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SHORT ABSTRACT

Perineural Tumour Spread in Head and Neck Cancer

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Keywords: Head and neck cancer; perineural tumour spread; magnetic resonance imaging; computed tomography

Many different malignant neoplasms may be seen in the head and neck. One of the most common, squamous cell carcinoma, arises from the mucosal surfaces. These cancers spread along the mucosal surface, but also submucosally, typically preferring the paths of least resistance. As there are many nerves in the head and neck region, these structures may provide tumours the opportunity to spread over a considerable distance from their point of origin. Perineural tumour spread occurs in all head and neck malignancies. Adenoid cystic carcinoma, a tumour of salivary gland origin, is notorious for its propensity to spread along nerves.

Perineural tumour spread is associated with a decreased survival rate. Symptoms include pain, paraesthesias and muscle weakness, but about 40% of patients do not show particular symptoms. Imaging diagnosis is important to map the full tumour extent and to avoid tumour progression from unrecognized perineural spread.

Perineural tumour spread occurs most frequently along the maxillary, mandibular and facial nerves. Imaging findings in perineural tumour spread include thickening and/or enhancement of one or more nerve branches; widening, destruction or enhancement of a skull base neural foramen or canal (e.g. foramen ovale, vidian canal); small tumoral lesions at some distance from the primary site, in a neural 'crossroad' such as the pterygopalatine fossa or Meckel's cave; and denervation atrophy of muscles supplied by the affected nerve (**Figure 1**).

Competing Interests

The author has no competing interests to declare.

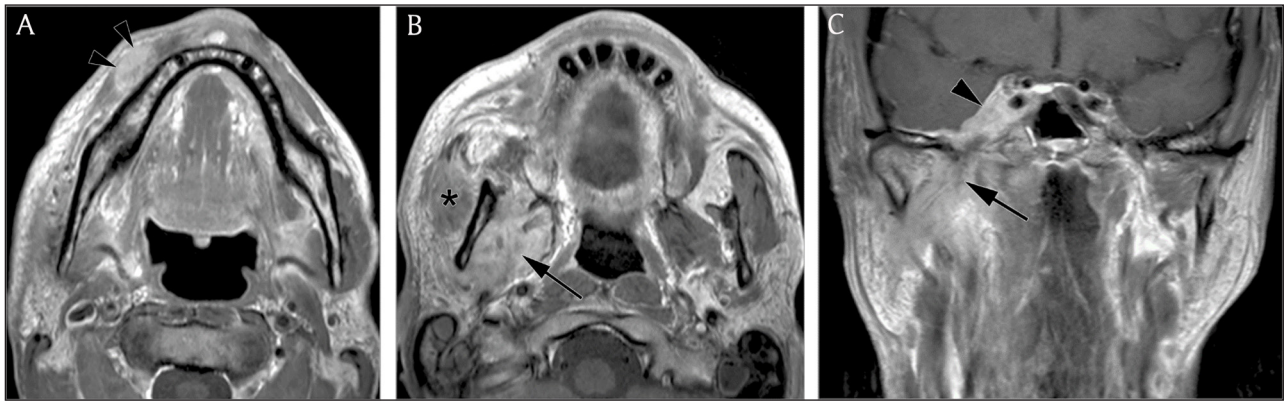

Figure 1: Gadolinium-enhanced T1-weighted spin echo images in a patient with a lower lip squamous cell carcinoma. The mass is centred on the mental foramen in the axial plane (**A**, arrowheads) and grows along the inferior alveolar nerve, a major branch of the mandibular nerve, reaching the other end of the mandibular canal, extending in the masticator space (**B**, arrow), without causing any visible mandibular bone destruction. Further extension is seen in the coronal plane along the mandibular nerve (**C**, arrow) through foramen ovale into the cavernous sinus (C, arrowheads). Atrophy of the muscles of mastication is seen, for example, at the level of the masseter muscle (B, asterisk).

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