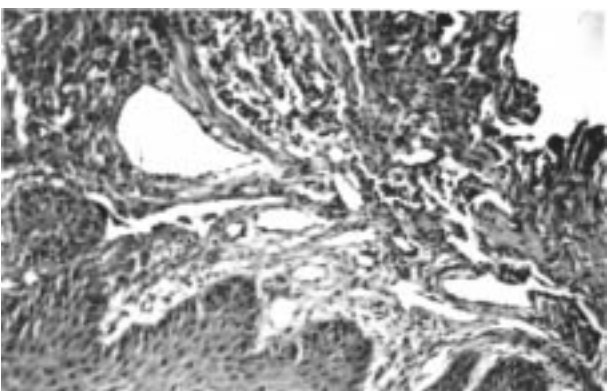


Figure 4. A Hm specimen with uncapsulated tumors composed of many small and large thin-walled blood vessels adjacent to a stratified squamous epithelium (H&E, x75).

Discussion

Gingival overgrowth is frequently encountered by dental profession. Interestingly, patients primarily suffer from the esthetic complications of such overgrowth and secondarily from bleeding and occasionally painful characteristics of these lesions. Prior to removal of gingival overgrowth, it is important to determine the etiopathogenesis of such lesions and an accurate diagnosis of the main and essential cause leading to this pathology. History of the patient, clinical characteristics of the lesion and histopathological examination should all be used in combination. In this report, our aim was to compare the clinical and histopathological nature of CIGE and Hm of gingiva, which can help to overcome the difficulties in differential diagnosis, and thus avoid the complications that can occur during management of these lesions due to the inadequate diagnosis, particularly for gingival Hm.

In clinical practice, the clinical appearance and the nature of a lesion is almost always helpful for pre-diagnosis. Therefore, being aware of the clinic features of a gingival enlargement will surely contribute to the differential diagnosis. Sixty-seven percent of our CIGE patients and 100% of our Hm patients, pre-diagnosed clinically, were confirmed by the subsequent histopathologic examination. Despite various advanced diagnostic techniques, determination of the microscopic nature of a pathology still seems to be the most accurate and reliable tool of differentiation. Although angiography is widely used for the diagnosis of Hms, its application in the oral cavity is limited due to the smaller size and extension of the lesion (8).

During the biopsy procedures, it is particularly important to take care of excess bleeding of any lesion, especially the ones that is suspected to be a vascular malformation. Therefore, an excisional type of biopsy may be hazardous in the diagnosing period. A punch biopsy or a incisional biopsy procedure under bleeding control may be suggested as the suitable ones. Microscopic examination of tissue where the pathogenesis is obscure may be great of importance to the dentist in determining the course of therapy to be instituted (12).

Since Hm is generally a developmental condition and is seen at early ages (13), and CIGE is mostly not age related (14), it is of great importance to know the onset and presence time of the lesion (i.e., birth, childhood, older ages) for the correct differential diagnosis. Most of our Hm patients were at younger ages (70%) and CIGE

patients were at older ages (85.7%), thus revealing results similar to those in the literature. Both the CIGE and Hm groups also individually displayed similarities with cases described in the dental literature in the distribution of the lesions by means of sex and localization (15, 16, 17). However, CIGE lesions under irritation by mastication and/or malocclusion and plaque accumulation were generally reddish, resembling Hm lesions, because of the high vascularization as a result of the intensity of the inflammatory response.

The histopathological appearance of CIGE is not specific, simply because of the similarity of all the lesions in which an inflammatory infiltrate dominates, and the lesions under excess trauma resulting from mastication and/or malocclusion clinically display a highly vascular microscopic nature (5,18). In our CIGE group, some lesions microscopically displayed an appearance of high vascularization, resembling capillary hemangiomas.

Since the management of Hm and the mode of therapy employed depend on factors including the age of the patient, size and extent of the lesion, and emergency surgery may become mandatory in the case of arterial bleeding (13), differential diagnosis of Hm with other lesions of gingiva is an essential preliminary step in the treatment and elimination of the lesion. Providing this step during the treatment of patients and/or populations that have inadequate oral hygiene regimens (e.g., in Turkey) is especially necessary, at least until establishing oral hygiene procedures satisfactorily.

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