

DISEASES OF THE ORAL CAVITY

A Clinical and Surgical Review for Postgraduate Students

Applied Anatomy & Congenital Anomalies • Mucosal Ulcers & Infections
Cysts & Odontogenic Lesions • Potentially Malignant Disorders
Oral Cavity Cancer: Staging, Surgery & Neck Management
Reconstruction & Adjuvant Therapy • Postoperative Complications

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A concise, examination-oriented text for postgraduate trainees in general surgery, oral and maxillofacial surgery, and ENT–Head & Neck surgery

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Contents

Learning Objectives	3
1. Introduction and Applied Surgical Anatomy	4
2. Developmental and Congenital Anomalies	5
3. Oral Mucosal Ulcers and Inflammatory Conditions	6
4. Infections of the Oral Cavity	7
5. Cysts and Odontogenic Lesions of the Jaws	8
6. Benign Tumours and Tumour-like Lesions of the Oral Cavity	9
7. Potentially Malignant Disorders of the Oral Cavity	10
8. Oral Cavity Cancer: Epidemiology, Aetiology and Risk Factors	11
9. Oral Cavity Cancer: Pathology and Patterns of Spread	12
10. Oral Cavity Cancer: Clinical Assessment and Staging	13
11. Oral Cavity Cancer: Surgical Management of the Primary Tumour	14
12. Oral Cavity Cancer: Management of the Neck	15
13. Reconstruction After Oral Cavity Resection	16
14. Oral Cavity Cancer: Adjuvant Therapy and Multidisciplinary Management	17
15. Complications of Oral Cavity Surgery and Postoperative Care	18
16. Trauma and Miscellaneous Conditions of the Oral Cavity	19
17. Summary of Current Guidelines and Evidence	20
Key Points for Revision	21
Further Reading and Key Sources	22

Learning Objectives

- Describe the applied surgical anatomy of the oral cavity, its subsites, and their patterns of lymphatic drainage.
- Distinguish the oral cavity from the oropharynx and explain why this distinction matters for staging and management.
- Recognise the common developmental, inflammatory, infective, and cystic conditions affecting the oral cavity and jaws.
- Identify the potentially malignant disorders of the oral mucosa and describe their surveillance and management.
- Outline the epidemiology, aetiology, pathology, and patterns of spread of oral cavity squamous cell carcinoma.
- Apply current AJCC staging principles, including the role of depth of invasion, to oral cavity cancer.
- Describe the surgical management of the primary tumour and neck, and the principles of reconstruction.
- Recognise indications for adjuvant therapy and anticipate the complications of oral cavity surgery.

1. Introduction and Applied Surgical Anatomy

The oral cavity extends from the vermilion border of the lips anteriorly to the junction of the hard and soft palate superiorly, and to the line of circumvallate papillae on the tongue posteriorly. This boundary is clinically important: disease posterior to it — the soft palate, tongue base, and tonsils — belongs to the oropharynx and is staged and managed differently. The oral cavity is conventionally divided into named subsites, each with characteristic patterns of spread that guide clinical assessment.

Subsite	Key anatomical and clinical notes
Lip (vermilion)	Most tumours are lower-lip SCC related to sun exposure; drains to submental and submandibular (level I) nodes.
Buccal mucosa	Lining of the cheek; strongly associated with smokeless tobacco and areca nut use; can invade buccinator and, late, the facial skin.
Upper and lower alveolar ridge (gingiva)	Mucosa overlying the tooth-bearing bone; early direct invasion of the maxilla or mandible is characteristic.
Retromolar trigone	Small triangular area behind the last molar; disease here spreads early to the mandible, pterygoid muscles, and skull base.
Floor of mouth	U-shaped area beneath the tongue; thin mucosa overlies the sublingual space, submandibular duct, and lingual nerve, permitting early deep spread.
Hard palate	Bony palate; minor salivary gland tumours are relatively more common here than squamous carcinoma.
Oral (anterior two-thirds) tongue	Mobile tongue anterior to the circumvallate papillae; rich intrinsic musculature allows early deep and perineural spread, and bilateral lymphatic drainage near the midline.

Lymphatic Drainage

Most oral cavity subsites drain predominantly to levels I–III of the neck (submental, submandibular, and upper and mid jugular nodes). The oral tongue and floor of mouth can drain directly to level IV, and midline or near-midline lesions carry a meaningful risk of bilateral or contralateral nodal spread — both facts that influence the extent of elective neck treatment (Chapter 12).

Neurovascular Supply

Sensory innervation is chiefly via the maxillary (V2) and mandibular (V3) divisions of the trigeminal nerve, with the lingual nerve supplying general sensation to the anterior two-thirds of the tongue and floor of mouth. Motor supply to the tongue musculature is via the hypoglossal nerve (XII); the marginal mandibular branch of the facial nerve supplies the lower lip depressors and is at risk during submandibular and neck dissection. Blood supply is chiefly from the lingual and facial arteries, branches of the external carotid artery.

2. Developmental and Congenital Anomalies

- **Cleft lip and palate** — the commonest congenital craniofacial anomaly, arising from failure of fusion of the facial processes; management is multidisciplinary and staged (lip repair in early infancy, palate repair typically by 12–18 months, later alveolar bone grafting and orthodontic/speech input).
- **Ankyloglossia (tongue-tie)** — an abnormally short or tight lingual frenulum restricting tongue mobility; may impair infant feeding or, later, speech articulation, and is treated by frenotomy or frenuloplasty when symptomatic.
- **Fordyce granules** — ectopic sebaceous glands presenting as small, painless yellow-white papules on the buccal mucosa and lips; a normal variant requiring reassurance only.
- **Geographic tongue (benign migratory glossitis)** — irregular, well-demarcated erythematous patches with a white serpiginous border on the dorsal tongue that change in shape and location over time; benign and usually asymptomatic, though it may cause mild soreness with acidic or spicy foods.
- **Torus palatinus and torus mandibularis** — benign bony exostoses of the hard palate midline or lingual mandible respectively; usually asymptomatic incidental findings, excised only if they interfere with denture fitting, speech, or are repeatedly traumatised.

3. Oral Mucosal Ulcers and Inflammatory Conditions

Recurrent Aphthous Stomatitis

The commonest cause of recurrent oral ulceration, classified as minor (<1 cm, heal within 1–2 weeks without scarring, the most common form), major (>1 cm, deep, slow-healing, may scar), and herpetiform (multiple small ulcers that may coalesce). Aetiology is multifactorial; associations include local trauma, stress, nutritional deficiency (iron, folate, B12), and — when ulcers are severe or atypical — systemic disease such as Behçet syndrome, inflammatory bowel disease, or coeliac disease should be considered.

Traumatic Ulceration

Caused by sharp teeth, ill-fitting dentures, cheek or tongue biting, or thermal/chemical injury. A traumatic ulcer should heal within 2 weeks of removing the causative factor; failure to heal mandates biopsy to exclude malignancy.

Vesiculobullous and Immune-mediated Disease

- **Oral lichen planus** — presents as reticular white striae (Wickham striae, usually asymptomatic) or, in erosive/atrophic forms, painful erythematous and ulcerated mucosa; carries a small but real risk of malignant transformation, warranting periodic review.
- **Pemphigus vulgaris** — autoimmune, intraepithelial blistering disease that frequently presents first in the mouth with fragile bullae and erosions; a positive Nikolsky sign (lateral shearing of apparently normal mucosa) supports the diagnosis, confirmed by biopsy with immunofluorescence.
- **Mucous membrane pemphigoid** — subepithelial blistering disease causing oral erosions and, importantly, ocular and other mucosal scarring if untreated.

Red Flags for an Oral Ulcer

Features Requiring Urgent Biopsy

Any ulcer persisting beyond three weeks despite removal of an obvious cause.
Induration, a rolled or everted edge, or a firm base on palpation.
Unexplained bleeding, fixation to deeper structures, or associated cervical lymphadenopathy.
Presence of established risk factors — tobacco, alcohol, or areca nut/betel quid use.
Associated numbness, loosening of teeth, or dysphagia.

4. Infections of the Oral Cavity

Viral Infections

- **Primary herpetic gingivostomatitis** — usually affects young children; painful vesicles and ulcers on the gingiva and oral mucosa with fever and cervical lymphadenopathy, self-limiting but occasionally requires antiviral therapy and hydration support.
- **Recurrent herpes labialis (cold sores)** — reactivation of latent HSV-1 at the mucocutaneous junction of the lip, precipitated by sunlight, stress, or immunosuppression.
- **Hand, foot, and mouth disease** — coxsackievirus infection causing oral ulcers alongside a characteristic hand and foot rash, chiefly in children.

Fungal Infection

Oral candidiasis presents as pseudomembranous (removable white plaques, "thrush"), erythematous (red, often painful mucosa, classically under dentures — denture stomatitis), or chronic hyperplastic (a white patch that does not wipe off and requires biopsy to exclude dysplasia) forms. Predisposing factors include antibiotic or corticosteroid use, diabetes, immunosuppression, dentures, and dry mouth.

Odontogenic Infection and Its Spread

Dental caries and periapical infection are the commonest source of orofacial infection. Untreated, infection can spread along fascial planes into the submandibular, sublingual, submental, parapharyngeal, or masticator spaces, with the potential to progress to a life-threatening deep neck space infection.

Ludwig's Angina — An Airway Emergency

Bilateral, rapidly spreading cellulitis of the submandibular and sublingual spaces, almost always odontogenic in origin, most often from the second or third mandibular molars.

Classic features: brawny, board-like induration of the floor of mouth, elevation and posterior displacement of the tongue, trismus, drooling, and progressive airway compromise.

Management priority is the airway — early anaesthetic and ENT/maxillofacial involvement for a secured airway (awake fibre-optic intubation or, if needed, tracheostomy) before sedation is attempted.

Definitive treatment combines high-dose intravenous antibiotics, surgical decompression/drainage of the affected spaces, and removal of the causative dental source.

5. Cysts and Odontogenic Lesions of the Jaws

Cysts and tumours of odontogenic origin arise from tooth-forming epithelium or ectomesenchyme and are classified as inflammatory or developmental.

Lesion	Key features
Radicular (periapical) cyst	The commonest jaw cyst; inflammatory, arising at the apex of a non-vital tooth secondary to pulp necrosis; usually resolves with root canal treatment or extraction of the causative tooth plus cyst enucleation.
Dentigerous cyst	Developmental cyst enclosing the crown of an unerupted tooth, most often the mandibular third molar; treated by enucleation with removal of the associated tooth.
Odontogenic keratocyst (keratocystic odontogenic tumour)	Locally aggressive with a high recurrence rate after simple enucleation; multiple keratocysts at a young age should raise suspicion of Gorlin (naevoid basal cell carcinoma) syndrome.
Ameloblastoma	Benign but locally aggressive and infiltrative odontogenic tumour; simple curettage carries high recurrence, so wide local or segmental resection with a margin of normal bone is preferred for larger lesions.
Nasopalatine duct cyst	The commonest non-odontogenic developmental cyst, arising in the incisive canal of the anterior maxilla; presents as a palatal or labial swelling.

6. Benign Tumours and Tumour-like Lesions of the Oral Cavity

- **Fibroma (irritation/traumatic fibroma)** — the commonest benign soft tissue lesion of the oral mucosa, a firm, pale, sessile nodule at a site of chronic minor trauma (typically the buccal mucosa along the occlusal line); excised for diagnosis and symptomatic relief.
- **Pyogenic granuloma** — a rapidly growing, highly vascular, friable nodule that bleeds easily; when arising from the gingiva in pregnancy it is termed a "pregnancy epulis" and often regresses after delivery.
- **Squamous papilloma** — a benign, exophytic, cauliflower-like lesion associated with low-risk HPV subtypes; excised for symptom relief and to confirm the diagnosis.
- **Peripheral giant cell granuloma and peripheral ossifying fibroma** — reactive gingival "epulides" arising from periodontal ligament or periosteum; excised with removal of the local irritant.
- **Haemangioma and lymphangioma** — vascular and lymphatic malformations respectively, often present from infancy; management is individualised and may involve observation, propranolol (for problematic infantile haemangioma), sclerotherapy, or surgery.
- **Pleomorphic adenoma of the palate** — the commonest minor salivary gland tumour, presenting as a slow-growing, painless, firm submucosal palatal swelling; managed by excision with a cuff of normal tissue given its risk of recurrence if enucleated (see the companion review of salivary gland disease for full discussion).

7. Potentially Malignant Disorders of the Oral Cavity

Potentially malignant (pre-malignant) disorders carry an increased risk of progression to oral squamous cell carcinoma and require biopsy, dysplasia grading, and structured surveillance.

- **Leukoplakia** — a clinical diagnosis of exclusion: a white patch that cannot be characterised as any other definable lesion. Homogeneous leukoplakia carries a lower malignant transformation risk than non-homogeneous (speckled, nodular, or verrucous) leukoplakia; proliferative verrucous leukoplakia is a distinct, multifocal, treatment-resistant, high-risk variant.
- **Erythroplakia** — a red, velvety patch that cannot be attributed to another cause; far less common than leukoplakia but carries a substantially higher rate of dysplasia or frank carcinoma at biopsy, and must always be biopsied.
- **Oral submucous fibrosis (OSMF)** — a chronic, progressive fibrosing condition of the oral mucosa strongly associated with areca nut and betel quid chewing, common in South Asia; presents with progressive burning sensation, blanching of the mucosa, and progressive trismus from fibrous bands, and is pre-malignant.
- **Erosive/atrophic oral lichen planus** — carries a small but recognised risk of malignant transformation and requires periodic clinical review (see Chapter 3).
- **Actinic cheilitis** — chronic sun-induced change of the lower lip vermilion (dryness, atrophy, blurring of the vermilion border) that is pre-malignant for lip squamous cell carcinoma; management includes sun protection, topical therapy, or vermilionectomy for high-risk change.

Dysplasia Grading and Management

Biopsy of any potentially malignant lesion is graded histologically as mild, moderate, or severe epithelial dysplasia, or carcinoma in situ. Mild dysplasia is often managed with risk-factor modification and surveillance; moderate-to-severe dysplasia generally warrants complete excision, given the progressively higher risk of underlying or subsequent invasive carcinoma.

8. Oral Cavity Cancer: Epidemiology, Aetiology and Risk Factors

Squamous cell carcinoma accounts for more than 90% of oral cavity malignancies. The global burden is disproportionately high in South and South-East Asia, reflecting the prevalence of smokeless tobacco and areca nut/betel quid chewing in these populations — oral cavity cancer is among the leading cancers in this region, in contrast to Western countries, where oropharyngeal HPV-driven disease predominates.

- **Tobacco** — both smoked and smokeless (chewing tobacco, gutka, naswar) forms are major independent risk factors; smokeless tobacco is particularly associated with buccal and gingival cancer.
- **Alcohol** — an independent risk factor that acts synergistically with tobacco, multiplying rather than simply adding to overall risk.
- **Areca nut and betel quid (paan)** — strongly associated with oral submucous fibrosis, leukoplakia, and buccal/gingival carcinoma; frequently combined with tobacco in regional preparations.
- **Human papillomavirus (HPV)** — a well-established driver of oropharyngeal carcinoma but plays a comparatively minor role in true oral cavity cancer.
- **Ultraviolet exposure** — the dominant risk factor for lower lip carcinoma.
- **Chronic mechanical irritation** — sharp teeth, ill-fitting dentures, and poor oral hygiene are contributory rather than primary causal factors.
- **Genetic conditions** — Fanconi anaemia and dyskeratosis congenita are rare but important causes of oral cancer at a young age.

9. Oral Cavity Cancer: Pathology and Patterns of Spread

Conventional squamous cell carcinoma accounts for the great majority of cases. **Verrucous carcinoma** is a well-differentiated, exophytic, warty variant with a low metastatic potential but a propensity for extensive local spread; it is managed primarily by surgery, as radiotherapy has historically been associated with anaplastic transformation in some reports.

Depth of Invasion

Depth of invasion (DOI) — the vertical extent of tumour invasion below the level of the adjacent normal mucosa — is a critical, independently validated prognostic factor for occult nodal metastasis and survival, and is incorporated directly into the T category of the AJCC 8th edition staging system (Chapter 10).

Local Spread by Subsite

- **Oral tongue** — early invasion of intrinsic tongue musculature along muscle bundles and neurovascular planes, often more extensive than surface appearance suggests.
- **Floor of mouth** — early involvement of the sublingual space, submandibular duct, and, with progression, the mandible.
- **Gingiva/alveolus** — direct invasion of the underlying alveolar bone occurs early given the thin overlying mucosa.
- **Buccal mucosa** — can spread through buccinator to involve the buccal fat pad, masticator space, and, in advanced disease, the facial skin.
- **Retromolar trigone** — early spread to the mandible, pterygoid musculature, and, in advanced disease, towards the skull base.

Perineural invasion and lymphovascular invasion are adverse histological features that independently predict local recurrence and nodal or distant metastasis, and both influence decisions on adjuvant therapy (Chapter 14).

10. Oral Cavity Cancer: Clinical Assessment and Staging

Clinical Presentation

- A non-healing ulcer, exophytic growth, or indurated mucosal lesion, often with pain out of proportion to appearance.
- Referred otalgia (via the auriculotemporal or glossopharyngeal nerve), loosening of teeth, ill-fitting dentures, or a non-healing extraction socket.
- Trismus — a particularly significant sign suggesting deep invasion of the masticator muscles or pterygoid plates.
- A palpable neck mass, which may occasionally be the presenting complaint even with a small or occult primary.

Examination and Investigation

Bimanual palpation of the lesion (intraoral finger against an extraoral hand) is essential to assess induration and depth, which cannot be judged by inspection alone. Cranial nerve examination (lingual, hypoglossal, inferior alveolar/mental nerve distribution) and careful neck examination for lymphadenopathy complete the assessment. Incisional biopsy confirms the histological diagnosis. Contrast-enhanced MRI is generally preferred for assessing soft tissue extent, depth of invasion, and perineural spread, while CT better delineates cortical bone invasion; PET-CT is used for staging locally advanced disease and detecting distant metastasis. An orthopantomogram (OPG) assesses mandibular involvement and is also used for pre-treatment dental clearance planning.

AJCC Staging Principles (8th Edition)

T category	Approximate defining features
T1	Tumour ≤2 cm with depth of invasion (DOI) ≤5 mm.
T2	Tumour ≤2 cm with DOI 5–10 mm, or tumour 2–4 cm with DOI ≤10 mm.
T3	Tumour >4 cm, or any tumour with DOI >10 mm.
T4a (moderately advanced local disease)	Invasion of adjacent structures such as cortical bone, deep/extrinsic tongue muscle, maxillary sinus, or facial skin.
T4b (very advanced local disease)	Invasion of the masticator space, pterygoid plates, or skull base, or encasement of the internal carotid artery.

The introduction of depth of invasion into T staging (a key change from the 7th to the 8th edition) reflects its strong, independent association with occult nodal disease. N staging in the 8th edition additionally incorporates the presence of **extranodal extension (ENE)**, which upstages disease and is a major adverse prognostic factor influencing adjuvant treatment decisions (Chapter 14).

11. Oral Cavity Cancer: Surgical Management of the Primary Tumour

Surgery is the mainstay of curative treatment for resectable oral cavity cancer. The principle is wide local excision with an adequate three-dimensional margin — a clinical margin of at least 1 cm is typically targeted, aiming for a histologically clear margin of 5 mm or more, since margin status is one of the strongest determinants of local control and survival.

Mandibular Management

When the tumour approaches but does not directly invade the mandible, a **marginal (rim) mandibulectomy** preserves mandibular continuity while achieving an adequate deep margin. When there is direct bone invasion, a **segmental mandibulectomy**, removing a full-thickness segment of mandible, is required, necessitating bony reconstruction (Chapter 13) to preserve form and function.

Glossectomy

The extent of tongue resection — partial, hemiglossectomy, subtotal, or total glossectomy — is dictated by tumour size and depth. Functional outcome (speech, swallowing, airway protection) is a central consideration in both resection planning and subsequent reconstruction.

Intraoperative Margin Assessment

Frozen section analysis of resection margins at the time of surgery allows immediate re-excision of a close or positive margin where feasible, reducing the likelihood of positive margins on final histology and the consequent need for margin-driven adjuvant chemoradiotherapy.

12. Oral Cavity Cancer: Management of the Neck

The risk of occult (clinically and radiologically undetectable) nodal metastasis in an apparently N0 neck rises significantly once depth of invasion exceeds a threshold of approximately 4 mm, which underpins the widespread recommendation for elective treatment of the N0 neck in all but the most superficial tumours.

- **Elective (selective) neck dissection** — for the clinically/radiologically N0 neck, selective dissection of levels I–III (extending to level IV for oral tongue primaries, given their drainage pattern) is standard, providing both staging information and therapeutic benefit.
- **Therapeutic neck dissection** — for clinically node-positive disease, a modified radical or radical neck dissection is performed, with the extent of preservation of the spinal accessory nerve, internal jugular vein, and sternocleidomastoid muscle guided by the degree of nodal involvement.
- **Sentinel lymph node biopsy** — an emerging, less morbid alternative to elective neck dissection in selected early-stage, clinically N0 oral cancers at experienced centres, allowing pathological nodal staging while sparing a full dissection in node-negative patients.
- **Bilateral neck treatment** — considered for tumours approaching or crossing the midline (particularly floor of mouth and anterior tongue), given the risk of bilateral lymphatic drainage.

Extranodal extension on final histology is one of the strongest adverse prognostic factors identified and is a key trigger for adjuvant concurrent chemoradiotherapy (Chapter 14).

13. Reconstruction After Oral Cavity Resection

Reconstructive goals after oral cavity resection are to restore oral competence, speech, and swallowing, to separate the oral cavity from the neck (preventing salivary fistula and protecting the great vessels), and, where bone is resected, to restore facial contour and enable future dental rehabilitation.

Reconstructive option	Typical use
Primary closure / healing by secondary intention	Small, superficial defects where function and form are not significantly compromised.
Local flaps (buccal fat pad, nasolabial, tongue flaps)	Small-to-moderate defects, particularly of the buccal mucosa or floor of mouth, where regional tissue is available and undamaged.
Pectoralis major myocutaneous flap	A robust regional workhorse flap, especially useful when free tissue transfer is not feasible or as a salvage option; carries a bulkier soft-tissue profile than free flaps.
Radial forearm free flap	Thin, pliable soft tissue well suited to resurfacing the tongue and floor of mouth, preserving mobility.
Fibula free flap	The workhorse for segmental mandibular reconstruction; provides a long segment of vascularised bone suitable for later osseointegrated dental implants.
Anterolateral thigh (ALT) flap	Versatile, larger-volume soft tissue for extensive composite defects, with variable pedicle length and adjustable bulk.

Dental rehabilitation planning — including consideration of osseointegrated implants into a vascularised bony reconstruction — should ideally begin at the time of initial treatment planning rather than as an afterthought, in conjunction with the restorative dental team.

14. Oral Cavity Cancer: Adjuvant Therapy and Multidisciplinary Management

Indications for Adjuvant Radiotherapy

- Advanced pathological T category (pT3/pT4) or close surgical margins.
- Perineural invasion or lymphovascular invasion.
- Multiple positive lymph nodes, or a high depth of invasion.
- Advanced nodal stage on final histology.

Adding Concurrent Chemotherapy

Landmark trials (EORTC 22931 and RTOG 9501) established that adding concurrent platinum-based chemotherapy to adjuvant radiotherapy — that is, adjuvant chemoradiotherapy — improves outcomes specifically when there is a **positive surgical margin and/or extranodal extension**; these two features remain the principal evidence-based indications for escalating from radiotherapy alone to chemoradiotherapy in the adjuvant setting.

The Multidisciplinary Team

Optimal management is delivered through a multidisciplinary head and neck tumour board, involving the head and neck/oral-maxillofacial surgeon, pathologist, radiologist, radiation and medical oncologists, restorative/oncology dentist, speech and language (swallowing) therapist, and dietitian. Pre-treatment dental assessment, with extraction of unsalvageable teeth before radiotherapy, reduces the later risk of osteoradionecrosis.

15. Complications of Oral Cavity Surgery and Postoperative Care

- **Airway compromise** — the most immediate postoperative concern after major resection or flap reconstruction; significant tongue/floor of mouth swelling may require planned tracheostomy or prolonged intubation.
- **Flap compromise** — venous congestion or arterial insufficiency in a free or pedicled flap requires urgent clinical recognition and, where a free flap is threatened, emergency surgical exploration and salvage.
- **Orocutaneous fistula** — breakdown of the closure between the oral cavity and neck, predisposing to salivary contamination and infection; risk is higher with prior radiotherapy, poor nutrition, or wound tension.
- **Wound infection and haematoma** — standard general surgical complications, with particular attention to airway risk from an expanding neck haematoma.
- **Osteoradionecrosis** — a late complication of radiotherapy to the jaws, presenting as exposed, non-healing bone; risk is reduced by pre-treatment dental clearance and managed conservatively (debridement, hyperbaric oxygen in selected cases) through to resection with vascularised reconstruction in advanced disease.
- **Functional sequelae** — dysphagia, aspiration, speech impairment, trismus (from fibrosis or radiotherapy), and lymphoedema are common and benefit from early, structured speech and swallowing therapy and jaw physiotherapy.
- **Nutrition** — enteral feeding (nasogastric or gastrostomy) is frequently required to support healing and maintain nutritional status through the perioperative period and any subsequent radiotherapy.

16. Trauma and Miscellaneous Conditions of the Oral Cavity

- **Dental and alveolar trauma** — avulsed permanent teeth have the best prognosis for successful reimplantation when replanted within 30–60 minutes, stored appropriately (e.g., milk or saline) in the interim.
- **Mandibular and maxillary fractures** — may present with disturbed occlusion, mucosal lacerations, or sublingual haematoma; assessment and fixation are typically shared with oral and maxillofacial surgery.
- **Foreign bodies and chemical/thermal burns** — require careful assessment of the extent of mucosal injury and airway risk, particularly after caustic ingestion.
- **Ranula** — a mucous extravasation cyst of the floor of mouth arising from the sublingual gland, presenting as a soft, bluish swelling; discussed further, alongside sialolithiasis, in the companion review of salivary gland disease.
- **Black hairy tongue** — benign elongation and staining of filiform papillae, associated with smoking, antibiotic use, or poor oral hygiene; managed with tongue hygiene and removal of the precipitant.
- **Median rhomboid glossitis** — a smooth, erythematous, rhomboid-shaped area on the posterior dorsal midline tongue, related to chronic candidal infection; usually asymptomatic and managed conservatively.

17. Summary of Current Guidelines and Evidence

Management recommendations in this review are aligned with the AJCC Cancer Staging Manual, 8th Edition (head and neck section), the NCCN Clinical Practice Guidelines in Oncology for Head and Neck Cancers, and the landmark adjuvant chemoradiotherapy trials EORTC 22931 and RTOG 9501, which together define positive margins and extranodal extension as the principal indications for adjuvant concurrent chemoradiotherapy. Key evidence-based practice points include the incorporation of depth of invasion into T staging, the recommendation for elective neck treatment once depth of invasion exceeds approximately 4 mm, and the central role of a multidisciplinary tumour board in treatment planning.

As with all oncological surgical guidance, recommendations continue to evolve; trainees should confirm current protocol details against the latest published guideline versions and their institutional multidisciplinary policies before applying them in clinical decision-making.

Key Points for Revision

High-Yield Summary

The oral cavity extends from the vermilion border of the lips to the circumvallate papillae of the tongue and the hard–soft palate junction; disease posterior to this is oropharyngeal, not oral cavity, disease.

Any oral ulcer persisting beyond three weeks, or showing induration, a rolled edge, or associated lymphadenopathy, requires biopsy to exclude malignancy.

Ludwig's angina is a bilateral submandibular/sublingual space infection that threatens the airway; airway security takes priority over any other intervention.

Leukoplakia is a diagnosis of exclusion; erythroplakia and non-homogeneous leukoplakia carry a higher malignant transformation risk and must always be biopsied.

Oral submucous fibrosis, strongly linked to areca nut/betel quid use, is premalignant and causes progressive trismus.

Squamous cell carcinoma accounts for over 90% of oral cavity malignancy; tobacco, alcohol, and areca nut/betel quid are the dominant risk factors, with strong synergy between tobacco and alcohol.

Depth of invasion is incorporated into AJCC 8th edition T staging and is a key determinant of the risk of occult nodal metastasis.

Elective treatment of the clinically N0 neck is recommended once depth of invasion exceeds approximately 4 mm.

A clinical margin of at least 1 cm (histological margin ≥ 5 mm) is the surgical target for oral cavity cancer resection; margin status is a major determinant of outcome.

Positive margins and/or extranodal extension are the principal evidence-based indications for adjuvant concurrent chemoradiotherapy rather than radiotherapy alone.

Airway compromise and flap vascular compromise are the most urgent early postoperative complications after major oral cavity cancer surgery.

Further Reading and Key Sources

The following primary sources informed this review and are recommended for deeper study:

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