

Oral Manifestations of Systemic Disease

A clinicopathologic approach to systemic disease presenting in the mouth

Infectious • Mucocutaneous • Hematologic • Other

Dr Abu Suraih Sakhri

MBBS, MD (Pathology)

www.abusuraihsakhri.com

Learning objectives

- Recognize characteristic oral patterns that suggest systemic disease.
- Associate infectious, mucocutaneous, and hematologic disorders with their oral findings.
- Distinguish lesions with similar appearances by location, evolution, and context.
- Use oral findings to formulate — not prematurely confirm — a systemic differential.

Why oral lesions matter

Visible mucosal change



Recognize a characteristic
pattern



Consider systemic
association

An oral lesion can be the first clue to an otherwise unsuspected systemic disorder.

The four major disease groupings

Group	Examples in the source	Common oral signals
Infectious	Scarlet fever; measles; mononucleosis; diphtheria; HIV	Tongue change; enanthema; membrane; opportunistic lesions
Mucocutaneous	Lichen planus; pemphigus; pemphigoid; erythema multiforme	Lacy keratosis; vesicles; erosions
Hematologic	Pancytopenia; acute / monocytic leukemia	Infection; gingival infiltration
Other	Pigment syndromes; drugs; pregnancy; telangiectasia	Pigment; gingival mass/enlargement; vascular spots

Morphology is the first diagnostic language

Appearance	Description	Important source associations
White / red tongue	Papillary prominence $\pm$ white coating	Scarlet fever
Spotty enanthema	Small mucosal spots	Measles
Lacy white keratosis	Reticulate mucosal network	Lichen planus
Vesicles $\rightarrow$ erosion	Ruptured fragile blisters	Pemphigus; pemphigoid
Pigmentation	Melanotic oral discoloration	Addison; hemochromatosis; others

Infection-associated findings

Acute exanthem / throat illness

Scarlet fever: Striking tongue changes

Measles: Koplik spots; Enanthema

Mononucleosis: Pharyngitis; Petechiae

Diphtheria: Tough fibrinosuppurative membrane

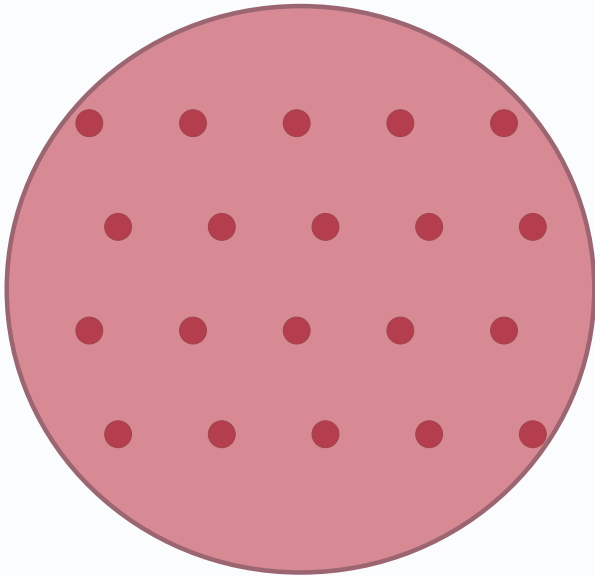
Immune dysfunction

HIV: Opportunistic oral infection

Hairy leukoplakia may signal immunosuppression

Kaposi sarcoma may affect oral tissues

Scarlet fever: Altered tongue papillae



Conceptual schematic — not a clinical image

Recognition and interpretation

- Fiery red tongue with prominent papillae is described as a raspberry tongue.
- A white-coated tongue with projecting hyperemic papillae is called a strawberry tongue.
- The conspicuous papillae provide the principal visual clue.

Raspberry tongue versus strawberry tongue

Raspberry tongue

Fiery red tongue

Papillae become visually prominent

No white coating required by the definition

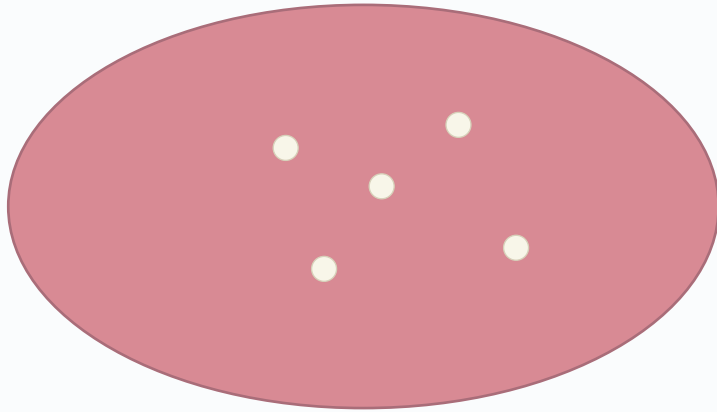
Strawberry tongue

White-coated dorsum

Hyperemic papillae project through coating

Two appearances associated with scarlet fever

Measles: Koplik spots



Conceptual schematic — not a clinical image

Recognition and interpretation

- Spotty oral enanthema can precede the cutaneous eruption.
- Koplik spots are described as buccal mucosal ulcerations near Stensen duct.
- Anatomic localization helps distinguish this finding from diffuse oral lesions.

Measles: Oral findings can precede skin signs

Oral enanthema



Recognize buccal Koplik
spots



Skin rash may follow

The oral examination can contribute to early syndromic recognition.

Infectious mononucleosis: Throat findings

- Acute pharyngitis and tonsillitis are characteristic listed associations.
- Tonsils may be coated by a gray-white exudative membrane.
- The oral examination should be integrated with the neck-node findings.

Mononucleosis: Anatomic pattern

Oropharynx

Acute pharyngitis

Exudative tonsillar coating

Gray-white membrane appearance

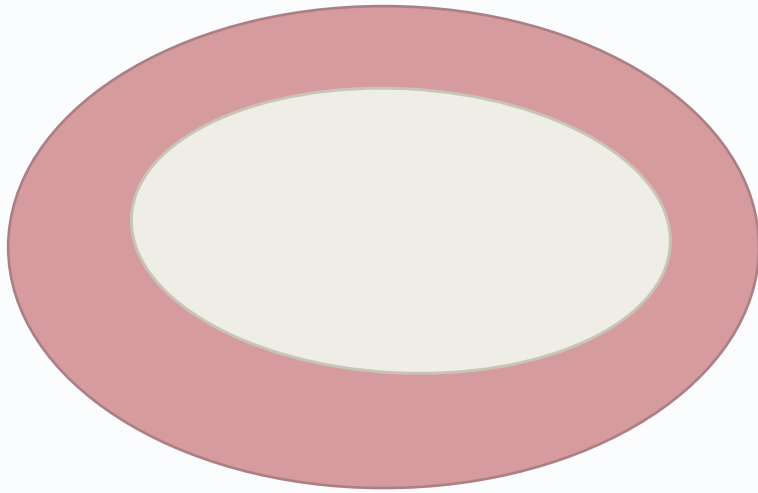
Additional clues

Palatal petechiae

Enlarged cervical lymph nodes

Combined findings strengthen syndromic suspicion

Diphtheria: Tough inflammatory membrane



Conceptual schematic — not a clinical image

Recognition and interpretation

- The source describes a dirty-white membrane over the tonsils and retropharynx.
- The membrane is tough and fibrinosuppurative.
- It is a different descriptive pattern from small mucosal spots or lacy lesions.

Exudates and membranes: Three different contexts

Condition	Source-described oral finding	Discriminating context
Infectious mononucleosis	Gray-white tonsillar exudative coating	Pharyngitis; cervical nodes; palatal petechiae
Diphtheria	Tough, dirty-white tonsillar/retropharyngeal membrane	Characteristic membrane appearance
Oral candidiasis	Gray-white superficial pseudomembrane	Can be scraped off; erythematous base

HIV: Why the oral spectrum is broad

- The source links HIV to susceptibility to opportunistic oral infections.
- Herpesvirus infections and candidiasis are specifically emphasized.
- Oral tumors and EBV-associated epithelial change form additional patterns.

HIV: Opportunistic oral infections

Infectious lesions listed

Herpesvirus-associated oral lesions

Candida infections

Other fungal infections

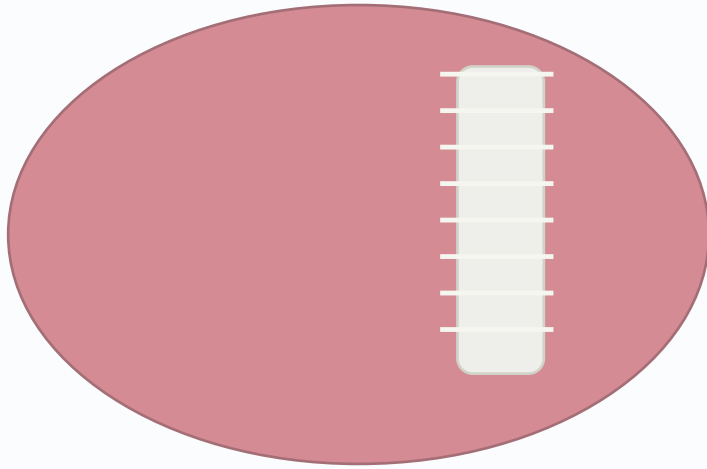
Pathologic interpretation

The oral findings may reflect altered immune defense.

No single opportunistic lesion uniquely establishes HIV.

Clinical and laboratory correlation remains necessary.

Hairy leukoplakia in the systemic-disease context



Conceptual schematic — not a clinical image

Recognition and interpretation

- EBV-associated lesion classically affects the lateral border of the tongue.
- Confluent white hyperkeratotic patches have a fluffy or hairy surface.
- Unlike thrush, the lesion cannot be scraped off.

Hairy leukoplakia versus oral thrush

Hairy leukoplakia

Typically lateral tongue

White, fluffy, hyperkeratotic thickening

Cannot be scraped off

EBV association; Immunocompromise

Pseudomembranous candidiasis

Superficial gray-white membrane

Scrapable; Erythematous base exposed

Candida infection

Can accompany immunosuppression

Infectious systemic diseases: Rapid differentiation

Disease	Oral clue	Additional context
Scarlet fever	Raspberry / strawberry tongue	Papillary prominence
Measles	Koplik spots	Buccal site; enanthema before rash
Mononucleosis	Exudative pharyngotonsillitis	Palatal petechiae; neck nodes
Diphtheria	Tough dirty-white membrane	Tonsillar and retropharyngeal location
HIV-associated disease	Opportunistic infection / other oral lesions	Candida; herpesvirus; Kaposi; EBV

Case reasoning: Febrile oral enanthema

Teaching vignette

A patient with an acute febrile exanthem has small mucosal abnormalities around a parotid duct opening, noted before the skin eruption.

Pattern-based interpretation

Temporal clue: Oral lesion before rash.

Localization: Buccal mucosa at Stensen duct.

Lesion pattern: Localized spots / ulcerations.

Measles-associated Koplik spots

Mucocutaneous diseases: Three dominant patterns

White keratotic change

Lichen planus: Reticular white lines

Some lesions become erosive

May accompany skin disease

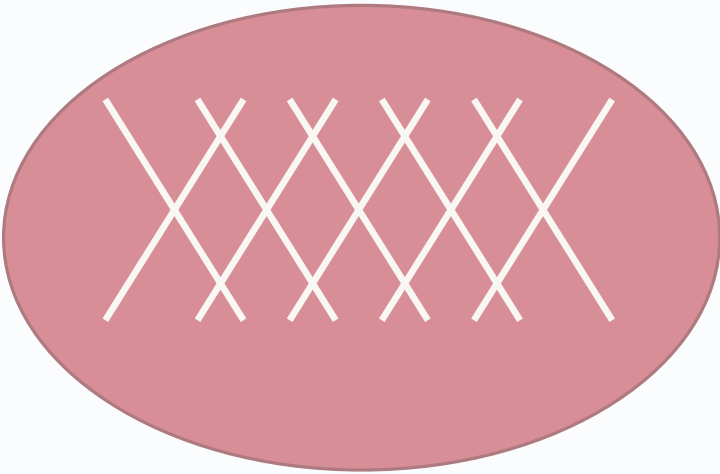
Blistering or erosive change

Pemphigus: Rupture-prone bullae

Pemphigoid: Similar clinical lesions

Erythema multiforme: Vesiculobullous eruption

Oral lichen planus: Reticular keratosis



Conceptual schematic — not a clinical image

Recognition and interpretation

- Reticulate, lacelike white lesions are the classic oral pattern.
- The keratotic lines may coexist with ulceration.
- A minority of cases have bullous change in the source description.

Lichen planus: Reticular versus erosive change

Reticular predominant

Lacelike network of white keratotic lines

White appearance dominates inspection

A morphologic pattern, not a standalone diagnosis

Erosive / ulcerated change

Mucosal surface may ulcerate

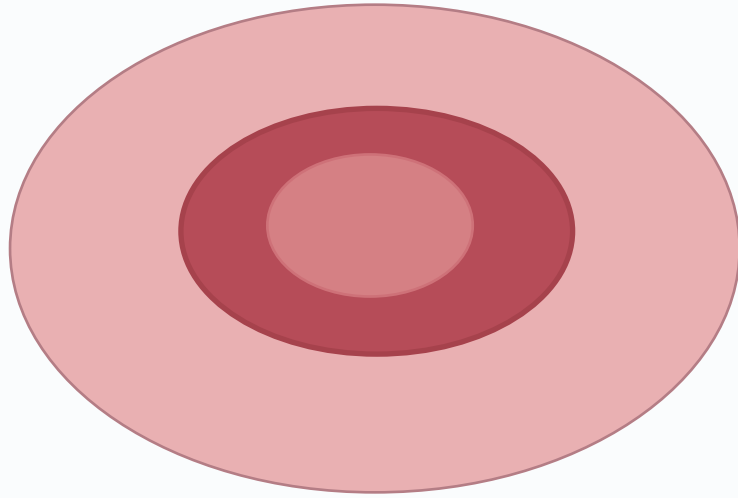
Symptoms or appearance may shift with erosions

Consider the broader clinical context

Skin–mouth relationship in lichen planus

- Oral lesions are reported in more than half of patients with cutaneous lichen planus.
- The textbook characterizes isolated oral involvement as uncommon.
- A skin history can therefore help contextualize the oral morphology.

Pemphigus: Fragile vesicles and bullae



Conceptual schematic — not a clinical image

Recognition and interpretation

- The source emphasizes mucosal vesicles and bullae that rupture readily.
- Rupture leaves hyperemic erosions covered by exudate.
- The observed mouth lesion may therefore be an erosion rather than an intact blister.

Pemphigus: Lesion evolution

Vesicle or bulla



Fragile blister ruptures



Exudate-covered red erosion

Morphologic evolution explains why persistent erosions can dominate the oral examination.

Pemphigoid: Overlapping oral appearance

- Oral lesions in mucous membrane pemphigoid as resembling pemphigus.
- Clinical appearance alone may not distinguish the two disorders.
- Histologic distinction is emphasized.

Pemphigus and pemphigoid: What can be concluded?

Feature	Pemphigus	Mucous membrane pemphigoid
Clinical oral lesions	Fragile vesicles / bullae; erosions	Can resemble pemphigus
Morphology as a discriminator	Insufficient alone	Insufficient alone
Histology	Differentiation required	Differentiation required
Limitation of source extract	No cleavage-plane details	No cleavage-plane details

Erythema multiforme: Mucocutaneous eruption

- The source describes a maculopapular, vesiculobullous eruption.
- Reported contexts include a preceding infection and drug ingestion.
- Cancer and collagen vascular disease are additional listed associations.
- Oral assessment should be interpreted alongside the skin involvement.

Extensive mucocutaneous reactions

Source language

Widespread mucosal and skin involvement to the Stevens–Johnson syndrome term.

This lecture does not use the short table entry to define current SJS classification.

Clinical inference

Extensive, destructive mucosal involvement is a serious presentation.

Recognition and urgent clinical assessment take priority over labeling from appearance alone.

White, bullous and erosive oral patterns

Lesion pattern	Primary association	Important qualification
Lacy white network	Lichen planus	Ulceration is possible
Rupture-prone blister → erosion	Pemphigus	Hyperemic base, exudate
Pemphigus-like oral disease	Mucous membrane pemphigoid	Histology needed to separate
Vesiculobullous mucocutaneous eruption	Erythema multiforme	Context and systemic distribution matter

Case reasoning: Lacelike oral plaques

Teaching vignette

A patient with known cutaneous lesions has intersecting white keratotic streaks in the oral mucosa; Superficial erosions are also noted.

Pattern-based interpretation

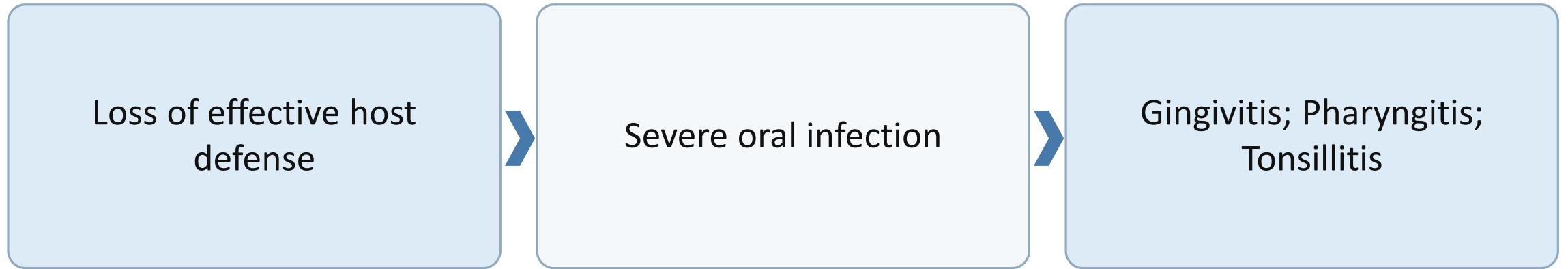
Dominant pattern: Reticular white keratosis.

Possible variant: Associated erosions.

Systemic clue: Cutaneous involvement.

Oral lichen planus pattern

Hematologic disorders: Two mechanisms

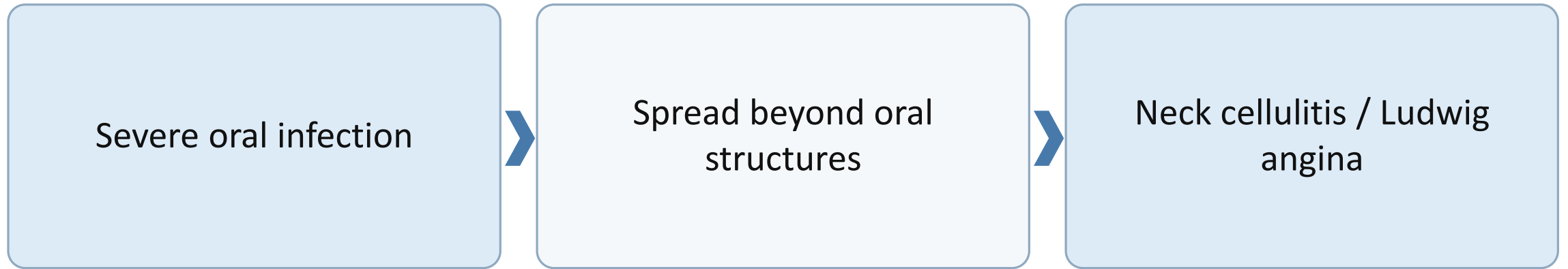


In the hematologic section, gingival enlargement has a different basis: Leukemic infiltration.

Pancytopenia: Oral infection burden

- Agranulocytosis and aplastic anemia are listed under pancytopenic disorders.
- The source describes potentially severe gingivitis, pharyngitis, and tonsillitis.
- The distribution may extend beyond the gingiva and oropharynx.

Pancytopenia: Potential neck extension

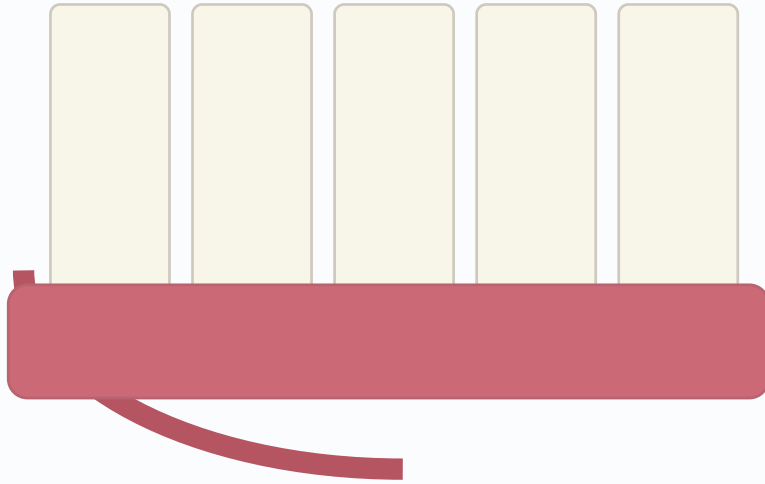


The source explicitly identifies deep neck extension as a potentially serious consequence.

Acute leukemia: Oral findings from host-defense loss

- The source links acute leukemia to depletion of functioning neutrophils.
- Oral lesions can resemble those described in pancytopenia.
- Severe mucosal and oropharyngeal infections are therefore a principal association.

Monocytic leukemia: Gingival infiltration



Conceptual schematic — not a clinical image

Recognition and interpretation

- Leukemic infiltration can enlarge the gingivae.
- Periodontitis frequently accompanies the infiltrative gingival change in the source description.
- This is an enlargement pattern, distinct from the infection-dominant acute leukemia entry.

Hematologic oral findings: Pathologic contrast

Disorder	Principal process	Oral consequence
Pancytopenia / agranulocytosis	Severe infection predisposition	Gingivitis; pharyngitis; tonsillitis
Acute leukemia	Loss of functioning neutrophils	Infections resembling pancytopenia
Monocytic leukemia	Leukemic tissue infiltration	Enlarged gingivae; periodontitis

Case reasoning: Enlarged gingiva in leukemia

Teaching vignette

A patient with a suspected hematologic disorder develops prominent gingival enlargement and concomitant periodontal inflammatory change.

Pattern-based interpretation

Finding: Enlargement, not just ulceration.

Source association: Leukemic infiltration.

Accompanying finding: Periodontitis.

Consider monocytic leukemia

Other systemic or physiologic associations

Pigment and vascular findings

Melanotic mucosal pigmentation: Several systemic diseases

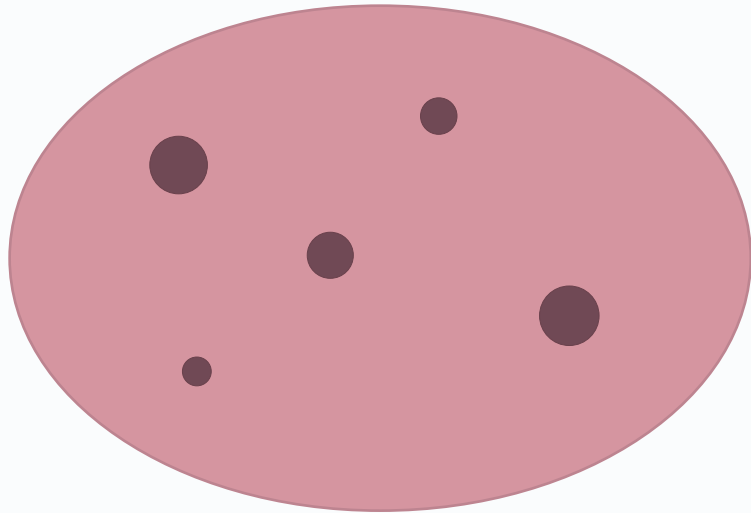
Telangiectasias: Rendu–Osler–Weber syndrome

Gingival proliferations

Phenytoin: Fibrous gingival enlargement

Pregnancy: Gingival pyogenic granuloma

Melanotic oral pigmentation: A systemic clue



Conceptual schematic — not a clinical image

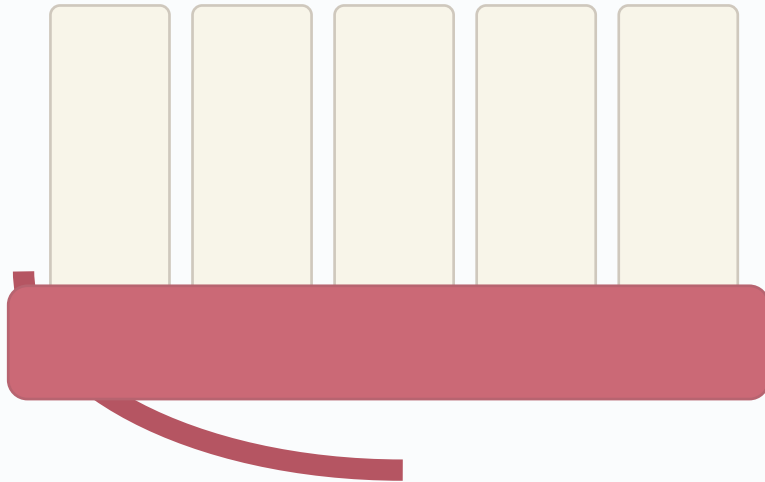
Recognition and interpretation

- The source lists several unrelated diseases with melanotic oral pigmentation.
- Pigmentation by itself is not specific for any one listed condition.
- Associated history and findings determine the differential.

Melanotic pigmentation: Source-listed causes

Systemic association	Oral manifestation	Other detail actually stated
Addison disease	Melanotic pigmentation	None in this oral table
Hemochromatosis	Melanotic pigmentation	None in this oral table
Fibrous dysplasia (Albright syndrome)	Melanotic pigmentation	Bone disorder name
Peutz–Jeghers syndrome	Melanotic pigmentation	Gastrointestinal polyposis

Phenytoin: Fibrous gingival enlargement

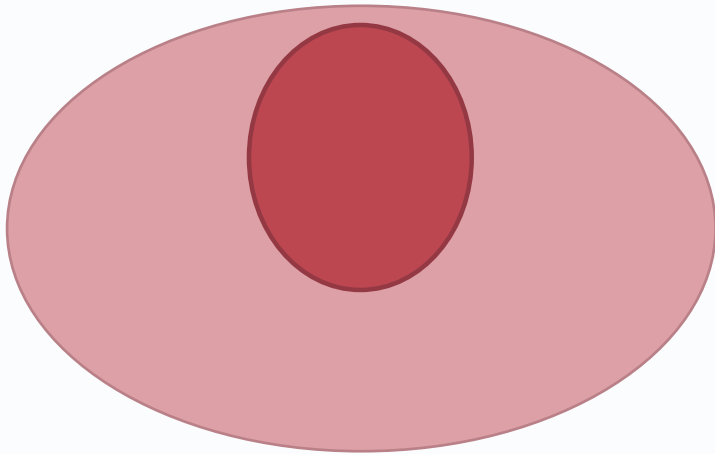


Conceptual schematic — not a clinical image

Recognition and interpretation

- The listed drug association is phenytoin ingestion.
- The characteristic oral change is striking fibrous enlargement of gingivae.
- Medication history is essential when interpreting this lesion type.

Pregnancy-associated pyogenic granuloma

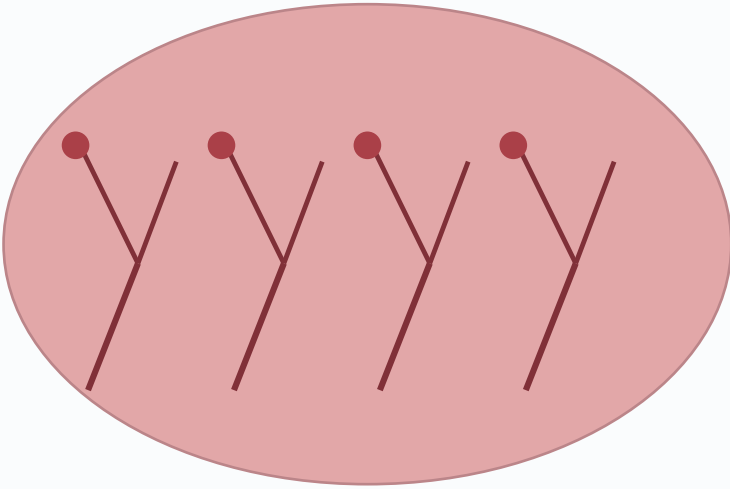


Conceptual schematic — not a clinical image

Recognition and interpretation

- The source describes a pyogenic granuloma projecting from the gingiva.
- It is labeled a pregnancy tumor in the oral-manifestations table.
- A focal gingival mass differs morphologically from diffuse fibrous enlargement.

Hereditary hemorrhagic telangiectasia



Conceptual schematic — not a clinical image

Recognition and interpretation

- Rendu–Osler–Weber syndrome is described as an autosomal dominant disorder.
- Multiple congenital telangiectasias occur beneath the oral and labial mucosa.
- The vascular pattern is distinct from melanotic pigmentation.

Gingival enlargement and masses: Differential

Context	Structural oral change	Dominant clue
Monocytic leukemia	Leukemic gingival infiltration	Enlargement plus periodontitis
Phenytoin ingestion	Fibrous gingival enlargement	Medication exposure
Pregnancy	Protruding pyogenic granuloma	Focal gingival mass

Pigment versus vascular change

Observed feature	Source association	Reasoning limitation
Melanotic pigmentation	Addison / hemochromatosis / Albright / Peutz–Jeghers	Pigment alone does not establish which disease
Multiple telangiectasias	Rendu–Osler–Weber syndrome	Inspect mucosal and lip sites
Gingival mass / enlargement	Pregnancy, phenytoin, leukemia	Assess morphology and context

White oral lesions require pattern discrimination

Syndrome-associated white findings

Mononucleosis: Tonsillar exudate

Diphtheria: Tough membrane

Lichen planus: Lacy keratotic network

In immunosuppression

Thrush: Scrapable white membrane

Hairy leukoplakia: Nonscrapable lateral tongue lesion

Do not equate all white oral lesions with one diagnosis

Oral erosions: The preceding event matters

Primary erosive / bullous patterns

Pemphigus: Rupture-prone vesicles

Pemphigoid: Clinically similar lesions

Erythema multiforme: Mucocutaneous eruption

Other oral inflammatory patterns

Lichen planus: Possible ulceration

Diphtheria: Membrane, not a classic bulla

Measles: Focal buccal abnormalities

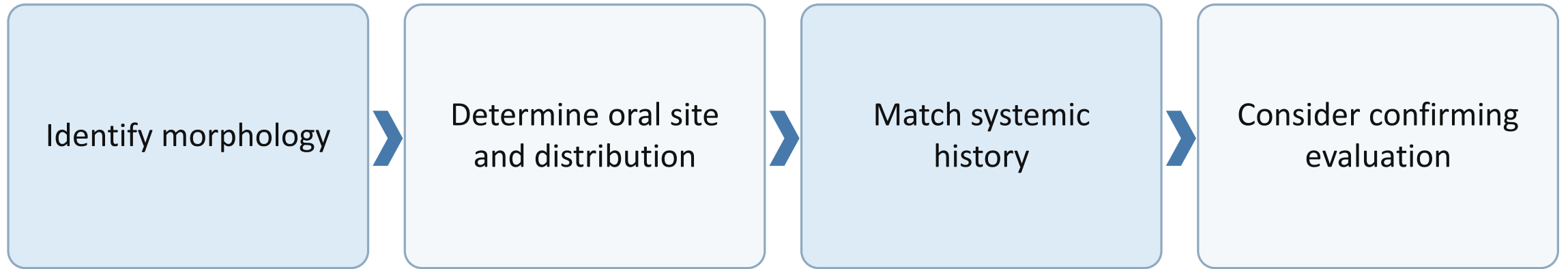
History directs the systemic differential

History domain	Examples suggested by source	Oral findings to inspect
Acute febrile illness	Scarlet fever, measles, mononucleosis	Tongue, buccal mucosa, tonsils
Skin or mucosal disease	Lichen planus, pemphigus, pemphigoid	Reticulation, bullae, erosions
Immune / blood disorder	HIV, pancytopenia, leukemia	Infection, white plaques, gingiva
Medication / pregnancy	Phenytoin, pregnancy	Gingival enlargement or focal mass
Inherited / systemic disorder	Pigment syndromes, HHT	Pigment or telangiectasias

Where to examine: Anatomic targets

Oral site	Characteristic lesions in the source
Dorsal tongue	Raspberry / strawberry tongue
Buccal mucosa near Stensen duct	Measles Koplik spots
Palate	Mononucleosis-related petechiae
Tonsils and retropharynx	Exudate or tough membrane
Lateral border of tongue	EBV-associated hairy leukoplakia
Gingiva	Infections, infiltration, hyperplasia, pregnancy mass

A source-grounded pattern workflow



This is a reasoning framework, not a validated diagnostic algorithm or test-selection guideline.

Case reasoning: Multiple oral pigment spots

Teaching vignette

A patient has unexplained melanotic oral pigmentation. The history mentions gastrointestinal polyposis, but no laboratory data are available.

Pattern-based interpretation

Finding: Melanotic pigmentation.

Context: Gastrointestinal polyposis.

The table contains several pigment-associated disorders.

Peutz–Jeghers association is salient

Case reasoning: Gingival enlargement and medication

Teaching vignette

A patient receiving long-term phenytoin has prominent, broadly enlarged gingivae. The presentation does not describe a discrete exophytic lesion.

Pattern-based interpretation

Morphology: Diffuse fibrous-type enlargement.

Relevant exposure: Phenytoin.

Contrast: Pregnancy-associated focal granuloma.

Phenytoin-associated gingival enlargement

Case reasoning: Widespread oral erosions

Teaching vignette

A patient has painful oral erosions after fragile mucosal blisters rupture. The clinical examination does not reliably define the underlying cleavage level.

Pattern-based interpretation

Evolution: Blister rupture → erosion.

Source association: Pemphigus.

Pemphigoid can resemble it clinically.

**Histopathologic distinction remains
necessary**

Case reasoning: Tonsillar coating and petechiae

Teaching vignette

A patient develops pharyngitis with gray-white tonsillar exudate, small petechiae on the palate, and enlarged cervical nodes.

Pattern-based interpretation

Site: Tonsils and palate.

Pattern: Exudate plus petechiae.

Extraoral clue: Cervical adenopathy.

Infectious mononucleosis pattern

Practical red flags in oral examination

- A tough tonsillar/retropharyngeal membrane deserves prompt clinical assessment.
- Extensive ulceration with concurrent skin disease requires broader mucocutaneous evaluation.
- Severe gingival or pharyngeal infection in a cytopenic patient may spread to the neck.
- Marked unexplained gingival enlargement can reflect systemic hematologic disease.

High-yield pattern-to-systemic association map

Oral phenotype	Priority source-linked associations
Red papillary tongue / white coating	Scarlet fever
Koplik spots / spotty enanthema	Measles
Exudative pharyngitis with palatal petechiae	Infectious mononucleosis
Lacelike keratosis, with or without erosion	Lichen planus
Fragile bullae / erosions	Pemphigus; pemphigoid
Severe oral infections or gingival infiltration	Cytopenia; leukemia
Pigmentation, gingival mass, telangiectasias	Endocrine / hereditary / drug / pregnancy associations

What this source supports — and what it does not

Established from the provided text

Named disease–oral manifestation pairs

Certain characteristic anatomic locations

Some clinical morphology and associations

Potential neck spread in severe oral infection

Not established by this excerpt

Sensitivity, specificity, or disease prevalence

Detailed immunofluorescence or histologic criteria

Formal testing or management algorithms

Current SJS/TEN nosology or staging thresholds

References and source limits

- Textbook: Robbins, Cotran & Kumar, Pathologic Basis of Disease, 11th edition (2026).
- Principal material: the table “Oral Manifestations of Some Systemic Diseases” and accompanying narrative.
- Context: adjacent oral candidiasis and hairy leukoplakia discussions.
- The original chapter PDF and licensed diagnostic photographs were not supplied; all schematics are conceptual, not clinical evidence.