

## Plasma Cell Gingivitis Among Herbal Toothpaste Users: A Report of Three Cases

Sukumaran Anil, BDS, MDS, PhD, FICD, FPFA



### Abstract

**Aim:** The aim of this article is to present a brief review of plasma cell gingivitis (PCG) along with reports of three cases with varying clinical presentations of the condition associated with the use of herbal toothpaste.

**Background:** PCG is a rare benign condition of the gingiva characterized by sharply demarcated erythematous and edematous gingivitis often extending to the mucogingival junction. This is considered a hypersensitive reaction. The histological appearance consists of a dense infiltration of normal plasma cells separated by collagenous stroma, usually confined to the free and attached gingiva. The lesion can be eliminated by identifying and avoiding the source of the allergen.

**Report:** Three patients ages 26, 27, and 36, respectively, presented with acutely inflamed gingival and a history of recently switching to herbal toothpaste. The gingiva bled readily on probing. Blood tests and gingival biopsy were not contributory. Patients were advised to refrain from the use of herbal toothpaste, and, along with periodontal treatment, the condition underwent remission within a week to two weeks in all three cases.

**Summary:** As more and more herbal products are gaining popularity, clinicians should be aware of some of the untoward effects of these products. Since PCG mimics lesions associated with leukemia and myeloma an early diagnosis of the condition is vital.

**Keywords:** Plasma cell gingivitis, PCG, dentifrices, herbal dentifrices, cinnamon

**Citation:** Anil S. Plasma Cell Gingivitis Among Herbal Toothpaste Users: A Report of Three Cases. J Contemp Dent Pract 2007 May;(8)4:060-066.

## Introduction

Plasma cell gingivitis (PCG) is a rare condition characterized by diffuse and massive infiltration of plasma cells into the sub-epithelial gingival tissue.<sup>1-3</sup> Clinically, it appears as a diffuse reddening and edematous swelling of the gingiva with a sharp demarcation along the mucogingival border.<sup>4</sup> Gingival ulceration is rare.<sup>2</sup> PCG is known by a variety of other names such as atypical gingivostomatitis,<sup>5,6</sup> idiopathic gingivostomatitis,<sup>7</sup> and allergic gingivostomatitis.<sup>8</sup>

Mucosal hypersensitivity and cheilitis related to gum chewing were prevalent even in the 1940's and 1950's.<sup>9</sup> Kerr et al.<sup>7</sup> reported a case of PCG or plasmacytosis of the gingiva in 1971 resulting from an allergic reaction to one of the constituents of chewing gum. Flavoring agents such as cinnamonaldehyde and cinnamon in chewing gums and dentifrices were also shown as etiologic factors in the development of PCG.<sup>10,11</sup> Flavoring agents added to chewing gums and dentifrices can produce an inflammatory reaction of both the free and attached gingival. The inflammatory reaction is characterized by intense hyperemic and erythematous changes. It is common for the affected patient to complain of "bleeding from mouth."<sup>11</sup>

The diagnosis requires hematological screening in addition to clinical and histopathological examinations. Pathologic changes are clinically similar to those of leukemia, HIV infection, discoid lupus erythematosus, atrophic lichen planus, desquamative gingivitis, or cicatricial pemphigoid which must be differentiated through hematologic and serologic testing.<sup>4,10,12</sup>

Histopathological changes mimic those of other more serious conditions such as multiple myeloma, solitary plasmacytoma, and Walden-Ströms macroglobulinaemia.<sup>1</sup> The presence of a large number of plasma cells in the established lesion of chronic inflammatory periodontal disease can occasionally lead to a difficulty in distinguishing this common condition from more exotic plasma cell lesions affecting the gingiva. These include rare cases of extramedullary plasmacytoma, plasmacytosis of the gingiva, PCG, and plasma-cell granuloma.<sup>7,13</sup> PCG is purely benign, and the detection and elimination of the exposure to the etiologic antigenic agent will bring about the remission of the condition.<sup>1</sup>

Three cases of PCG, associated with the use of a cinnamon (*Cinnamomun zeylanicum*) containing toothpaste, are presented here. The importance of differentiating this benign condition from other serious lesions is also emphasized.

## Case Reports

### Case One

A 27-year-old woman presented for the diagnosis of red, swollen gingiva. Clinically, the patient appeared to have severe inflammation of the gingival tissues ranging from the free gingival margin to the mucogingival junction in both the maxillary and mandibular arches (Figure 1). Heavy plaque accumulation was present around the teeth, and gingival bleeding occurred with the slightest provocation. The patient exhibited a moderate loss of periodontal attachment throughout the dentition with the greatest loss in the mandibular incisor region.



**Figure 1.** Clinical appearance showing erythematous and edematous gingivitis extending to the mucogingival junction.

The only positive historical finding was the patient had recently switched to a new herbal toothpaste. A diagnosis of PCG was made based on the history, clinical examination, and blood tests. A gingival biopsy was carried out to confirm the diagnosis as well as to exclude other conditions. Microscopic examination disclosed the normal appearing epithelium without acanthosis or ulceration. A foci of plasma cells separated by collagen septae were found to be present in the connective tissue with no cellular atypia present (Figure 2).

A complete mouth radiographic examination revealed no bone loss. A diagnosis consistent with PCG was made. The patient was advised

to stop the use of the herbal toothpaste, and subsequent periodontal treatment resolved the condition after a period of ten days.

### Case Two

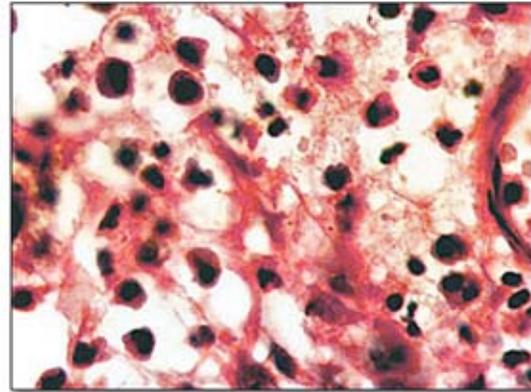
A 26-year-old male patient presented with a complaint of gingival bleeding. An intraoral examination revealed generalized gingival inflammation which was more profound in the maxillary and mandibular anterior gingiva (Figure 3).

These areas appeared intensely erythematous, friable, and edematous but free of ulceration, desquamation, or vesicles. No other swelling, ulcers, or masses were noted on the lips, tongue, palate, buccal mucosa, or the floor of the mouth. Hematologic evaluation showed no abnormal findings. The microscopic examination of the gingiva revealed a foci of plasma cells separated by collagen septae in the connective tissue without any cellular atypia which is consistent with PCG. The patient was advised to discontinue the use of the herbal toothpaste; further follow up after a week showed remission of the inflammatory changes of the gingiva. Subgingival scaling and root planing was performed, and the patient was advised to continue with regular toothpaste without cinnamon.

### Case Three

A 36-year-old female presented for an evaluation of persistent inflammation and bleeding from the gingiva (Figure 4).

The general dentist treated the patient with scaling followed by 500 mg of amoxicillin, three times daily for seven days. However, there was no remission of the condition. Clinical examination showed moderate to severe inflammation of the maxillary and mandibular gingiva extending to the first molar area. The only relevant finding in the medical history was the patient was allergic to penicillin. The patient also gave a history of a recent change to a new herbal toothpaste containing cinnamon. A biopsy was not done. The patient was advised to discontinue the toothpaste resulting in dramatic improvement in the condition after only one week. Subsequent to the complete remission (14 days) of the acute inflammatory condition, subgingival scaling and root planing was carried out.



**Figure 2.** Histological appearance showing plasma cell infiltrate in the lamina propria (H & E 400X).



**Figure 3.** Clinical appearance of the gingiva showing hyperemia and swelling of the free and attached gingiva.



**Figure 4.** Photograph showing the marginal gingivitis and granulomatous appearance of the tissue.

### Discussion

PCG is an uncommon condition, characterized by a sharply demarcated, erythematous, and edematous gingivitis often extending to the mucogingival junction.<sup>1,14</sup> The number and infiltration of plasma cells vary in various cases and are said to result from an allergic hypersensitivity reaction to various flavoring agents used in chewing gums and dentifrices.

Strong spices and some herbs such as chili, pepper, and cardamom may be also be considered important factors in the etiology of PCG.<sup>9,12</sup>

Cinnamonaldehyde, which is usually added to dentifrices to mask the unpleasant taste of pyrophosphate, has been associated with the development of PCG.<sup>10,14</sup> Macleod and Ellis<sup>1</sup> reported a case related to the use of herbal toothpaste. Cinnamon, when used as a flavoring agent in toothpaste, was found to be an etiological factor in cheilitis.<sup>14</sup>

Usually the patient presents with edematous and inflamed gingiva on the labial aspect of the anterior regions of the maxillary gingiva. A tendency for gingival bleeding upon tissue manipulation is invariably present in all cases.<sup>15,17</sup> The local etiological factors for severe gingival manifestations remain a mystery as oral prophylaxis and mouth rinses have shown to be of very little value. Vickers et al.<sup>16</sup> suggest *Candida albicans* as an etiological factor, but treating it with antifungal agents proved unsuccessful and in some of the reported cases there was a lack of a positive fungal culture.<sup>18</sup>

The differential diagnosis of the condition is very important because of its similarity with some other aggressive conditions. A negative "Nikolsky's Sign" would help exclude lesions such

as pemphigus. The presence of atypical plasma cells suggests malignancy such as multiple myeloma and solitary myeloma.<sup>13,14</sup> Once the diagnosis of PCG is made the screening for the various antigenic substances should be done. In the three cases presented here, the patients had all switched to the same herbal toothpaste containing cinnamon. Miller et al.<sup>14</sup> described 14 cases of cinnamon induced stomatitis. The cases presented here highlight the adverse effects and irrational use of such herbal agents in dentifrices.

### Summary

These three cases showed varying clinical presentations and the final diagnosis of each case was made by the exclusion of other conditions. Biopsy examinations also supplemented the exclusion of leukemia and other local manifestations of some systemic diseases. Careful history taking as well as hematological examination help rule out these conditions. In all three cases spontaneous remission was noticed upon the cessation of the herbal toothpaste containing cinnamon.

As more and more herbal products are gaining popularity, clinicians should be aware of some of the untoward effects of these products. Since PCG mimics lesions associated with leukemia and myeloma, an early diagnosis of the condition is vital.

## References

1. Macleod RI, Ellis JE. Plasma cell gingivitis related to the use of herbal toothpaste. *Br Dent J* 1989;166(10):375-376.
2. Gargiulo AV, Ladone JA, Ladone PA, Toto PD. Case report: plasma cell gingivitis *CDS Rev* 1995;88(3):22-23.
3. Timms MS, Sloan P. Association of supraglottic and gingival idiopathic plasmacytosis. *Oral Surg Oral Med Oral Pathol* 1991;71(4):451-453.
4. Hedin CA, Karpe B, Larsson A. Plasma-cell gingivitis in children and adults. A clinical and histological description. *Swed Dent J* 1994;18(4):117-124.
5. Owings JR, Jr. An atypical gingivostomatitis: a report of four cases. *J Periodontol* 1969;40(9):538-542.
6. Bhaskar SN, Levin MP, Frisch J. Plasma cell granuloma of periodontal tissues. Report of 45 cases. *Periodontics* 1968;6(6):272-276.
7. Kerr DA, McClatchey KD, Regezi JA. Idiopathic gingivostomatitis. Cheilitis, glossitis, gingivitis syndrome; atypical gingivostomatitis, plasma-cell gingivitis, plasmacytosis of gingiva. *Oral Surg Oral Med Oral Pathol* 1971;32(3):402-423.
8. Sugarman MM. Contact allergy due to mint chewing gum. *Oral Surg Oral Med Oral Pathol* 1950;3(9):1145-1147.
9. Serio FG, Siegel MA, Slade BE. Plasma cell gingivitis of unusual origin. A case report. *J Periodontol* 1991;62(6):390-393.
10. Lamey PJ, Lewis MA, Rees TD, Fowler C, Binnie WH, Forsyth A. Sensitivity reaction to the cinnamonaldehyde component of toothpaste. *Br Dent J* 1990;168(3):115-118.
11. Marker P, Krogdahl A. Plasma cell gingivitis apparently related to the use of khat: report of a case. *Br Dent J* 2002;192(6):311-313.
12. Poswillo D. Plasmacytosis of the gingiva. *Br J Oral Surg* 1968;5(3):194-202.
13. Palmer RM, Eveson JW. Plasma-cell gingivitis. *Oral Surg Oral Med Oral Pathol* 1981;51(2):187-189.
14. Miller RL, Gould AR, Bernstein ML. Cinnamon-induced stomatitis venenata, Clinical and characteristic histopathologic features. *Oral Surg Oral Med Oral Pathol* 1992;73(6):708-716.
15. Kerr DA, McClatchey KD, Regezi JA. Allergic gingivostomatitis (due to gum chewing). *J Periodontol* 1971;42(11):709-712.
16. Vickers RA, Hudson CD. A Clinicopathologic investigation of "Plasma cell gingivostomatitis". *IADR Abstracts*, 1971, 755, p.241.
17. Lubow RM, Cooley RL, Hartman KS, McDaniel RK. Plasma-cell gingivitis. Report of a case. *J Periodontol* 1984;55(4):235-241.
18. Silverman S, Jr., Lozada F. An epilogue to plasma-cell gingivostomatitis (allergic gingivostomatitis). *Oral Surg Oral Med Oral Pathol* 1977;43(2):211-217.

## About the Author

Sukumaran Anil, BDS, MDS, PhD, FICD, FPFA



Dr. Anil is an Associate Professor of Periodontics in the College of Dentistry at King Saud University in Riyadh, Kingdom of Saudi Arabia. His research interests include the immunology of periodontal disease and the oral manifestations of HIV infection. Dr. Anil is a fellow in the International College of Dentists, the International Academy of Periodontology, and in the Pierre Fauchard Academy.

e-mail: [anil@graduate.hku.hk](mailto:anil@graduate.hku.hk)