Management of Mouth Cancer—Screening, Early Diagnosis, and Treatments

Clinical presentation and strategies for early detection of mouth cancer

Mouth cancers vary significantly in their clinical presentation

90%

Oral squamous cell carcinoma (OSCC), which accounts for 90% of all mouth cancers, can present with a wide range of mucosal changes and symptoms, including[1,2]:

- Erythema
- Speckled red/white patch
- Swelling
- Ulceration

OSCC has a poor overall 5-year survival rate ~50–55%[2]

Mucosal abnormalities in the mouth should, therefore, be regarded as suspicious until cancer is ruled out[1,2]

Detection of tumours in their early stages, particularly when small, can help improve patient survival[1]

Mouth cancer can be detected visually and accessed easily compared to other deep tissue cancers, which require extensive imaging or invasive procedures[2]

Frequent and regular screening can aid early detection[2]

Screening and early detection[2]

Screening strategies for asymptomatic individuals

| Population screening | Integrated medical opportunistic screening | Screening of high-risk individuals | Industrial/workplace screening | Mouth self-examination |

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# Detection methods and diagnostic procedures[1,2,3]

Clinical examination
- External – abnormal enlargement or swelling of the neck and mandibular region
- Internal – identification of mucosal abnormalities and induration

Biopsy
- Mucosal biopsy – excisional or incisional
- Punch biopsy – 0.4–0.8 mm small cylindrical part of mucosa, may be insufficient to detect dysplasia or invasion
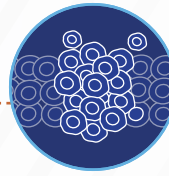
Histopathological analysis
Specific histopathological features assessed to confirm findings post biopsy

Clinical imaging
Ultrasound, computed tomography, positron emission tomography, or magnetic resonance imaging

Adjunct non-invasive and point-of-care detection methods[1,3]

Optical imaging technologies and tissue autofluorescence devices

Vital rinsing with toluidine blue

Liquid biopsy or 'Salivaomics'—screening of candidate saliva biomarkers relevant to mouth cancer

Further studies are needed to establish the accuracy of adjunctive tests in primary care settings

Artificial intelligence-based analysis can integrate various patient- and tumour-specific characteristics to build a risk prediction model[4]

Prognosis and treatment response | Survival | Risk of recurrence

Staging and grading: Tumour-Node-Metastasis staging[5,6]

Size of the primary tumour (T) and depth of invasion

Involvement of locoregional lymph nodes (N) and extracapsular spread

Distant metastases (M)

Stage	Diameter of tumour			Cancer growing into the epiglottis, larynx, tongue muscle, or bones, such as the medial pterygoid plate, the hard palate, or the jaw	Spread to lymph nodes near primary tumour (measures <6 cm)			Spread to distant sites like the lungs and bones
	≤4 cm	>4 cm	Any size		Same side	Opposite side	Both sides of neck	
I	✓			✗	✗	✗	✗	✗
II		✓		✓	✓	✗	✗	✗
III		✓		✓	✗	✓	✓	✗
IV			✓	✓	✓	✓	✓	✓

Grading[5]

Degree of differentiation—Well-, moderately-, or poorly-differentiated
- Tumour–host interface or invasion patterns
- Host reactions or inflammatory responses
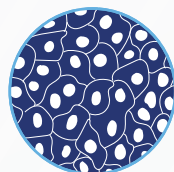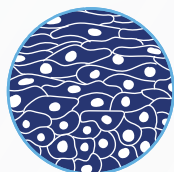
Multifactorial grading systems for risk stratification
- Clinicopathological features
- Stromal features
- Tumour stroma ratio
- Host response
- Tumour microenvironment

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Treatment approaches[7]

Treatments that focus on tumour reduction and permit better functional and cosmetic outcomes are preferable

Management of mouth cancer requires a multi-disciplinary approach that combines clinical, radiological, functional, cosmetic, and psychological aspects of patient care
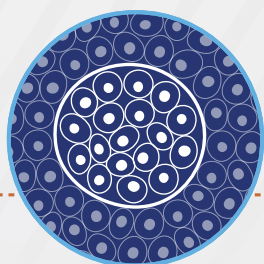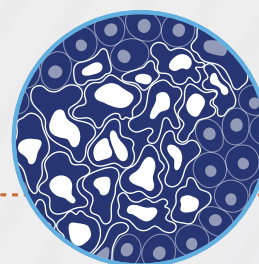
Localised cancer

Surgical resection of the primary tumour

Minimally invasive curative surgical techniques, such as sentinel lymph node biopsy in the early stages to minimise surgery-related morbidity

Advanced metastatic disease, recurrence, and unresectable tumours

Adjuvant radiotherapy or chemoradiation

Systemic therapies

Risk stratification[2,7]

✓ Screening and early detection can significantly improve patient outcomes and survival

✓ Preoperative imaging surveillance can identify high-risk patients who may benefit from early radiotherapy or chemoradiation

✓ Disease monitoring and treatment intensification for patients with advanced disease and metastasis can improve their survival

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Challenges

High incidence of mouth cancer in developing countries

Low accessibility to oral care

Inadequate screening

Limited skilled dental workforce

Scarcity of healthcare resources

Poor public awareness

Strategies to overcome challenges in mouth cancer diagnosis

Train primary healthcare professionals for mouth cancer screening

Promote E-health services and mobile screening to improve access

Authorise primary healthcare providers to prescribe medications and provide autonomous care

Incorporate risk prediction models into screening programs

Improve access to healthcare supplies and treatments

Develop efficient saliva biomarker-based panels to make diagnosis quick, accurate, and cost-effective

Scale-up population-based screening in high-risk regions

Key messages

Regular screening and early diagnosis of mouth cancer are crucial to improve patient outcomes

Upscaling screening can improve diagnosis and timely treatment

The choice of treatment is cancer- and patient-specific and should be targeted at achieving better oncological and functional outcomes

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