

Imaging

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Contemporary cross-sectional imaging techniques are essential in the management of head and neck cancer. They inform treatment decisions and prognosis. CT and/or MRI are the gold standard imaging modalities to stage a tumour of the oral cavity. Plain film radiography and ultrasonography, along with positron emission tomography-computed tomography (PET - CT) are useful adjuncts. The aims of imaging are as follows: outline the anatomical extent of the primary tumour (T - stage), as well as the 'resectability' of the tumour based on its relationship to vital structures; detection of metastatic disease precluding cure; detection of synchronous primary tumours of the lung and upper aerodigestive tract; monitoring of disease response following non-surgical treatment and for detection of disease recurrence.

Computed tomography Contrast-enhanced CT (CECT), typically modern multi-detector slice computed tomography (MDCT), is a commonly available staging tool. This offers the advantage of rapidly acquired spatially accurate cross-sectional images. Hard-tissue detail is a particular advantage of CT, relative to MRI; this is particularly important when assessing bony involvement (mandible/maxilla) in oral SCC. CT is also the usual imaging modality for thoracic staging. Magnetic resonance imaging By comparison with CT, MRI has improved soft-tissue contrast resolution and, depending upon specialist radiologist preference, it is frequently the imaging modality of choice for defining the primary extent of oral cavity cancers. Additionally, it offers more information on perineural spread and bone marrow invasion. T1-weighted 'anatomical' images have good spatial resolution, while T2-weighted images preferentially highlight oedema and therefore pathology. MRI has a sensitivity of 82% and specificity of 66.7% for the detection of bone/bone marrow invasion in the mandible. The ability of MRI to detect neck metastases is comparable to that of CT. Positron emission tomography combined with computed tomography PET-CT is not a first-line imaging investigation for head and neck cancer and its use is usually restricted to detection of distant metastases or synchronous tumours, investigation of tumours of unknown primary and post-treatment surveillance. Plain film and panoramic radiographs Plain film or panoramic radiographs can be helpful in defining gross bony involvement during tumour staging; however, their main utility is for evaluation of the dentition to plan essential prophylactic dental treatment and highlight infection or inflammation. Ultrasonography Ultrasonography is a non-invasive, chair-side investigation that is now most commonly used to guide FNAC sampling of suspicious lymph nodes. It is operator dependent but in experienced hands is very useful in the detection of lymphadenopathy. It is of limited value in investigation of oral cavity tumours. It has 85% sensitivity and 78.9% specificity for cervical lymphadenopathy. Sentinel lymph node biopsy Sentinel lymph node biopsy (SLNB) has become a recognised technique to support staging of the neck in patients who do not have clinical or radiological evidence of lymph node cancer cells are most likely to spread. SLNB seeks to determine the presence of nodal metastasis within the first draining node(s) and guides the necessity (or otherwise) for further treatment of the neck. There is robust evidence that, in patients with a T1/2 oral cavity SCC, performing a prophylactic elective neck dissection as opposed to adopting a 'watch and wait' policy leads to 3 superior overall and

disease-free survival. However, not all patients will have nodal metastases and as such provision of a neck dissection for all will inevitably result in overtreatment of a significant proportion. SLNB can be utilised to highlight those patients with occult metastases and who can then proceed to formal neck dissection. Additionally, SLNB may demonstrate unexpected contralateral lymph node drainage that would not otherwise have been identified or treated. Despite its potential 4 benefits, the SLNB technique has a false-negative rate of 14%. To date, evidence providing a comparative analysis of elective neck dissection versus SLNB (where survival is the primary end point) is still lacking. - Imaging

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