

Desquamative gingivitis: Does the gingiva tell you more than what meets the eye? A comprehensive review

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Abstract

Several systemic diseases and conditions, allergic reactions to various agents, and psychological stress manifest in different ways on the gingiva. Desquamative gingivitis is one such condition that presents as erythema, ulcerations, or erosions on the gingiva and may be indicative of a bigger underlying condition/disease. While examining the oral cavity, we often forget that it is an integral part of the rest of the body, the oral mucosa, particularly the gingiva, is the site where several systemic diseases and conditions manifest. This review paper attempts to throw light on the various conditions and diseases manifesting as desquamative gingivitis, the importance of clinical examination, and proper history recording, along with relevant histopathological and immunological investigations. It also looks into the different modalities of management and treatment of desquamative gingivitis.

Introduction

In our day-to-day practice, we sometimes encounter certain unusual gingival manifestations that can put a clinician in a quandary, as to what the diagnosis is. The free and attached gingiva may present as an intense erythema, desquamation, and/or ulceration and most often with pain, glazing, and friability.^[1] This peculiar condition was seen as early as 1932 and was coined as “desquamative gingivitis” by Prinz.^[2]

The initial cause for this condition was unclear for quite sometime, and since these cases were seen predominantly in women in the fourth–fifth decades, they were suspected it to be linked to some hormonal derangement during menopause. Later, McCarthy *et al.*, in 1960, suggested that desquamative gingivitis was not a specific disease entity but a gingival response associated with a variety of conditions such as vesiculobullous lesions as well as adverse reactions to chemicals or allergens. Thus, desquamative gingivitis denotes a particular clinical picture and is not a diagnosis in itself.^[2,3]

A literature search revealed a very strong correlation between dermatologic mucocutaneous disorders and desquamative gingivitis, with 75% of cases having a dermatologic genesis.^[4] In many instances, desquamative gingivitis may present as vesicles and bullae with patients presenting only when the vesicles have broken down and are evident as desquamations, erosions, or ulcers. This review endeavors to look into the etiology, clinical

and histological features, and management of desquamative gingivitis.

It also deals with the stages in making a methodical diagnosis by clinical examination, history, and routine histology and immunofluorescence assays. The different modalities of treatment, comprising of chemotherapeutic approaches, other non-surgical methods as well as surgical techniques, have been reviewed here.

Diagnosis of Desquamative Gingivitis

The diagnosis involves a systematic assessment of the following:

1. Clinical history: This should cover the symptomatology associated with the lesion, onset, exacerbating factors, and any previous therapy undertaken to manage the condition.^[2]
2. Clinical examination: This involves both general examination and clinical examination. The pattern of distribution of the lesions, such as focal or multifocal, is to be recognized. A positive Nikolsky sign, where a blister forms or spreads or the surface epithelium floats away, when lateral pressure is applied to the mucosa, indicates a vesiculobullous lesion.^[1]
3. Histopathological examination: A perilesional biopsy should be taken avoiding areas of ulceration. 10% buffered formalin should be used to fix the solution for conventional H and E Michelle’s buffer (ammonium sulfate buffer, pH7)

used as transport solution for immunofluorescence study. Immunological markers are generally found in normal mucosa, with the exception of lichen planus and subacute lupus erythematosus, where it presents only in the lesional tissue.

Formalin-fixed, paraffin-embedded H and E stained tissue is evaluated under the light microscope.

Direct immunofluorescence uses unfixed frozen tissue with a variety of fluorescein-labeled, antihuman serum (anti-IgG, anti-IgM, antifebrin, and anti-C3). In indirect immunofluorescence, monkey oral or oesophageal mucosa is used. This is frozen and is incubated with patient's serum to allow the attachment of serum antibodies. This is later incubated with fluorescein-labeled antihuman serum. If a fluorescent signal is observed in the epithelium, connective tissue, or basement membrane, the test is said to be positive.^[2,5,6]

Diseases and Conditions Presenting as Desquamative Gingivitis

The common diseases

The prevalence of desquamative gingivitis was studied in a group of 414 patients with the most common mucocutaneous diseases being mucous membrane pemphigoid (41.6%), followed by lichen planus (11.8%), and pemphigus vulgaris (9.1%).^[7]

The use of clinical and laboratory methods shows that desquamative gingivitis has a dermatological genesis in 75% of the cases, wherein 95% of the cases are accounted for cicatricial pemphigoid and lichen planus.^[2,6]

Most reviews, however, consider lichen planus, mucous membrane pemphigoid, and pemphigus vulgaris to contribute to the majority of desquamative gingivitis cases.^[8-11]

Lichen planus

This is the most common cause for dermatosis responsible for desquamative gingivitis. It is currently accepted to be an immunologically mediated disorder, where T-lymphocytes play a central role. It shows a preponderance for middle-aged and older females; children are rarely affected.

In the oral cavity, they present in one or more of the following patterns: Keratotic, erosive/ulcerative, vesicular/bullous, and/or atrophic. The atrophic and ulcerative forms account for about 10–15% of all oral lichen planus and give rise to desquamative gingivitis.

Histologically, it is characterized by:

- Hyper/parakeratosis
- Hydropic degeneration of the basal layer
- Band-like infiltrate, predominantly of T-lymphocytes in the lamina propria.

Immunological evaluation reveals linear fibrillar deposits of fibrin in the basement membrane zone and scattered immunoglobulin staining cytooid bodies in the upper areas of the lamina propria.^[1-3,6,8,10-13]

Pemphigoid

It is a subepithelial vesiculobullous disorder of late middle age. The variant includes bullous pemphigoid that mainly affects the skin and cicatricial/mucous membrane pemphigoid, predominantly affecting mucous membranes with/without scarring. Antibodies are produced against target antigens in the basement membrane, resulting in detachment of epithelium from the lamina propria.^[3]

Mucous membrane pemphigoid

This condition is seen with a female predominance, in their fifth decade. The major antigenic determinants are bullous pemphigoid 1 and 2 (BP1 and 2). Most of the changes are due to an immune response directed against BP 2. The response is less against BP 1, epiligrin (a lamina lucida protein in the basement membrane) and β - 4 integrins.

In cases presenting first to the dentist, 25% show ocular changes. It can range from unilateral/bilateral conjunctivitis, symblepharon, ankyloblepharon, vesicular lesions on the conjunctiva leading to scarring, corneal damage, and blindness.

In the oral cavity, it may present with the classical features of desquamative gingivitis, where the patient presents with gingival soreness and long-standing superficial ulcers.

Histology, however, is the mainstay of diagnosis. Linear deposits of IgG and C3 are commonly detected in the basement membrane zone.^[1-3,6,8,10,11,14]

Bullous pemphigoid

Bullous pemphigoid presents as tense bullae that rupture and become flaccid in the skin. One third of the patient's present with desquamative gingivitis, with desquamative gingivitis or erosions on the gingiva.

Here too, the antigenic determinants are BP1 and the collagen-like transmembrane protein BP 2.

Immunofluorescence: IgG and complement 3 immune deposit along the epithelial basement membranes. Direct immunofluorescence is positive in 90%–100% of cases and indirect in 40%.^[1-3,6,8,10,11,14]

Pemphigus

Pemphigus is an autoimmune condition, characterized by damage to desmosomes. Here, antibodies are directed against ciphery type epithelial cell adhesion molecules (desmoglein 3 and plakoglobin). There are intraepithelial immune deposits and loss of cell-cell contact (acantholysis), leading to intraepithelial vesiculation.

Oral lesions can range from vesicles to large bullae that eventually rupture to form large ulcers. Almost every region in the oral cavity is involved, with multiple ulcers in sites of trauma/irritation. Pemphigus vulgaris is the most common of the pemphigus diseases, which also include pemphigus foliaceus, pemphigus vegetans, and pemphigus erythematosus. Pemphigus vulgaris is also the severest form, with a 10% mortality rate. Women in their fourth decade are the most affected and unusually children and newborns.

Recent evidence points out that DSG3, the gene coding for pemphigus vulgaris, is located in chromosomes.

Immunofluorescence: By direct and indirect methods, the test is positive if there is immunofluorescence in the intercellular spaces of the stratified squamous epithelium of the mucosa^[1,2,3,6,8,10,11]

Other Less Common Conditions

Chronic ulcerative stomatitis

It appears similar clinically and histologically, to lichen planus. It is seen predominantly in women, in their fourth decade of life. Erosions and ulcerations of the oral mucosa are common, rarely with skin lesions.

Direct immunofluorescence reveals nuclear deposits of IgG in the basal one-third of the epithelium, i.e., stratified epithelium-specific antinuclear antibodies (SES-ANA). Fibrin deposits are also revealed in the epithelial-connective tissue interface. SES-ANA is also seen in indirect immunofluorescence.^[2,8,10,11]

Linear IgA disease

It is a rare mucocutaneous disorder seen in middle aged women. Children and younger individuals may also be affected. Skin lesions have characteristic plaques or crops, with an annular presentation, surrounded by a rim of blisters peripherally. Oral lesions mimic mucous membrane pemphigoid. The gingiva usually presents with diffuse desquamative gingivitis, with non-specific ulcers on the rest of the mucosa. Although the causes are not well known, there have been reports on LAD induced by angiotensin-converting enzyme inhibitors.

Immunofluorescence shows linear deposits of IgA at the epithelial-connective tissue interface.^[2,8,10,11,15]

Dermatitis herpetiformis

This chronic skin disorder is seen in middle-aged males, with a symmetrical papulovesicular eruption on the extensor surfaces. The name “herpetic” is derived from the way the disease presents in clusters or papules on the skin. Evidence suggests that dermatitis herpetiformis is a cutaneous manifestation of celiac disease, with transglutaminase as the predominant autoantigen in the intestine, skin, and often mucosa.

Oral lesions consist of vesicles and/or desquamative gingivitis.

Direct immunofluorescence shows that IgG and C3 are present at the dermal papillary apices, from perilesional and normal uninvolved skin.^[2,3]

Lupus erythematosus

It is an autoimmune condition that presents as systemic lupus erythematosus, chronic cutaneous lupus erythematosus and subacute cutaneous erythematosus. It has a 10-time predilection for women.

The systemic variant may affect vital organs, with a classical butterfly distribution malar rash. The cutaneous variant has skin

lesions referred to as discoid lupus erythematosus. Gingiva may clinically present as desquamative gingivitis.

Direct immunofluorescence shows immunoglobulins and C3 deposits at the dermal-epidermal interface. Antinuclear antibodies are present in more than 95% of cases.^[1-3]

Erythema multiforme

It is an acute vesiculobullous disorder. Triggering factors can be diverse, ranging from an immune reaction triggered by drugs such as sulfonamides, barbiturates, or hydantoin or by infective agents such as herpes simplex or mycoplasma.^[2,3]

Drug eruptions

This could be local hypersensitivity reaction to mouthwashes, drugs, cosmetics, chewing gum, dental materials, and cinnamon. Tartar control pastes and sodium lauryl sulfate in toothpaste may be the cause in certain patients.^[1,2,16-18] The use of certain herbal toothpaste may also be the cause of desquamation of the gingiva, with plasma cell gingivitis.^[16] The local reaction of a drug used as a medicament topically is referred to as stomatitis medicamentosa.

If it is an eruption in the oral cavity, secondary to drugs taken orally and parenterally, it is termed as stomatitis venenata/contact allergy. This is generally seen secondary to topical penicillin or aspirin burns. Sometimes, it may present as an allergy to mercurial compounds present in amalgam.^[1,2,17]

Rare Causes

Toxic epidermal necrolysis (TENS)

It is usually seen as extensive detachment of full thickness epithelium, following intake of certain drugs. A large number of AIDS patients have been recorded. Patients with TENS have predisposing cough, sore throat, burning eyes, malaise, and low fever, followed by skin and mucosal lesions 1–2 days later.^[3]

Pyostomatitis vegetans

Mainly when associated with Crohn’s disease or ulcerative colitis, it may present with military pustules, ulcers, or erosions affecting the gingivae.^[2,3]

Epidermolysis bullosa acquisita

This is a rare condition, characterized by autoantibodies directed against type VII collagen. It is ultrastructurally present as bullae beneath the basal lamina. The gingiva presents either as desquamative gingivitis or localized bullae that rupture leaving ulcers, which scar.^[3]

Psoriasis

It is a condition that rarely manifests on the gingiva, as erythema, white or grayish plaques, and lesions similar to erythema multiforme.^[3]

Conditions Mimicking Desquamative Gingivitis

1. Factitious injuries

Injuries that are caused by the patient himself/herself intentionally and consciously are factitious injuries. These when present on the gingiva may mimic desquamative gingivitis.^[2,19,20]

2. Candidiasis

When candidiasis is limited to the gingiva, it may masquerade as desquamative gingivitis.^[2]

3. Graft versus host disease

Oral lesions in patients receiving allogeneic bone marrow transplant may mimic desquamative gingivitis.^[2]

4. Wegener's granulomatosis

It is a systemic disease presenting as a typical "strawberry" appearance of the gingiva and intense erythema.^[2,21]

5. Foreign body gingivitis

This generally does not have a gingival site predilection. However, sometimes, in women approaching their fifth decade, foreign bodies that are associated with lichenoid or granulomatous response may masquerade as desquamative gingivitis. The foreign bodies are generally dental abrasives or restorative materials.^[2,22,23]

6. Kindler's syndrome

Here, the oral lesions closely resemble desquamative gingivitis. The syndrome also comprises cutaneous neonatal bullae, poikiloderma, photosensitivity, and acral atrophy.^[2,24]

7. Squamous cell carcinoma

Management of Desquamative Gingivitis

The management of the symptoms of desquamative gingivitis is as follows:

1. Eliminating the underlying cause where possible, such as avoiding suspected/known allergens and irritants.
2. Improvement in oral hygiene: While this may not treat the primary underlying cause, it resolves the plaque-induced inflammation, rendering the true clinical pathology clearly visible.
3. Treating the underlying pathology
4. Local or systemic immunosuppressive treatment.^[1]
5. Local and systemic immunosuppressive treatment

Most symptomatic cases can be managed by topical corticosteroids. Steroid inhalers such as alclometasone dipropionate 50–100 µg/inhalation or fluticasone propionate 50 µg/spray nasal spray can be used for localized patches, up to 4 times, directed on the patches.^[1,2]

Generalized lesions may be treated with mouthrinses (soluble prednisolone tablets, 5–10 mg; betamethasone tablets, 0.5–1 mg; or fluticasone, 1 nasule: 15 ml water). This is rinsed twice or thrice a day and then spat out.

Corticosteroid creams such as flucinolone acetone 0.0025% or 0.00625% dispensed and carried in vinyl occlusal splints, to provide targeted therapy, when lesions are restricted to the free and attached gingiva.^[1,24-26]

Mouthrinses with active agents such as benzydamine hydrochloride 0.15% can be used for pain relief. If there is candidal superinfection, appropriate antifungals can be given.

Cyclosporin as mouthwash can be used when topical steroids fail. The benefit of topical cyclosporin for the management of desquamative gingivitis due to lichen planus is documented.^[1,27]

In cases unresponsive to topical corticosteroids, tacrolimus can be used topically, in an adhesive dental paste or ointment. Systemic steroids are indicated for severe cases and/or when there are extraoral tissues involved. In such cases, hematological monitoring as well as prophylaxis for osteoporosis may be required.^[1]

A multidisciplinary approach is often required for case management, comprising oral medicine, periodontology, dermatology, ophthalmology, otolaryngology, or gastroenterology.^[1,2]

While corticosteroids form the mainstay of management, other immunosuppressant drugs that have been used are azathioprine, dapsone, mycophenolate mofetil, cyclophosphamide, minocycline, and nicotinamide are other agents. Monotherapy or combined therapy, often with corticosteroids, has been tried. Other chemotherapeutic agents that have been tried are methotrexate and gold.^[1,2]

Individual cases of desquamative gingivitis may have a customized protocol for management. Specifically, in hypersensitivity reactions, skin patch tests can be done. Here, known potential irritants such as antiseptic mouthwashes, tartar control toothpaste, pastes with sodium lauryl sulfate, and known food allergens should be avoided. In lichenoid reactions of the mucosa, where a number of medications are suspected, it may be warranted to withdraw the suspected drug for several weeks, for a resolution to take place.

Secondary procedures, in addition to drug therapy, include plasmapheresis, where blood is removed from the patient, plasma was separated out, and autoantibodies were removed and again transfused to the patient and photopheresis, where the buffy coat (WBC and platelets) is separated from whole blood, chemically treated with 8-methoxypsoralen, exposed to ultraviolet light, and returned to the patient. 8-Methoxypsoralen irreversibly binds covalently to both strands of the DNA of nucleated cells following photoactivation. The photochemically damaged T-cells returned to the patient appear to induce cytotoxic effects on T-cell formation.^[1,2,11]

Labial veneers have been given to mask the gingival in some cases.^[28]

Surgical modalities that have been attempted for management include the use of free gingival grafts and connective tissue grafts in the management of lichen planus and pemphigoid, to either excise the desquamative gingival lesions or attempt root coverage in recession defects caused by desquamative gingivitis.^[29]

Surgery using LASERS, specifically, diode LASERS can be used at different locations. A wavelength of 980 nm, the optical penetration depth appears to be smaller than the depth of penetration of 1.064 nm and higher than that of CO₂. This can be used to coagulate superficial and interstitial lesions.^[30]

Conclusion

In the present day of technological advances in periodontics and other specialties, it may seem dated to be writing about desquamative gingivitis. The purpose of this review paper is to reinforce sound and thorough clinical examination, along with relevant investigations, to arrive at a diagnosis.

The oral mucosa and gingiva, in particular, serve as mirrors to reflect several underlying systemic diseases and conditions. No investigation can serve to substitute clinical acumen in diagnosis.

This review gives a comprehensive outline on how to consider a differential diagnosis in order of prevalence for conditions presenting as desquamative gingivitis and also provides a run through on laboratory investigations and the different modalities to treat and manage both desquamative gingivitis and the underlying disease/condition.

References

- Richards A. Desquamative gingivitis: Investigation, diagnosis and therapeutic management in practice. *Periodontol* 2000 2005;2:183-190.
- Newman MG, Takei H, Klokkevold PR, Carranza FA. *Carranza's Clinical Periodontology* 10th ed. St. Louis: Saunders, Elsevier; 2006. p. 411-33.
- Scully C, Laskaris G. Mucocutaneous disorders. *Periodontol* 2000 1998;18:81-94.
- Neville BW, Damm DD, Allen C, Bouquot JE. Dermatological disease. In: Neville BW, Damm DD, Allen C, Bouquot JE, editors. *Oral and Maxillofacial Pathology*. Philadelphia PA: Saunders; 1995.
- Suresh L, Neiders ME. Definitive and differential diagnosis of desquamative gingivitis through direct immunofluorescence studies. *J Periodontol* 2012;83:1270-8.
- Rogers RS 3rd, Sheridan PJ, Nightingale SH. Desquamative gingivitis: Clinical, histopathologic, immunopathologic, and therapeutic observations. *J Am Acad Dermatol* 1982;7:729-35.
- Markopoulos AK, Antoniadis D, Papanayotou P, Trigonidis G. Desquamative gingivitis: A clinical, histopathologic, and immunologic study. *Quintessence Int* 1996;27:763-7.
- Scully C, Porter SR. The clinical spectrum of desquamative gingivitis. *Semin Cutan Med Surg* 1997;16:308-13.
- Lo Russo L, Fierro G, Guiglia R, Compilato D, Testa NF, Lo Muzio L, *et al.* Epidemiology of desquamative gingivitis: Evaluation of 125 patients and review of the literature. *Int J Dermatol* 2009;48:1049-52.
- Robinson NA, Wray D. Desquamative gingivitis: A sign of mucocutaneous disorders a review. *Aust Dent J* 2003;48:206-11.
- Weinberg MA, Insler MS, Campen RB. Mucocutaneous features of autoimmune blistering diseases. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1997;84:517-34.
- Scully C, el-Kom M. Lichen planus: Review and update on pathogenesis. *J Oral Pathol* 1985;14:431-58.
- Scully C, Beyli M, Ferreiro MC, Ficarra G, Gill Y, Griffiths M, *et al.* Update on oral lichen planus: Etiopathogenesis and management. *Crit Rev Oral Biol Med* 1998;9:86-122.
- Lilly JP, Spivey JD, Fotos PG. Benign mucous membrane pemphigoid with advanced periodontal involvement: Diagnosis and therapy. *J Periodontol* 1995;66:737-41.
- Porter SR, Scully C, Midda M, Eveson JW. Adult linear immunoglobulin A disease manifesting as desquamative gingivitis. *Oral Surg Oral Med Oral Pathol* 1990;70:450-3.
- Macleod RI, Ellis JE. Plasma cell gingivitis related to the use of herbal toothpaste. *Br Dental J* 1989;166:375-6.
- Reed BE, Barrett AP, Katelaris C, Bilous M. Orofacial sensitivity reactions and the role of dietary components. Case reports. *Aust Dent J* 1993;38:287-91.
- Koch P, Bahmer FA. Oral lesions and symptoms related to metals used in dental restorations: A clinical, allergological, and histologic study. *J Am Acad Dermatol* 1999;41:422-30.
- McGrath KG, Pick R, Leboff-Ries E, Patterson R. Factitious desquamative gingivitis simulating a possible immunologic disease. *J Allergy Clin Immunol* 1985;75:44-6.
- McCartan BE. Psychological factors associated with oral lichen planus. *J Oral Pathol Med* 1995;24:273-5.
- Cohen RE, Cardoza TT, Drinnan AJ, Aguirre A, Neiders ME. Gingival manifestations of Wegener's granulomatosis. *J Periodontol* 1990;61:705-9.
- Gordon SC, Daley TD. Foreign body gingivitis: Clinical and microscopic features of 61 cases. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2003;95:688.
- Ricketts DN, Morgan CL, McGregor JM, Morgan PR. Kindler syndrome: A rare cause of desquamative lesions of the gingiva. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1997;84:488-91.
- Lozada-Nur F, Miranda C. Oral lichen planus: Topical and systemic therapy. *Semin Cutan Med Surg* 1997;16:295-300.
- Lozada F, Silverman S Jr. Topically applied fluocinonide in an adhesive base in the treatment of oral vesiculoerosive diseases. *Arch Dermatol* 1980;116:898-901.
- Lapidoth M, David M, Ben-Amitai D, Katzenelson V, Lustig S, Sandbank M, *et al.* The efficacy of combined treatment with prednisone and cyclosporine in patients with pemphigus: Preliminary study. *J Am Acad Dermatol* 1994;30:752-7.
- Porter SR, Scully C, Eveson JW. The efficacy of topical cyclosporin in the management of desquamative gingivitis due to lichen planus. *Br J Dermatol* 1993;129:753-5.
- Wray D, McCord JF. Labial veneers in the management of desquamative gingivitis. *Oral Surg Oral Med Oral Pathol* 1987;64:41-2.
- Chaikin BS. A treatment of desquamative gingivitis by the use of free gingival grafts. *Quintessence Int* 1980;9:105-11.
- Romanos G, Nentwig GH. Diode laser (980 nm) in oral and maxillofacial surgical procedures: Clinical observations based on clinical applications. *J Clin Laser Med Surg* 1999;17:193-7.

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