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Original Article

A case series of epulides in diabetic and non-diabetic patients: is there a link?

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Abstract

The epulis is a tumor caused by the chronic irritation or trauma of restorations, of any sharp and overhanging edges of crowns/bridges, or mobile prostheses, found mostly in the buccal side of the gingiva and interdental papillae. It appears like a sessile lesion with a smooth or ulcerated surface. The main scope of this study is to show some clinical and histological features of epulides from patients suffering or not from diabetes mellitus. The study is a series of 15 cases of patients with and without diabetes melitus. The diagnosis of epulis was made by an oral medicine specialist based on clinical and histopathological features. In most cases, the epulides were located on the buccal side of the gingiva and near an irritating factor (dental crowns or bridges). The most frequent histopathological diagnosis was the fibrous pattern with abundant chronic perivascular and interstitial lymphoplasmacytic infiltrate covered by acanthotic non-keratinized stratified squamous epithelium.

Keywords: epulis, diabetes, gingiva, bleeding, prevention.

Introduction

The Consensus Report of World Workshop on Periodontal Health and Gingival Diseases and Conditions classified the spectrum of clinical periodontal diseases into two main etiologies: dental-plaque induced and non-plaque conditions [1]. The non-dental plaque-induced diseases are included the reactive processes – epulides (plural of epulis) with the following subtypes fibrous epulis (FFH), calcifying fibroblastic granuloma (POF), vascular epulis (pyogenic granuloma – PG) and peripheral giant cell granuloma (PGCG).

Classically, the gingival enlargement etiology is related to local inflammatory causes, drug intake (anticonvulsants, immuno-suppressants and calcium channel blockers) and prevalent diseases or conditions such as pregnancy [2].

In Greek, the word "epulis" means "on the gum" or "gum boil". In the literature, epulis is a gingival localized enlargement with some clinical subtypes. The congenital variant of epulis named Neumann's' Tumor is a benign oral lesion of unknown etiology, present from the moment of birth. It is a pedunculated and non-ulcerated tumor with a variable size. The clinical form is suggestive of the diagnosis and the management of surgical excision [3].

In adults, the clinical epulis is a pseudotumor caused by chronic irritation from dental restorations, crowns/bridges, and prostheses, found mostly in the buccal side of the gingiva and in interdental papillae.

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It can be easily detected on a regular dental check-up because of its size. Epulis appears like a sessile lesion with a smooth or ulcerated surface and having a normal pink color, like oral mucosa. As the inflammation grows, the color turns into red [4, 5].

Another clinical entity is the epulis fissuratum. This is a reactive pseudotumoral overgrowth observed in the vestibular sulcus caused by a denture's sharp or overhanging edges [5]. The treatment management includes the excision and the restoration of the denture.

Histologically, epulis may have different grades of hypertrophy and hyperplasia. The WHO classification of gingiva disorders from 2015 identified 5 histologic patterns for epulis fissuratum: fibrous epulis, flabby ridge, giant cell epulis, peripheral giant cell granuloma and pyogenic granuloma of gingiva [4, 5].

The fibrous epulis is the most frequent type. The terms *irritation fibroma* and *fibroepithelial polyp* are also used for fibrous epulis. The pink color of the gingiva and its enlargement caused by local irritation, which can lead to fibrous hyperplasia, are the main clinical features [3]. Histologically it is a fibromatous hyperplasia of the gingiva consisting of hyperplastic epithelium, which covers a fibrous connective tissue. It develops from the periosteum and the periodontal ligaments [6].

The calcifying fibroblastic granuloma, also named *peripheral ossifying fibroma*, develops from the periodontal ligament and contains mineralized tissues (cement-like or bone) in the connective tissue [7].

Pyogenic granuloma can be found mostly in children and teens, on the gingiva and also on lips and tongue. Etiology includes irritating local factors such as dental plaque, malocclusion, and orthodontic appliances. Giant cell granulomas are also found in children by local irritation and they present red interdental papillae in frontal or premolars areas [8]. The peripheral giant cell granuloma has a vascular and cellular stroma consisting of fibroblasts, macrophages, endothelial cells and a variable number of multinucleated giant cells [9].

On the other hand, the link between type 1 or 2 diabetes mellitus and the periodontal diseases is well known. People with type 1 or 2 diabetes have various gingival inflammatory changes, periodontal attachment loss, and loss of alveolar bone as well. The high blood sugar levels cause many changes in the periodontal tissues, such as increased production of TNF in the epithelium and connective tissue, fibroblast apoptosis, and the influence on the osteoblast and osteoclast cells, which may lead to bone resorption. All this above can lead to periodontitis [10].

There are several previous case reports which presented epulides with different histopathological patterns in diabetic patients [11, 12].

The epulis fissuratum does not necessarily have a high prevalence (0.7%) in diabetes patients [13] since it is caused by local irritation, but it can have a bad evolution and prognosis.

The current study aims to find some clinical and histological features of a series of epulides in diabetic and non-diabetic patients.

Material and methods

Study design and patients

A total of 18 medical charts of patients diagnosed with localized gingival enlargement were retrospectively assessed. The files were selected from the private practice of an oral medicine specialist (OMS). The dentists sent the patients from September 2020 to March 2023 to the OMS for diagnosis. All the patients included in the study signed the informed consent. The following data were recorded: age, gender, level of education, smoking habit, drug intake, medical and surgical history, as well as the presence of diabetes. The clinical features (location, size, aspects of covering mucosa) of the gingival enlargement were also noticed. Following the recommendations of the *World Workshop on Periodontal Health and Gingival Diseases and Conditions*, the histopathological diagnosis leads to the following types: fibrous epulis, calcifying fibroblastic granuloma, vascular epulis (pyogenic granuloma) and peripheral giant cell granuloma [1].

The patients were included in the study if they met some criteria, such as the presence of gingival enlargement and the detailed clinical features and histological diagnosis. Three cases with missing data were removed. The study group consisted of 15 patients who fulfilled all the criteria for selection.

Two of the patients reported the presence of diabetes in their medical history. The diabetes criteria was established by increased values of glycemia and abnormal glycosylated hemoglobin following the WHO guidelines.

Statistical analysis

Data were analyzed using Microsoft Excel (version 2021, Microsoft, WA, USA) and version 24 of SPSS (IBM, NY, USA).

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Results

The main results of this study are presented in Table 1, such as characteristics of the 15 patients (gender, smoking history, level of education, drug intake, oral hygiene status), clinical and histological features of the tumors (location, mean size, surface, histological subtypes).

Some cases are shown in Figures 1 to 3.

Discussion

Both general and local risk factors have an impact on gingival status. Poor oral hygiene, crowns, and bridges with improper fit and adaptation lead to a kind of gingival enlargement named epulis. On the other hand, systemic diseases influence gingival homeostasis. Moreover, diabetes is frequently linked to periodontal disease most because of the increased gingival inflammation [14].

Only two patients included in our study had diabetes. This means 1 in 8 patients with epulis can have diabetes. However, since the number of patients with epulis and diabetes is very few in this series, this may also be a chance result.

Some epulis-related patterns were discovered: they are more present in men on the buccal side of the upper teeth gingiva, and their surfaces are often ulcerated. Also, it seems they are related to an acceptable or poor oral hygiene status.

Comparing our results to other similar studies, the mean age of patients was 54, higher than some studies, 43 years [4] or 45.5 years [15] but similar to others [16]. We found clinical epulis more frequently in males, which differs from previous studies [4, 15, 17]. This can be due to the small number of patients included in our study or due to the fact that other studies analyzed different populations with different habits [15, 17].

Our case series align with previously reported studies regarding the most affected sites of epulis, the maxilla being the most frequently involved [4, 15–17] and

Table 1: The clinicopathological and demographic features of the patients.

Characteristic	No.	%
Age (years) (median, range)	54 (IR*=20; SE**=3.73)	
Sex		
Female	5	33
Male	10	66
Smoking history		
Yes	3	20
No	11	73.3
Unknown	1	6.6
Level of education		
Higher education	7	46.6
Lower education	6	40
Not mentioned	2	13.3
Drug intake		
Calcium channel blockers	3	20
Other antihypertensive agents (non-calcium channel blockers)	5	33.3
Other drugs	1	6.6
No drugs	6	40
Oral hygiene status		
Good	3	20
Acceptable	8	53.3
Poor	4	26.6

Table 1: Continued.

Characteristic	No.	%
Location		
Anterior region	8	53.3
Posterior region	7	46.6
Upper jaw	11	73.3
Lower jaw	4	26.6
Buccal	10	66
Oral	5	33
Mean size (cm, range)	1 (0.8–1.2; SE*=0.09)	
Surface		
Ulcerated	12	80
Smooth	3	20
Histological subtypes		
FFH	8	53.3
POF	-	-
PG	4	26.6
PGCG	3	20
Diabetes		
Yes	2	13.3
No	13	86.6

Note: * – Interquartile range; ** – Standard Error.

the anterior region [15–17]. The mean size of the lesions was 1 cm, slightly lower than the data reported by Zhao N *et al.*, for example [15].

A recent systematic review came up with some results about lesions considered to be epulides in regular dental check-ups and detected a large number of histopathological entities. From the 105 clinical cases, the diagnosis varied from early lesions such as peripheral ossifying fibroma, fibroma, giant cell lesion, granuloma pyogenic, hyperplastic squamous epithelium to metastatic lesions from breast, renal or gastric [18].

Our histopathological results are very similar to other studies which reported focal fibrous hyperplasia as the most common lesion [15, 16]. However, other

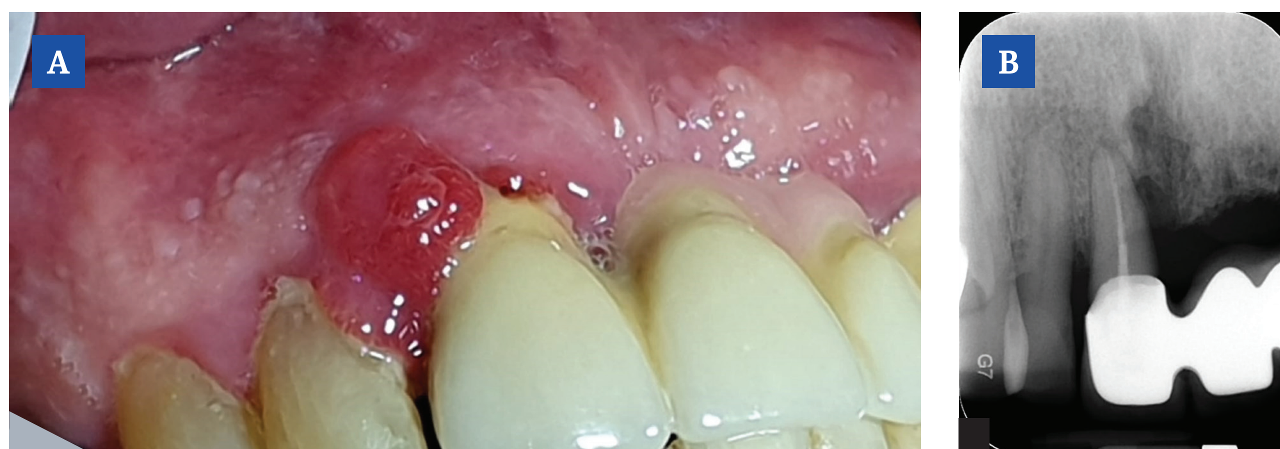

Figure 1: A – Fibrous epulis on upper central incisor gingiva of a non-diabetic patient. The incisor has a ceramic crown. B – Radiological view.

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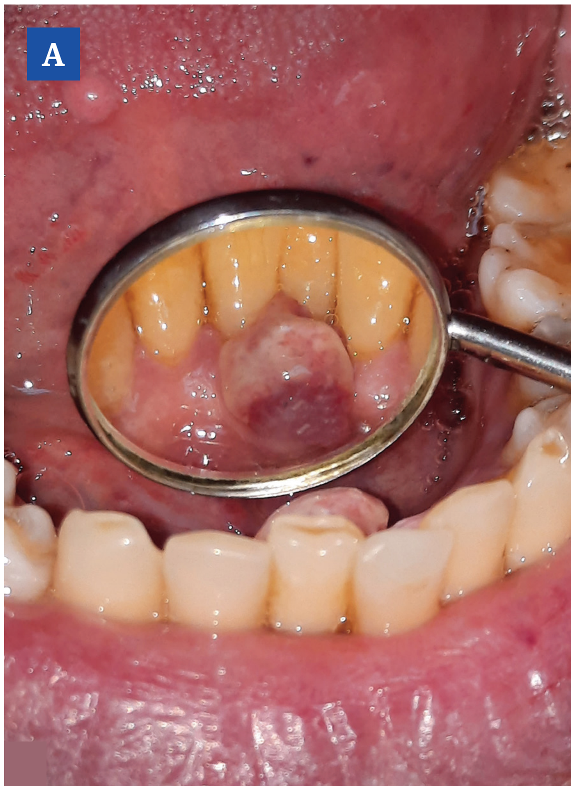


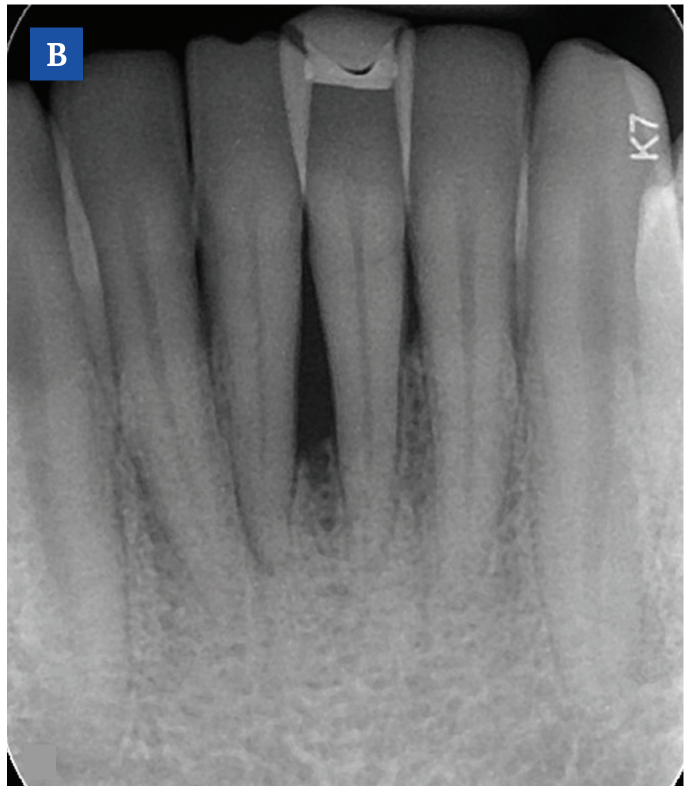
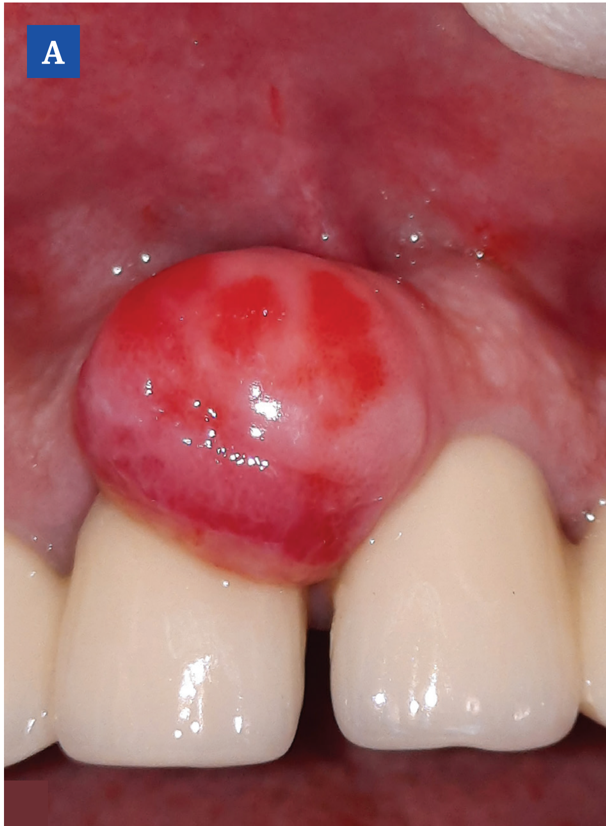


Figure 2: A – Epulis on interdental papilla between the lower central incisors of a diabetic patient. Histologically, it is a peripheral giant cell granuloma. B – Radiological view.



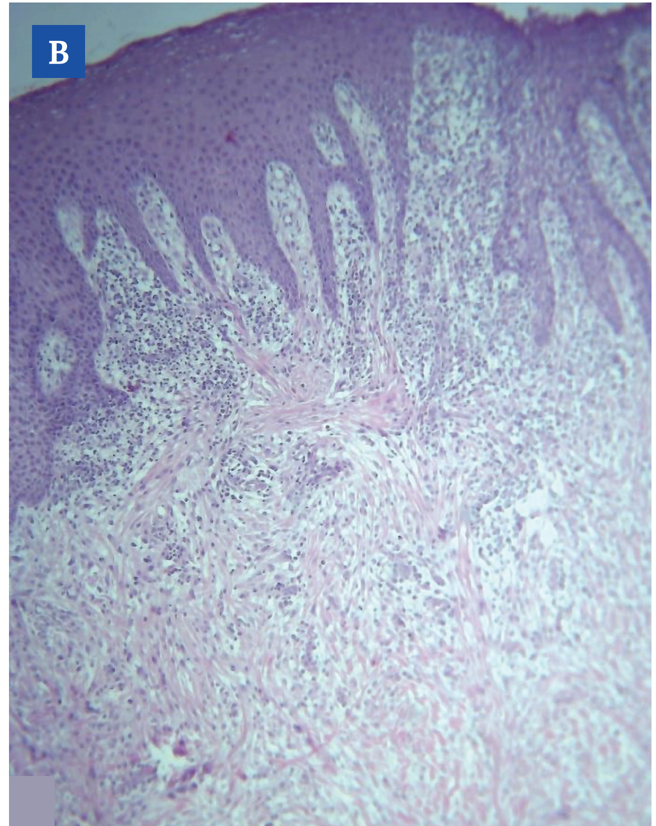


Figure 3: A – Epulis on the upper central incisor gingiva. B – Histopathological aspect: polypoid lesional fragment centered on the conjunctival-fibrous and vascular axis with abundant chronic perivascular and interstitial lymphoplasmacytic infiltrate covered by acanthotic non-keratinized stratified squamous epithelium with elongated and sharp basal epithelial ridges (Col. hematoxylin-eosin 100X).

studies reported peripheral ossifying fibroma as the most frequent histopathological pattern [4].

Another factor that influences gingival enlargement is the drug intake of calcium channel blockers [19]. The mechanism is explained by the increased synthesis of collagen and ground substance, which is also stimulated by the presence of dental plaque in genetically susceptible individuals [20]. Three patients reported taking calcium channel blockers, and we decided to include them in our study. The gingival overgrowth was localized and had a clinical and suggestive aspect for epulis rather than being diffuse and generalized as a common side effect reaction of calcium channel blockers [20].

Although we did not include more patients with diabetes in our study, both patients had epulides. Thus, having many people with diabetes, we expect to find many epulides in these patients.

Our study has some limits because there was no control group, and the number of patients was very small, as well as the number of patients with diabetes. We found the descriptive information about *abnormal gingival enlargements* very useful for the practitioners to better understand the concept.

The treatment management should begin with a strict oral hygiene protocol: using mouthwash for at least 10 days and two dental brushes daily until the inflammation disappears. After, the irritating factors should be removed and surgical treatment applied.

Conclusions

The epulides were present in both patients with and without diabetes. In most cases, the epulides were located on the buccal side of the gingiva and near an irritating factor (dental crowns or bridges). Histology showed us that fibrous pattern is the most present in epulides.

Conflict of interest

The authors declare no conflict of interest.

Ethics approval

The approval for this study was obtained from the Ethics Committee of the Carol Davila University of Medicine and Pharmacy, Bucharest, Romania (approval ID: 19184 project PAT-PREV01).

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