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Oral Lichen Planus: Identification and Management, 2nd Edition

A peer-reviewed continuing education course written by
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ABSTRACT

Oral lichen planus—a chronic, inflammatory, immune-mediated condition—may result in erosion of the oral mucosa. The disease presents in four forms—reticular, erosive, atrophic, or bullous—and typically develops in women in their fifth and sixth decades. Reticular oral lichen planus, when absent of erythema, is asymptomatic and does not typically require intervention. However, there is clinical potential of conversion to carcinoma with reticular oral lichen planus associated with erythema or erosion. This potential requires treatment and periodic reevaluation for tissue changes that may indicate conversion to carcinoma. The erosive and ulcerated forms of oral lichen planus are best managed with topical corticosteroids. Refractory cases are recommended to be treated with systemic steroids or other immunosuppressive medications. Nonmedication-based interventions are also available, but with greater potential for adverse reactions, greater degree of side effects, and at greater cost. This review article will discuss identification of oral lichen planus and its management.

EDUCATIONAL OBJECTIVES

At the conclusion of this educational activity, participants will be able to:

1. Identify the clinical presentation of oral lichen planus
2. Identify the different forms of lichen planus and differentiate them from lichenoid reaction
3. Understand how to treat lichen planus and manage patient comfort
4. Identify interventions discussed in the literature that are supported by limited evidence

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INTRODUCTION

Oral lichen planus (LP) is a rare, chronic, inflammatory, immune-mediated condition affecting the mucous membranes of the oral cavity and causing erosion of the soft tissue. Clinically, LP may appear as itchy, lacy, white patches; swollen, red tissues; or open sores. These lesions may cause burning, pain, or other discomfort. The lesions may appear on the inside of the cheeks (their most common location), gingiva, tongue, inner tissues of the lips, or on the palate (hard or soft). The name "lichen" comes from a plant that is often seen growing on rocks and having a mossy, weblike appearance.

This condition typically develops in the fifth or sixth decade of life. Prevalence of LP in the general population ranges from 1%[1,2] to 6.3%[3] and is rare in children.[4,5] The literature reports an increased prevalence of LP in middle-aged patients (40% are 40–60 years old), with a significant female predominance (67.5% versus 32.5%).[6] The majority of patients with LP present with both oral and cutaneous lesions (62.5%).[6]

LP is noncommunicable. The disorder occurs when the immune system reacts against cells of the oral mucous membranes. The etiology is unknown. LP is considered by the World Health Organization (WHO) to be a premalignant condition.[7] Symptoms can usually be managed, but people who have LP need regular monitoring because they may be at risk of developing mouth cancer in the affected areas. Four forms of the condition present clinically and can be characterized as reticular, erosive, atrophic, and/or bullous.

Etiology

The cause of lichen planus is not fully understood, but it is believed to have a genetic and immunity-related connection. Reported findings suggest that the body is reacting to an antigen in an allergic type reaction within the skin or mucosa. Experts feel that lichen planus is an autoimmune disorder in which the skin cells lining the mouth are attacked by white blood cells. Research is continuing to expand on these theories. Some experts classify lichen planus as a cell-mediated immune response, but a specific antigen has not been identified to date, and further research is needed to classify the disorder as autoimmune. Although the specific antigen that triggers lichen planus is unknown, experts agree that it may be a self-peptide, which would confirm that LP is a true autoimmune disease. The role of autoimmunity in the pathogenesis is supported by many autoimmune features of LP, including its chronicity, onset in adults, predilection for females, as well as its association with other autoimmune diseases.

Current literature suggests that LP is a T cell–mediated autoimmune disease in which autocytotoxic CD8+ T cells trigger apoptosis of oral epithelial cells.[8-10] Antigen-specific and nonspecific mechanisms may be involved in the pathogenesis of LP. The antigen-specific mechanisms include antigen-specific keratinocyte killing by CD8+ cytotoxic T cells and antigen presentation by basal keratinocytes. The nonspecific mechanisms include matrix metalloproteinase (MMP) activation and mast cell degranulation. These mechanisms may combine to cause T cell accumulation in the superficial lamina propria, leading to basement membrane disruption, intraepithelial T cell migration, and keratinocyte apoptosis.[11] It can reasonably be concluded that these abnormalities are linked to the presence of inflammatory infiltrates.

Stress has been a main etiological factor of lichen planus. Reported exacerbations of lesions have been associated with anxiety and psychological stress.[12-14] Prolonged emotional stress contributes greatly to initiation and clinical expression of LP lesions.[15] Systemic medications such as beta blockers,[16] nonsteroidal anti-inflammatory drugs,[17] antimalarials,[18] diuretics,[19] oral hypoglycemics,[20,21] and oral retrovirals[22] are reported to initiate or exacerbate LP and oral lichenoid reactions. Dental materials have been implicated in initiation of LP in sensitive patients. Amalgam, composite resins, and lab-related resins used in removable prosthetics have been reported to cause an increased incidence of oral lichenoid reactions and contact hypersensitivity lesions.[23-26] Metals such as nickel and gold have also been reported.[27-30] Vitamin or mineral deficiencies, such as B_{12} deficiency or iron-deficient anemia, and systemic diseases, such as rheumatoid arthritis and the autoimmune disorder Sjögren's syndrome, have also been shown to lead to an increased occurrence of LP.[31]

Oral appearance

Lichen planus can appear orally in several different forms: reticular, erosive/ulcerative, bullous, atrophic, or lichenoid. Oral lichen planus is classically present as a lesion with radiating whitish-gray lines, threadlike papules, and a velvety appearance. It presents bilaterally and can be lacy or reticular, annular, patchy, or stringy. The occurrence and distribution of the lesion orally is 80% on the buccal mucosa, 65% on the tongue, 20% on the lips, and <10% on the floor of the mouth and palate. Vesicles and bullae are seen in the oral lesions of lichen planus. LP manifests in the oral cavity several weeks before the skin lesions appear. Approximately 15% of oral LP patients have concurrent skin lesions.[32,33] The reticular form has a better prognosis with 40% of cases undergoing spontaneous remission.[34,35] The erosive form is a chronic condition that presents with frequent exacerbations and severe pain and complications.

Reticular LP: The reticular type of oral lichen planus has the highest occurrence. This form is often asymptomatic and is only identified visually during clinical examination.[36] The other forms cause mucosal erosion or lesions and are more frequently reported due to the severity of the symptoms leading the patient to seek intervention. The reticular pattern is commonly found on the cheeks, presenting as lacy and weblike, with white threads that are slightly raised. Those lines are referred to as Wickham's striae and are typically noted on the buccal mucosa (figures 1, 2).[37] Wickham's striae have been reported in 88.5% of those patients with the reticular form of LP.[6] As the white striations have a similar appearance to oral cancer, their appearance should be documented in the chart and photos taken for later comparison on recall to verify they have not worsened from the initial presentation. These lesions should be monitored for changes in

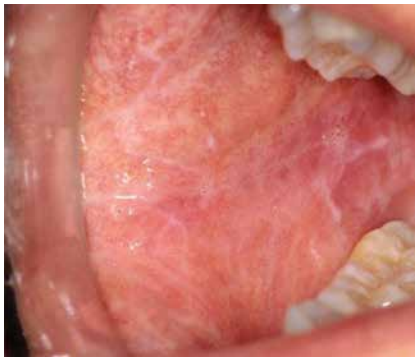

FIGURE 1: The reticular form of lichen planus demonstrating white lace like Wickham's striae on the buccal mucosa

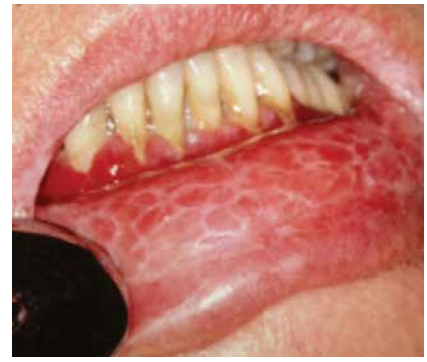

FIGURE 2: Wickham's striae forming a white lacy appearance on the interior lip, indicating reticular lichen planus

size, thickness, tissue coloration, and emergent symptoms such as pain, which may be indicative of dysplastic conversion.[38-41] Dysplastic transformation is relatively rare and reported to occur in only 3.7% of oral LP cases. It is more frequently found in females, with the tongue being the most common site.[42]

Erosive/ulcerative LP: Erosive/ulcerative LP (ELP) is associated with significant inflammation, tissue erosion, and possible bullous oral lesions.[43] Patients with ELP are likely to experience a continuous moderate to severe pain that is aching in nature and may be accompanied by a burning sensation. Pain worsens when eating, particularly hot or spicy foods, and when the lesions contact alcohol. Generalized distribution of lesions orally can be debilitating. ELP cycles between periods of remission and episodes of recurrence. The erosive pattern can affect any mucosal surface, including the cheeks, tongue, and gingiva (figures 3-6). This form often appears bright red due to the loss of the top layer of the mucosa in the affected area. In most instances, individuals with ELP are uncomfortable when eating and drinking, particularly with extremes of temperature or acidic, coarse, or spicy foods. Future research may identify cellular and genetic mechanisms that aid in development of effective long-term treatment strategies and a possible cure. Current treatment for ELP utilizes pharmacotherapy to suppress immune function and pain with methods to promote healing or nonpharmacological interventions in managing the disease. Most pharmacotherapy strategies have limited supportive evidence.

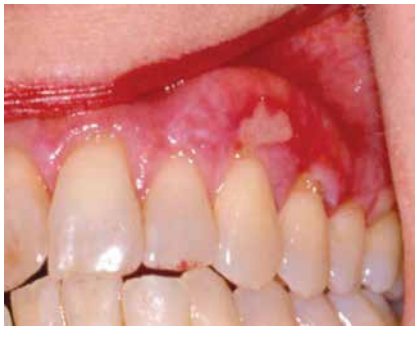

FIGURE 3: Erosive lichen planus lesion located on the attached gingiva adjacent to the dentition

FIGURE 4: Erosive lichen planus on the lateral border of the tongue

Bullous form: Bullous lichen planus (BLP) is a rare variant of lichen planus characterized by vesicles or bullae, which usually develop with preexisting LP lesions[44] (figures 7-9). BLP may also be found outside of the oral environment.[45] It is often misdiagnosed and should be differentiated from other subepidermal bullous diseases, especially lichen planus pemphigoides (LPP). The concomitant formation of blisters is rare. This can be the effect of severe liquefactive degeneration of cells forming the basal layer related to extensive inflammation from the LP. When the blisters form because of circulating autoantibodies, the disease is called LPP, which is clinically characterized by vesicular and/or bullous lesions that develop on preexisting LP lesions or on perilesional skin.[46] The exact prevalence of BLP remains unknown, and the disease is usually sporadic in nature. Familial cases of BLP have also been reported in the literature.[47] Familial BLP has an earlier onset with a more prolonged course compared to nonfamilial BLP, with both types affecting the same areas, mainly lower and

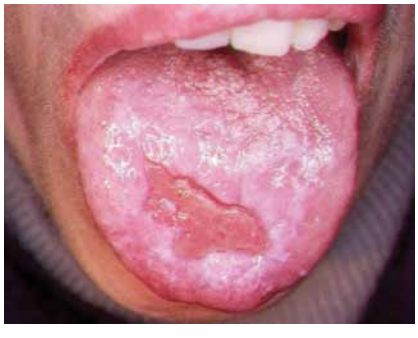

FIGURE 5: Erosive/ulcerative form of oral lichen planus on the dorsal surface of the tongue

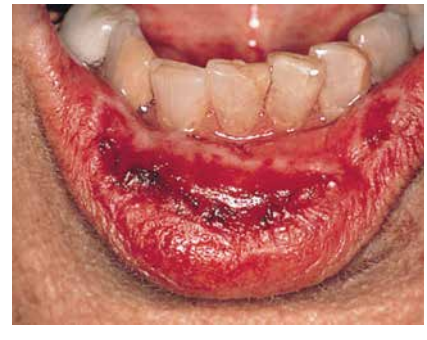

FIGURE 6: Erosive/ulcerative lichen planus lesions on the interior of the lower lip

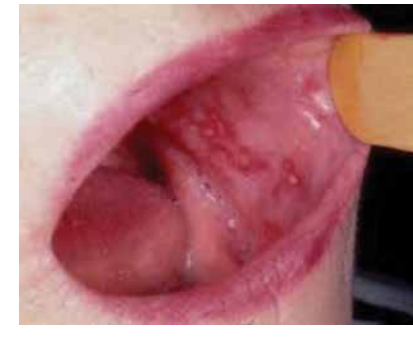

FIGURE 7: Bullous lichen planus lesions located on the buccal mucosa

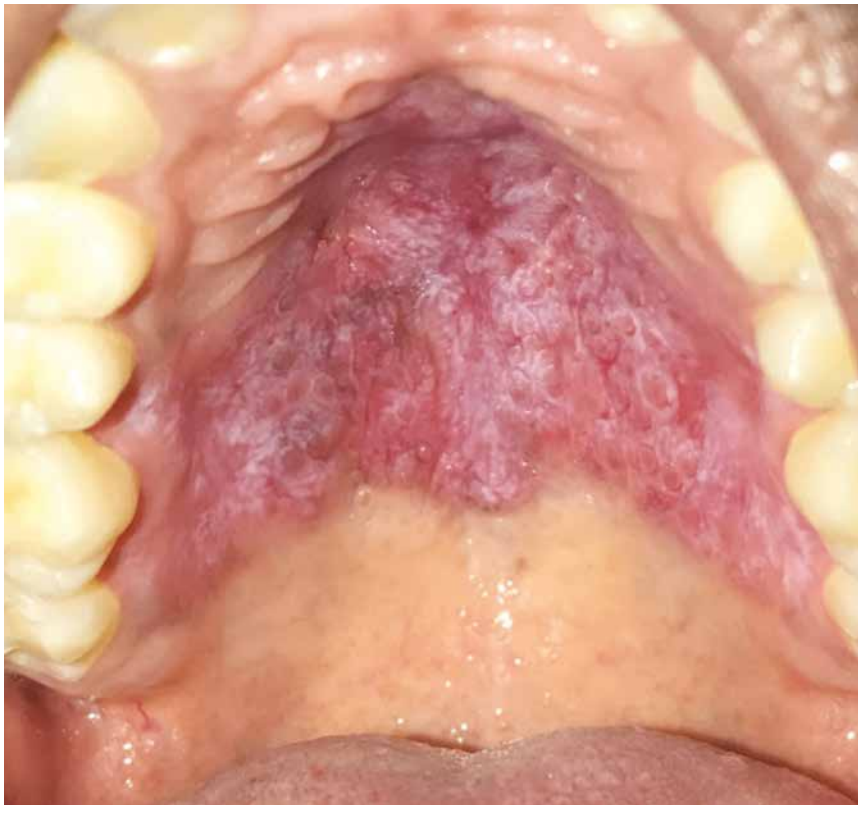

FIGURE 8: The hard palate covered with bullous lichen planus

upper extremities, trunk, and mucosa, but it is more frequently associated with nail involvement.[48]

Atrophic form: Atrophic lichen planus is a rare form of lichen planus in which those affected develop pale papules or plaques with an atrophic (broken down tissue) center. Although these papules can be found anywhere on the body, they most commonly affect the trunk and/or legs on skin areas previously affected by classic lichen planus. They are also identified intraorally.[49] The exact underlying cause of atrophic LP is unknown, and treatment may not be necessary as some cases resolve on their own. Mild cases can often be managed with topical steroids, while more intensive therapies may be required for severe cases. This form of LP differs from the reticular form as redness presents on the soft tissue, but the white lacy lines are not present. Patients may have no sensitivity, or they may complain of irritation in the affected areas (figure 10).

Lichenoid form: Oral lichenoid reactions (OLR) or lesions are clinical and histological contemporaries of oral LP, often indistinguishable in their manifestations. Lichenoid reactions resemble lichen planus both clinically and microscopically but are due to an allergic response (figures 11, 12). The differentiation between the two conditions is the association of known inciting factors with lichenoid lesions. The list of potential offending agents is extensive and includes medications, oral hygiene products, and occasionally, metallic filling materials.[50,51] When those factors are identified and eliminated, regression of the lesion occurs. Lesions caused by the irritant nature of the dental material have local inflammation induced by primary contact with the chemicals in the material and are not mediated by lymphocytes. Due to repeated contact with the irritating agent, a chronic toxic reaction may be established over long periods of time in low concentrations. These reactions are frequently localized to the area where the irritant is in direct contact with soft tissue (e.g., where the denture acrylic contacts the soft tissue).[52]

FIGURE 9: Bullous lichen planus lesions on the interior lip

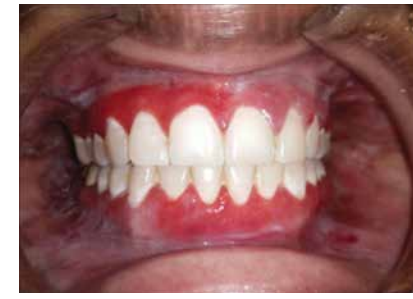

FIGURE 10: Atrophic lichen planus on the attached gingival tissue of the maxilla and mandible

NONORAL LICHEN PLANUS

Those patients who present with oral lichen planus may have lesions affecting other parts of the body. Skin lesions usually appear as purplish, flat-topped bumps that are often itchy. Lesions on the female genitalia often cause pain or burning and discomfort with intercourse. The lesions are usually red and eroded and occasionally appear as white areas. Lesions can also occur on male genitalia. Lichen planus of the ears may lead to hearing loss. When skin lesions appear on the scalp, they may cause temporary or permanent hair loss. Although rare, LP of the fingernails or toenails may result in ridges on the nails, thinning or splitting of the nails, and temporary or permanent nail loss. LP related to the eyes is rare and may involve the mucous membrane surfaces, resulting in scarring and blindness. Lichen planus of the esophagus is also rare and may cause narrowing of the esophagus or the formation of tight, ringlike bands that make swallowing difficult. Patients who are identified in the dental office as having LP should be asked if they have any areas of itchiness, pain, burning, redness, or rashes elsewhere systemically. Should they indicate yes, referral to their physician is appropriate as treatment

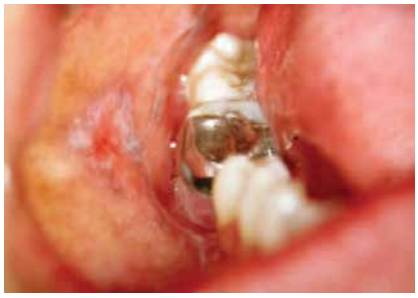

FIGURE 11: A lichenoid lesion on the buccal mucosa that resembles lichen planus

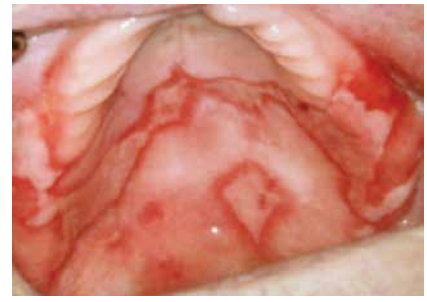

FIGURE 12: Lichenoid lesions on the hard and soft palate

requires a systemic approach.

TREATMENT

Oral lichen planus is a chronic condition with no cure; treatment focuses on helping severe lesions heal and reducing pain or other discomfort. If no pain or discomfort is present, treatment may not be required, and monitoring the condition for tissue changes may be all that is indicated. Those patients with more severe symptoms may require one or more types of treatment to improve their condition and make them more comfortable.

Symptomatic treatment with topical numbing agents may be used to provide temporary relief for areas that are particularly painful. When the area is localized, topical anesthetic gels applied with a clean cotton swab are the best treatment. But when LP covers larger areas of the mouth, topical anesthetic rinses are easier and more effective for the patient to use as needed. Corticosteroids may reduce inflammation related to oral lichen planus and may be used in various forms. Topical mouthwash, ointment, or gel is applied directly to the mucous membrane. This is the preferred method, as the patient is able to use as needed at home. Topical corticosteroids continue to be widely utilized as a first-line therapy for LP.[53] High-potency topical steroids are considered to be the most effective strategy for reducing symptoms and minimizing the disease in those with severe pathology.[54] High-potency topical corticosteroid treatments include 0.05% creams or ointments: clobetasol (Temovate), fluocinonide (Lidex), and halobetasol (Ultravate). When broader coverage is required, a vacuform stent can be fabricated and used like a bleaching/fluoride tray to maintain gel contact with the affected tissue. Clobetasol propionate and fluocinonide are also available in a 0.05% solution, but are FDA recommended to be used externally only because of the possibility of hypothalamus-pituitary-adrenal inhibition.[55,56] Corticosteroid gels may be mixed by the pharmacist with equal parts of topical anesthetic (Orabase) to make an adhesive paste with inflammation-reducing effects (corticosteroid) and topical anesthetic properties for application to small- or medium-sized lesions.[57]

Dexamethasone, another potent corticosteroid, is effective in treating generalized erosive or ulcerative lesions and is prescribed as an oral rinse. The patient is instructed to swish with a small volume (tablespoon) and hold in the mouth for a minute or longer before swallowing to maximize the effects on the tissue it contacts. This is used three or four times daily for maximum benefit and is prescribed as follows:[58]

1. Dexamethasone (Decadron) elixir 0.5 mg/5 ml; disp: 320 ml; sig: first three days, rinse with one tablespoonful (15 ml) qid and swallow. Then, next three days, rinse with one teaspoonful (5 ml) qid and swallow. Then, for three days, rinse with one teaspoonful (5 ml) qid and alternate swallowing with expectorating. Then, final three days, rinse with one teaspoonful (5 ml) qid and expectorate.
2. For milder cases: Dexamethasone elixir 0.5 mg/5 ml; disp: 100 ml; sig: rinse with one teaspoonful (5 ml) for three to four minutes qid and expectorate; discontinue when lesions become asymptomatic.

For severe cases of erosive LP or for those patients who are not responding well to topical approaches, a systemic pill form may be used. If a systemic corticosteroid is considered, it should be prescribed at the lowest possible dosage and only for a short period of time. There are a number of prescribing regimens that are effective, such as:

1. Prednisone tablets, 5 mg; disp: 40 tabs; sig: take five tablets in the morning for five days, then five tablets in the morning every other day until gone.
2. Alternatively: Medrol dose pack; disp: one pack; sig: take as pack directs (six tabs first day, five tabs second day, four tabs third day, three tabs fourth day, two tabs fifth day, and one tab on the last day).

Any patient using corticosteroids should be monitored for the emergence of a yeast (candidiasis) or fungal infection that can occur with topical or systemic use of any corticosteroid-type drug. With the use of systemic corticosteroid medicines, the yeast infection may occur elsewhere in the system. The patient should be warned that any irritation or burning sensation that arises elsewhere on their body during treatment should be brought to the doctor's attention for appropriate intervention. If the LP patient is prone to fungal infections or has experienced a candida infection in the past following steroid administration, prophylactic antifungal therapy should be pursued as concurrent therapy. During treatment with the corticosteroids (topical or systemic), the patient should be scheduled for regular follow-up visits to check for secondary oral infections and receive treatment, or with their physician for nonoral yeast infections.

In patients with lichenoid lesions caused by hypersensitivity to amalgam or other restorative materials, or for those with lesions that suggest a lichenoid drug reaction, treatment should consist of removal of the associated material and replacement with an alternative material or discontinuation of the offending medication under the guidance of the patient's physician.

The medications associated with lichenoid drug reactions include: antihypertensives, including beta-blockers, angiotensin-converting enzyme (ACE) inhibitors, and diuretics; antibiotics (such

as penicillin, aminosalicylate sodium, isoniazid rifampin, streptomycin, and tetracyclines); nonsteroidal anti-inflammatories (NSAIDs); oral hypoglycemic agents; antiretroviral medications; antimalarials (such as hydroxychloroquine); anticonvulsants (such as carbamazepine, oxcarbazepine, phenytoin, valproate); antidiarrheals (such as bismuth); antifungals (such as amphotericin B and ketoconazole); and antihistamines (such as cimetidine, cinnarizine, and triprolidine). Medication-related lichenoid reactions tend to be widespread over the mucosa, while those associated with dental restorative materials are confined to mucosa that is in close contact with the material.[59,60]

NONPHARMACOLOGICAL TREATMENT MODALITIES

Pain is what frequently causes the patient to present to the dental office; management of that aspect is the key to patient comfort as the condition resolves over what may be weeks or several months. As has been outlined, use of topical anesthetics may help manage minor pain associated with LP, but for those patients who have moderate to severe pain that hampers daily activities, topical anesthetics will not provide adequate relief.

Lasers have been supported in the literature for treatment of painful oral areas, utilizing low-level laser therapy (LLLT). LLLT is a noncontact treatment modality using laser energy for photodynamic therapy (PDT) of LP to improve quality of life by elimination of pain associated with the condition.[61] A systematic review compared the efficacy of PDT to topical corticosteroids.[62] A laser wavelength between 420 nm and 660 nm, with an irridation duration of 30 seconds to 10 minutes, and power 10-500 mW/cm^2 was found to be effective in the management of symptomatic LP. Two studies in the review reported PDT to be as effective as corticosteroids; one study reported a better efficacy of PDT compared to corticosteroids; and two studies found PDT to be inferior to corticosteroids. This is supported by similar studies.[63] Further study is indicated, but this mode of treatment may aid in patient comfort and can be combined with topical corticosteroid use for maximum benefit.[64,65] LLLT seems to be a reliable alternative to corticosteroids for treating LP without the adverse effects associated with the pharmacological method and may be considered in those patients for whom corticosteroid use is either contraindicated or will cause side effects that would further compromise them.[66]

LLLT has also been reported as an effective treatment in patients who present with erosive LP in speeding healing of the lesions while improving comfort during the course of the disease.[67] Improved treatment has been reported utilizing methylene blue dye on the affected tissue, and then use of LLLT to provide more effective pain reduction and lesion regression than with use of only the laser without the dye.[68] Laser use has been reported as an effective and harmless modality for management of erosive-atrophic LP.[69] Additionally, it may be used as an alternative to corticosteroid use.[70] Platelet-rich plasma (PRP) has been proposed after the failure of conventional therapies based on the use of topical and systemic corticosteroids and LLLT. PRP provides growth factors, such as epidermal growth factor (EGF), fibroblast growth factor (FGF), and keratinocyte growth factor (KGF). As LP is a disease that affects the oral mucosa chronically, it frequently worsens the patient's quality of life, particularly when clinical manifestations are of the erosive/ulcerative type. PRP has been reported as an alternative treatment when patients with LP do not respond to conventional therapies, or when conventional treatments have contraindications or side effects.[71,72]

Laser treatment of LP is a noncontact application and may be utilized with different types of lasers in the dental office. Diode lasers have become a standard item in many dental offices. This type of laser has been reported to be effective in treatment of LP and improving healing and patient comfort.[73] Lasers may be used alone or in conjunction with topical corticosteroids and appear to augment their individual benefits.[74] Toluidine blue has been reported to enhance the effectiveness of the diode laser and may be considered for improving healing and pain modulation, especially when treating erosive LP cases.[75] The Er:YAG laser has been reported to offer several advantages, including a rapid healing process with a very low level of discomfort during and after treatment, and a rapid disappearance of symptoms.[76] As an alternative, the Nd:YAG laser is an effective modality that can be used safely in the management of erosive-atrophic LP.[77,78] CO_2 lasers have also been reported as an effective treatment for erosive LP and may be considered if available in the office.[79]

Key with any laser used to treat LP is that the tip (energy) is not focused on the tissue and is used in a noncontact technique with the tip constantly moving in a paintbrush motion to avoid tissue damage or discomfort. Should the patient indicate sensation using LLLT, the tip should be moved farther from the tissue. If this does not improve treatment comfort, then decreasing the energy output is recommended. Patients will typically report a decrease in discomfort immediately following treatment, but discomfort may not be eliminated fully after a single treatment. The patient may be re-treated after a few days to a week if required to improve comfort. It is advised to have the patient return after a week to monitor site healing, and at that time additional LLLT may be performed if necessary.

CONCLUSION

Eating, drinking, and oral hygiene procedures may be painful in patients with LP, resulting in reduced quality of life. Patients with LP may report a burning sensation or pain in the area that may bleed or become irritated with toothbrushing. Painful, thickened patches may be present on the tongue, and patients may have discomfort speaking, chewing, and swallowing. This may lead to weight loss and nutritional deficiencies. Scarring may occur with the erosive form of LP, and secondary oral yeast or fungal infections may result. Increased stress and anxiety may result when the discomfort affects daily activities and can lead to depression. Dental professionals are likely to encounter one or more cases of LP during clinical practice and may be the first health-care professional the patient seeks for treatment. It is important that dental professionals are able to identify

the different forms of LP and monitor the lesions to identify and treat any dysplastic changes that may occur to avoid worsening of a cancerous situation. As the erosive/ulcerative LP form will require direct clinical intervention due to the discomfort associated with it, the various treatments described should be considered to improve patient comfort and aid in healing.

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QUESTIONS

1. Which group is most prone to lichen planus?
A. Children
B. Females
C. Males
D. All are equally affected

2. Which form of lichen planus is most frequently encountered?
A. Reticular
B. Bullous
C. Erosive
D. Atrophic

3. Which is not a form of lichen planus?
A. Reticular
B. Atrophic
C. Erosive
D. Lichenoid

4. Wickham's striae are associated with which form of lichen planus?
A. Reticular
B. Bullous
C. Erosive
D. Atrophic

5. Dysplastic transformation is reported to occur in what percent of cases of lichen planus?
A. 1%
B. 2.3%
C. 3.7%
D. 4.1%

6. White lacy lines are indicative of which form of lichen planus?
A. Reticular
B. Atrophic
C. Bullous
D. Erosive

7. Ulcerations are indicative of which form of lichen planus?
A. Reticular
B. Atrophic
C. Bullous
D. Erosive

8. Vesicles are indicative of which form of lichen planus?
A. Reticular
B. Atrophic
C. Bullous
D. Erosive

9. Presence of a pale plaque is indicative of which form of lichen planus?
A. Reticular
B. Atrophic
C. Bullous
D. Erosive

10. The reticular form undergoes spontaneous remission in what percent of cases?
A. 10%
B. 30%
C. 40%
D. 60%

11. Which area of the mouth has the highest incidence of lichen planus?
A. Tongue
B. Gingiva
C. Lips
D. Buccal mucosa

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QUESTIONS

12. What has been identified as the main etiological factor with lichen planus?
A. Prolonged emotional stress
B. Nutritional deficiency
C. Age
D. Hereditary

13. Experts feel that lichen planus is:
A. Hereditary
B. Autoimmune, affecting epithelial cells
C. Autoimmune, affecting vascular cells
D. Environmental

14. Oral lichen planus is considered by the World Health Organization (WHO) to be a:
A. Premalignant condition
B. Malignant condition
C. Hereditary condition
D. Psychosomatic condition

15. What percentage of all lichen planus cases are found in women?
A. 37.5%
B. 47.5%
C. 57.5%
D. 67.5%

16. Lichen planus treatment is geared toward:
A. Comfort management
B. Elimination of the condition
C. Diet management
D. Infection management

17. The erosive/ulcerative form of LP is associated with all of the following except:
A. Significant inflammation
B. Moderate to severe pain
C. Tissue erosion
D. Wickham's striae

18. Current treatment for erosive lichen planus utilizes pharmacotherapy to suppress all but:
A. Cell replication
B. Immune function
C. Pain
D. Inflammation

19. Which statement is not true?
A. Lichen planus is noncurable.
B. Lichen planus has periods of remission and recurrence.
C. Lichen planus does not recur once it resolves.
D. Lichen planus is a premalignant condition.

20. Treatment of erosive lichen planus may include:
A. Pain management
B. Corticosteroid topical application
C. Systemic corticosteroid use
D. All of the above

21. Skin lesions with lichen planus appear as:
A. Flat purplish areas
B. White raised areas
C. Red raised areas
D. Depressed areas

22. Lichen planus is:
A. Communicable
B. Noncommunicable
C. A common ailment
D. Infection related

23. What age range is most prone to develop lichen planus?
A. 20-40
B. 30-50
C. 40-60
D. 50-70

24. Lichen planus of the esophagus may lead to:
A. Voice changes
B. Difficulty swallowing
C. Breathing issues
D. Thyroid issues

25. Treatment of pain related to erosive lichen planus may include all but the following:
A. Topical anesthetic gel
B. Topical anesthetic rinses
C. Corticosteroid rinses
D. Corticosteroid topical gel with Orabase

26. What is the dosage of dexamethasone rinse prescribed?
A. 0.5 mg/1 ml
B. 0.5 mg/5 ml
C. 1.0 mg/1 ml
D. 1.0 mg/5 ml

27. Use of corticosteroids has the potential for all but which of the following?
A. Yeast infection
B. Fungal infection
C. Bacterial infection
D. Autoimmune reaction

28. Lichenoid reaction may be caused by:
A. Amalgam
B. Composite
C. Acrylic
D. All of the above

29. When treating pain associated with erosive lichen planus with the laser, which is contraindicated?
A. Noncontact with tissue
B. Contact with the tissue
C. The laser tip is kept in motion
D. A paintbrush motion is used

30. Which lasers can be used for LLLT when treating lichen planus?
A. Diode
B. Er:YAG
C. Nd:YAG
D. All of the above

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ANSWER SHEET

Oral lichen planus: Identification and management, 2nd edition

Name: Title: Specialty:

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EDUCATIONAL OBJECTIVES

1. Identify the clinical presentation of oral lichen planus
2. Identify the different forms of lichen planus and differentiate them from lichenoid reaction
3. Understand how to treat lichen planus and manage patient comfort
4. Identify interventions discussed in the literature that are supported by limited evidence

COURSE EVALUATION

1. Were the individual course objectives met?

Objective #1: Yes No Objective #2: Yes No

Objective #3: Yes No Objective #4: Yes No

Please evaluate this course by responding to the following statements, using a scale of Excellent = 5 to Poor = 0.

2. To what extent were the course objectives accomplished overall?	5	4	3	2	1	0
3. Please rate your personal mastery of the course objectives.	5	4	3	2	1	0
4. How would you rate the objectives and educational methods?	5	4	3	2	1	0
5. How do you rate the author's grasp of the topic?	5	4	3	2	1	0
6. Please rate the instructor's effectiveness.	5	4	3	2	1	0
7. Was the overall administration of the course effective?	5	4	3	2	1	0
8. Please rate the usefulness and clinical applicability of this course.	5	4	3	2	1	0
9. Please rate the usefulness of the supplemental webliography.	5	4	3	2	1	0

10. Do you feel that the references were adequate? Yes No

11. Would you participate in a similar program on a different topic? Yes No

12. If any of the continuing education questions were unclear or ambiguous, please list them.

_____

13. Was there any subject matter you found confusing? Please describe.

_____

14. How long did it take you to complete this course?

_____

15. What additional continuing dental education topics would you like to see?

_____

Mail/fax completed answer sheet to:

Endeavor Business Media
Attn: Dental division
7666 E. 61st St. Suite 230, Tulsa, OK 74133
Fax: (918) 831-9804

☐ Payment of $59 is enclosed.
Make check payable to Endeavor Business Media

If paying by credit card, please complete the following: ☐MC ☐Visa ☐AmEx ☐Discover

Acct. number: _____

Exp. date: _____ CVC #: _____

Billing address: _____

_____

Charges on your statement will show up as PennWell / Endeavor.

1.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		16.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
2.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		17.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
3.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		18.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
4.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		19.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
5.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		20.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
6.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		21.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
7.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		22.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
8.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		23.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
9.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		24.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
10.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		25.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
11.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		26.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
12.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		27.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
13.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		28.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
14.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		29.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
15.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		30.	Ⓐ	Ⓑ	Ⓒ	Ⓓ

PLEASE PHOTOCOPY ANSWER SHEET FOR ADDITIONAL PARTICIPANTS.

INSTRUCTIONS

All questions have only one answer. If mailed or faxed, grading of this examination is done manually. Participants will receive confirmation of passing by receipt of a Verification of Participation form. The form will be mailed within two weeks after receipt of an examination.

COURSE EVALUATION AND FEEDBACK

We encourage participant feedback. Complete the evaluation above and e-mail additional feedback to Aileen Southerland (asoutherland@endeavorb2b.com) and Laura Winfield (lwinfield@endeavorb2b.com).

COURSE CREDITS AND COST

All participants scoring 70% or higher on the examination will receive a verification form for three (3) continuing education (CE) credits. Participants are urged to contact their state dental boards for CE requirements. The cost for courses ranges from $20 to $110.

PROVIDER INFORMATION

Endeavor Business Media is an ADA CERP–recognized provider. ADA CERP is a service of the American Dental Association to assist dental professionals in identifying quality providers of continuing dental education. ADA CERP neither approves nor endorses individual courses or instructors, nor does it imply acceptance of credit hours by boards of dentistry. Concerns about a CE provider may be directed to the provider or to ADA CERP at ada.org/gotocerp.

Endeavor Business Media is designated as an approved PACE program provider by the Academy of General Dentistry. The formal continuing dental education programs of this program provider are accepted by the AGD for fellowship, mastership, and membership maintenance credit. Approval does not imply acceptance by a state or provincial board of dentistry or AGD endorsement. The current term of approval extends from 11/1/2019 to 10/31/2022. Provider ID# 320452. AGD code: 730.

Dental Board of California: Provider RP5933. Course registration number CA code: 03-5933-21004. Expires 7/31/2022. "This course meets the Dental Board of California's requirements for three (3) units of continuing education."

Endeavor Business Media is designated as an approved provider by the American Academy of Dental Hygiene Inc. #AADHPNW (January 1, 2021 - December 31, 2022). Approval does not imply acceptance by a state or provincial board of dentistry. Licensee should maintain this document in the event of an audit.

RECORD KEEPING

Endeavor Business Media maintains records of your successful completion of any exam for a minimum of six years. Please contact our offices for a copy of your CE credits report. This report, which will list all credits earned to date, will be generated and mailed to you within five business days of receipt.

CANCELLATION AND REFUND POLICY

Participants who are not 100% satisfied can request a refund by contacting Endeavor Business Media in writing.

IMAGE AUTHENTICITY

The images in this educational activity have not been altered..