

# Chloroxylenol: A new Allergen to Dentistry

Paritosh M.Bhatt<sup>1</sup>, Leena G Shettar<sup>2</sup>, Srinath L.Thakur<sup>3</sup>

1-Postgraduate Student, Department of Periodontology and Implantology, SDM College of Dental Sciences and Hospital, Dharwad Karnataka, India. 2-Professor, Department of Periodontology and Implantology, SDM College of Dental Sciences and Hospital, Dharwad Karnataka, India. 3-MDS, FDSRCP(S)(UK).

Correspondence to:

Dr. Paritosh M.Bhatt, Postgraduate Student, Department of Periodontology and Implantology, SDM College of Dental Sciences and Hospital, Dharwad Karnataka, India. Contact Us: www.ijohmr.com

## ABSTRACT

Plasma cell gingivitis is an infrequent benign inflammatory condition of unknown etiology. As the name suggests, it shows diffuse and substantial infiltration of plasma cells into subepithelial connective tissue. The cause for plasma cell gingivitis is not known, but authors have suggested that it might be due to some immunological reaction to allergens which may be present in toothpaste, chewing gum, mint pastels and certain foods. Here we present a case report of 47 year-old female with generalised gingival enlargement associated with the use of chloroxylenol as mouthwash diluted with water and also applied topically in the affected areas. Histopathology report demonstrated psoriasiform hyperplasia and spongiosis of surface epithelium, with neutrophilic micro abscess formation. The underlying lamina propria contained dilated vascular channels, and extremely dense chronic inflammatory infiltrate predominantly of plasma cells. There was a significant improvement in gingival condition after discontinuation of chloroxylenol and scaling and root planing.

**KEYWORDS:** Allergy, Chloroxylenol, Gingivitis, Plasma cells, Plasma cell gingivitis

## INTRODUCTION

Plasma cell gingivitis (PCG) is a benign inflammatory condition that is uncommon and found on the anterior gum.<sup>1</sup> PCG is characterized by dense plasma cell infiltration in the gingiva secondary to hypersensitive reactions.<sup>2</sup> This condition is a type of plasmacytosis circumorificialis or plasma cell orificial mucositis.<sup>3</sup> Plasma cell gingivitis has been sub classified into 3 types based on the cause; namely, allergic, neoplastic and of unknown cause.<sup>4</sup> On clinical examination there is appearance of diffuse red and oedematous swelling of the gingiva with a sharp delineation along the mucogingival border. PCG also may be characterized by macular lesions that are bright red, sharply circumscribed, and flat to slightly elevated. Other synonyms which can be used for PCG are atypical gingivitis, plasma cell gingivostomatitis and allergic gingivostomatitis.<sup>5</sup> These lesions are generally asymptomatic, although some patients complain of pruritus, burning, or pain. However, the etiology of this lesion is not clear. Literature reviews of cases, reports it as an allergic reaction to any specific toothpaste, flavoring or coloring ingredients, condiments,<sup>6,7,8,9</sup> khat leaves or food materials, but more often no allergen is detected. Sometimes bacterial plaque biofilm has been speculated to be one of the allergen for PCG.<sup>4,9</sup>

## CASE REPORT

A 47 year old female patient was referred to the Department of Periodontics, SDM College of Dental sciences and Hospital, Dharwad with the chief complaint of gingival swelling and pain associated with bleeding in upper and lower front teeth region since 6 months. Patient appeared fit with no current or previous systemic disease during her medical history interview. Intraorally, severe

diffuse gingival enlargements of both the arches were observed covering almost all the surfaces of teeth. History revealed that initially, the swelling started involving a small part of gingiva which progressed slowly and attained the present size. Occasional bleeding was seen initially that became frequent later on, especially during brushing, which stopped itself within 1-2 minutes. It was associated with pain in the gums which was mild in severity but persistent.

On intraoral examination gingiva was bright red to reddish pink in colour, friable, soft and edematous on consistency with granular surface texture. Exudation was evident on palpation with finger pressure without any abscess formation. Full complement of teeth was present except the missing first molars in all four quadrants (Figure 1). While evaluating the oral hygiene status abundant amount of plaque and calculus was observed in relation to the site of involvement. Patient brushes her teeth with toothpaste and toothbrush in horizontal scrub technique once daily. Detailed interrogation was done with the patient who revealed the history of using Chloroxylenol as mouthwash diluted with water used for past 2 months once daily and concentrated Chloroxylenol applied topically with cotton pellet in most reddish and swollen area.

Excisional biopsy was taken from marginal gingiva of overgrowth. Biopsy histopathology report showed ulcerative to the reactive acanthotic stratified squamous parakeratinized epithelium of varying thickness with long thin elongated rete ridges. Leukocytic exocytosis and area of neutrophils microabscess were evident in superficial layer, underlying connective tissue was edematous juxta epithelially, central area was fibrocellular and replaced by

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Figure 1. Pre Operative Frontal, right and left lateral view

sheets of chronic inflammatory cells predominantly plasma cells identified by eccentric nuclei (cart wheel appearance) and few russel bodies and lymphocytes with interspersed dense bundles of thick and thin parallel arranged collagen fibers, presence of few endothelial lined blood vessels with engorged RBCs were seen. Based on the typical characteristic clinical features and histopathological findings a diagnosis of plasma cell gingivitis was made (Figure 2).

Blood investigation was carried to rule out leukaemia or any other blood dyscrasias. The complete blood count investigations were normal, and the patient presented no relevant medical history. The diagnosis of plasma cell gingivitis was made on the basis of histopathological examination of the excised gingival tissue.

Till the reports of histopathological examination were awaited, initial therapy was instituted which included the usual periodontal treatment of scaling and normal oral

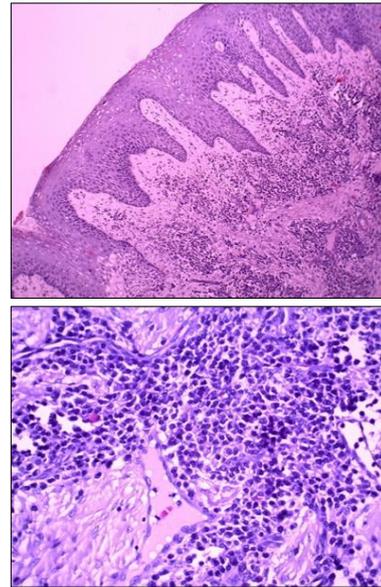


Figure 2: Histopathological picture showing presence of plasma cells with inflammatory cells in connective tissue

hygiene measures with the use of a soft bristled toothbrush and toothpaste. Patient was instructed to stop using chloroxylenol as a mouthwash and was advised to use chlorhexidine 0.2% mouthwash twice daily for 15 days, and routine follows up was done.

On follow-up, slow rate of regression of the lesion was noticed with the conventional therapy at the recall visits at first and second month. On 3<sup>rd</sup> month recall visit there was complete resolution of the lesion with no associated signs and symptoms. (Figure 3).

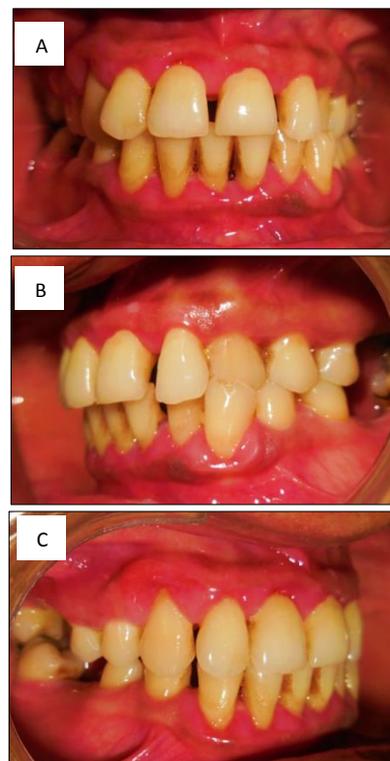


Figure 3. 3 months Post Operative Frontal, right and left lateral

## DISCUSSION

Plasma cell gingivitis (PCG) is a rare condition characterized by diffuse and massive infiltration of plasma cells into the sub epithelial gingival tissue.<sup>12,13,14</sup>

Clinically, PCG presented as a diffuse reddening with oedematous swelling of the gingiva, with sharp demarcation along the mucogingival border.<sup>15</sup>

The etiology of PCG is not known, but due to infiltration of plasma cells many authors suggest that it is an immunological reaction to allergens which may also be seen in toothpaste, chewing gum, mint pastels and certain foods. In addition to clinical and histopathological examination, haematological screening is also required in order to exclude leukemia. To exclude connective tissue disease like lupus erythematosus sometimes a serological examination may also be required.<sup>10,11</sup> Other possibilities with regard to the differential diagnosis are lichen planus and benign mucous membrane pemphigoid.<sup>5,10</sup> According to literature the histological changes mimic those of other more serious conditions such as multiple myeloma, solitary plasmacytoma, and Waldenströms macroglobulinaemia.<sup>16,17</sup>

The presence of a large number of plasma cells can occasionally lead to a difficulty in distinguishing PCG from more exotic and rare plasma cell lesions affecting the gingiva such as extramedullary plasmacytoma, plasmacytosis of the gingiva and plasma cell granuloma.

Some authors<sup>18,19,20</sup> sub-divide PCG into three types: 1) caused by an allergen, 2) neoplastic, 3) unknown cause.

The present case belongs to type 1 as; the changes had developed after use of chloroxylenol as a mouthwash. Remission occurred when the use of the chloroxylenol was discontinued. Chloroxylenol is a common household disinfectant. It contains Chlorxylenol (4.8%), Pine oil (9%) and Isopropyl alcohol (12%). Chlorxylenol is a phenol and is chemically related to the other phenolic disinfectants such as carbolic acid and cresols. Toxicity profile is in many ways similar to that seen in other phenolic compounds. It causes central nervous system depression, corrosion of oral mucosa and gastrointestinal tract, laryngeal edema, upper airway obstruction, nephrotoxicity, hepatitis and cardiac arrhythmias however, not all of the effects are predictable.<sup>21</sup>

Chloroxylenol, also known as p-chloro-m-xylenol (PCMX), is a compound that has been used as a preservative in cosmetics and as an active agent in chloroxylenol reported as an allergen in dermatology literature.<sup>22</sup>

In a case report where the patient used chloroxylenol on irritant contact dermatitis, a skin biopsy was performed, and it showed focal hyperkeratosis, epidermal atrophy, flattened rete ridges, perivascular lymphocytic infiltrate in the upper dermis.<sup>23</sup> The histological findings of this case report are in accordance with our histological finding in the gingiva.

Chloroxylenol is a popular over-the-counter antiseptic and widely used in India. A high incidence of contact sensitivity to chloroxylenol has been reported in the west, as opposed to reports of a low incidence from India. To the best of our knowledge, allergic reactions intraorally (plasma cell gingivitis) to chloroxylenol have not been reported previously.

## CONCLUSION

PCG is purely benign, and early detection and elimination of exposure to this etiologic antigenic agent brought the remission of the condition. This report outlines a case of PCG which was due to the use of chloroxylenol as a mouthwash. It is our responsibility for proper patient education and awareness of antiseptic mouthwash among the general population.

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