

Sinonasal high grade malignancies

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Several of the malignant tumours occurring primarily in the sinonasal tract may present with an undifferentiated or poorly differentiated morphology, being composed of small to medium and large size, round or polygonal atypical cells. Overall, these lesions pose significant diagnostic difficulties for the surgical pathologist, especially in limited biopsy material, but their correct classification by means of histology, immunohistochemistry or molecular biology is becoming increasingly important for initiating an appropriate treatment strategy.

To follow a practical diagnostic approach, sinonasal undifferentiated neoplasms can be broadly divided into epithelial and non-epithelial. The first group primarily includes sinonasal undifferentiated carcinoma (SNUC), sinonasal nasopharyngeal-type undifferentiated carcinoma (NPTUC), small cell neuroendocrine carcinoma (SCNEC), and NUT midline carcinoma, but several other sinonasal carcinomas, such as squamous cell carcinoma and its variants, as well as glandular neoplasms like adenoid cystic carcinoma, may have a poorly differentiated histologic aspect requiring differential diagnosis. The group of non-epithelial malignancies includes 1) tumors with neuroectodermal differentiation: olfactory neuroblastoma (ON), Ewing's sarcoma/peripheral neuroectodermal tumour (PNET), malignant melanoma; 2) sinonasal malignant haematologic neoplasms: lymphomas, plasmacytoma, granulocytic sarcoma, histiocytic sarcoma; 3) sarcomas: rhabdomyosarcoma and mesenchymal chondrosarcoma.

Immunohistochemistry remains the main additional technique for the identification of specific tumour categories. Through careful microscopic examination of haematoxylin and eosin stained sections in light of clinical information and imaging data, a list of differential diagnoses can be made and an appropriate panel of antibodies can be chosen to further categorise the tumour. An initial panel including cytokeratins, synaptophysin, desmin, S100 protein, and CD45 may allow the classification of most lesions or may help to narrow the list of differential diagnoses. Further refinement can be obtained through second line markers, such as in situ hybridization for Epstein Barr virus, which is positive in NPTUC and negative in SNUC, melanocytic markers for melanoma, myogenin for rhabdomyosarcoma, CD99 for Ewing's sarcoma, other lymphocyte markers for classifying lymphomas, and CD138 and light chains for plasmacytoma. Finally, molecular analysis can further assist in the recognition of NUT midline carcinoma, Ewing's sarcoma/PNET and alveolar rhabdomyosarcoma.