Staging for thymomas and thymic carcinomas – modified Masaoka (Required) and proposed TNM Pathologic Staging for Thymic Epithelial Tumours (Recommended)

Reason/Evidentiary Support

At least 15 different stage classification systems have been proposed, beginning as far back as 1978,[1] with most widely known being the Masaoka system,[2] modified and refined in 1994,[3] with refinement of definitions for anatomic staging parameters proposed in 2011.[4]

Although this remains the required staging system, it is highly likely that this system will be superseded by a TNM-based classification based on data from the ITMIG retrospective database of over 8000 patients.[5] In the newly-proposed system, T stage is based on the extent of direct invasion of mediastinal structures (see above section),[6] nodal disease is based on involvement of lymph nodes in anterior (perithymic) (N1) and deep/cervical (N2) compartments, and M stage based on the presence of separate pleural and pericardial nodules (M1a) and pulmonary intraparenchymal nodule or distant organ metastasis (M1b).[7] This system is currently viewed as recommended, although will likely become the recognized system in the near future.

Table 2: ITMIG Definition of Details of the Masaoka-Koga Staging System

Stage Definition *(the ITMIG interpretation of details is in italics)*

I **Grossly and microscopically completely encapsulated tumour**
This includes tumours with invasion into but not through the capsule, or …
Tumours in which the capsule is missing but without invasion into surrounding tissues

II a **Microscopic transcapsular invasion**
M*icroscopic transcapsular invasion (not grossly appreciated)*

b **Macroscopic invasion into thymic or surrounding fatty tissue, or grossly adherent to but not breaking through mediastinal pleura or pericardium**
Gross visual tumour extension into normal thymus or perithymic fat surrounding the thymoma (microscopically confirmed), or …
Adherence to pleura or pericardium making removal of these structures necessary during resection, with microscopic confirmation of perithymic invasion (but without microscopic extension into or through the mediastinal pleura or into the fibrous layer of the pericardium)

III **Macroscopic invasion into neighbouring organ (i.e. pericardium, great vessel or lung)**
This includes extension of the primary tumour to any of the following tissues:
Microscopic involvement of mediastinal pleura (either partial or penetrating the elastin layer); or …
Microscopic involvement of the pericardium (either partial in the fibrous layer or penetrating through to the serosal layer); or …
Microscopically confirmed direct penetration into the outer elastin layer of the visceral pleura or into the lung parenchyma; or …
Invasion into the phrenic or vagus nerves (microscopically confirmed, adherence alone is not sufficient); or …
Invasion into or penetration through major vascular structures (microscopically confirmed);
Adherence (i.e. fibrous attachment) of lung or adjacent organs only if there is mediastinal pleural or pericardial invasion (microscopically confirmed)

IV a **Pleural or pericardial metastases**
Microscopically confirmed nodules, separate from the primary tumour, involving the visceral or parietal pleural surfaces, or the pericardial or epicardial surfaces,

b **Lymphogenous or hematogenous metastasis**
Any nodal involvement (e.g. anterior mediastinal, intrathoracic, low/anterior cervical lymph nodes, any other extrathoracic lymph nodes)
Distant metastases (i.e. extrathoracic and outside the cervical perithymic region) or pulmonary parenchymal nodules (not a pleural implant)

References

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