Reporting of carcinomas of the nose and paranasal sinuses

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Disclosure Information

I have no actual or potential conflict of interest in relation to this presentation.
Sinonasal malignancies are rare and aggressive tumors, with an incidence of less than 1 case per 100,000 population annually, representing 3% to 5% of all head and neck cancers.

They occur predominately in adult male patients and present with nonspecific symptoms that are often indistinguishable from inflammatory diseases.

Thus, the diagnosis is often delayed with the tumor in locally advanced stage.
In comparison with other malignancies of the head and neck, an elevated fraction of sinonasal carcinomas can be attributed to occupational exposures, including wood and leather dusts for intestinal-type adenocarcinoma or to several chemical substances (glues, formaldehyde, chrome, nickel, and compounds used in the textile industry) for squamous cell carcinoma.

Sinonasal neuroendocrine carcinoma may also arise in the setting of previous high-dose radiotherapy.

Finally, human papillomavirus (HPV) is emerging as an important etiologic factor in a subset of sinonasal carcinomas.
The dataset has been developed for the reporting of resection and biopsy specimens of mucosal malignancies originating in the nasal cavities and paranasal sinuses.

Neuroectodermal neoplasms (including melanoma) and sarcomas are not included.

Bone, soft tissue and lymphoma protocols are separately listed.

In addition, neck dissections and nodal excisions are dealt with in a separate dataset and this dataset should be used in conjunction, where applicable.

ICCR data sets include core and non-core elements.
Patients affected by locally advanced sinonasal carcinomas may be treated with pre-operative chemo-radiation protocols, could result, in selected cases, in a significant improvement in survival.

- In this case, specimens should be extensively sampled and changes presumably induced by treatment should be reported.

- Quantification of the extent of response is currently considered not relevant for clinical purposes.

- Type of (chemo) therapy, number of cycles, interval between last cycle of chemotherapy and local regional treatment initiation can be annotated if available.
Different options are currently available for the surgical treatment of sinonasal malignancies, which can be chosen according to histopathology, extent of the lesion, and experience of the surgeon.

Surgical approaches include craniofacial resections, endoscopic endonasal resections, and combined approaches.

This results in a wide range of surgical specimens submitted for histopathological analysis.
Specimens submitted

- According to the surgical approach, different types of specimen can be submitted for histological analysis.
- Specimens from surgery often consist of fragmented material that should be properly labelled at the time of surgery including a description of the anatomic site and type of tissue submitted (tumour or other).
- Due to the difficulty in the orientation of the samples (impossible in some cases) it is recommended that margins be submitted separately, properly identified and labelled (especially in suspicious areas).
- Surgical resection specimens consist most often of the maxillary bone and adjacent anatomic structures removed according to the extent of the tumour.

**SPECIMENS SUBMITTED** (select all that apply) (Note 3)

- Not specified
- Nasal cavity
  - Septum
  - Lateral wall
  - Floor
  - Vestibule
- Paranasal sinus(es), maxillary
- Paranasal sinus(es), ethmoid
- Paranasal sinus(es), frontal
- Paranasal sinus(es), sphenoid
- Other, specify
TUMOUR SITE (select all that apply) (Note 4)

- Cannot be assessed
- Nasal cavity
  - Septum
    - Left
    - Right
    - Midline
    - Laterality not specified
  - Floor
    - Left
    - Right
    - Laterality not specified
  - Lateral wall
    - Left
    - Right
    - Laterality not specified
  - Vestibule
    - Left
    - Right
    - Laterality not specified
- Paranasal sinus(es), maxillary
  - Left
  - Right
  - Laterality not specified
- Paranasal sinus(es), ethmoid
  - Left
  - Right
  - Laterality not specified
- Paranasal sinus(es), frontal
  - Left
  - Right
  - Laterality not specified
- Paranasal sinus(es), sphenoid
  - Left
  - Right
  - Laterality not specified
- Cribiform plate
  - Left
  - Right
  - Laterality not specified
- Other, specify including laterality

Tumour Site

• The precise tumour site within the sinonasal tract is important to record:
  – Different staging schemes are utilized for maxillary sinus carcinomas and those arising in the ethmoid sinus or nasal cavity
  – Prognostic importance: carcinomas of the nasal cavity have an improved prognosis over carcinomas primary to the paranasal sinuses, likely because nasal carcinomas give rise to symptoms (e.g. nasal obstruction or epistaxis) and this come to clinical attention sooner
  – Among maxillary sinus carcinomas, those arising from the anterior-inferior portion have a better prognosis than those arising from the superior-posterior portion, likely because the latter group has easier access to structures such as the orbit or skull base
  – Certain carcinomas are closely associated with specific sinonasal sub-sites

• It is recognized that some carcinomas, particularly highly aggressive types like sinonasal undifferentiated carcinoma or NUT carcinoma, usually affect more than one sinonasal anatomic sub-site

• In this case, every affected sites should be selected
The maximum diameter of the tumour should be possibly assessed on the unfixed specimen to avoid size underestimation resulting from formalin fixation-induced shrinkage.

Care should be taken not to overestimate tumour size by including areas of adjacent non-neoplastic tissue.

The gross assessment of tumour size should be confirmed microscopically and in cases where non-neoplastic tissue has been mistakenly incorporated into the tumour measurement, tumour size should be adjusted accordingly.

If tumour dimensions are estimated only microscopically, then “at least” should be added to indicate that the measurement is an underestimation resulting from fixation and tissue processing.

The option “Cannot be assessed” can be used when the tumour is submitted in fragments, as in endoscopic resections.

In these cases, radiographic imaging may also be considered to determine tumour dimensions.

**TUMOUR DIMENSIONS (Note 6)**

Maximum tumour dimension (largest tumour)

| mm |

Additional dimensions (largest tumour)

| mm | x | mm |

☐ Cannot be assessed, specify
The list of histologic types discussed in the chapter on sinonasal tumours in the 4th Edition of the WHO does not include some squamous cell carcinoma variants and salivary gland type tumours because they are described in sections devoted to other sites where they are more commonly encountered.

Additional tumour types were included as provisional entities in the WHO classification may be mentioned at the pathologist’s discretion.

These include HPV-related multiphenotypic sinonasal carcinoma, SMARCB1 (INI1) deficient sinonasal carcinoma, and sinonasal renal cell-like adenocarcinoma.

Accurate tumour typing is important because specific tumour types are associated with different prognoses and, in some cases, different treatments.

Diagnostic accuracy is also expected to take on additional importance in the future as targeted, molecular-based therapies become more prominent (NUT carcinoma/bromodomain inhibitors).
HISTOLOGICAL TUMOUR GRADE (Note 8)

- Not applicable
- GX: Cannot be assessed
- G1: Well differentiated
- G2: Moderately differentiated
- G3: Poorly differentiated
- G4: Undifferentiated
- Other, specify

- Cannot be assessed, specify
BONE/CARTILAGE INVASION (Note 9)
- Not identified
- Present
  - Erosive (cortical)
  - Infiltrative (medullary involvement)
- Cannot be assessed, *specify*

PERINEURAL INVASION (Note 10)
- Not identified
- Present
- Cannot be assessed, *specify*

LYMPHOVASCULAR INVASION (Note 11)
- Not identified
- Present
- Cannot be assessed, *specify*
Complete tumor resection with negative surgical margins poses a significant challenge in sinonasal carcinomas, given the proximity to critical anatomic structures.

The presence of residual microscopic disease has been reported with high frequency in cases managed both by open and by endoscopic surgical techniques.

In a large series of sinonasal squamous cell carcinomas treated with surgery, 16% had microscopic residual disease and 13% had macroscopic positive resection margins.

A negative surgical margin is associated with improved overall survival in retrospective studies for both open and endoscopic approaches.

Most studies also consider carcinoma in situ/high-grade dysplasia as a positive margin.

The presence of dysplasia at the margin is associated with a significant risk of local recurrence and development of a second primary.

Thus, this information, including distance to the margin from invasive and in situ/dysplasia, is reported.
• Because of limited data, a clear margin ranges from 3 to 7 mm, with 5 mm generally associated with a better prognosis, although recurrence is seen in up to 25% of patients with a clear margin.
• Depending on stage and other factors, a narrower margin may be adequate.
• When the complex anatomy is taken into consideration, a “pushing” border into the periorbital tissues may not require orbital exenteration to achieve a 5 mm margin, if it is a low-grade neoplasm.
• Thus, margin status is one parameter of many used in treatment and prognostication.
PATHOLOGICAL STAGING (UICC TNM 8th edition) ** (Note 15)

TNM Descriptors (only if applicable) (select all that apply)

☐ m - multiple primary tumours
☐ r - recurrent
☐ y - post-therapy

Primary tumour (pT)***

☐ TX Primary tumour cannot be assessed
☐ Tis Carcinoma in situ

Maxillary sinus

☐ T1 Tumour limited to the mucosa with no erosion or destruction of bone
☐ T2 Tumour causing bone erosion or destruction, including extension into the hard palate and/or middle nasal meatus, except extension to posterior wall of maxillary sinus and pterygoid plates
☐ T3 Tumour invades any of the following: bone of posterior wall of maxillary sinus, subcutaneous tissues, floor or medial wall of orbit, pterygoid fossa, or ethmoid sinuses
☐ T4a Tumour invades any of the following: anterior orbital contents, skin of cheek, pterygoid plates, infratemporal fossa, cribriform plate, sphenoid or frontal sinuses
☐ T4b Tumour invades any of the following: orbital apex, dura, brain, middle cranial fossa, cranial nerves other than maxillary division of trigeminal nerve (V2), nasopharynx, or clivus

Nasal cavity and ethmoid sinus

☐ T1 Tumour restricted to one subsite of nasal cavity or ethmoid sinus, with or without bony invasion
☐ T2 Tumour involves two subsites in a single site or extends to involve an adjacent site within the nasoethmoidal complex, with or without bony invasion
☐ T3 Tumour extends to invade the medial wall or floor of the orbit, maxillary sinus, palate, or cribriform plate
☐ T4a Tumour invades any of the following: anterior orbital contents, skin of nose or cheek, minimal extension to anterior cranial fossa, pterygoid plates, sphenoid or frontal sinuses
☐ T4b Tumour invades any of the following: orbital apex, dura, brain, middle cranial fossa, cranial nerves other than V2, nasopharynx, or clivus
COEXISTENT PATHOLOGY (select all that apply) (Note 13)

- □ None identified
- □ Carcinoma in situ
- □ Sinonasal papilloma
- □ Intestinal metaplasia
- □ Squamous metaplasia
- □ Epithelial hyperplasia
- □ □ Epithelial dysplasia, specify

- □ Other, specify

ANCILLARY STUDIES (Note 14)

- □ Not performed
- □ Performed, specify

TUMOUR FOCALITY (Note 5)

- □ Cannot be assessed
- □ Unifocal
- □ Multifocal, specify number of tumours in specimen
Conclusions

• A comprehensive pathologic report is essential for cancer diagnosis, staging, prognostication, and optimal therapeutic decision making

• Moreover, standardized procedures enable reliable data collection, cohort stratification, and research, especially in rare cancers

• A standardized data set ensures that histopathology reports include all relevant information and present it in a concise and consistent format that conforms to international standards
Carcinomas of the Nasal Cavity and Paranasal Sinuses Histopathology Reporting Guide

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