Heart

Protocol applies to primary malignant cardiac tumors.

Protocol revision date: January 2004
No AJCC/UICC staging system

Procedures

- **Cytology** (No Accompanying Checklist)
- **Incisional Biopsy**
- **Excisional Biopsy**

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Surgical Pathology Cancer Case Summary (Checklist)

Protocol revision date: January 2004
Applies to malignant cardiac tumors only
No AJCC/UICC staging system

HEART: Resection

Patient name:
Surgical pathology number:

Note: Check 1 response unless otherwise indicated.

MACROSCOPIC

Specimen Type
___ Excisional biopsy
___ Other (specify): _____
___ Not specified

Tumor Site (check all that apply)
___ Pericardium
___ Right ventricle
___ Left ventricle
___ Right atrium
___ Left atrium
___ Other (specify): _____
___ Not specified

Tumor Size
___ Not applicable
Greatest dimension: ___ cm
*Additional dimensions: ___ x ___ cm
___ Cannot be determined (see Comment)

* Data elements ***with asterisks*** are ***not required*** for accreditation purposes for the Commission on Cancer. These elements may be clinically important, but are not yet validated or regularly used in patient management. Alternatively, the necessary data may not be available to the pathologist at the time of pathologic assessment of this specimen.

MICROSCOPIC

Histologic Type
___ Angiosarcoma
___ Malignant fibrous histiocytoma
___ Myxosarcoma
___ Fibrosarcoma
___ Leiomyosarcoma
___ Rhabdomyosarcoma
___ Osteosarcoma
___ Synovial sarcoma
___ Malignant schwannoma (malignant peripheral nerve sheath tumor)
___ Malignant mesenchymoma
___ Other (specify): _____
___ Sarcoma, type cannot be determined

Histologic Grade
___ Not applicable
___ Cannot be determined
___ Low-grade
___ High-grade
___ Other (specify): _____

Extent of Invasion (as appropriate)
___ Cannot be determined
___ No involvement of adjacent tissue(s)
___ Involvement of adjacent tissue(s)
___ Other organ involvement (specify): _____

Margins (as appropriate)
___ Not applicable
___ Cannot be assessed
___ Uninvolved by tumor
___ Involved by tumor
Specify site(s), if known: _____

***Additional Pathologic Findings (check all that apply)**
*___ None identified
*___ Benign tumor (specify): _____
*___ Therapy-related changes (specify): _____
*___ Inflammation
*___ Other (specify): _____

***Comment(s)**

* Data elements ***with asterisks*** are ***not required*** for accreditation purposes for the Commission on Cancer. These elements may be clinically important, but are not yet validated or regularly used in patient management. Alternatively, the necessary data may not be available to the pathologist at the time of pathologic assessment of this specimen.

Background Documentation

Protocol revision date: January 2004

I. Cytologic Material
(Pericardial Fluid)

A. Clinical Information

1. Patient identification
   a. Name
   b. Identification number
   c. Age (birth date)
   d. Sex
2. Responsible physician(s)
3. Date of procedure
4. Other clinical information
   a. Relevant history
      (1) primary cardiovascular disease
      (2) myocarditis
      (3) congenital heart disease
      (4) history of tumor elsewhere
      (5) immunosuppression
      (6) tuberous sclerosis
      (7) previous irradiation
   b. Relevant findings (eg, echocardiographic [ECHO] findings, evidence of tumor elsewhere in body)
   c. Clinical diagnosis
   d. Procedure (eg, fine-needle aspiration [FNA] of pericardial fluid)
   e. Anatomic site(s) of specimen (eg, anterior pericardial sac)

B. Macroscopic Examination

1. Specimen
   a. Description
   b. Unfixed/fixed (specify fixative)
   c. Number of slides received, if appropriate
   d. Quantity, appearance of fluid specimen, if appropriate
   e. Results of intraprocedural consultation
2. Material submitted for microscopic evaluation
3. Results of rapid smear review
4. Special studies (specify)

C. Microscopic Evaluation

1. Adequacy of specimen (if unsatisfactory for evaluation, specify reason)
2. Tumor (Note **A**)
   a. Histologic type, if possible
   b. Histologic grade, if possible
3. Additional pathologic findings, if present
   a. Therapy-related changes
   b. Degenerative changes
   c. Atypical cellular reaction
   d. Inflammation
   e. Other

4. Status/results of special studies (specify)
5. Comments
    a. Correlation with intraprocedural consultation, as appropriate
    b. Correlation with other specimens, as appropriate
    c. Correlation with clinical information, as appropriate

II. Incisional or Excisional Biopsy

A. Clinical Information

1. Patient identification
    a. Name
    b. Identification number
    c. Age (birth date)
    d. Sex
2. Responsible physician(s)
3. Date of procedure
4. Other clinical information
    a. Relevant history
        (1) primary cardiovascular disease
        (2) myocarditis
        (3) congenital heart disease
        (4) history of tumor elsewhere
        (5) immunosuppression
        (6) tuberous sclerosis
        (7) previous irradiation
    b. Relevant findings (eg, ECHO findings, evidence of tumor elsewhere in body)
    c. Clinical diagnosis
    d. Procedure
    e. Operative findings
    f. Anatomic site(s) of specimen (eg, pericardium, left/right ventricle, atrium)

B. Macroscopic Examination

1. Specimen
    a. Tissue(s) received
    b. Unfixed/fixed (specify fixative)
    c. Number of fragments
    d. Dimensions
    e. Descriptive features (color/consistency)
    f. Orientation, if designated by surgeon
    g. Results of intraoperative consultation
2. Tumor
    a. Size (Note **B**)
    b. Descriptive features (eg, consistency, color, hemorrhage, necrosis)
    c. Extension
3. Margins, if appropriate
    a. Vascular
    b. Pericardial
    c. Other
4. Tissue submitted for microscopic evaluation
    a. Tumor (Note **C**)
    b. Designated areas including those marked adherent to other structures

   c. Margin(s)
   d. Frozen section tissue fragment(s) (unless saved for special studies)
   e. Other (specify)
5. Special studies (specify) (eg, histochemistry, immunohistochemistry, electron microscopy, morphometry, DNA analysis [specify type])

C. Microscopic Evaluation

1. Tissue(s) present
2. Tumor
   a. Histologic type(s) (Note **D**)
   b. Histologic grade (Note **E**)
   c. Status of designated areas
   d. Extent of invasion (adjacent tissues)
3. Margins, as appropriate
4. Additional pathologic findings, if present
   a. Benign tumor
   b. Therapy-related changes
   c. Degenerative changes
   d. Atypical cellular reaction
   e. Inflammation
   f. Other
5. Results/status of special studies (specify) (Note **F**)
6. Comments
   a. Correlation with intraoperative consultation, as appropriate
   b. Correlation with other specimens, as appropriate
   c. Correlation with clinical information, as appropriate

Explanatory Notes

A. Cytologic Findings

Pericardial effusions are rarely caused by primary cardiac tumors. The most common causes of malignant pericardial effusions are metastatic adenocarcinoma from lung or breast, malignant melanoma, or extension of malignant mesothelioma into the pericardium. The pathologist should evaluate the nature and clinical significance of a malignant pericardial effusion by discussing the findings with the clinician, reviewing the patient's medical record, or both. Cellular changes considered to be infective, reactive, or degenerative (eg, viral infection, immunotherapy, chemotherapy, or radiation effect) should be clearly distinguished from malignant or atypical (potentially malignant) cytologic findings. Additional patient history and pertinent clinical findings may be helpful in arriving at a definitive diagnosis.

B. Staging

The greatest diameter of the tumor in centimeters should be recorded. There is no published staging system for primary cardiac tumors.

C. Number of Sections

The number of sections varies with the size of the specimen and the nature of the neoplasm. The pathologist should sample areas with diverse gross appearances. In addition to tumor evaluation, routine sampling of the non-neoplastic components of the specimen should be performed.

D. Histologic Type

The classification of malignant cardiac tumors as recommended by the Armed Forces Institute of Pathology (AFIP) fascicle on tumors of the heart and great vessels follows.[1] This protocol, however, does not preclude the use of other histologic classifications.

AFIP Classification of Malignant Cardiac Tumors

Angiosarcoma
Malignant fibrous histiocytoma
Myxosarcoma
Fibrosarcoma
Leiomyosarcoma
Rhabdomyosarcoma
Osteosarcoma
Synovial sarcoma
Malignant schwannoma (malignant peripheral nerve sheath tumor)
Malignant mesenchymoma
Malignant mesothelioma
Other

As with sarcomas in other sites, a variety of histologic patterns may be found. Although not included in the classification, lymphomas also are found in the heart.

E. Histologic Evaluation

Pathologists should grade the tumor and indicate the grading system used. Most malignant tumors of the heart are sarcomas. Necrosis of groups of cells and mitotic rates of greater than 5 mitoses per 10 high-power fields have been associated with reduced survival.[1]

F. Special Studies

Immunohistochemistry can be used to ascertain the histogenesis of a sarcoma or substantiate the diagnosis of mesothelioma. Generally speaking, mesotheliomas contain cytokeratins, which are usually lacking from sarcomas (see Thoracic Mesothelioma protocol). Transmission electron microscopy is also very helpful in the distinction of these tumor types. Myxoma, the most common benign tumor, has no distinctive immunohistochemical features.

Reference

1. Burke AP, Renu V. *Atlas of Tumor Pathology. Tumors of the Heart and Great Vessels.* 3rd series. Fascicle 16. Washington, DC: Armed Forces Institute of Pathology; 1996.

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