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Metastases in the cervical spine from primary head and neck cancers: current concepts of diagnosis and management

S.D. Colbert [a,*], S. Ramakrishna [b], J.R. Harvey [b], P.A. Brennan [c]

[a] *Dept of Oral and Maxillofacial Surgery, Queen Alexandra Hospital, Cosham, Portsmouth PO6 3LY*
[b] *Department of Spinal Surgery, Queen Alexandra Hospital, Cosham, Portsmouth PO6 3LY*
[c] *Queen Alexandra Hospital, Cosham, Portsmouth PO6 3LY*

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Abstract

Vertebral metastases from primary head and neck cancers are uncommon, and so there are no clear guidelines about management. The spinal cord can be compressed by a vertebral fracture or invasion of a tumour, and may present as an oncological and spinal emergency. The goals of treatment are to relieve pain and maintain neurological function. However, surgical treatments in this group of patients have not been defined, and primary operative treatment of spinal metastases remains controversial. Here we discuss their contemporary management. Surgical options should be considered for treatment to achieve stability of the spine, relieve pain, and preserve neurological function in certain cases.

Keywords: cervical spinal metastasis; oral; head and neck; squamous cell carcinoma

Introduction

Head and neck cancers account for lesions in the oral cavity, oropharynx, laryngopharynx, salivary glands, and nasopharynx, and squamous cell carcinoma (SCC) accounts for over 95% of cancers in this area.[1] The most common sites are tongue, floor of the mouth, retromolar area, tonsils, and lower lip. They carry an appreciable morbidity that affects appearance and important functions such as swallowing, speaking, and breathing. Although resection is the definitive treatment, adjuvants such as chemotherapy and some types of radiotherapy have proved useful. Cancers of the cranial sinuses, brain, and thyroid are not included in this review.

SCC carries a high risk of metastasis with increased morbidity and mortality. However, the incidence of spinal metastases is less than 2%.[2] Other head and neck cancers that are rare and aggressive include salivary duct carcinoma and pleomorphic adenoma. Salivary duct carcinoma carries a poor prognosis, and often metastasises to the cervical lymph nodes. Again, spinal involvement through metastasis from both it and pleomorphic adenoma is rare. Other cancers such as adenoid cystic carcinoma and acinic cell carcinoma are also rare, but are low grade with good prognosis.

There is little to suggest that treatment of metastatic disease to the cervical spine is evidence-based, and to our knowledge there are no current publications that have reviewed the management. Most multidisciplinary teams are guided by the type of tumour and the case-specific characteristics. However, as local and regional control of oral SCC and other head and neck cancers continues to improve, more

* Corresponding author at: Dept of Oral and Maxillofacial Surgery, Royal United Hospitals Bath NHS Foundation Trust, Combe Park, Bath, BA1 3NG. Fax: +441225825776; tel.: +441225428331.
E-mail addresses: serryth@yahoo.com, scolbert@nhs.net (S.D. Colbert), Sush.ramakrishna@porthosp.nhs.uk (S. Ramakrishna), Jason.harvey@porthosp.nhs.uk (J.R. Harvey), peter.brennan@porthosp.nhs.uk (P.A. Brennan).

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patients are at risk of developing distant metastases, particularly in the cervical vertebrae. Consequently it is important to examine the current treatments available and review both the non-operative and operative strategies when dealing with patients with cervical spine metastases from head and neck cancer.

Diagnosis

The spine is the third most common site of metastasis after lungs and liver. However, spinal involvement is less than 5% in head and neck cancers, and involvement of the cervical spine is even rarer at around 1%.[3] The main presenting symptom is usually pain that is progressive and worse at night. It can be non-mechanical, radicular, or neuropathic. Compression of the spinal cord is an advanced feature of the disease, and this may result from fracture, invasion by tumour, or progressive osteoblastic remodelling.[4]

About 90% of patients present with pain, which may be localised and constant. When not related to movement it is probably the result of periosteal stretching or a rise in the endosteal pressure. If it is relieved by rest it is usually attributed to structural vertebral deformity. Occasionally, when the pain is radicular, it follows a dermatomal distribution. It has been reported that pain almost always precedes neurological abnormalities such as sensory loss, paraparesis, or paraplegia, which are the presenting features in up to half of patients. Progressive compression of the spinal cord may result in so-called malignant epidural compression of the spinal cord. This is an oncological and spinal emergency that demands prompt recognition and acute intervention. A patient with a history of malignant disease who presents with neck or back pain or any focal neurological deficit is at risk of developing catastrophic malignant epidural compression of the spinal cord.

A detailed history should be taken and a thorough neurological examination made. Plain radiographs are useful to detect vertebral metastases. The collapse of vertebral bodies and surface erosion indicate vertebral involvement. Plain films are also useful in assessing spinal stability (dynamic flexion-extension views). Definitive imaging such as computed tomography (CT) and magnetic resonance imaging (MRI) are essential if you suspect malignant epidural compression of the spinal cord. Contrast-enhanced MRI of the spine provides excellent imaging of paraspinal and epidural masses. Involvement of the skull base and foraminae can also be delineated with MRI. However, CT provides superior detail of the bony anatomy, which is particularly important if spinal stabilisation is planned. CT angiography can also identify highly vascular lesions, and is also useful in differentiating between soft tumours that may respond to radiotherapy and abnormal bony fragments that may require operation.

Other imaging techniques such as radionuclide bone scans and CT-PET (positron emission tomography) are also useful. In cases where MRI is not suitable or contraindicated, myelography can be considered. Although invasive, it is more sensitive than MRI in detecting early lesions. To formulate a management plan, a CT-guided biopsy of the lesion is crucial to stage the spinal metastases.[5] The histological information is useful to direct the multidisciplinary team towards a realistic goal and plan the appropriate strategy. Prognostic factors in the disease play an important part in making the decision about non-operative and operative interventions.

Medical treatment

Medical options include analgesics, intravenous steroids, bisphosphonates, and chemotherapy. Opiates are effective for nociceptive pain whereas amitriptyline and doxepin have been shown to be useful for neuropathic pain.[6] Steroids given intravenously improve neurological symptoms and pain by decreasing reactive oedema in the spinal cord and nerve roots. The use of corticosteroids is well-established in the treatment in cord compression, and they also have antitumoral activity in certain tumours such as lymphoma and myeloma. Although there is some evidence in support of high doses of steroids, such a regimen is associated with an increase in adverse side effects.[7]

Bisphosphonates are antiresorptive agents used in metastatic bone disease to prevent osteoclastic resorption, which reduces pain and the risk of fracture,[8,9] and they also seem to exert antitumoral activity. A multidisciplinary approach is the key to finding the most appropriate regimen of treatment.

Chemotherapy

Chemotherapy alone is of little value, particularly in patients with neurological involvement. Platinum-based chemotherapy has been the basis of treatment of metastatic head and neck SCC since the 1980s, but although it is considered palliative it may actually aggravate pain in some patients. It is now known that spinal metastases from tumours that are relatively resistant to chemotherapy are unlikely to respond to chemotherapy. However, chemotherapy has a place in some cases as an adjuvant after radiation and operation.

Radiotherapy

Radiotherapy (RT) is used to palliate pain, inhibit the growth of the tumour, and prevent local recurrence. It is used in a standard, fractionated dose, independent of vertebral level and of type of tumour. Contraindications include spinal instability, deteriorating neurological signs, complete paraplegia for longer than 24 hours (does not apply to children), radioresistance (for example melanoma, osteosarcoma, or thyroid cancer) and life expectancy of less than six months.[10,11]

Until recently, it has not been clear whether neurological function, specifically walking, is adequately treated by a single-fraction course of treatment, but recent prospective