

Angular Cheilitis, Part 1: Local Etiologies

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Angular cheilitis (AC) is a common condition characterized by erythema, moist maceration, ulceration, and crusting at the corners of the mouth. This article focuses on the common local factors that act alone and in combination to produce AC. These factors are categorized as irritant, allergic, and infectious causes. Identifying the underlying etiology of AC is a critical step in developing an effective treatment plan for this condition.

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Angular cheilitis (AC), also known as angular cheilosis, commissural cheilitis, angular stomatitis, or perlèche (from the French term *pourlècher* [to lick one's lips]), is characterized by inflammation of the vermilion commissures and adjacent mucous membranes.¹ Initially, the corners of the mouth show a grayish white thickening with adjacent erythema. Acute AC can quickly evolve with worsening erythema, moist maceration, ulceration, and crust formation. In cases of long-term AC, granulation tissue forms and the adjacent skin often shows a scaly dermatitis.² Patients report associated soreness, pain, burning, or pruritus. Angular cheilitis can be unilateral or bilateral and occurs most commonly in the third, fifth, and sixth decades of life.³ It accounts for 0.7% to 3.8% of all oral mucosal lesions in adults and 0.2% to 15.1% of oral lesions in children.⁴⁻¹⁰ Angular

cheilitis can evolve into diffuse cheilitis involving the entire surface of the upper and lower lips.

Studies focusing on the prevalence of AC and its etiologies are limited, but experience suggests that AC is associated with a variety of local and systemic factors that act alone and in combination. Local factors (irritant, allergic, or infectious) are the most common. The centerpiece of initial treatment is to neutralize the impact of specific local factors on the barrier function at this anatomic site to mitigate what can become a chronic refractory condition.

Irritant Contact Dermatitis

Angular cheilitis was shown to be related to irritants in 22% of cases in one study (N=156).³ The skin at the corner of the mouth is subject to maceration and digestion from salivary enzyme stasis with resultant inflammatory/irritant changes of greater severity than elsewhere on the lips where saliva contacts the skin for shorter periods of time.¹¹ These enzymes include amylase, maltase, lipase, catalase, sulfatase, hexokinase, carbonic anhydrase, and others.¹ Prolonged contact with these irritants is commonly associated with the anatomical changes that produce a deeper than normal fold of skin at the corners of the mouth (Table 1). Any factor that

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Figure 1. An 80-year-old woman with angular (irritant) cheilitis demonstrated loss of vertical dimension of the mouth due to overclosure, chronic sun damage, and a long history of cigarette smoking.

Table 1.

Irritant Contact Dermatitis Causing Angular Cheilitis

Category	Etiology ^a	Treatment
Anatomical: modifications that facilitate increased exposure to irritant(s); common in elderly, debilitated, and/or malnourished patients	Reduced vertical dimension, loss of facial support	Decrease depth of angular skin fold with fillers or collagen injections
	Abnormal skeletal, tooth, and soft tissue anatomy	Assess need for dentures or prosthetics with follow-up and maintenance, proper positioning of appliances
	Orthodontic/dental appliances	Reassess proper fit, local preventive measures
	Weight loss, solar elastosis	Local preventive measures
Mechanical: redundant behaviors and actions that lead to irritation	Tobacco use	Cessation of tobacco use
	Trauma (eg, dental flossing)	Switch to waxed dental floss and do not open mouth too widely
	Factitious/psychogenic	Behavior modification, assess underlying psychiatric issues
	Habitual (eg, drooling, excessive salivation, lip licking, gum chewing, onychophagia, thumb or object chewing/sucking)	Behavior modification, local preventive measures
	Dryness from mouth breathing	Behavior modification, adequate moisturization
Chemical: caustic factors leading to irritation	Heat/thermal burns	Avoid trauma
	Saliva (eg, pooling, altered composition, or excessive production)	Local preventive measures
	Dental cleaning, denture cleaners	Warm solutions of denture cleaner followed by thorough rinsing

^aDiagnosed by history and physical examination.

reduces vertical dimension or facial support between the mandible and maxilla leads to overclosure and accentuation of this anatomic condition (Figure 1), which may be a contributing factor in up to 11% of AC in the elderly and up to 18% of AC in denture wearers.^{5,12-14} Loss of vertical dimension also can be associated with edentulousness, tooth migration, the presence of orthodontic appliances, and elastic tissue damage caused by long-term UV light and tobacco use. Clinically, AC due to irritants tends to be long term, bilateral, and associated with periods of relapse and remission.³

Angular cheilitis caused by irritation is especially common in patients with eczema because of their sensitive skin. In addition, drooling, excessive salivation, and/or lip licking, as well as dental cleaning, lollipop sucking, gum chewing, persistent mouth breathing, thumb sucking, chewing or sucking on objects such as pencils or pipes, heat/thermal burns, denture cleaners, and trauma from dental flossing can initiate or aggravate AC. Factitious cheilitis, a psychogenic process produced when anxious individuals lick and/or pick at the lips, also must be considered. It can be unilateral or bilateral and may last for just a few days or persist for months to years.³

Allergic Contact Dermatitis

When allergens come in contact with both the oral mucosa and lips, they often produce cheilitis only.^{1,11} In addition, the presence of irritant AC may predispose patients to a superimposed allergic contact dermatitis due to increased penetration of allergens at this site.¹⁵ Thus a nickel-sensitive patient with oral exposure to nickel-containing orthodontic braces may develop AC rather than diffuse cheilitis or mucositis.¹⁶ Although patch test data involving large series of AC patients are not available, studies in patients with generalized cheilitis reveal up to 22% of cases in the United Kingdom, 25% of cases in Australia, and 34% of cases in Singapore had an allergic basis.¹⁷⁻¹⁹ Generalized cheilitis has been etiologically related to regional allergic reactions to lipstick, toothpaste, acne products, cosmetics, chewing gum, mouthwash, foods, dental appliances, and denture substrates or mercury amalgams (Table 2),^{1,16-22} which is important when confronted with patients with AC because any substance that can cause allergic cheilitis can produce angular involvement as the presenting clinical picture.

Allergic contact dermatitis often is impossible to distinguish from irritant contact dermatitis using

Table 2.

Allergic Contact Dermatitis Causing Angular and Generalized Cheilitis^{1,16-22}

Type	Most Common Allergens	Common Sources/Exposures
Flavorings and fragrances	Cinnamic aldehyde, oak moss, eugenol, isoeugenol, geraniol, methyl cinnamic aldehyde, cinnamic alcohol, anethole, spearmint oil, peppermint, menthol, carvone, propolis, essence of mint, <i>Myroxylon balsamum</i> (balsam of Peru), limonene, aniline dye, azo dye, FD&C yellow 11	Lip gloss, lipstick, lip balm, lip liner, cosmetics/makeup, aftershave, cologne, perfume, toothpaste, chewing gum, toothpicks, foods, ice cream, confectionery, cigarettes, soap, lotion, oral hygiene products, liquors, dentifrices
Metals	Nickel	Orthodontic devices, dentures, dental instruments, lipstick casing, eyeglass frames, jewelry, pencils, pens, musical instruments
	Gold, mercury, palladium	Fillings
	Potassium dichromate, cobalt	Braces, bridges, retainers

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Table 2. (continued)

Type	Most Common Allergens	Common Sources/Exposures
Sunscreens	Benzophenones, <i>p</i> -aminobenzoic acid	Lipstick, lip balm, sunscreen
	Butyl methoxydibenzoylmethane	Self-tanner
	Isopropyl dibenzoylmethane	Foundation
	Phenyl salicylate (salol)	Creams, hair products, lotions
Preservatives, antiseptics, and antioxidants	Propyl gallate	Lipstick, cosmetics, foods
	Formaldehyde	Nail polish
	Quaternium-15	Face powder, blush, facial cleanser, sunscreens
	Octyl gallate	Lipstick, foods
	Propolis	Gum, musical instrument varnish
	Preservative with 2 active ingredients (1,2-dibromo-2,4-dicyanobutan and 2-phenoxyethanol) (methyl dibromo glutaronitrile)	Lotions, cosmetics, sunscreens
	Polyglyceryl-3-di-isostearate, cetostearyl maleate, butylated hydroxyanisole, butylated hydroxytoluene	Lipstick, lip gloss, lip balm, sunscreen, foundation, blush, lip liner, facial moisturizer
Medications	Neomycin sulfate-polymyxin B sulfate, bacitracin, idoxuridine, benzocaine, corticosteroids	Creams, ointments
	Triclosan	Toothpaste, shaving cream, mouthwash
Oral hygiene	Pyrophosphate, azulene, guaiazulene (also see Flavorings and fragrances)	Toothpaste, mouthwash, dental floss
Vehicles, emollients, and sealants	Ricinoleic acid/castor oil, microcrystalline wax	Lipstick, lip balm
	Lanolin (wool wax)	Lip balm, shaving cream, topical medicaments, cosmetics

Type	Most Common Allergens	Common Sources/Exposures
Vehicles, emollients, and sealants (continued)	Colophony	Pharmaceuticals, gum
	Shellac	Pharmaceutical glaze, lipstick sealant, lip cosmetics
	Sodium lauryl sulfate, cocamidopropyl betaine	Toothpaste, shaving foam, cosmetics
	Sesame/sesamin/sesamol	Sunscreen, facial moisturizer, shaving cream, facial cleanser, foodstuffs
Glues and acrylates	<i>p</i> -tert-butylphenol-formaldehyde resin, tosylamide/formaldehyde resin, acrylates, methyl methacrylate monomer and polymers	Bonding agents, nail polish/varnish, acrylic/synthetic nails, nail glue
Rubber products	Rubber (latex and nonlatex)	Gloves, dental dams, rubber bands (braces)
Cigarettes	Formaldehyde, cocoa, menthol, licorice, colophony	Tobacco (smoked and unsmoked), filters, paper

Abbreviation: FD&C, Federal Food, Drug, and Cosmetic Act.

clinical parameters. When AC is presumed to be irritating in nature and efforts to identify and avoid potential allergens are delayed, patients will not improve.¹⁹ As a result, patch testing is of critical importance in patients with a suggestive history or those not responding to initial nonspecific treatment approaches. One study of 146 patients showed that 18% with allergic contact cheilitis reacted only to their own products and to none of the allergens contained in various patch test series.¹⁷

Infectious Etiologies

The fissured inflamed skin of AC often harbors localized *Candida albicans*, *Staphylococcus aureus*, and/or β -hemolytic streptococci overgrowth (Table 3). Although colonization is possible, these infectious agents also can serve as true pathogens.

Candida albicans infection (monilial perlèche) and poor oral hygiene account for 10% of cases of AC, often presenting as a long-term bilateral process with periods of relapse and remission (Figure 2).³ This yeast

organism can be cultured from 93% of active AC lesions, but it also has been cultured in 35% to 37% of cured asymptomatic patients.¹⁵ In fact, healthy individuals are so commonly culture positive to *C albicans* that it is considered normal mouth flora.²³ For this reason, it is recommended that a potassium hydroxide preparation be performed in patients with AC rather than a fungal culture. When pseudohyphae and budding yeast are found, it is likely that *Candida* truly is a pathogen.^{15,24,25} Overt systemic candidosis also can produce commissural involvement and any individual with oropharyngeal or esophageal disease often has candidosis and can present with oral symptoms.²⁶

Staphylococcus aureus is commonly associated with AC, with an isolation rate of 63%; the methicillin-sensitive *S aureus* strain is most prominent.²⁷ β -Hemolytic streptococci also have been cultured from 8% (n=360) to 15% (n=68) of patients.^{28,29}

Recurrent herpes simplex virus most often occurs at the vermilion border of the lip. When this infection occurs at the corner of the mouth, it can resemble

Table 3.

Infectious Causes of Angular Cheilitis

Localized Infections	Diagnosis	Treatment
<i>Candida albicans</i>	KOH (pseudohyphae and spores)	Ketoconazole cream 2% twice daily
<i>Staphylococcus aureus</i> and β -hemolytic streptococci	Bacterial culture and sensitivity	Mupirocin ointment 2% twice daily
Herpes simplex virus	Viral culture or unroof blister for Tzanck preparation and/or direct immunostaining	Systemic (oral): acyclovir, famciclovir, or valacyclovir; topical: penciclovir or acyclovir cream

Abbreviation: KOH, potassium hydroxide.



Figure 2. A 76-year-old woman with angular cheilitis was found to have positive results for *Candida albicans* from a potassium hydroxide preparation and responded to treatment with ketoconazole cream 2% twice daily.

AC, especially after 48 to 72 hours when the vesicles of herpes simplex virus have broken and only crusted lesions remain. A history of multiple recurrences at the same spot over a period of years, each lasting 5 to 7 days, is an important clue to the diagnosis of angular herpes simplex.³⁰

Combinations of Local Factors

Multiple etiologic factors are commonly identified in patients with AC. For example, an elderly debilitated patient may have decreased vertical dimension of the mouth, malnutrition, or xerostomia, and harbor *Candida* or bacterial pathogens that combine to produce chronic AC.

Diagnostic Approach and Management

The initial evaluation of AC targets local factors because treatment focused on these issues most commonly leads to resolution of AC. When approaching the patient with AC, it is necessary to take a careful and complete history noting details of location; duration; history of possible contactants; and exacerbating or alleviating factors, including tobacco usage, UV exposure, drug history, the presence of an immunocompromised state, history of systemic diseases, malnutrition, anemia, gastrointestinal tract disease, and the patient's dental/orthodontic history. Examination of the oral cavity and lower face is important, as poor oral hygiene, presence of dental or orthodontic appliances, skin elasticity, and other skin or mucosal lesions can help determine a specific etiology for AC. Cultures for bacteria and potassium hydroxide preparation for *Candida* may be useful; select patients will require patch testing. Human immunodeficiency virus testing, complete blood cell count, and testing for nutritional deficiencies may be indicated when prompted by findings on history or physical examination and the search for a local etiology has been exhausted.

Local treatment efforts involve simple measures such as improving denture fit and proper cleaning, proper oral hygiene, and the use of salivary substitutes (sialogogues) when needed. These treatments as well as the use of barrier creams (zinc oxide paste) at bedtime may be all that is needed to alleviate AC. Short therapeutic trials utilizing azole antifungal

creams, neomycin sulfate–polymyxin B sulfate, or mupirocin ointments may be appropriate. When loss of vertical dimension of the mouth is present, barrier creams should be continued overnight to decrease irritation that can lead to flares of AC. In addition, if conservative measures are not successful, injection of tissue fillers (eg, bovine or human collagen, cross-linked hyaluronic acid, autologous fat) may be used to decrease the depth of the fold at the corner of the mouth to decrease salivary stasis. Refractory cases should be reexamined to make sure that a nutritional, medicine-related, or systemic underlying etiology that could lead to more specific targeted treatment has not been missed.

This article is the first of a 2-part series. The second part focusing on nutritional, medicine-related, and systemic causes and treatment will appear in a future issue of Cutis®.

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