Plasma Cell Gingivitis Affecting the Gingiva, Palatal Mucosa and Laryngeal Cords

Alifya Patanwala, Edward W Fisher, Iain LC Chapple

Plasma cell gingivitis is a condition, thought to represent a hypersensitivity response, which affects the gingival tissues, usually in the anterior maxilla, where it often appears as an asymptomatic, diffuse, erythematous and papillary lesion which bleeds readily with minimal trauma. The aetiology is often difficult to elicit but may be related to specific allergens, neoplasia or it may be of unknown origin. Many cases have been reported in the literature over the last 4–5 decades, related to a variety of aetiological factors, and at one point it was thought to have disappeared until further cases were subsequently reported.
The reported case was a 41-year-old female who was referred to the department with bleeding gingivae by her general dental practitioner. She underwent routine examination and clinical investigation, which did not reveal anything abnormal. Biopsy of the palatal mucosa showed the specimen to contain a plasmacytic infiltrate. The patient subsequently underwent patch testing to identify potential allergens, which demonstrated positive responses to sodium metabisulphite, used in many cleaning agents, and cinnamaldehyde, which is used as a flavouring agent in a number of foods. The patient then developed laryngeal cord lesions very similar in appearance to the oral lesions, and it was thought that the lesions may be related to occupational exposure to an environmental allergen (such as a component of a cleaning agent). Management initially involved the use of systemic prednisolone in reducing doses, followed by inhaled steroids and steroid mouthwashes, which brought some improvement in symptoms.

Key words: hypersensitivity reaction, laryngeal cord, plasma cell gingivitis

INTRODUCTION

The enigma of plasma cell gingivitis has been recognised as a clinical condition for a number of years, with several reports appearing in the literature. Plasma cell gingivitis is a rare condition, presenting clinically as a diffuse, erythematous and papillary lesion of the gingiva, which frequently bleeds with minimal trauma. It may produce swelling of the gingiva and upper lip, and a burning sensation of the tongue (Sollecito and Greenberg, 1992). The condition often affects the anterior gingivae and is usually seen in the maxilla, although direct contact with an allergen in the mandibular gingivae has reportedly produced a case of plasma cell gingivitis (Marker and Krogdahl, 2002). Although normally localised to the gingiva, Hedin et al (1994) reported a case that was also associated with a similar histological lesion affecting the genital mucosa. Whilst plasma cell gingivitis occasionally produces discomfort, the patient is often unaware that he/she has the lesion.
Plasma cell gingivitis is thought to represent a hypersensitivity response, and putative allergens include mint (Lubow et al, 1984), present in toothpastes

and chewing gum. Indeed there are reports of symptomatic relief in patients presenting with a plasma cell gingivitis, following withdrawal of toothpastes and chewing gums. Three categories of plasma cell gingivitis have been proposed based upon the aetiology of the condition (Sollecito and Greenberg, 1992):

1. Lesions caused by an allergen.
2. Neoplastic lesions.
3. Lesions of unknown cause.

It has also been suggested that plasma cell gingivitis may constitute an allergic reaction to microbial plaque (Hedin et al, 1994).

During the 1940s and 1950s (Miller, 1941; Sugarman, 1950) and between 1966 and 1971 (Owings, 1969; Perry et al, 1973; Silverman and Lozada, 1977; Kerr et al, 1981) several cases related to chewing gum were reported in the literature. By the mid to late 1970s, the condition was considered to have virtually disappeared, but it then reappeared during the 1980s, a phenomenon thought to be due to flavouring agents in foods and oral care products, such as cinnamon (Bhaskar et al, 1968; Poswillo, 1968; Paul et al, 1978; Allen et al, 1988), used in chewing gum. At present, plasma cell gingivitis is still considered to be rare, and there have been few reported cases from the 1990s to the present day. However, it is likely that more than one aetiological factor is involved in the pathogenesis. In previously reported cases, patients have also suffered concomitantly with psoriasis (Lubow et al, 1984). One unusual case involved the chewing of khat leaves, which are popular in many African countries, and chilli peppers have also been implicated (Marker and Krogdahl, 2002). Patients presenting with what appears to be plasma cell gingivitis should be patch tested, to identify potential allergens; however, frequently no allergen can be identified.

Plasma cell gingivitis is so named because of the presence of an abundant plasma cell infiltrate within the connective tissues histologically. Previous authors have described plasma cell gingivitis occurring with angular cheilitis and glossitis (Palmer and Eveson, 1981), but gingival involvement may also arise in isolation. Often candidosis is included within the differential diagnosis at initial presentation and prior to cytological investigation.

The case presented in this report is of interest because the patient developed laryngeal lesions, consistent with the appearance of a plasma cell gingivitis, subsequent to the appearance of her intra-oral pathology.

CASE REPORT

A 41-year-old female presented to the Periodontal Department at Birmingham's Dental Hospital. At initial presentation, the patient complained of bleeding from the gingivae when brushing her teeth and had been referred by her general dental practitioner (GDP), who had noticed the presence of bilateral red areas affecting the buccal gingivae in the canine region, as well as a red lesion on the palate. The GDP had noticed these areas approximately 7 weeks prior to the patient being seen in the department. She had been a regular dental attendee and was seen on a regular basis by the hygienist within the practice for non-surgical periodontal therapy. She had mentioned to her dentist that she had been suffering with a dry throat for approximately 6–7 weeks.

The patient was aware of bleeding from the red areas on the buccal aspects of the canines, on tooth brushing, which stopped spontaneously. She did not report any bleeding whilst eating, or any soreness or discomfort from the areas.

Medically, the patient was fit and well, she was not taking any regular medication and had no known allergies. The patient had given up smoking 18 years previously and consumed minimal alcohol. She was married with two teenage daughters and worked as a receptionist/telephonist.

On examination, erythematous, papillary areas were noted affecting the right and left free and attached gingivae of the canine region (Fig 1). The area affecting the right buccal gingivae was more pronounced than the left side and was approximately 2–3 cm in diameter. Both areas blanched under pressure. A similar lesion was also present on the junction of the hard and soft palate and was approximately 3 cm in diameter (Fig 2). The following blood investigations were performed:

1. Full blood count.
2. Random blood glucose.
3. Routine immunology, including total IgG, IgM, IgA, IgE and complement C3 and C4 levels.
4. Specific IgE antibodies to egg, milk and wheat.
5. Tissue transglutaminase (tTG) antibody screen to eliminate Coeliac disease.

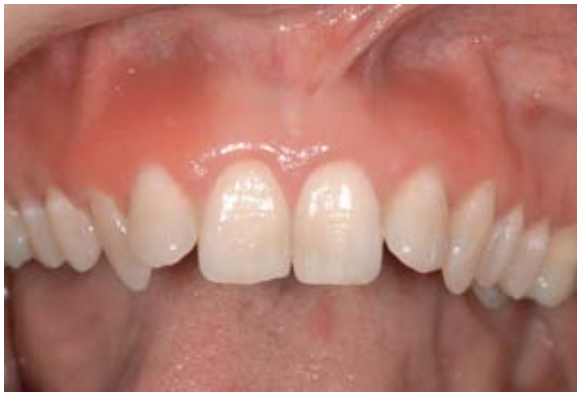

Fig 1a Bilateral, patchy erythematous lesions, in the maxillary lateral incisor/canine region and affecting the free and attached gingivae and also extending to the non-keratinised reflected oral mucosa.

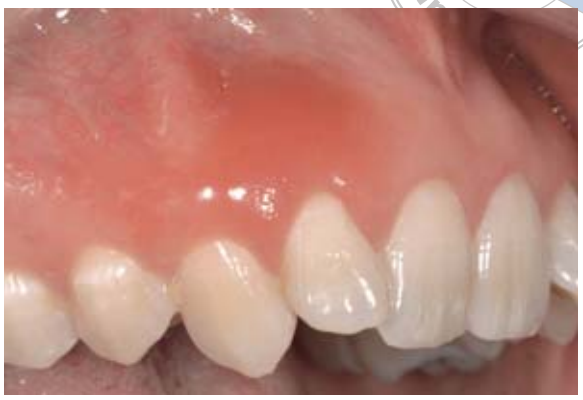

Fig 1b High-power view of the lesion of the right maxillary gingivae/oral mucosa.

A urine sample was also taken to check for glycosuria and smears were taken from the palate and the right and left buccal gingivae to eliminate candidosis. Clinical photographs were taken and a differential diagnosis formulated of:

- Candidosis.
- Granulomatous inflammation (e.g. Crohn disease, Coeliac disease).
- Plasma cell gingivitis.
- Wegener's granulomatosis.

The patient was reviewed 2 weeks later, when blood tests demonstrated a normal full blood count and random blood glucose. The serology revealed a slightly low C4 level, but was otherwise unremarkable and the intra-oral smears were negative for *Candida*. The patient had noticed some improvement in the lesion on the right buccal gingivae. The palatal lesion was still clinically obvious, and an incisional biopsy was therefore performed in this area under local analgesia.

The patient was reviewed a few weeks later and reported that she had been suffering with a painful and dry throat since her last visit. There had been noticeable discomfort on the left side of the neck on extension and she reported some relief on consumption of fluids. At this visit, the areas of anterior erythema were significantly more pronounced. In addition to these findings, the biopsy had revealed a focal plasmacytic infiltrate in the corium along with a more diffuse plasmacytic infiltrate affecting the minor salivary glands of the palate. In view of the clinical and histopathological findings,

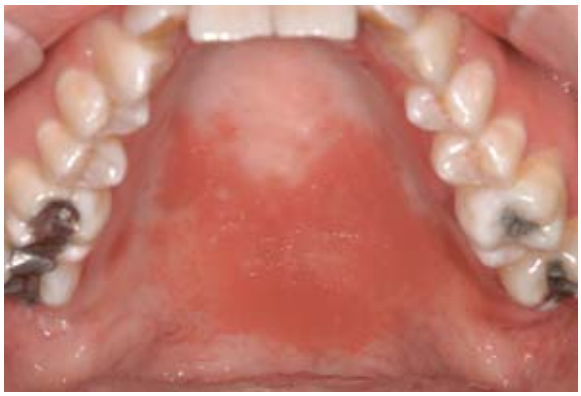

Fig 2 Lesion of the hard/soft palate showing again a close to symmetrical presentation. The mucosa was soft and spongy with a papillary surface. Candidosis was ruled out by cytology and also biopsy and the lesions completely resolved with systemic prednisolone.

a provisional diagnosis of plasma cell gingivitis was made, and the patient prescribed a course of systemic prednisolone, starting with 30 mg daily for one week in reducing doses at weekly intervals until cessation.

The patient subsequently failed to attend for a review appointment because her symptoms had resolved, but was eventually reviewed 6 weeks later. She reported that there had been a complete resolution during the course of oral prednisolone, but that the lesions had returned on the palate and buccal gingivae once the prednisolone had been stopped. She was advised to switch toothpastes to a non-zinc-containing toothpaste and was referred

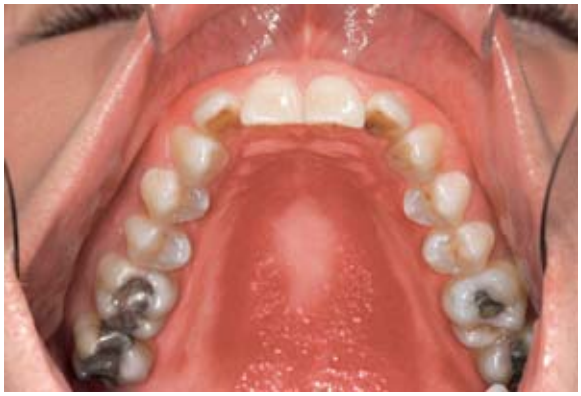

Fig 3 Lesion shown in Fig 2 after a period of 2 months without oral steroids (prescribed as a prednisolone mouthwash). The lesions re-bounded but the patient experienced no oral symptoms.

to a dermatologist for patch testing to identify potential allergens.

Patch testing revealed a delayed reaction to sodium metabisulphite (a component of surface cleaners and polishes) and a strong positive reaction to cinnamaldehyde. The patient was therefore advised to try and avoid foods containing preservatives such as cinnamaldehyde.

Interestingly, the patient had also been referred to an ENT surgeon by her general medical practitioner for an opinion regarding her dry and sore throat. Examination of the patient's laryngopharynx revealed lesions similar in appearance to those of the gingivae and palate affecting the vocal cords, supraglottic larynx and adjacent hypopharynx. The lesions were widespread, patchy and symmetrical in nature and in addition some vocal cord oedema was noted. She was given a prescription for anti-reflux medication (proton pump inhibitor), which provided an initial improvement in her symptoms. Recognising the similarity in oral and vocal cord lesions, the ENT surgeon (EF) telephoned the specialist responsible for the patient's oral care (ILC) and the consultation resulted in the decision not to biopsy the vocal cords due to the potential morbidity and the low chance of enlightening the working diagnosis. The patient subsequently lost her voice and the ENT surgeon treated the laryngeal lesions in the same manner as the oral lesions had been managed (oral prednisolone), which improved her symptoms greatly, alongside a marked decrease in laryngeal erythema and oedema.

Due to the problems associated with long-term systemic steroid use, a decision was made to try to maintain the situation using inhaled steroids and the patient was prescribed a fluticasone propionate inhaler, to be used twice daily. She was also reviewed again in the Periodontal department, where unfortunately her oral lesions were found to be as severe as previously seen. The oral symptoms were managed by use of a prednisolone mouthwash (15 mg tablet dissolved in a cup of water and rinsed once daily). Due to the possibility of a delayed hypersensitivity reaction to the sodium metabisulphite, present within cleaning agents used on the telephone headsets at work, a request was made for a personal telephone headset, which should not be cleaned with sodium-metabisulphite-containing fluids. The patient was further reviewed by the ENT department, and, interestingly, there had been a complete remission of symptoms whilst the patient had been away from work and on vacation, suggesting that there was indeed something within the patient's working environment that was giving rise to her symptoms. Further review within the Periodontal department 6 months later, revealed that the laryngeal symptoms remained under control, but the oral lesions had worsened, with the entire palate involved in the papillary erythema (Fig 3). Smears were taken once more to eliminate candidosis and the patient was re-interviewed about her work and home environment. She had been away from work for a 6-week vacation, indicating that this environment may not in fact be the cause of her palatal tissue pathology. However, she admitted to copious and frequent use of household cleaning agents, which she continued to employ, due to a lack of symptoms from her oral lesions. She was counselled about the use of cleaning fluids at home, and provided with oral prednisolone tablets again to use as a mouthwash. At review 6 months later, she reported improvements in her oral lesions whilst using the oral prednisolone mouthwash and also claimed to have limited the use of household cleaning agents to those not containing sodium metabisulphite. Her oral mucosa, however, remained unchanged with florid erythema of the hard and soft palate, despite an absence of oral symptoms. Currently, she remains under review and the oral lesions remain unresolved.

DISCUSSION

The appearance of this case of plasma cell gingivitis is consistent with results of previous reports in that it affected the anterior gingivae of the maxilla. However, there have previously been reported cases affecting the mandibular gingivae. There is a suggestion of an allergic aetiology, in light of the results of skin patch testing which, as previously stated, showed a reaction to cinnamaldehyde and sodium metabisulphite. Interestingly, the laryngeal symptoms have always seemed to be more problematic for the patient than her oral symptoms. This case highlights the importance of a multidisciplinary approach to management of certain conditions, because laryngeal cord biopsy and the associated morbidity was avoided by consultation between the lead clinicians.

When patients present with plasma cell gingivitis/mucositis, other underlying conditions must be eliminated from the differential diagnoses, namely a haematological malignancy such as leukaemia, mixed connective tissue diseases e.g. systemic lupus erythematosus (SLE), lichen planus and cicatricial pemphigoid (Macleod and Ellis, 1989; Al-Meshal, 1988). The histological appearance of the lesion can also resemble more uncommon but serious conditions such as multiple myeloma, solitary plasmacytoma and Waldestrom's macroglobulinaemia. In addition to this, previous authors have also carried out T-cell marker analysis of biopsy specimens in order to establish whether the condition is of neoplastic or reactive/inflammatory origin, using direct immunofluorescence. These have shown the condition to be of a reactive/inflammatory nature (Sollecito and Greenberg, 1992).

Management of patients with plasma cell gingivitis has traditionally been symptomatic, with use of steroid inhalers and mouthwashes. If patch testing has identified an allergen, sometimes an exclusion diet may result in some improvement of symptoms. In this case, the patient was given prednisolone mouthwash and advised to eliminate cinnamaldehdye from her diet. This did bring an improvement in her symptoms, although it is difficult to know whether this was due to the steroids, the exclusion of cinnamaldehyde or perhaps a combination of the two.

The patient in this case had seen an ENT specialist with regard to her dry throat and fluctuating voice quality. It was felt that her job, which was voice intensive, could be exacerbating the condition affecting her larynx.

This presented case would appear to be one of the first reported cases of plasma cell gingivitis with laryngeal involvement; the appearance of the larynx was similar to that of the gingivae as verified by laryngoscopy of the patient. Presently, the working hypothesis is of plasma cell gingivitis caused by exposure to sodium-metabisulphite-containing cleaning agents. Given the previous reports of non-gingival site involvement, a better diagnostic term to employ may be 'plasma cell mucositis', since this reflects the histological features of these lesions and the variable site predilection (both oral and non-oral) in different patients, rather than limiting the diagnosis to lesions affecting the gingival tissues.

REFERENCES

Al-Meshal IA. Effect of α chationone, an active principle of *Catha edulis* Forssk (khat) on plasma amino acid levels and other biochemical parameters in male Wistar rats. Phytother Res 1988;2:63–66.

Allen CM, Blozis GG. Oral mucosal reactions to cinnamon-flavored chewing gum. J Am Dent Assoc 1988;116:664–667.

Bhaskar SN, Levin MP, Frisch J. Plasma cell granuloma of periodontal tissues. Report of 45 cases. Periodontics 1968;6:272–276.

Hedin CA, Karpe B, Larsson A. Plasma-cell gingivitis in children and adults. A clinical and histological description. Swed Dent J 1994;18:117–124.

Kerr DA, McClatchey KD, Regezi JA. Allergic gingivostomatitis (due to chewing gum). J Periodontol 1981;42:709–712.

Lubow RM, Cooley RL, Hartman KS, McDaniel RK. Plasma-cell gingivitis: report of a case. J Periodontol 1984;55:235–241.

Macleod RI, Ellis JE. Plasma cell gingivitis related to the use of herbal toothpaste. Br Dent J 1989;166:375–376.

Marker P, Krogdahl A. Plasma cell gingivitis apparently related to the use of khat: report of a case. Br Dent J 2002;192:311–313.

Miller J. Cheilitis from sensitivity to oil of cinnamon present in bubble gum. J Am Med Assoc 1941;116:131.

Owings JR. An atypical gingivostomatitis: a report of four cases. J Periodontol 1969;40:538–542.

Palmer RM, Eveson JW. Plasma-cell gingivitis. Oral Surg Oral Med Oral Pathol 1981;51:187–189.

Paul RE, Hoover D, Dunlap C, Gier R, Alms T. An immunologic investigation of atypical gingivostomatitis. J Periodontol 1978;49:301–305.

Perry HO, Deffner NF, Sheridan PJ. Atypical gingivostomatitis. Arch Dermatol 1973;107:872–878.

Poswillo D. Plasmacytosis of the gingival. Br J Oral Surg 1968;5:194–202.

Silverman S, Lozada F. An epilogue to plasma cell gingivostomatitis (allergic gingivostomatitis). Oral Surg Oral Med Oral Pathol 1977;43:211–217.
Sollecito TP, Greenberg MS. Plasma cell gingivitis: report of two cases. Oral Surg Oral Med Oral Pathol 1992; 73:690–693.
Sugarman MM. Contact allergy due to mint chewing gum. Oral Surg Oral Med Oral Pathol 1950:1145–1147.

Reprint requests
Professor Iain LC Chapple
Birmingham Dental School
St Chads Queensway
Birmingham, B4 6NN
UK
E-mail: i.l.c.chapple@bham.ac.uk