

REVIEW

Imaging of hypopharyngeal and cervical oesophageal cancer

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Abstract

Hypopharyngeal cancer, and particularly cervical oesophageal cancer, are infrequent tumours. Imaging methods assist in pre-treatment planning by better defining the extension of the lesions, by detecting subclinical neck adenopathies, as well as distant metastasis. In selected cases, imaging is also useful for treatment response assessment and surveillance.

Keywords: *Head and neck cancer; pharyngeal cancer; staging; surveillance imaging.*

Introduction

Most primary head and neck cancers are mucosal lesions, and their mucosal extent can be far better evaluated by the clinician than with CT or MRI. Indeed, imaging plays little role in the initial detection and characterisation of head and neck malignancies. However, these tumours do have the tendency to spread submucosally, and this extension into the deeply lying tissue planes is sometimes impossible to detect by clinical examination. Metastatic adenopathies can be identified, sometimes still in a subclinical stage or at places not accessible by clinical examination, such as in the retropharyngeal or paratracheal lymph nodes. All these findings can profoundly influence the staging and management of the patient with head and neck cancer. Finally, imaging may be used to monitor tumour response and to try to detect recurrent or persistent disease before it becomes clinically evident, possibly with a better chance for successful salvage.

Nearly all malignant tumours of the hypopharynx and cervical oesophagus are squamous cell carcinoma. The incidence of these tumours is clearly affected by

environmental factors. High alcohol consumption has a synergistic effect together with smoking.

Hypopharyngeal cancer

Clinically, these lesions may remain asymptomatic for a long period; at presentation, the disease is often advanced. The characteristic symptoms are sore throat, referred otalgia and dysphagia, but frequently a neck lump (due to metastatic neck adenopathies) is the presenting symptom.

The T-staging is determined by tumour size, tumour extent and the presence of hemilaryngeal fixation.

Early piriform sinus tumours may be very subtle; images obtained during a modified Valsalva manoeuvre (while letting the patient blow against closed lips) may be helpful. Larger cancers appear as soft-tissue masses, often involving the anterior, lateral and posterior walls of the piriform sinus. Piriform sinus cancers have the tendency to grow anteriorly in the laryngeal paraglottic space. Anterolateral spread often results in invasion of the thyroid cartilage. Soft-tissue thickening or obliteration of

the deep fat planes behind the level of the true vocal cord signifies involvement of the piriform sinus apex. Inferior extension into the postcricoid area may occur submucosally and, therefore, is endoscopically undetectable. Lateral extension may result in extrapharyngeal spread into the neck; the large neck vessels are then at risk of becoming involved by the primary tumour.

Cancer of the posterior hypopharyngeal wall commonly appears as a flat but often widespread mass lesion, which may extend into the lower oropharynx.

Cancer originating in the postcricoid area is rare. Besides superior spread within the hypopharynx and extrapharyngeal spread, also involvement of the cervical oesophagus may be seen.

These cancers may invade the prevertebral muscles; CT and MRI have a high true-negative but also high false-positive rate in diagnosing such posterior tumour spread.

At least 60% of patients with hypopharyngeal cancer present with clinically positive nodal metastases. In a small minority of patients, the primary cancer may at that stage be clinically occult, and may be detected by imaging. At least 75% will have neck adenopathies at some time during the course of disease^[1].

Apart from clinical examination, minimal screening for distant metastasis at first presentation should include chest X-ray. CT of the chest is the next step when a suspect abnormality is seen on the plain film^[2]. Chest CT seems justified in advanced stages of the primary tumour and/or bulky neck disease. In borderline-resectable disease, FDG-PET scan may be considered to exclude occult distant disease.

Most posterior hypopharyngeal wall lesions are treated by radiotherapy. Postcricoid cancer is treated by total laryngopharyngectomy and reconstruction, usually with a pectoralis major myocutaneous flap. If the tumour extends to the oesophagus, an oesophagectomy is also required. In cancer confined to the piriform sinus or with minimal extension beyond it, a partial laryngopharyngectomy is feasible if the piriform apex is not involved. If the apex is involved, the risk of laryngeal invasion is high and a total laryngopharyngectomy has to be performed.

Low-volume hypopharyngeal cancer can be effectively treated by radiation therapy. As in laryngeal cancer, CT (or MRI) is helpful in assigning patients to a favourable group for radiation treatment, by providing an estimate of tumour volume. It appears that patients with bulky disease at the piriform apex on imaging have a less favourable local outcome after radiotherapy^[3].

Cancer of the cervical oesophagus

Cancer of the cervical portion of the oesophagus is relatively rare, comprising 3–5% of all oesophageal cancer. Dysphagia and weight loss are the most common symptoms. As the lumen of the cervical oesophagus is smaller, these symptoms usually occur earlier than in hypopharyngeal cancer.

The diagnosis is established by oesophagoscopy and biopsy. Oesophagography is used to further define the position and extension of the cancer and degree of obstruction. CT/MRI are useful to further define the intra- and extraluminal extent of the lesion. Submucosal tumour spread and intramural skip metastases should be looked for.

The primary drainage nodes of the cervical oesophagus are the paratracheal nodes. As the general lymphatic flow in the upper oesophagus is directed upward, adenopathies commonly appear in the lower neck. The incidence of nodal metastasis depends on the length of the primary lesion; lesions more than 5 cm long show adenopathies in 90% of cases.

Distant metastasis is frequently present at presentation, most commonly to the lungs/mediastinum (in about 30% of patients) and liver (about 15%)^[4]. The high incidence of nodal and distant metastases in patients with cervical oesophageal cancer warrants an extensive pre-operative imaging work-up, including FDG-PET if available^[5].

In more than 75% of cases, the primary tumour invades adjacent structures (T4). When technically feasible, the cancer is surgically treated (oesophagectomy), including pharyngolaryngectomy when no safe margin with the upper oesophageal sphincter can be obtained. The value of induction chemoradiotherapy is under investigation. Response to chemoradiotherapy as assessed by serial FDG-PET is strongly correlated with pathological response and survival; such a correlation was not found for CT and endoscopic ultrasound^[6].

Overall, the 5-year survival of cervical oesophageal cancer is low (between 10 and 20%).

Key points

- Hypopharyngeal and cervical oesophageal cancer are nearly always squamous cell carcinomas.
- At presentation, hypopharyngeal cancer and cervical oesophageal cancer are often in an advanced local stage.
- Hypopharyngeal cancer commonly presents with neck nodal disease, and the primary tumour may be clinically occult.
- Nodal and distant metastases are frequent in cervical oesophageal cancer.
- Subclinical submucosal cancer spread is common in both locations, and may be detected by CT/MRI.
- FDG-PET is a useful technique to stage cervical oesophageal cancer, and to assess response to chemoradiotherapy. FDG-PET may be useful in selected cases of hypopharyngeal cancer.

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