



Facultad de Medicina
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TUMORES DEL MEDIASTINO: TIMOMA Y CARCINOMA TIMICO

Dra. Yumay Pires N.

Servicio de Anatomía Patológica

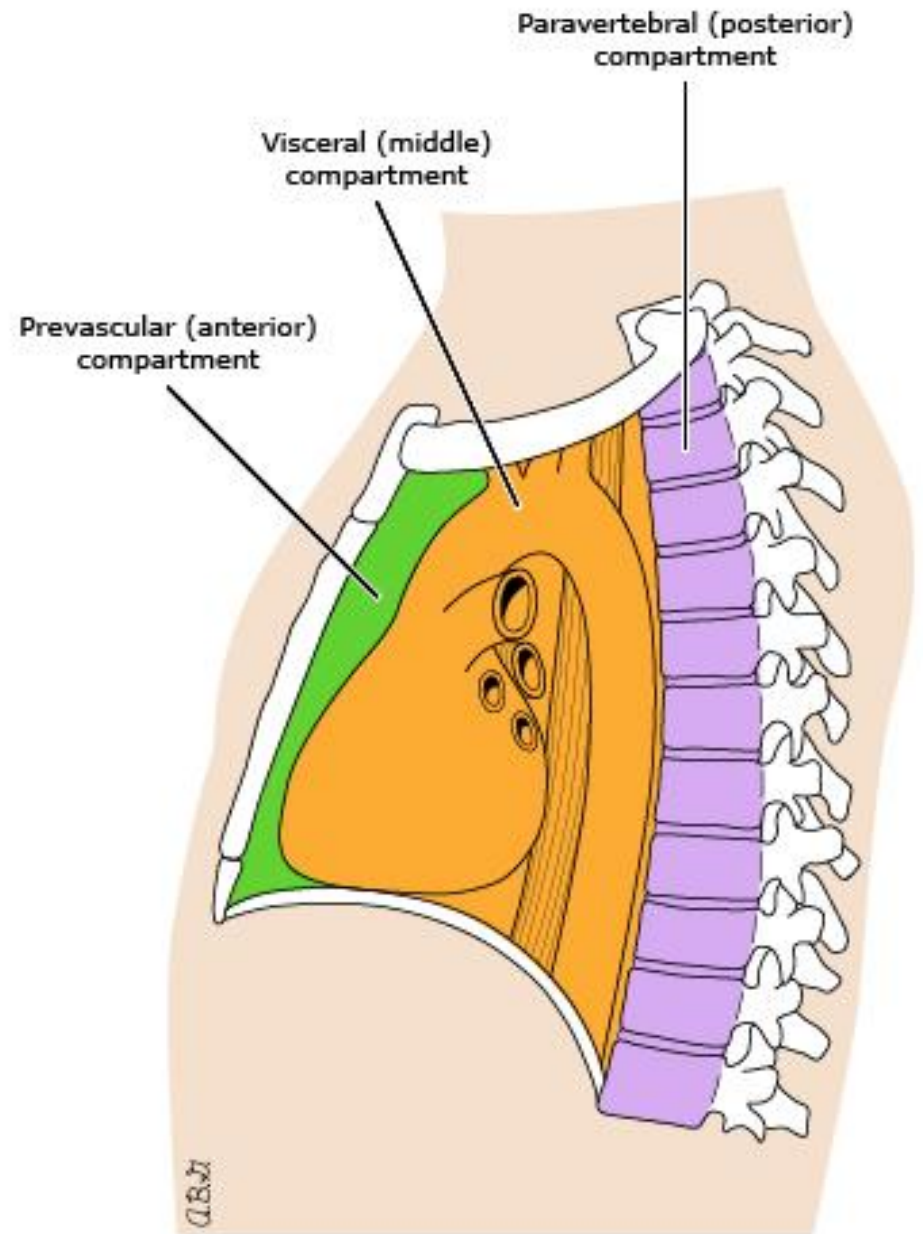
Clínica Alemana de Santiago

Objetivos



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- Revisar los aspectos fundamentales de la aproximación diagnóstica en la patología tumoral del Mediastino
- Analizar las recomendaciones sobre el procesamiento y diagnóstico de Timomas y Carcinomas Tímicos
- Comentar los cambios más relevantes en la clasificación OMS vigente y en el nuevo sistema de etapificación de Tumores epiteliales tímicos



International Thymic Malignancy Interest Group (ITMIG)



Differential diagnosis of mediastinal mass

Anterior compartment	Middle compartment	Posterior compartment
Thymus - Thymoma - Thymic cyst - Thymic hyperplasia - Thymic carcinoma	Bronchogenic cyst	Neurogenic tumors - Neurofibroma - Neurilemmoma - Neurosarcoma - Ganglioneuroma - Ganglioneuroblastoma - Neuroblastoma - Chemodectoma - Pheochromocytoma
Lymphoma	Pericardial cyst	Meningoceles
Germ cell tumor - Teratoma/dermoid cyst - Seminoma - Non-seminoma - Yolk sac tumor - Embryonal carcinoma - Choriocarcinoma	Lymphadenopathy - Lymphoma - Sarcoid - Metastatic lung cancer	Thoracic spine lesions (eg, Pott's disease)
Intrathoracic thyroid - Substernal goiter - Ectopic thyroid tissue	Enteric cyst	
Parathyroid adenoma	Esophageal tumors	
Hemangioma	Vascular masses and enlargement	
Lipoma		
Liposarcoma		
Fibroma		
Fibrosarcoma		
Foramen of Morgagni hernia		



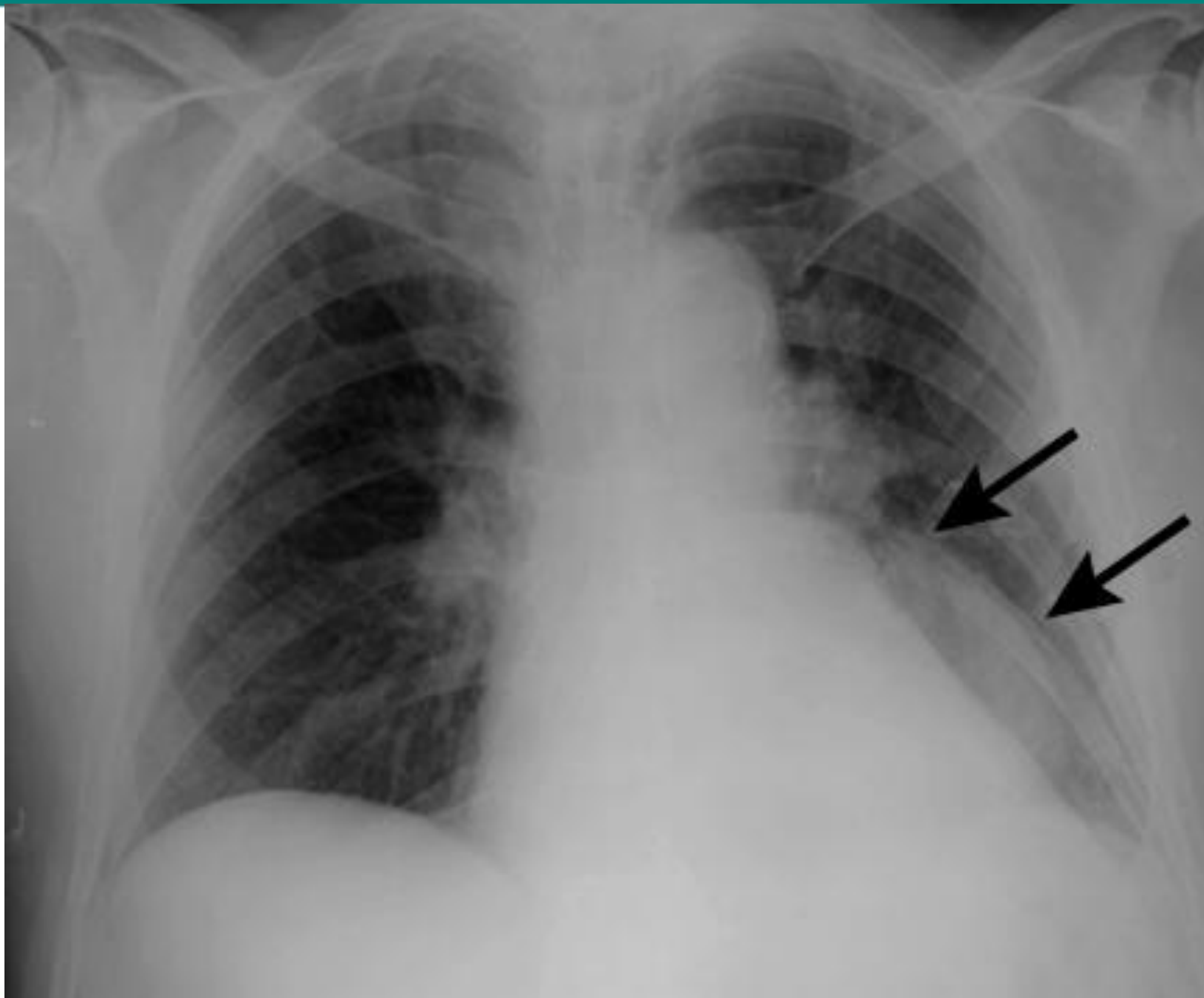
- Diferentes tipos de lesiones
- Sobreposición de características histológicas
- Numerosos diagnósticos diferenciales
- Patología poco frecuente
- Origen tumoral: ¿primario o metastásico?



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Abordaje diagnóstico en pacientes con tumores mediastínicos

- HALLAZGO INCIDENTAL EN ESTUDIOS POR IMÁGENES





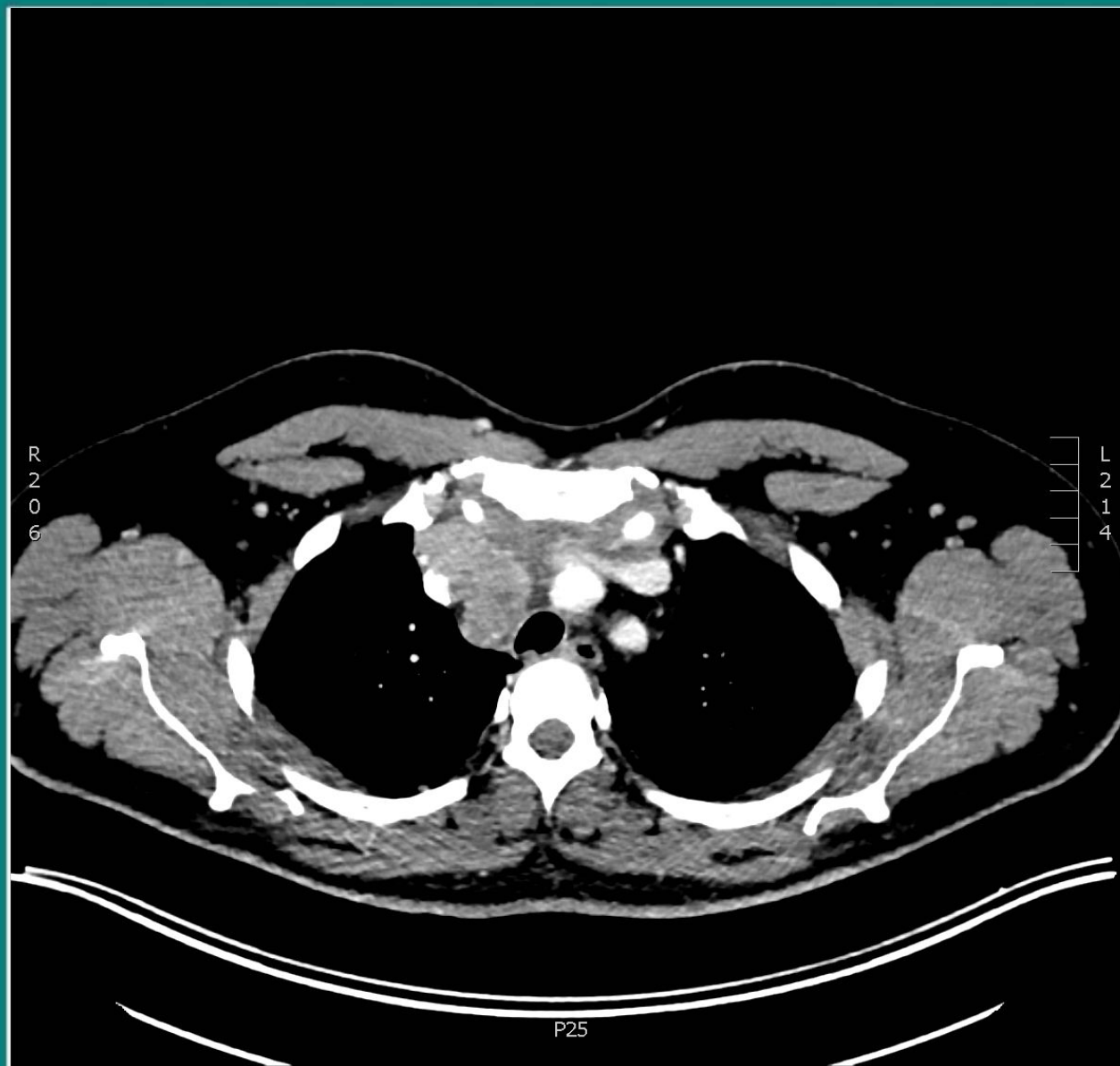
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Abordaje diagnóstico en pacientes con tumores mediastínicos

- SINTOMAS LOCALES (efecto de masa)
- SINTOMAS SISTEMICOS (síntomas B, síndrome paraneoplásico)



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CLINICA ALEMANA
26-03-2019
W 226 : L 51

CONTRASTE I.V
CT WB + C 2.0 I26f 3
PET CT de Cuerpo Entero



- CLINICA
- EXAMENES DE LABORATORIO

anticuerpos de receptor anti-acetilcolina

alfa-fetoproteína (AFP)

gonadotrofina coriónica humana-beta (beta-hCG)

lactato-deshidrogenasa (LDH)



- CLINICA
- EXAMENES DE LABORATORIO
- ESTUDIOS POR IMÁGENES

Tomografía computada (CT)

Resonancia magnética (MR)

Tomografía de emisión de positrones (PET)

PET-CT

Ecografía testicular



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- CLINICA
- EXAMENES DE LABORATORIO
- ESTUDIOS POR IMÁGENES
- **BIOPSIA**

percutánea

endobronquial

quirúrgica



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BIOPSIA DIAGNOSTICA POR METODOS MINIMAMENTE INVASIVOS

- Indicaciones:

Sospecha de linfoma

Confirmar diagnóstico en tumor no operable (a quimioterapia neoadyuvante)

- Riesgo de muestras insatisfactorias / no diagnósticas:

Muestras pequeñas

Artefacto mecánico (aplastamiento tisular durante toma de muestra)

Necrosis, fibrosis, zonas quísticas tumorales



BIOPSIA DIAGNOSTICA

- Asegurar muestra adecuada

percutánea

endobronquial



“ROSE” (rapid on-site cytological examination)

- Riesgo de siembra tumoral (reportes de casos)
- Errores diagnósticos por características histológicas similares en lesiones diferentes

quirúrgica



biopsia contemporánea

- Artefacto de congelación



BIOPSIA

- percutánea guiada por TAC

masas mediastínicas anteriores y posteriores

rendimiento diagnóstico de 74-100% en tumores tímicos

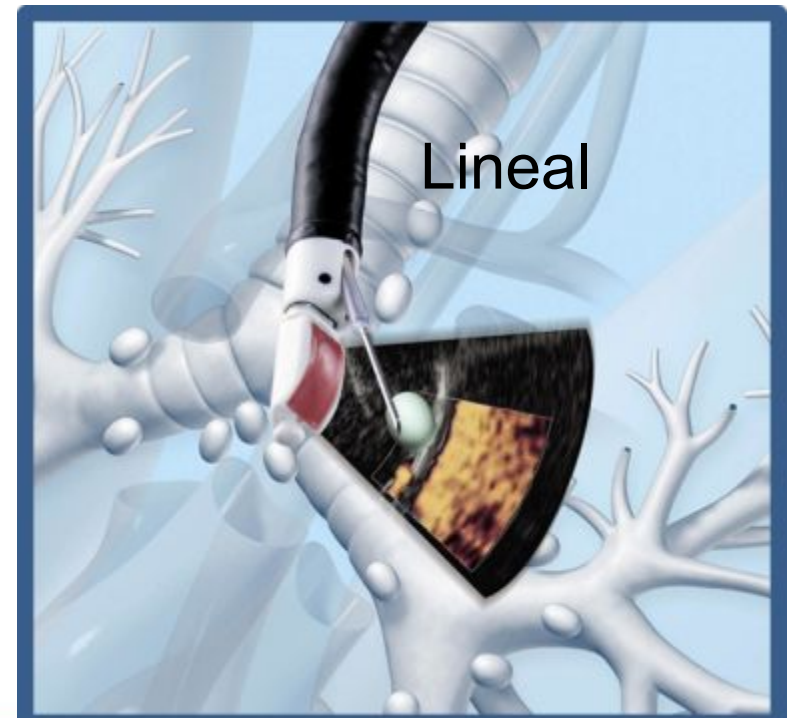
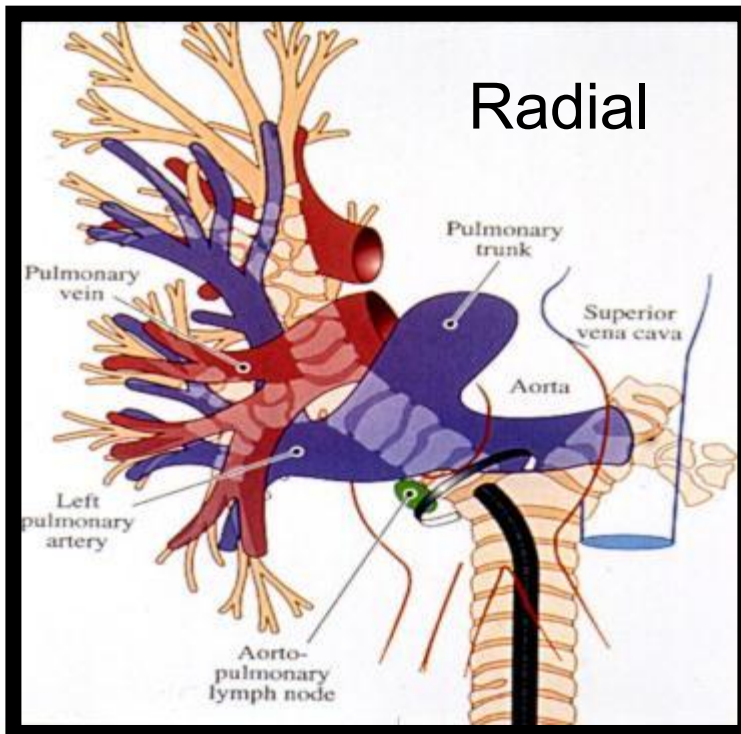
no diagnóstico en hasta 75% en linfomas

biopsias “core” : rendimiento diagnóstico de 77%

aspirado con aguja fina: rendimiento diagnóstico de 60%

BIOPSIA

- endobronquial con aguja fina guiada por endosonografía (EBUS-TBNA)





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BIOPSIA

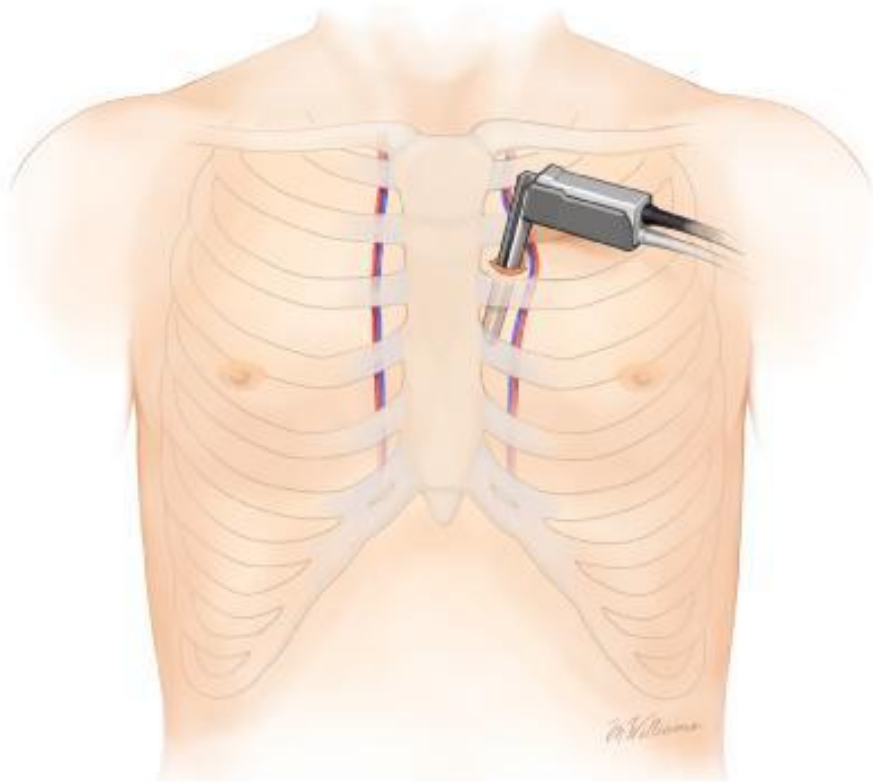
- quirúrgica

Mediastinotomía anterior (procedimiento de Chamberlain)

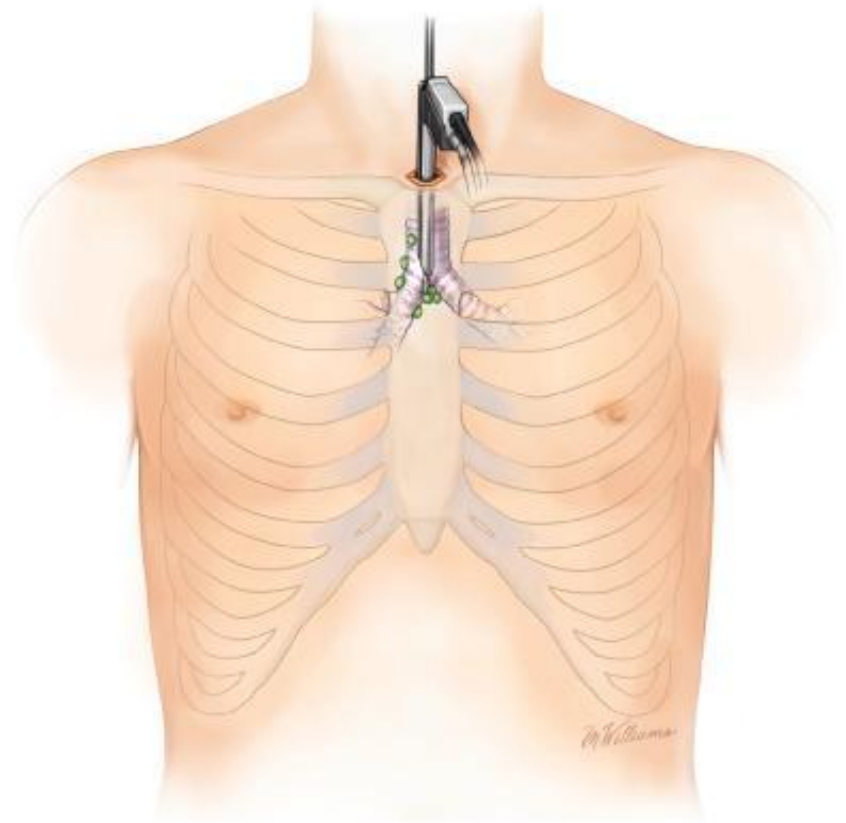
Mediastinoscopía

Toracoscopia videoasistida (VAT)

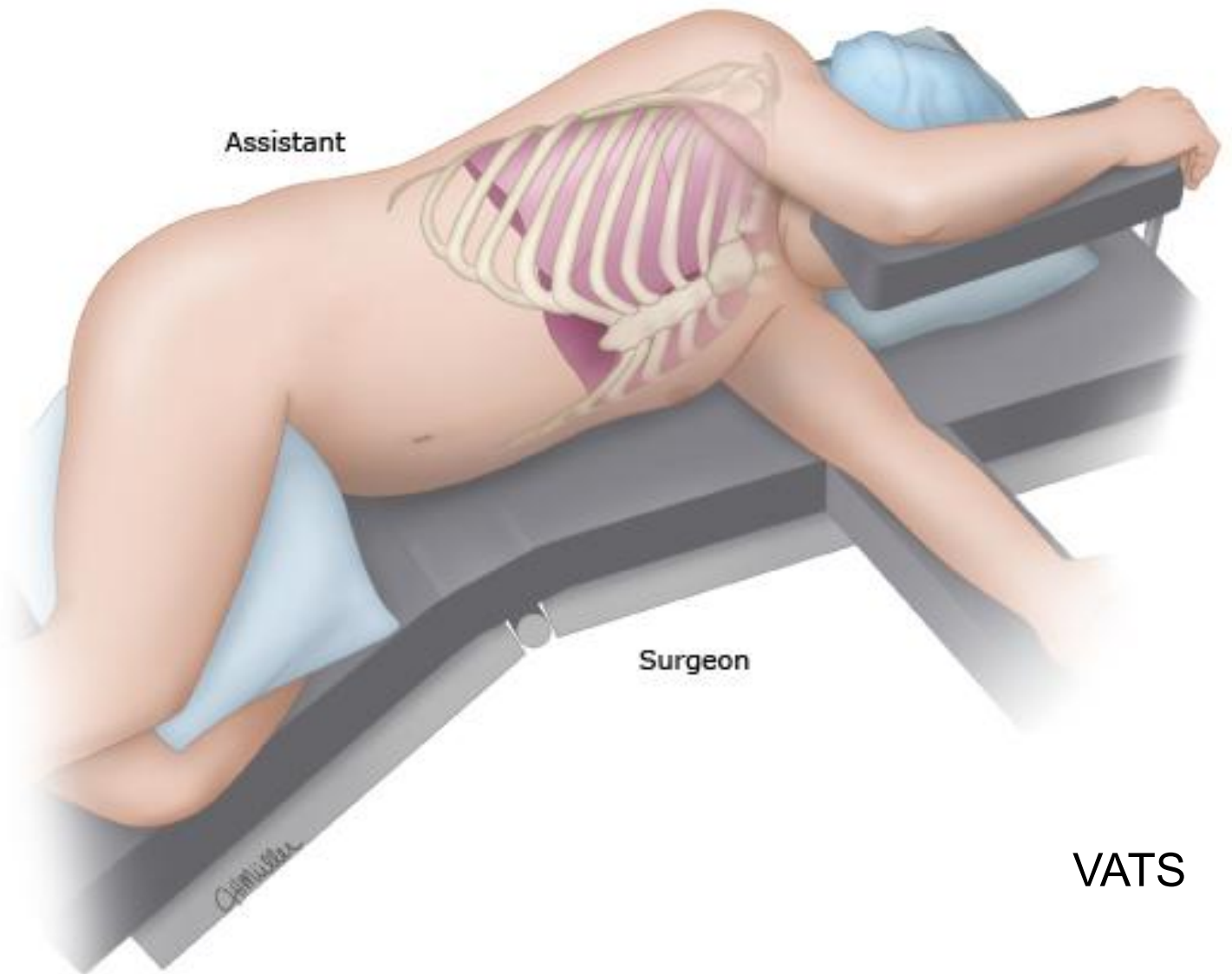
Cirugía abierta



Mediastinotomía anterior



Mediastinoscopía cervical



VATS



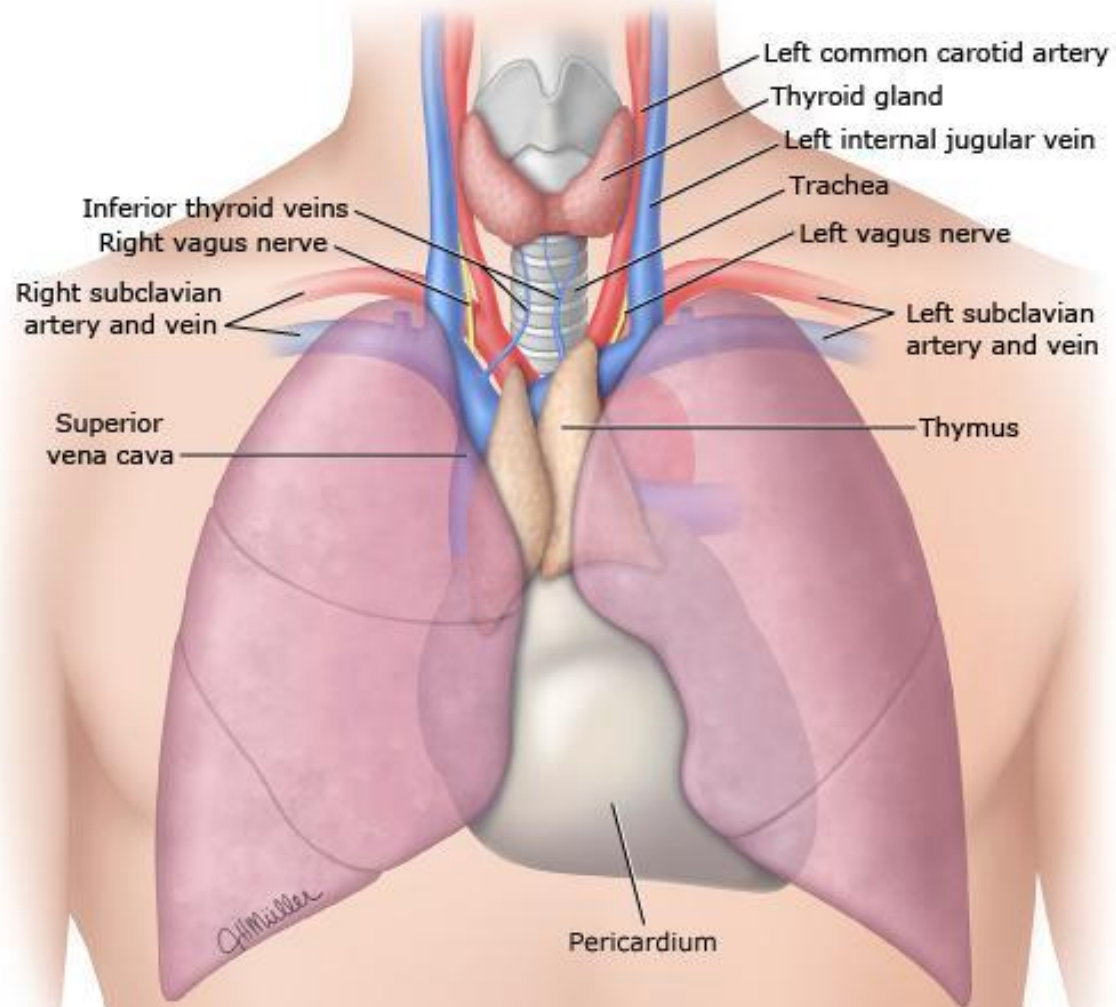
Differential diagnosis of mediastinal mass

50% de masas del
mediastino anterior

Anterior compartment	Middle compartment	Posterior compartment
Thymus - Thymoma - Thymic cyst - Thymic hyperplasia - Thymic carcinoma	Bronchogenic cyst	Neurogenic tumors - Neurofibroma - Neurilemmoma - Neurosarcoma - Ganglioneuroma - Ganglioneuroblastoma - Neuroblastoma - Chemodectoma - Pheochromocytoma
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Fibroma		
Fibrosarcoma		
Foramen of Morgagni hernia		



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TIMOMAS Y CARCINOMAS TIMICOS



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- Neoplasias epiteliales malignas originadas en el timo
- Timomas: 0.2 a 1.5% de todas las neoplasias malignas
90% de las neoplasias del timo
- Más comúnmente en mediastino prevascular
- “Peak” de incidencia entre 40-60 años
- Similar en ambos sexos
- Sin factores de riesgo conocidos



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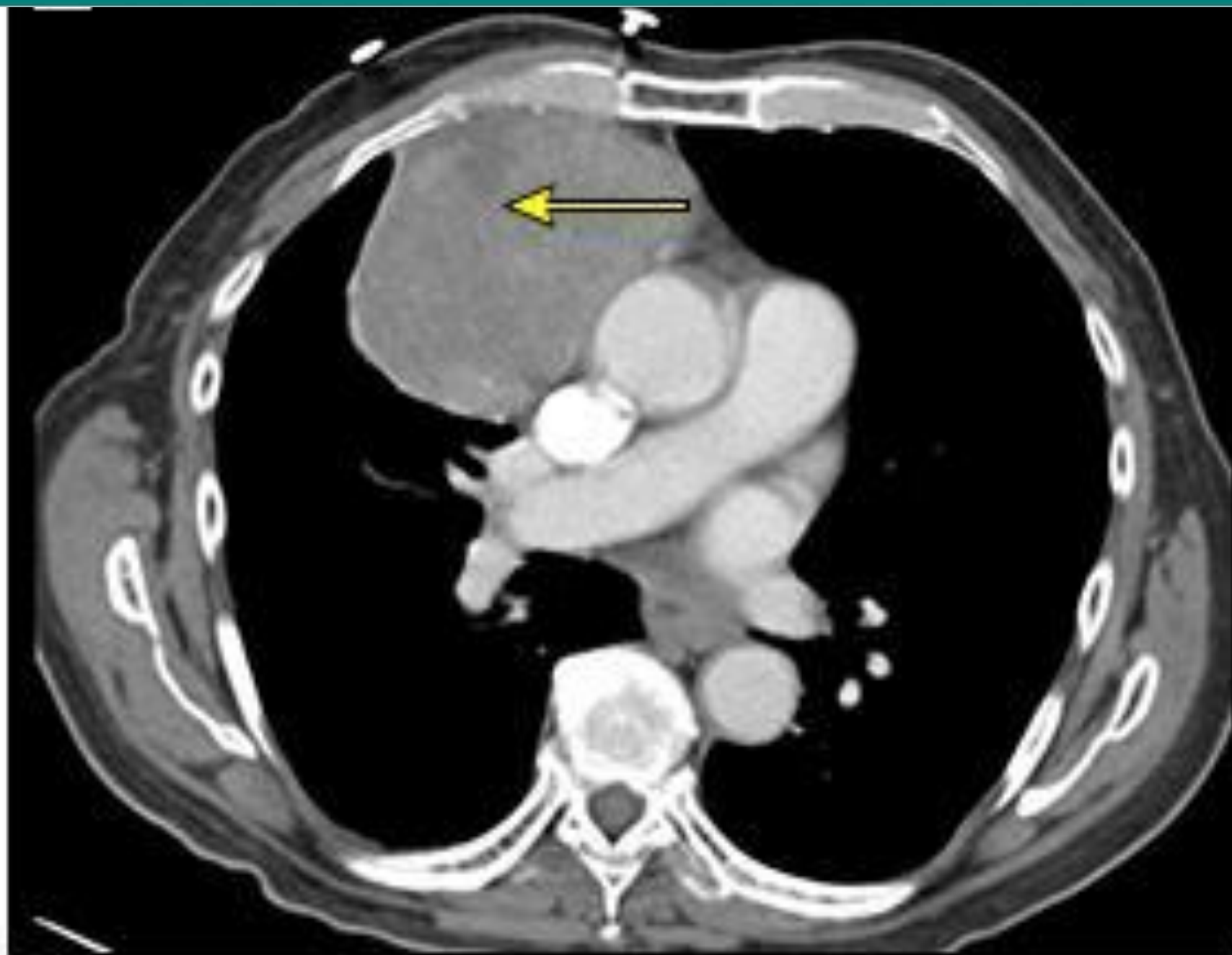
CLINICA

- Asintomáticos (30%)
- Síntomas locales
- Síntomas sistémicos
- Metástasis extratorácicas



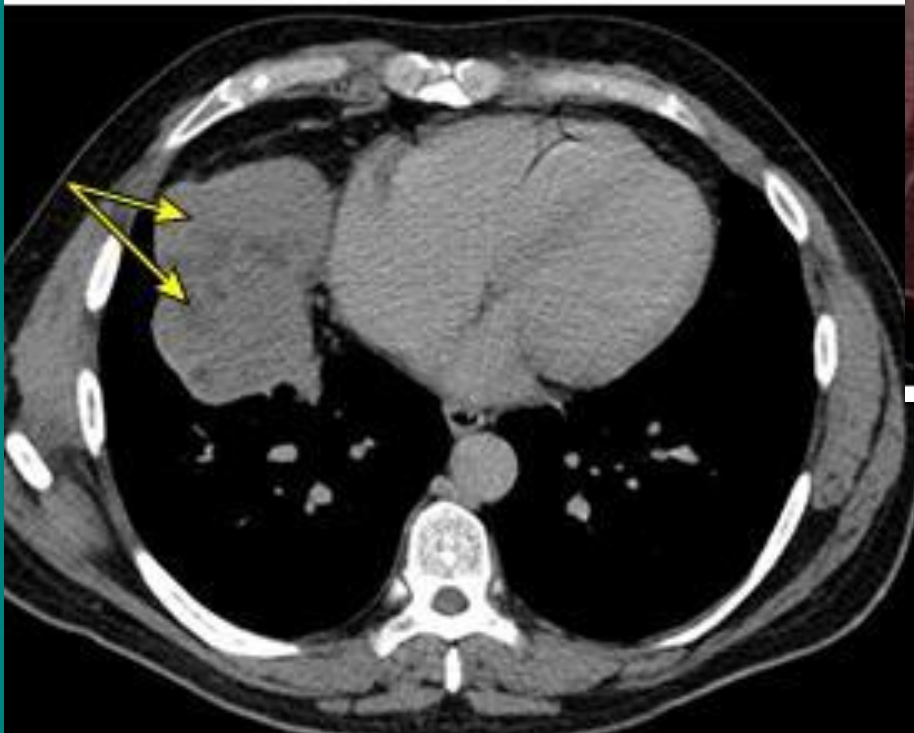
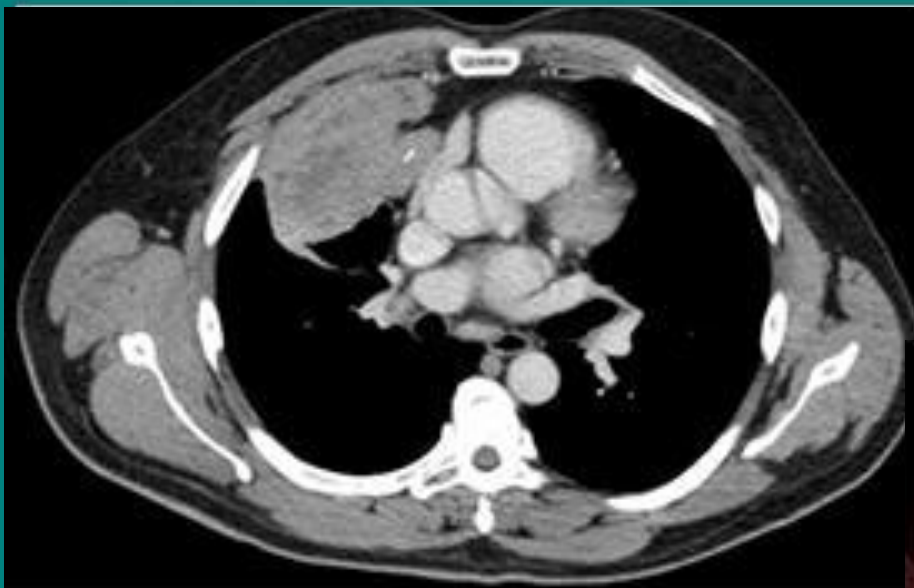
Paraneoplastic syndromes associated with thymic neoplasms

Neurologic and neuromuscular	Myasthenia gravis, polymyositis, sensory neuropathy, stiff person syndrome, neuromyelitis optica, Isaac's syndrome (neuromyotonia), Eaton Lambert syndrome, hemichorea
Hematologic	Pure red cell aplasia, agranulocytosis, hemolytic anemia, pernicious anemia
Dermatologic	Alopecia areata, pemphigus, scleroderma, oral lichen planus, vitiligo
Endocrine	Addison's disease, Cushing syndrome, panhypopituitarism, thyroiditis
Miscellaneous	Acquired hypogammaglobulinemia, myocarditis, nephrotic syndrome, rheumatoid arthritis, sarcoidosis, hepatitis, gastrointestinal pseudoobstruction, ulcerative colitis





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CLINICA ESTUDIOS POR IMÁGENES

Confirmación diagnóstica histológica:

- Tumor infiltrativo, irresecable (biopsia core o quirúrgica)
- Tumor bien delimitado, posible R0 (tumorectomía)



Protocolo del CAP para examen y reporte de Tumores epiteliales tímicos (piezas quirúrgicas)

- Timomas
- Carcinomas tímicos
- Tumores neuroendocrinos



Protocolo del CAP para examen y reporte de Tumores epiteliales tímicos (piezas quirúrgicas)

- Tamaño tumoral
- Tipo histológico
- Invasión transcapsular
- Márgenes quirúrgicos
- Respuesta a tratamiento pre-quirúrgico
- Invasión linfovascular
- Compromiso de linfonodos regionales
- Etapificación
- Hallazgos histopatológicos adicionales



Recomendaciones en piezas quirúrgicas de tumores tímicos

- Marcado:

De rutina de áreas adyacentes a pericardio

De rutina superficie de pleura mediastínica

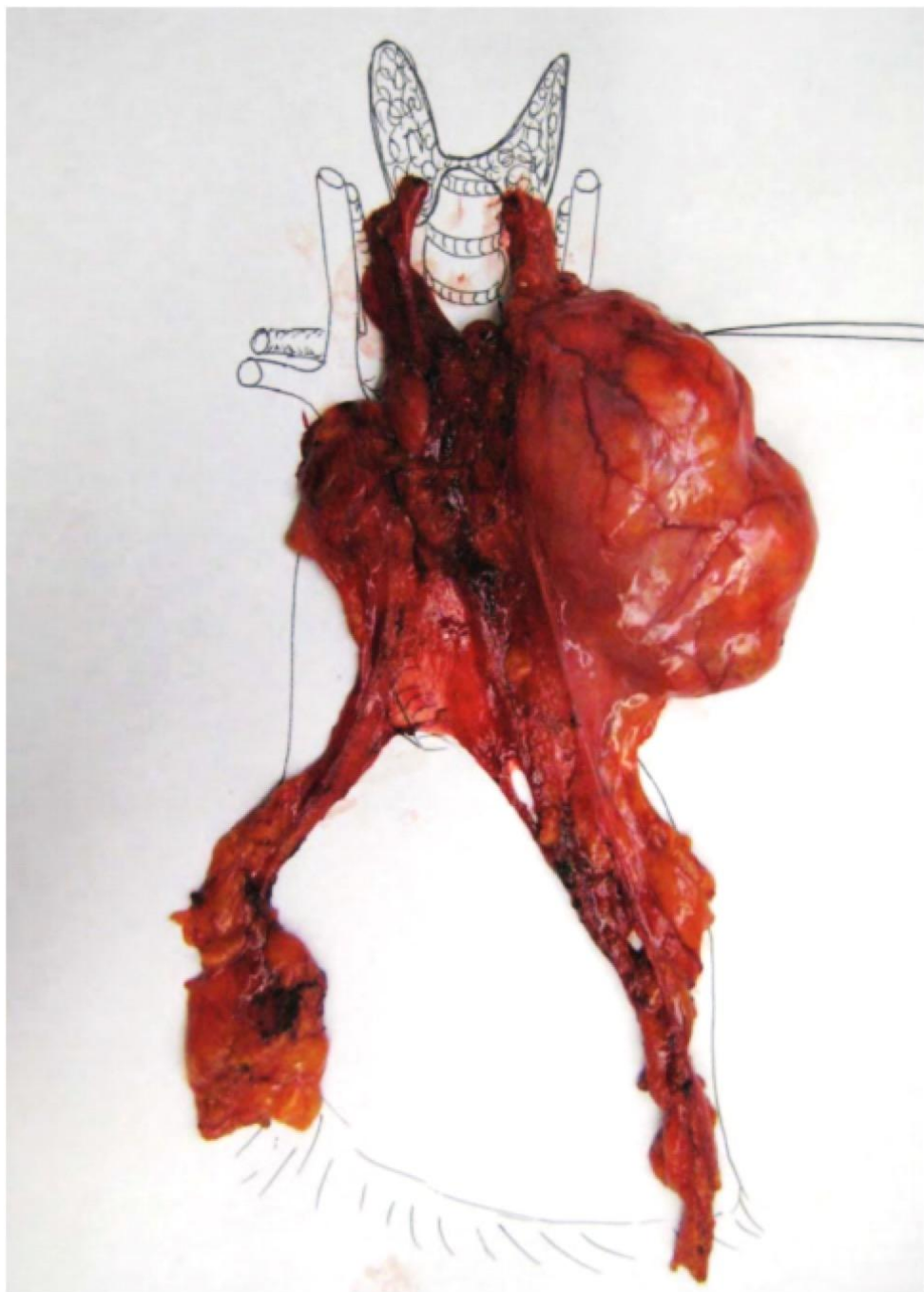
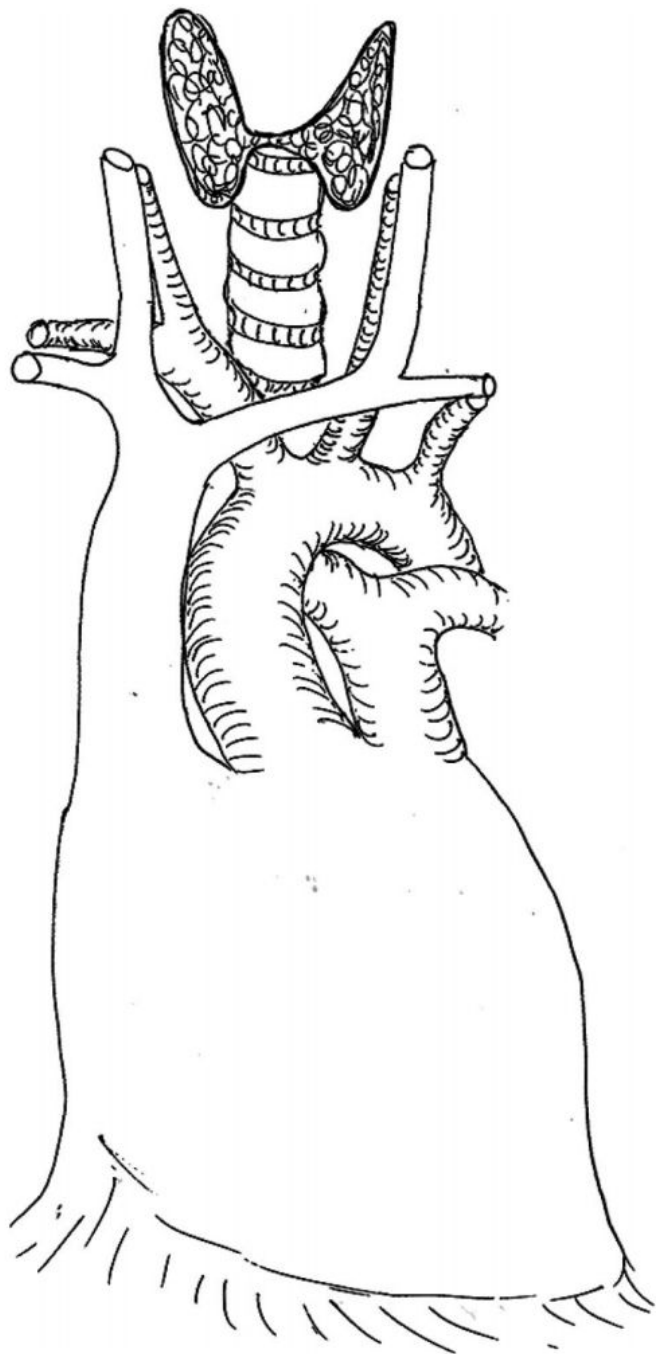
De áreas adyacentes a estructuras vecinas

Which way is up?: policies and procedures for surgeons and pathologists regarding resection specimens of thymic malignancy. J Thorac Oncol. 2011;6(7 Suppl 3):S1730.



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- Mercado
- Orientación





- Marcado
- Orientación
- Linfonodos:

Anteriores (peritímicos))
Intratorácicos profundos
Cervicales

2% de metástasis en linfonodos en timomas
27% de metástasis en linfonodos en carcinomas tímicos



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- Marcado
- Orientación
- Linfonodos
- Biopsia intraoperatoria

Confirmación de tumores no epiteliales y/o no resecables



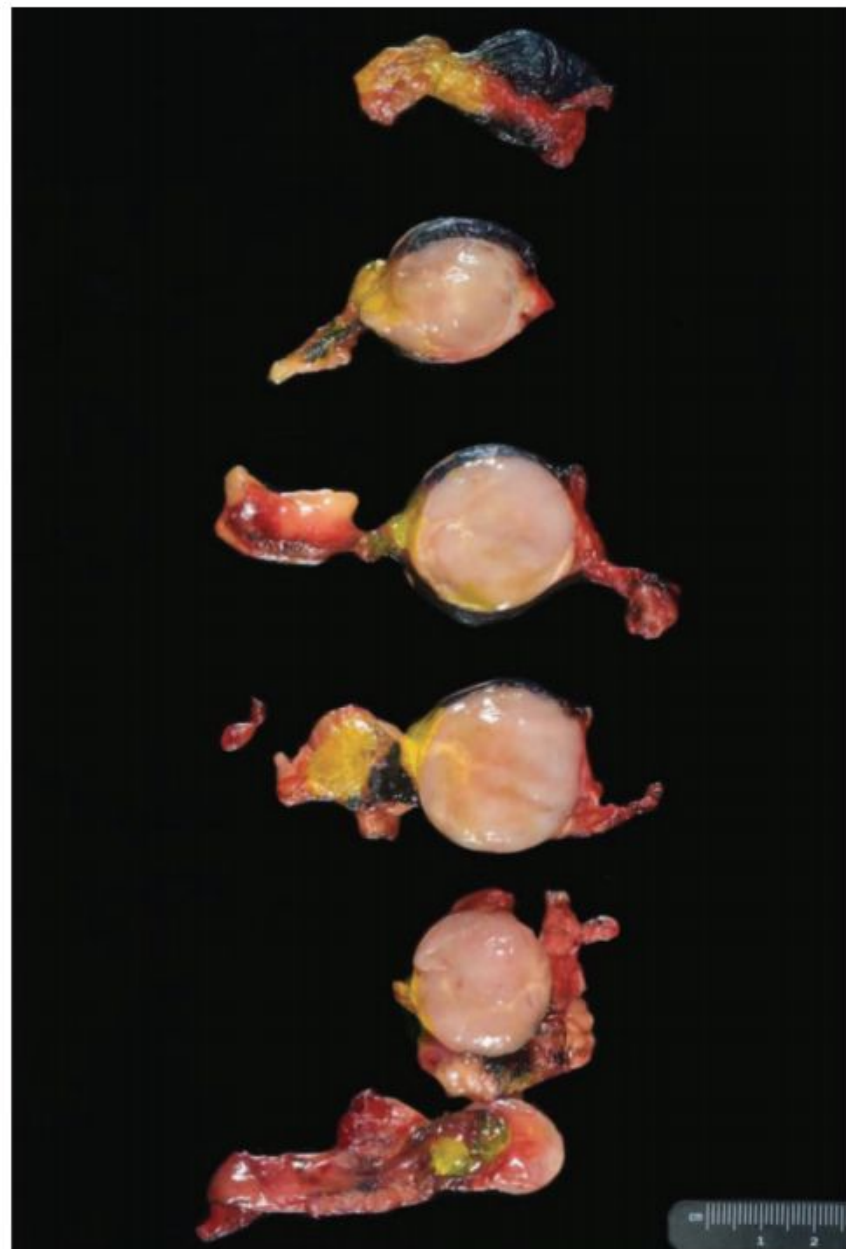
- Marcado
- Orientación
- Linfonodos
- Biopsia intraoperatoria
- Aclaraciones en solicitud de biopsia:

Estructuras adicionales en la pieza
Sospecha de adherencia o infiltración
Indicación de márgenes quirgúrgicos



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- Procesamiento



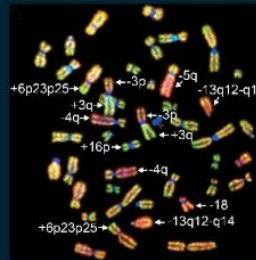
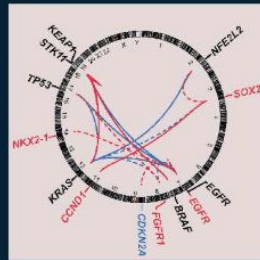
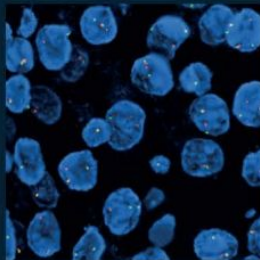
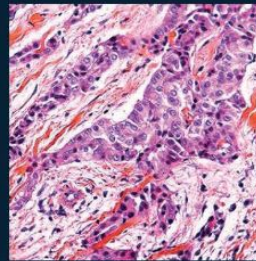
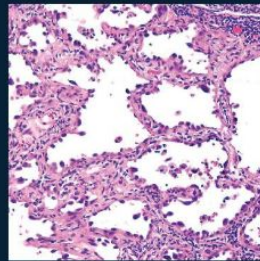
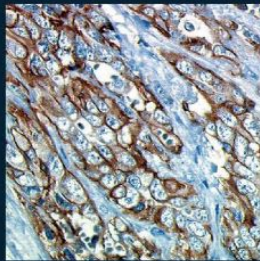
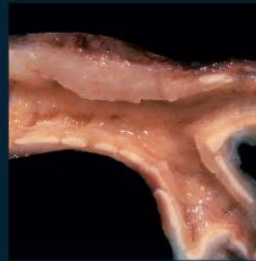
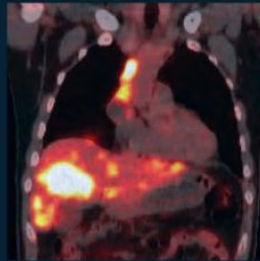


- 1 block/cm de tumor
- ≥ 5 cortes representativos
- Posibles márgenes positivos (distancia en mm)
- Cápsula tumoral
- Zonas de adherencia y posible infiltración a otras estructuras en la muestra
- Muestreo extenso de zonas quísticas
- Muestras al azar del timo no tumoral

WHO Classification of Tumours of the Lung, Pleura, Thymus and Heart

Edited by

William D. Travis, Elisabeth Brambilla, Allen P. Burke, Alexander Marx, Andrew G. Nicholson



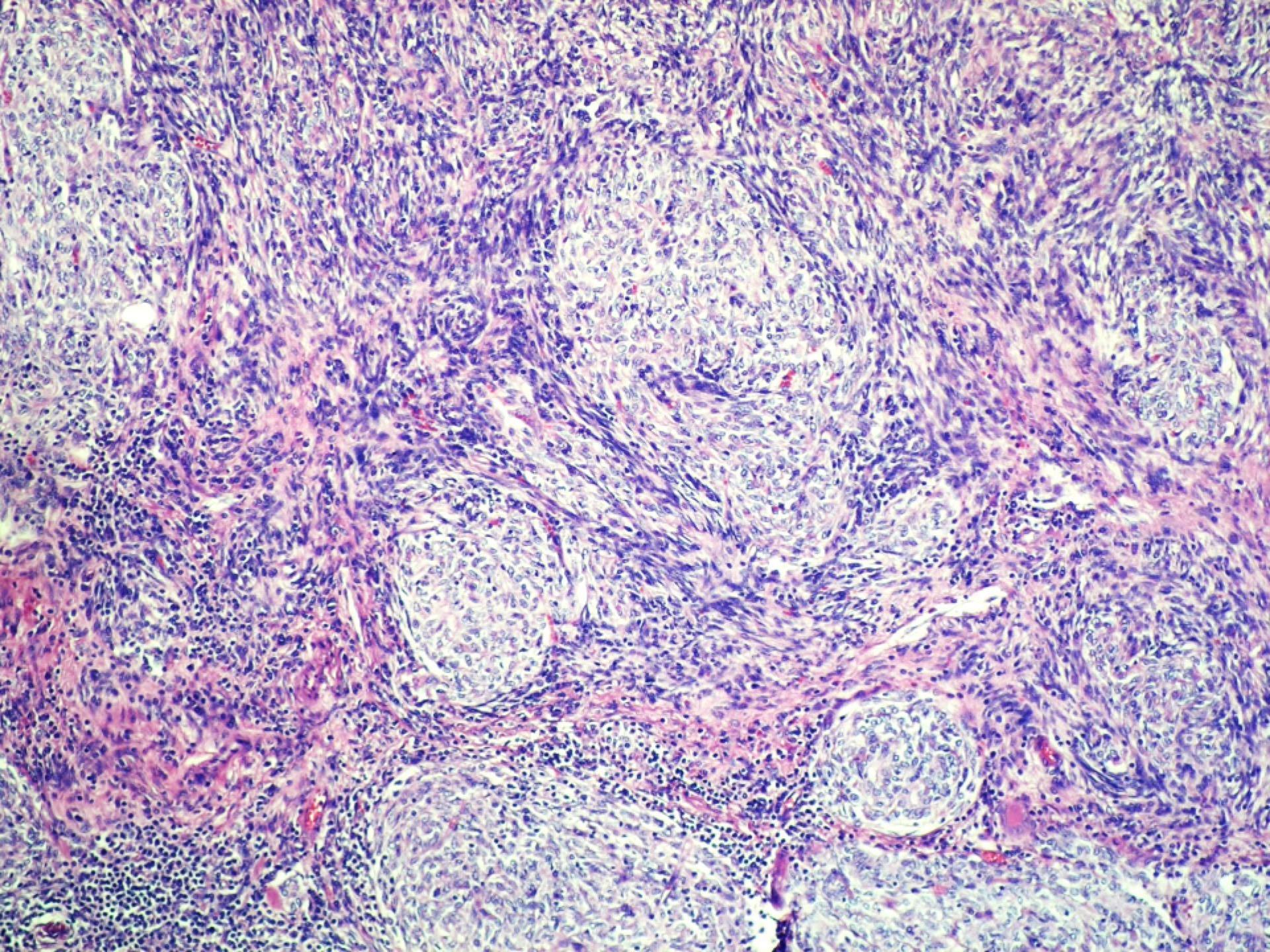
Travis WD, Brambilla E, Burke AP, Marx A, Nicholson AG 4th edition, WHO 2015.

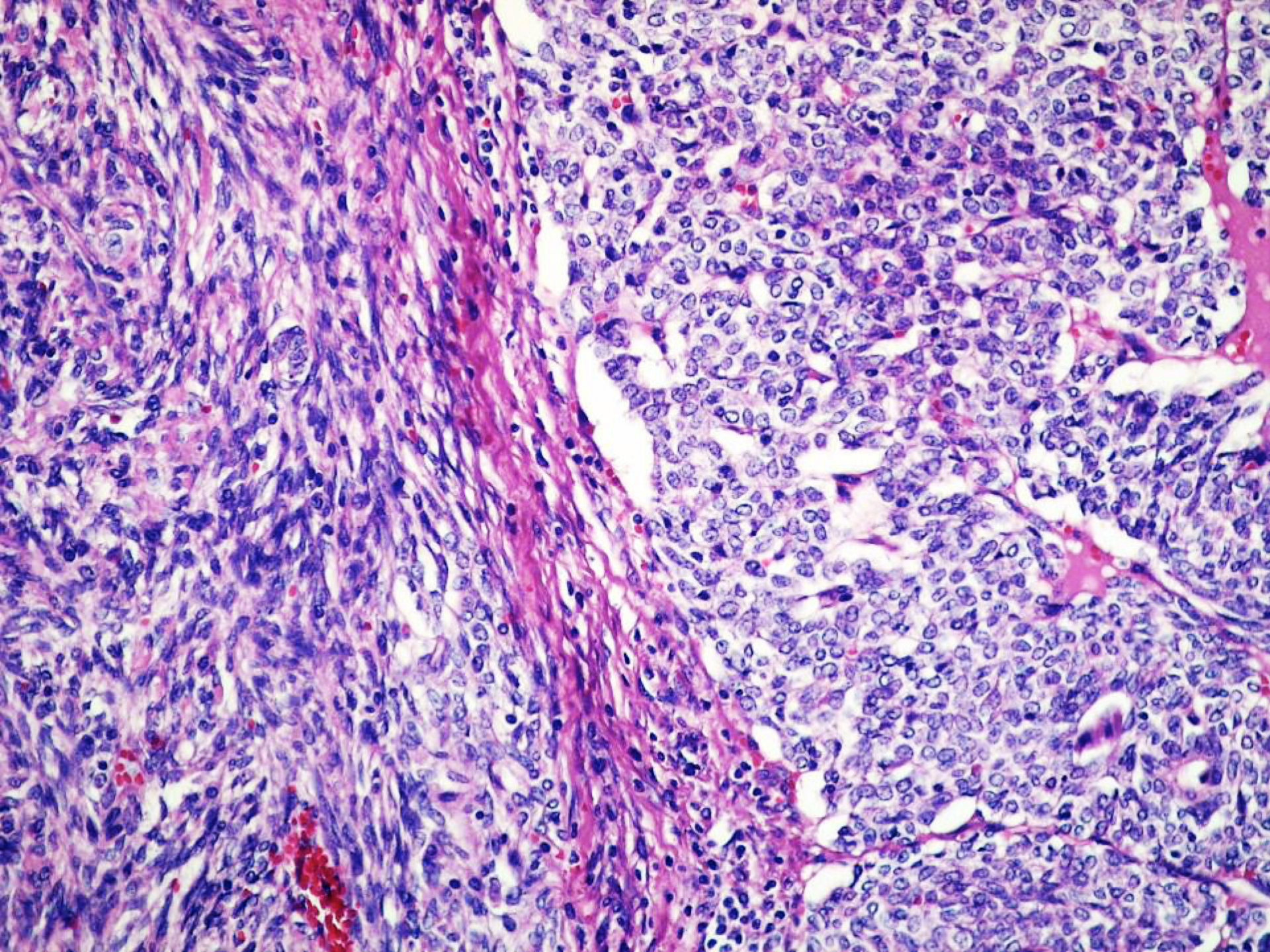
Thymoma subtype	Obligatory criteria	Optional criteria
Type A	Occurrence of bland, spindle shaped epithelial cells (at least focally); paucity ^a or absence of immature (TdT+) T cells throughout the tumor	Polygonal epithelial cells CD20+ epithelial cells
Atypical type A variant	Criteria of type A thymoma; in addition: comedo-type tumor necrosis; increased mitotic count (>4/2mm ²); nuclear crowding	Polygonal epithelial cells CD20+ epithelial cells
Type AB	Occurrence of bland, spindle shaped epithelial cells (at least focally); abundance ^a of immature (TdT+) T cells focally or throughout tumor	Polygonal epithelial cells CD20+ epithelial cells
Type B1	Thymus-like architecture and cytology: abundance of immature T cells, areas of medullary differentiation (medullary islands); paucity of polygonal or dendritic epithelial cells without clustering (i.e. <3 contiguous epithelial cells)	Hassall's corpuscles; perivascular spaces
Type B2	Increased numbers of single or clustered polygonal or dendritic epithelial cells intermingled with abundant immature T cells	Medullary islands; Hassall's corpuscles; perivascular spaces
Type B3	Sheets of polygonal slightly to moderately atypical epithelial cells; absent or rare intercellular bridges; paucity or absence of intermingled TdT+ T cells	Hassall's corpuscles; perivascular spaces
MNT ^b	Nodules of bland spindle or oval epithelial cells surrounded by an epithelial cell-free lymphoid stroma	Lymphoid follicles; monoclonal B cells and/or plasma cells (rare)
Metaplastic thymoma	Biphasic tumor composed of solid areas of epithelial cells in a background of bland-looking spindle cells; absence of immature T cells	Pleomorphism of epithelial cells; actin, keratin, or EMA-positive spindle cells
Rare others ^c		

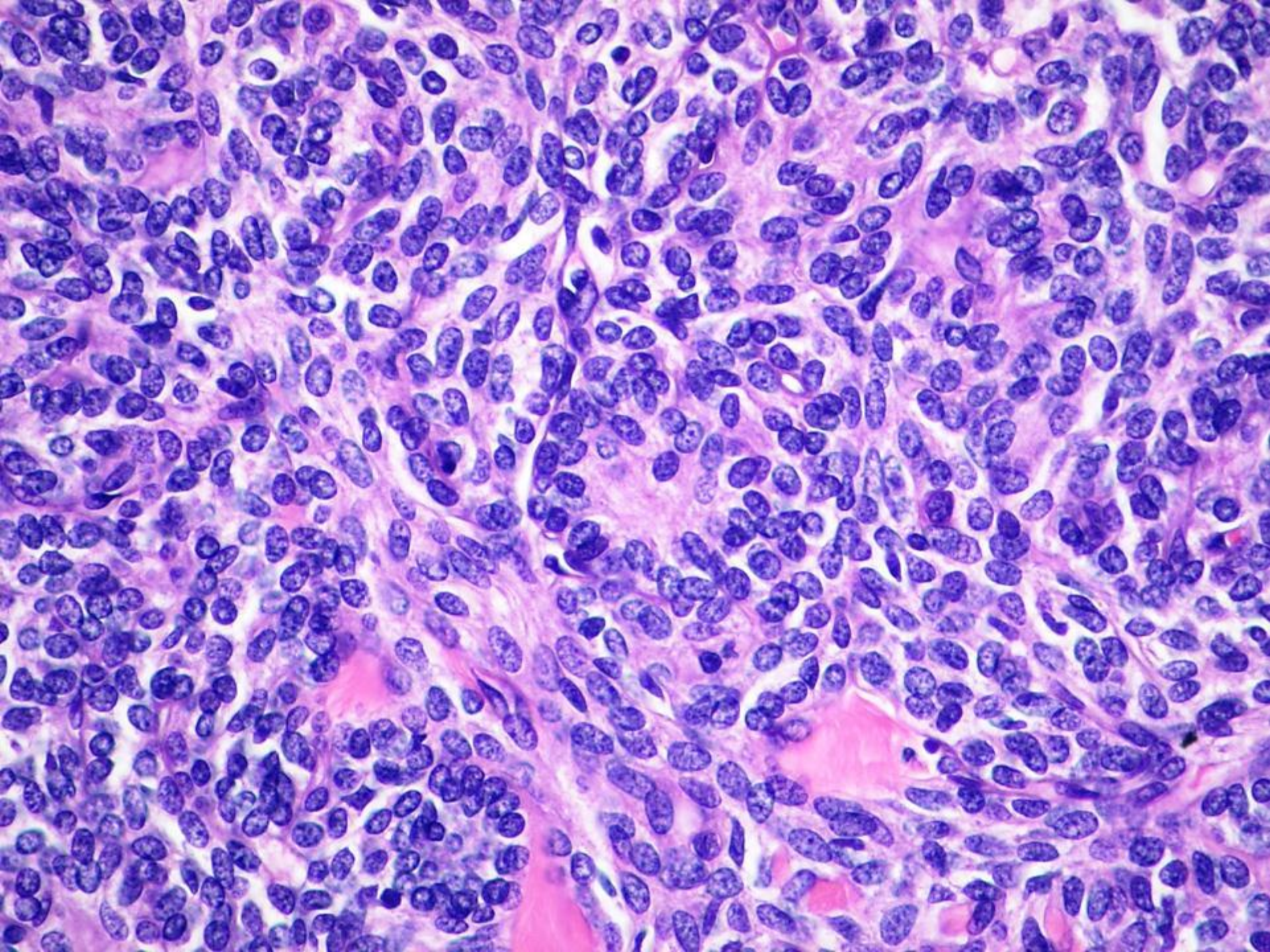
^a Paucity versus abundance: any area of crowded immature T cells or moderate numbers of immature T cells in >10% of the investigated tumor are indicative of "abundance";

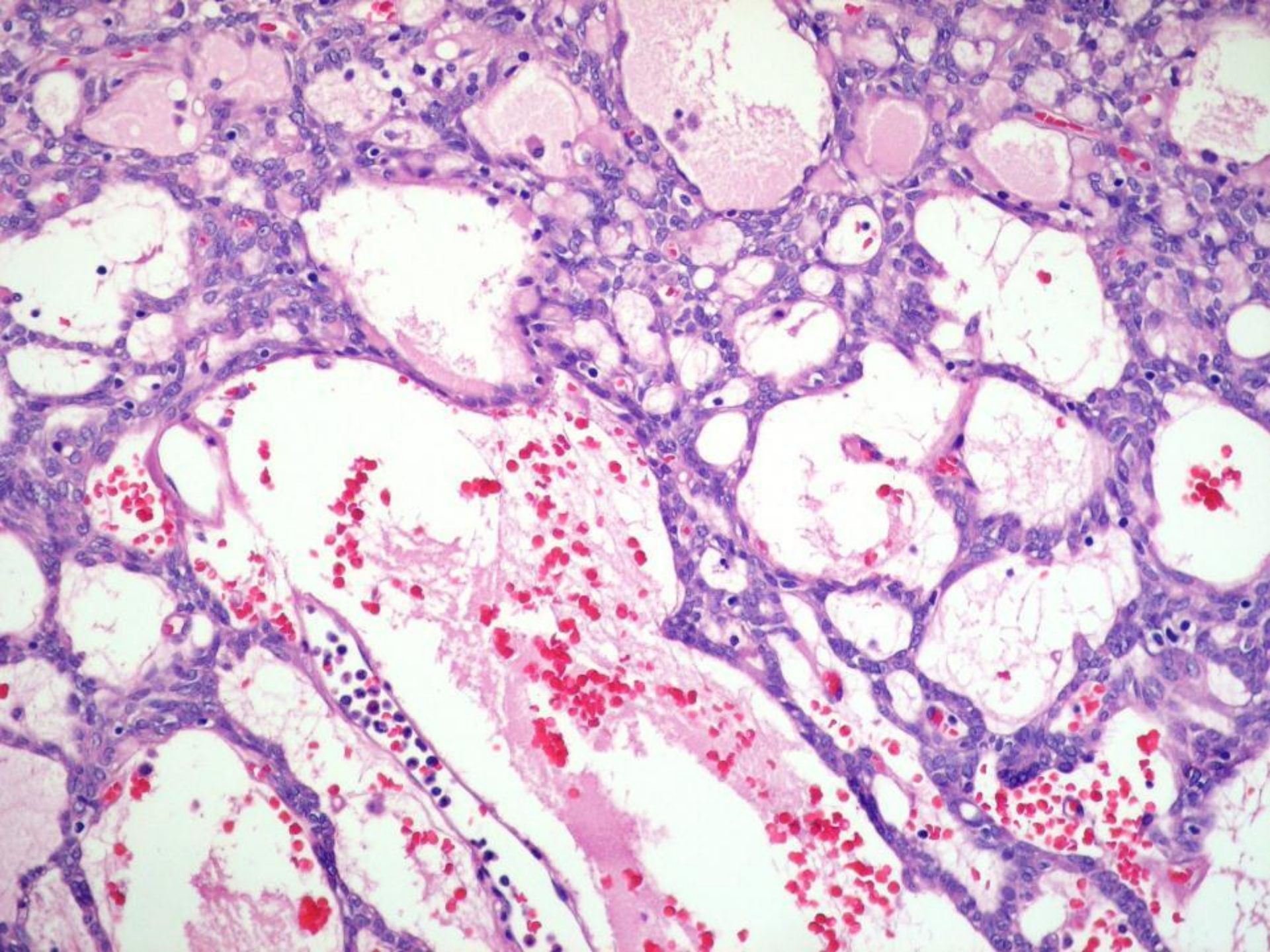
^b MNT, micronodular thymoma with lymphoid stroma;

^c Microscopic thymoma; sclerosing thymoma, lipofibroadenoma



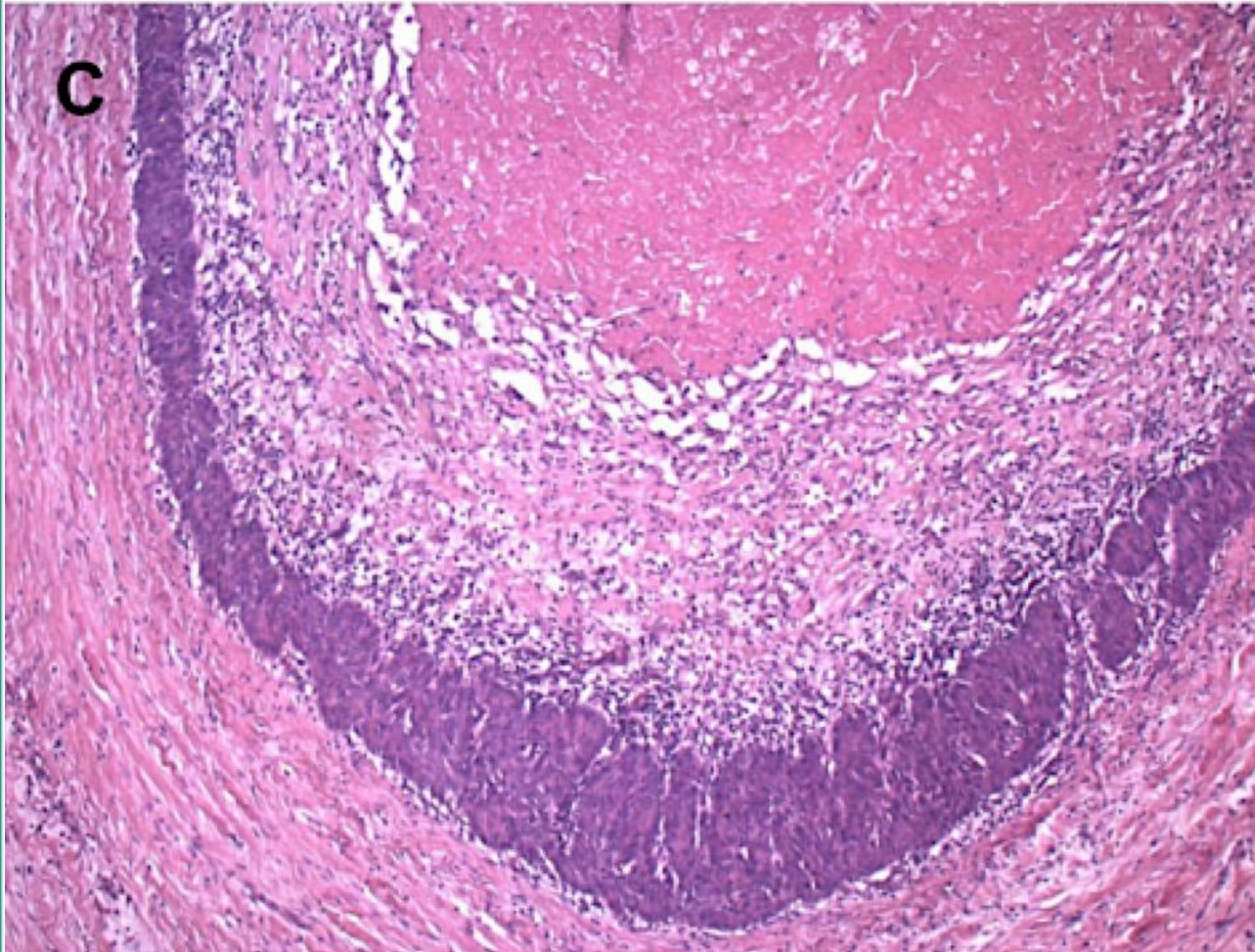




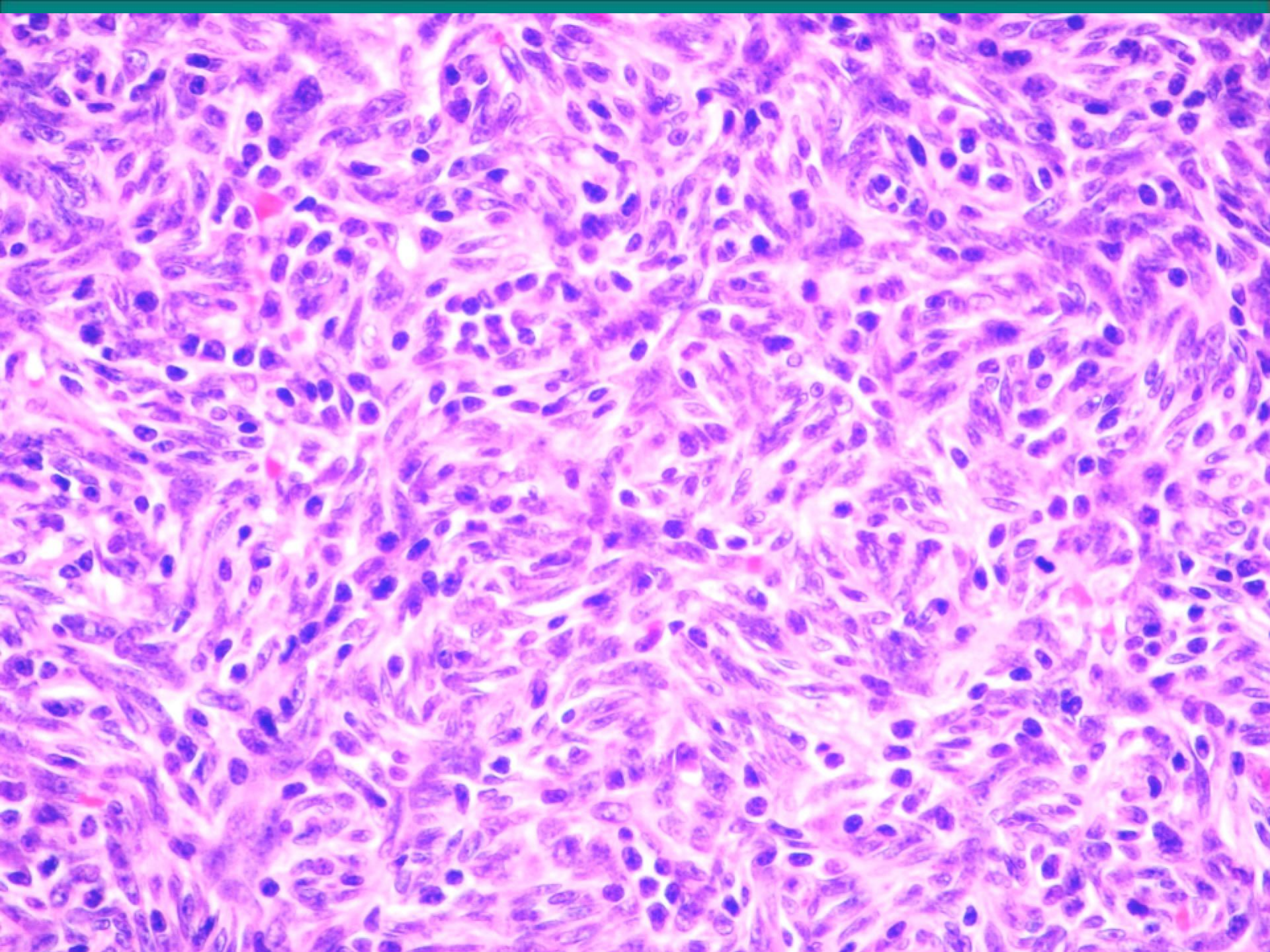


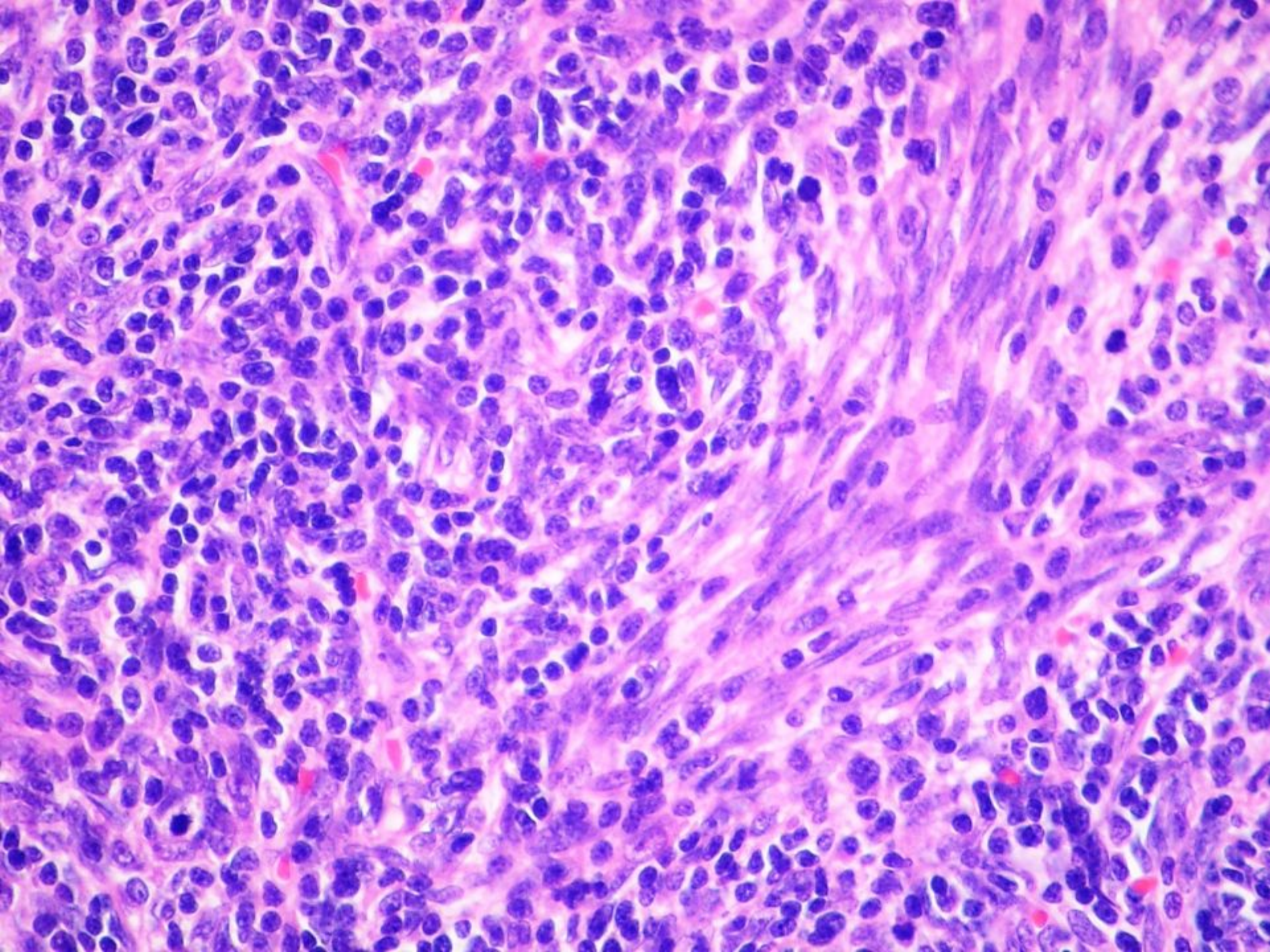


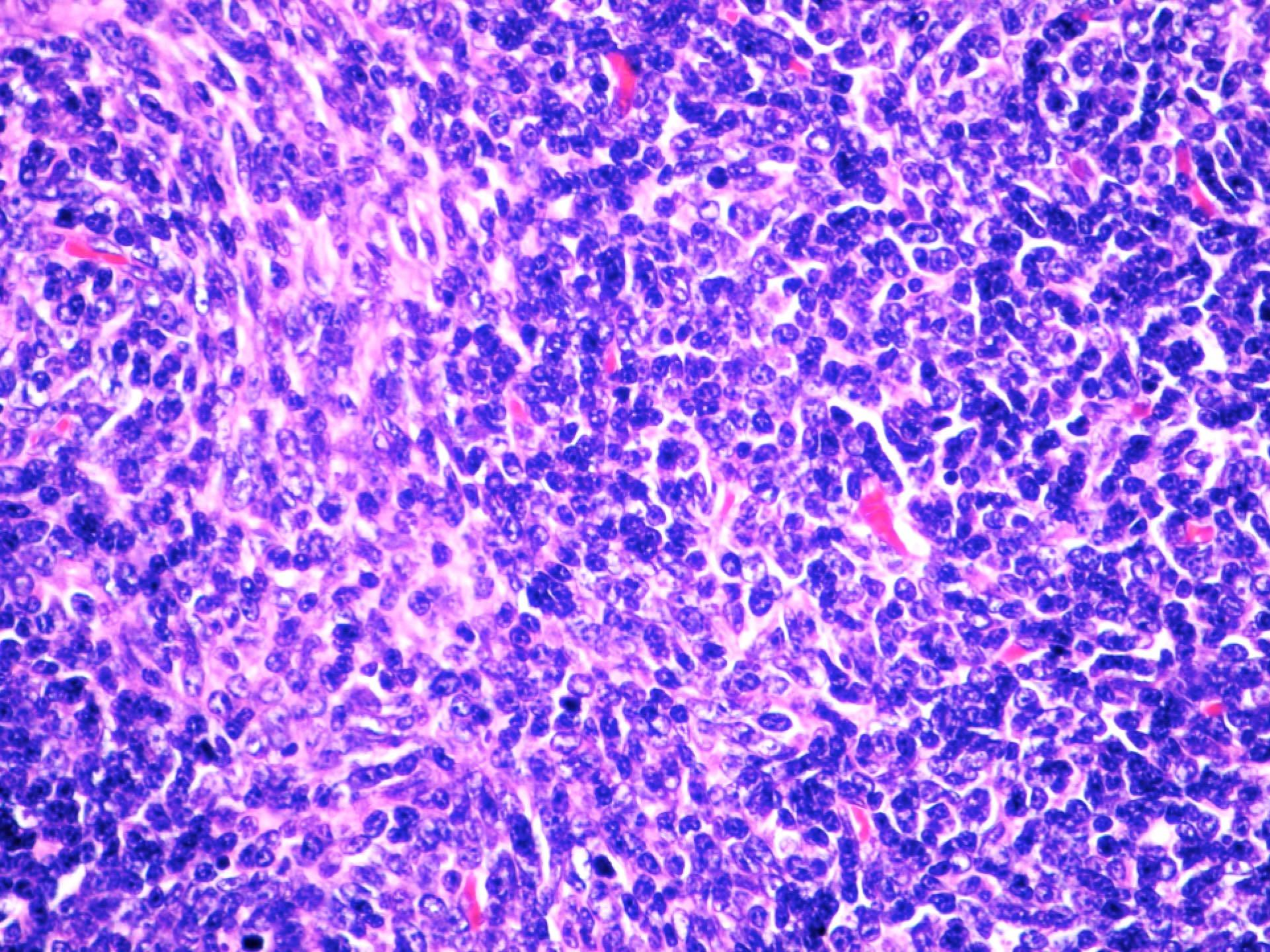
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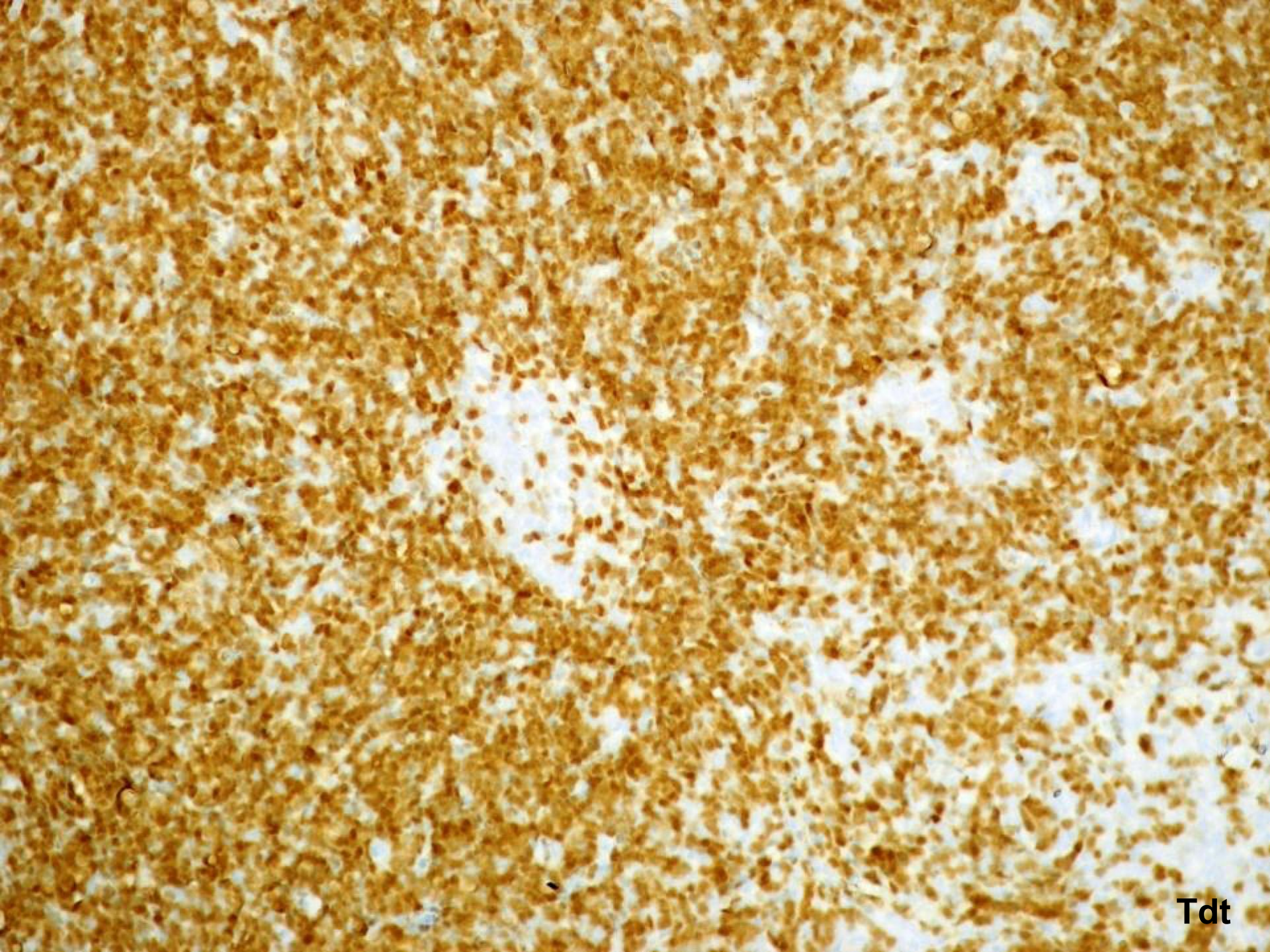


The 2015 World Health Organization Classification of Tumors of the Thymus: Continuity and Changes. J Thorac Oncol. 2015;10(10):1383-1395.

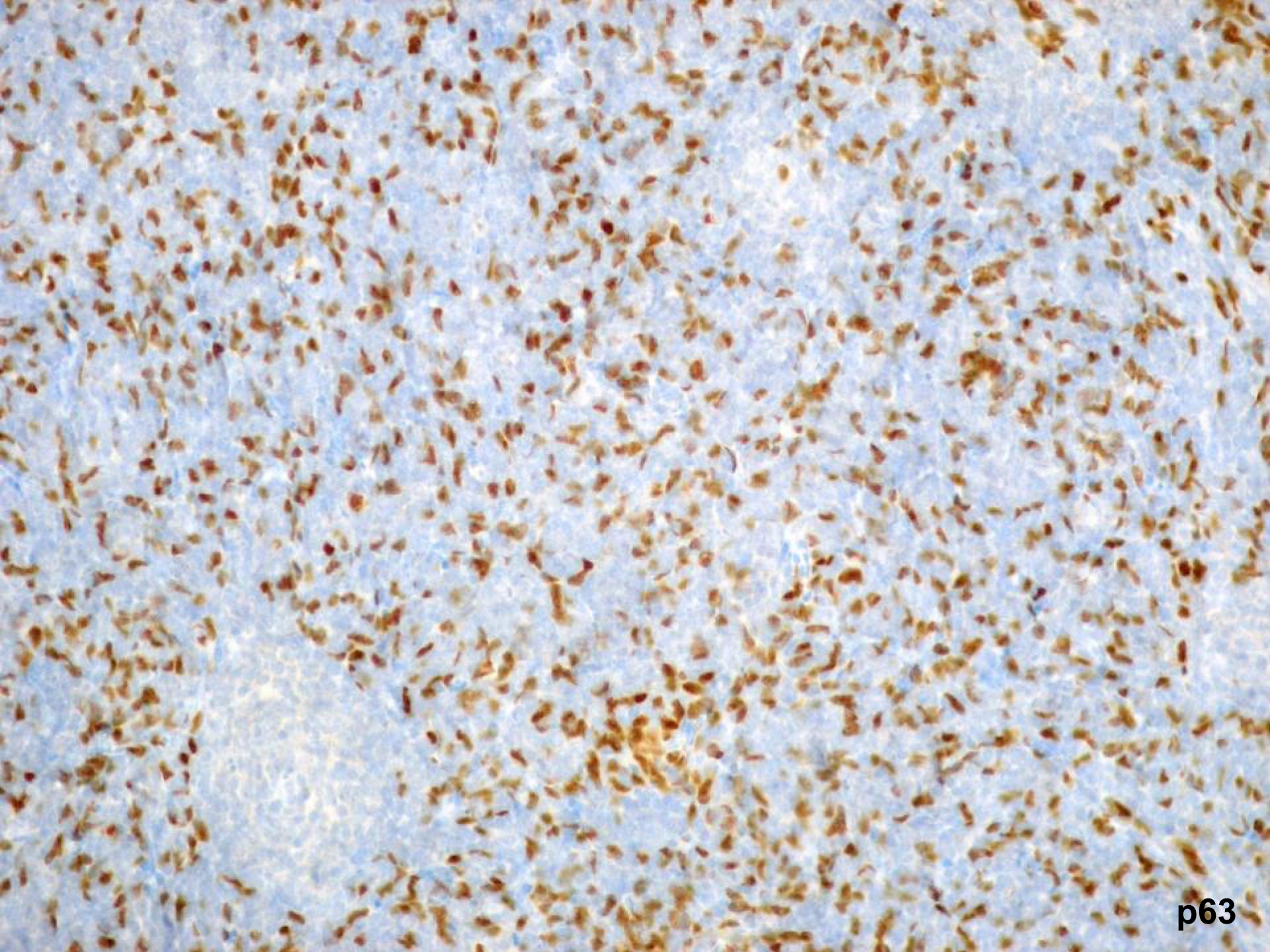


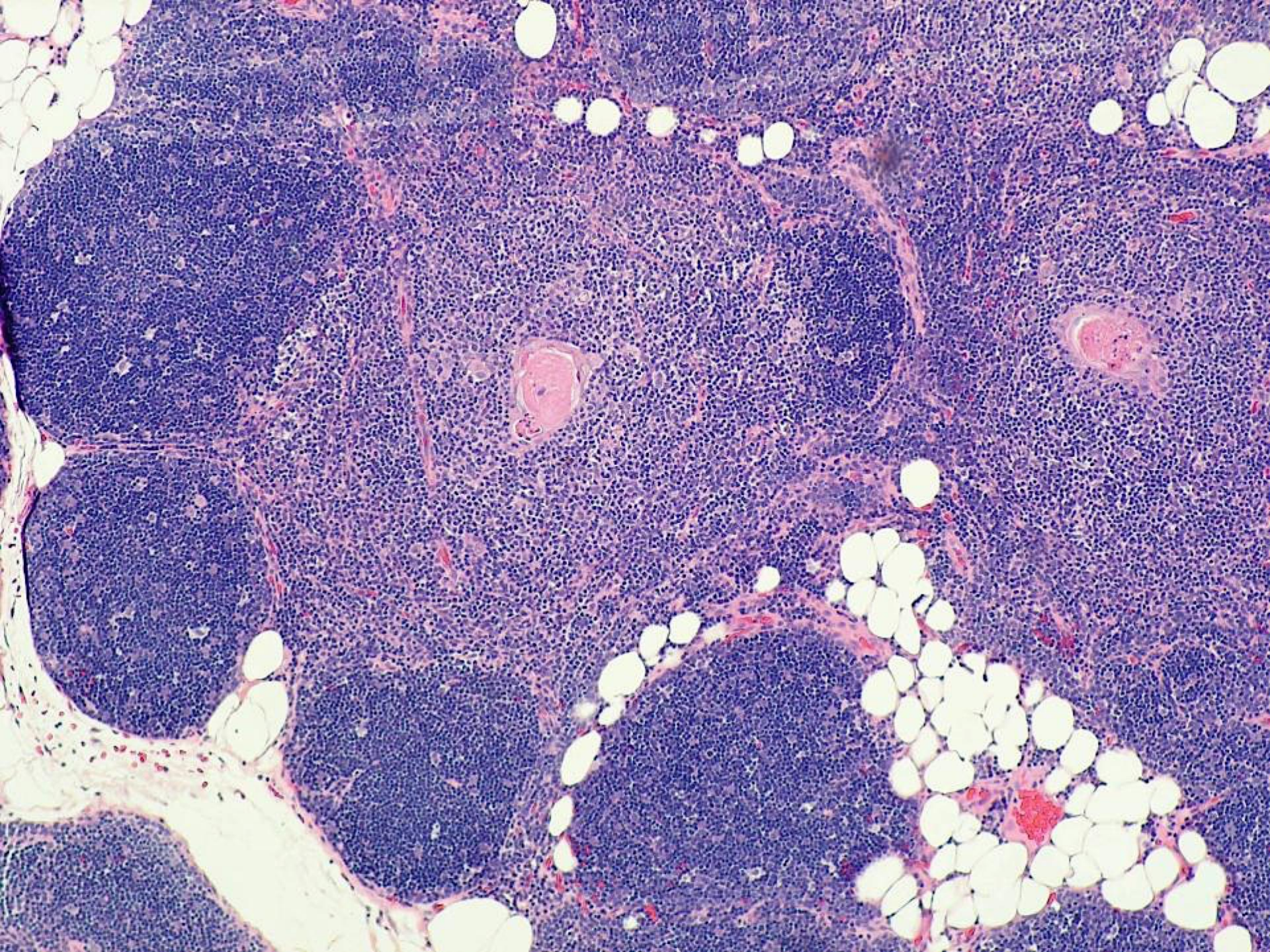


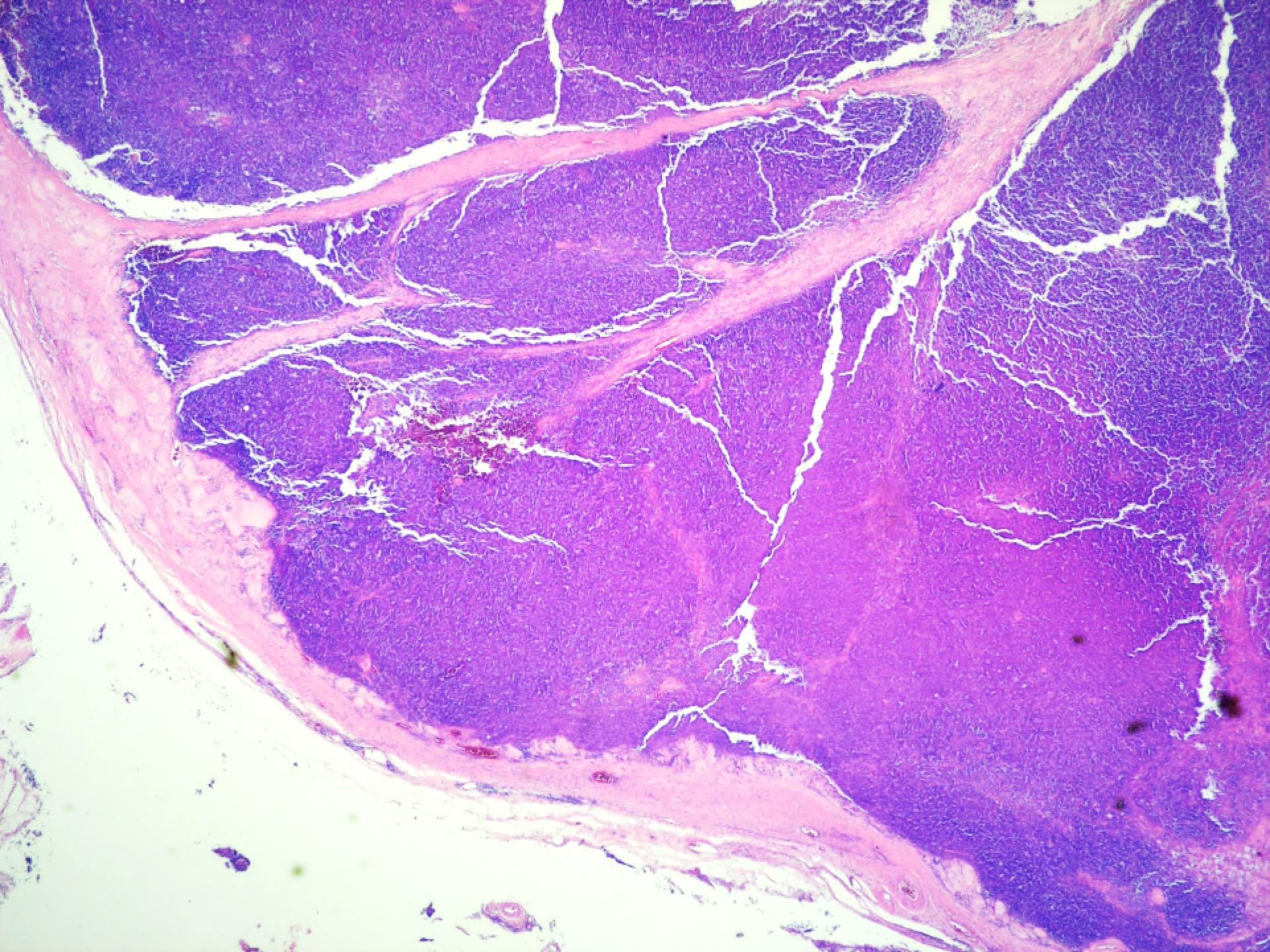


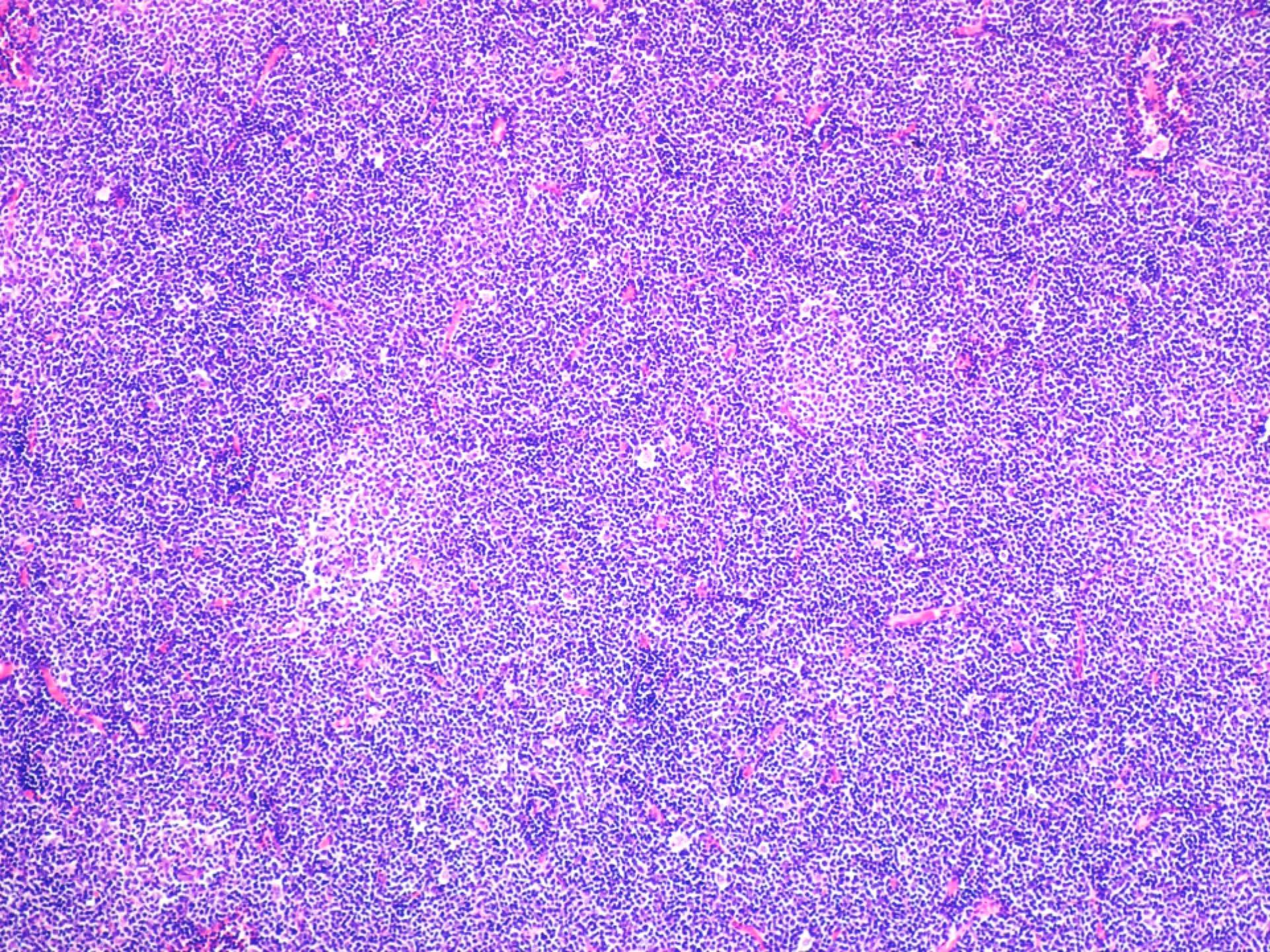


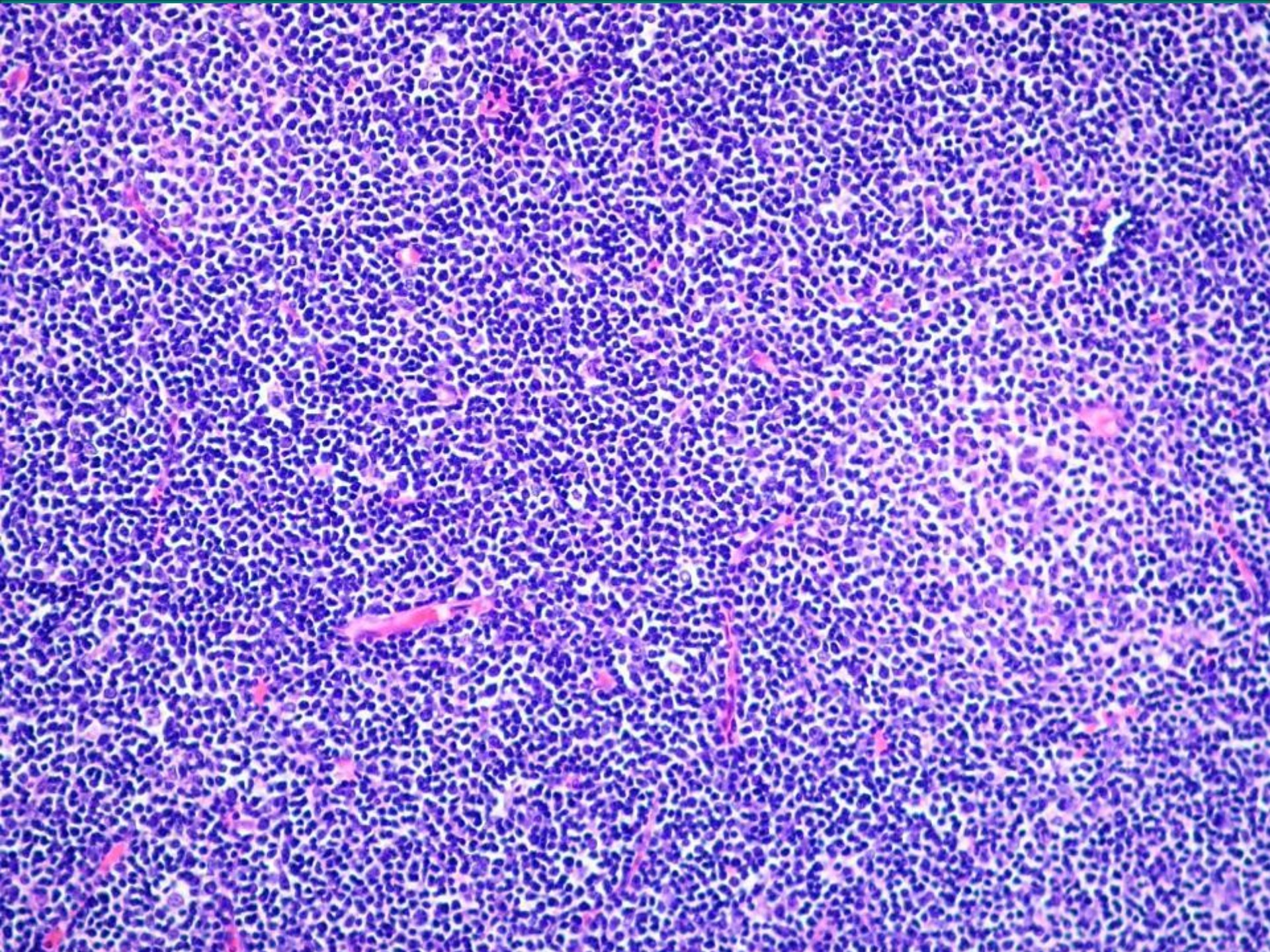
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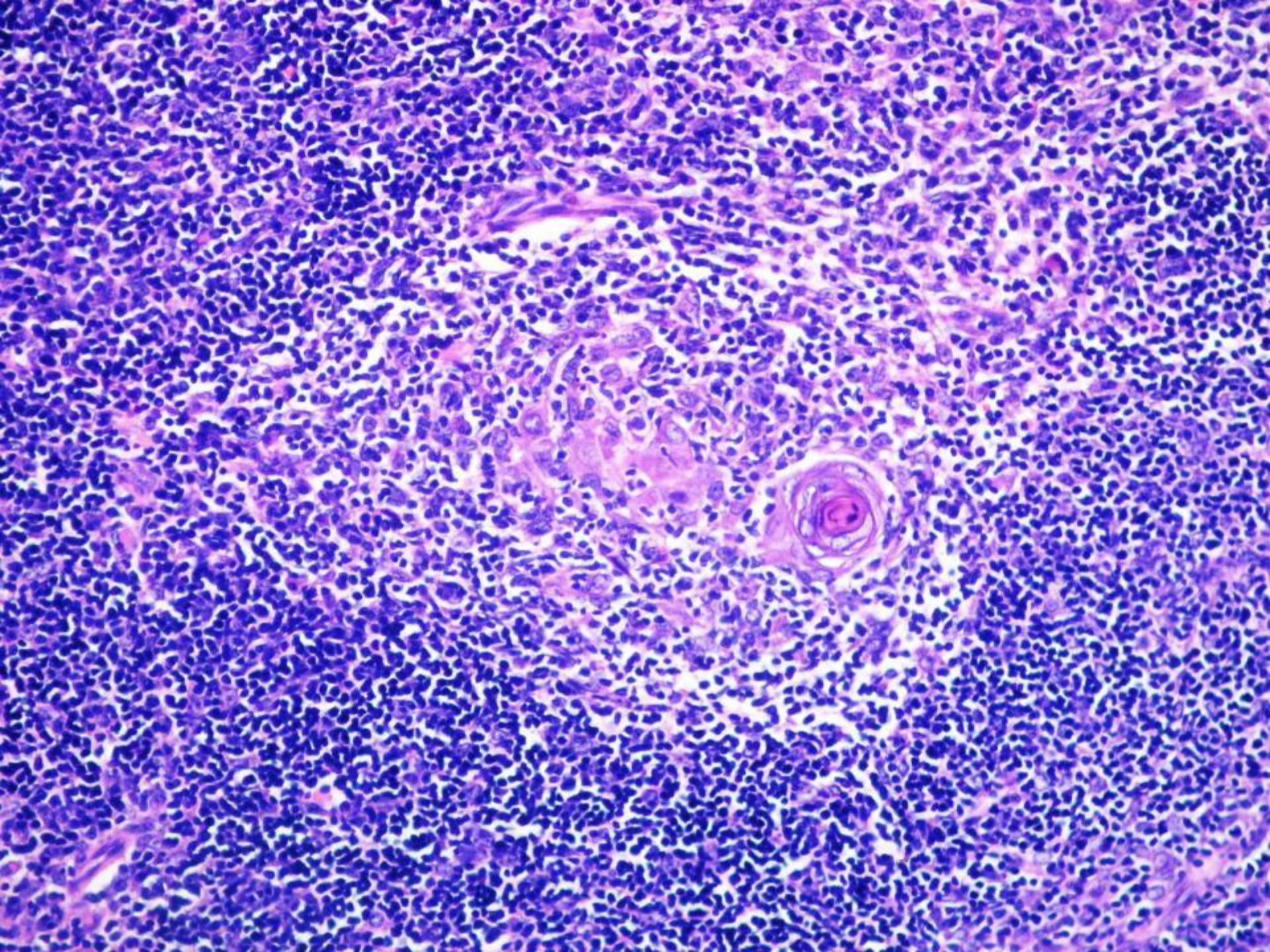


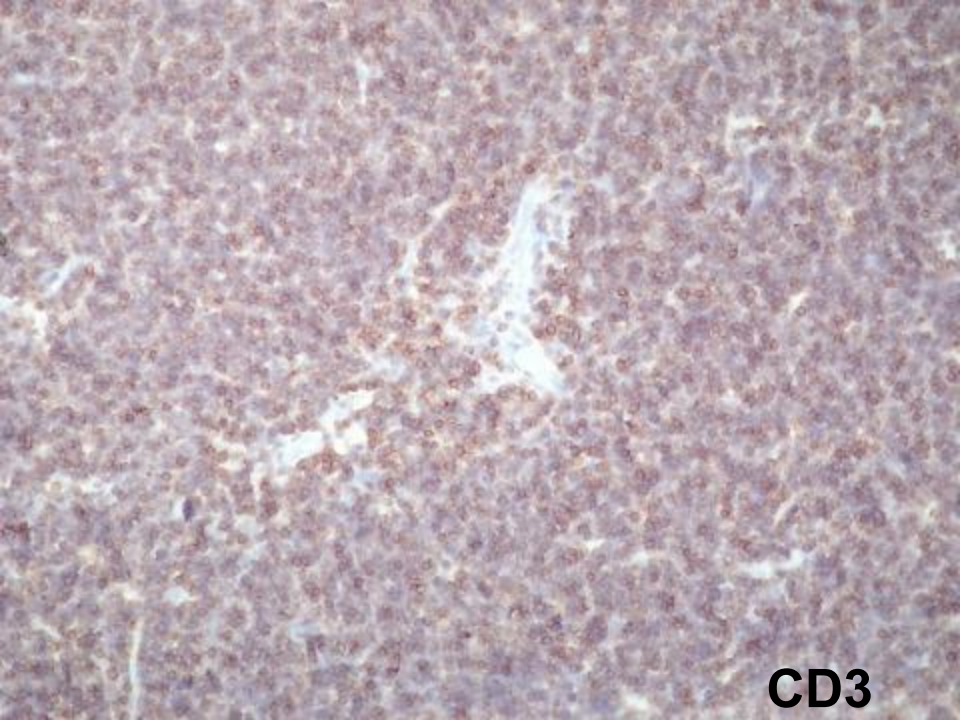




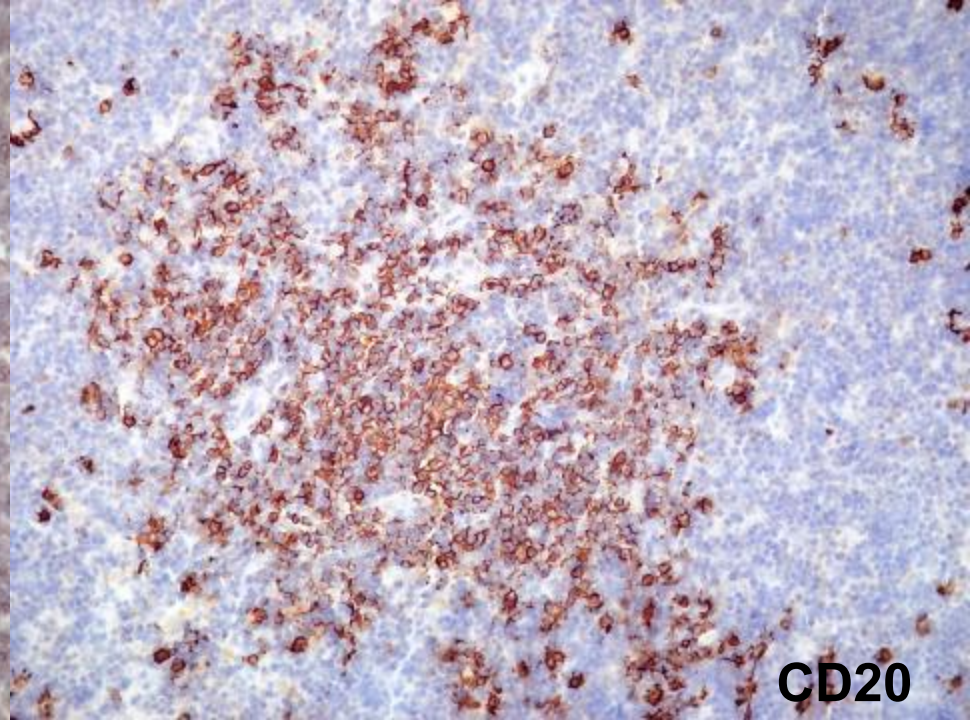




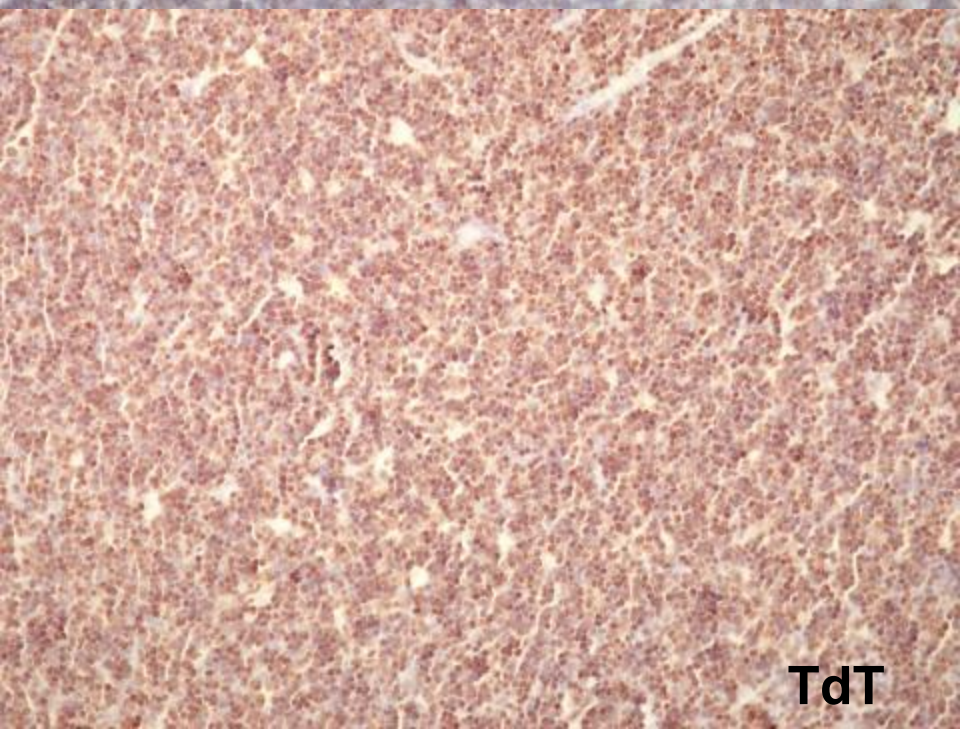




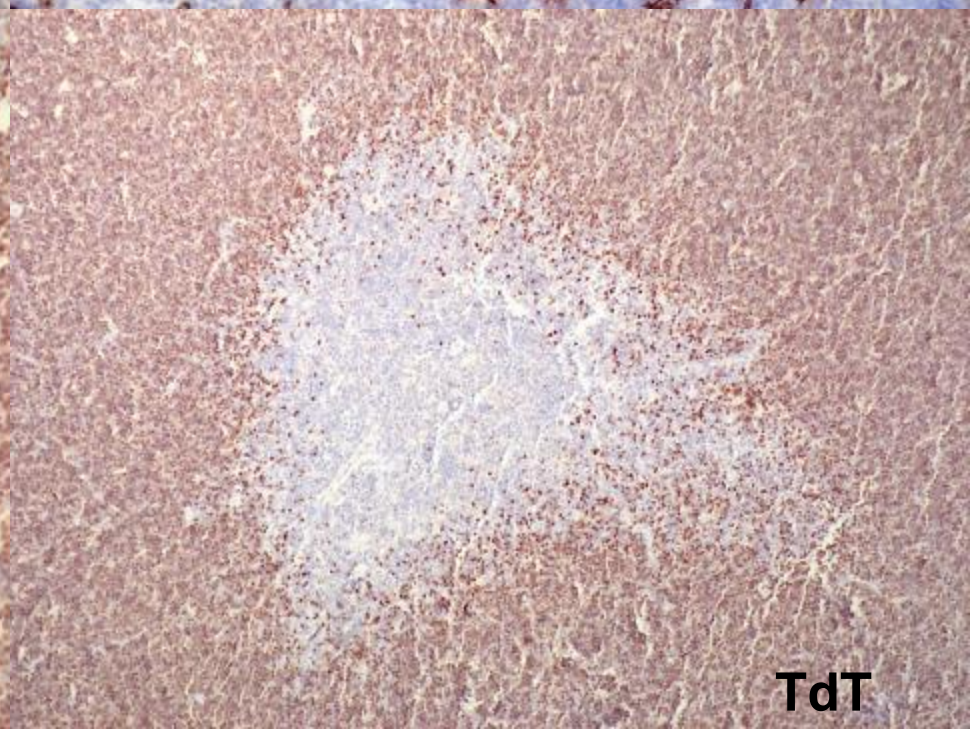
CD3



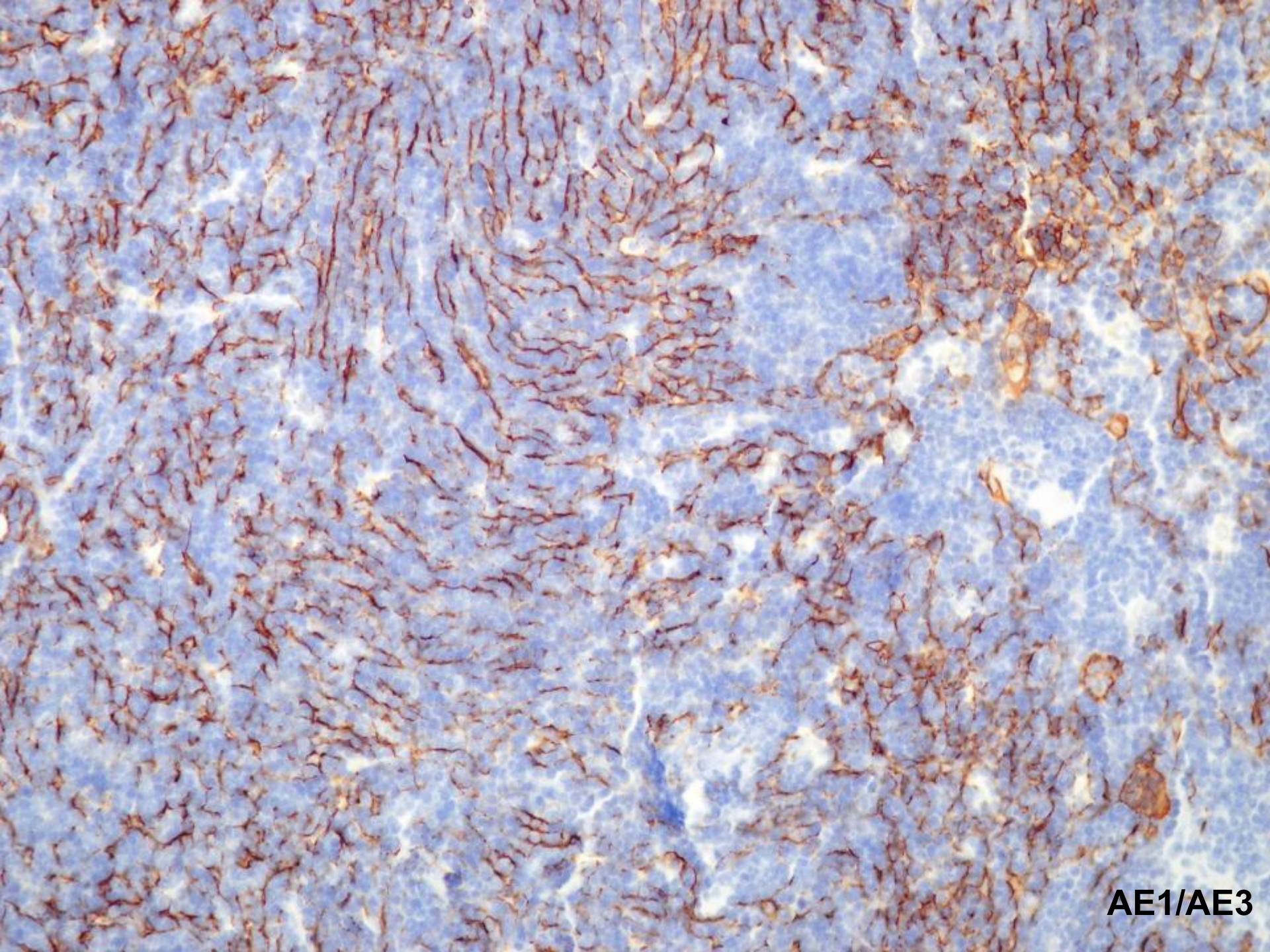
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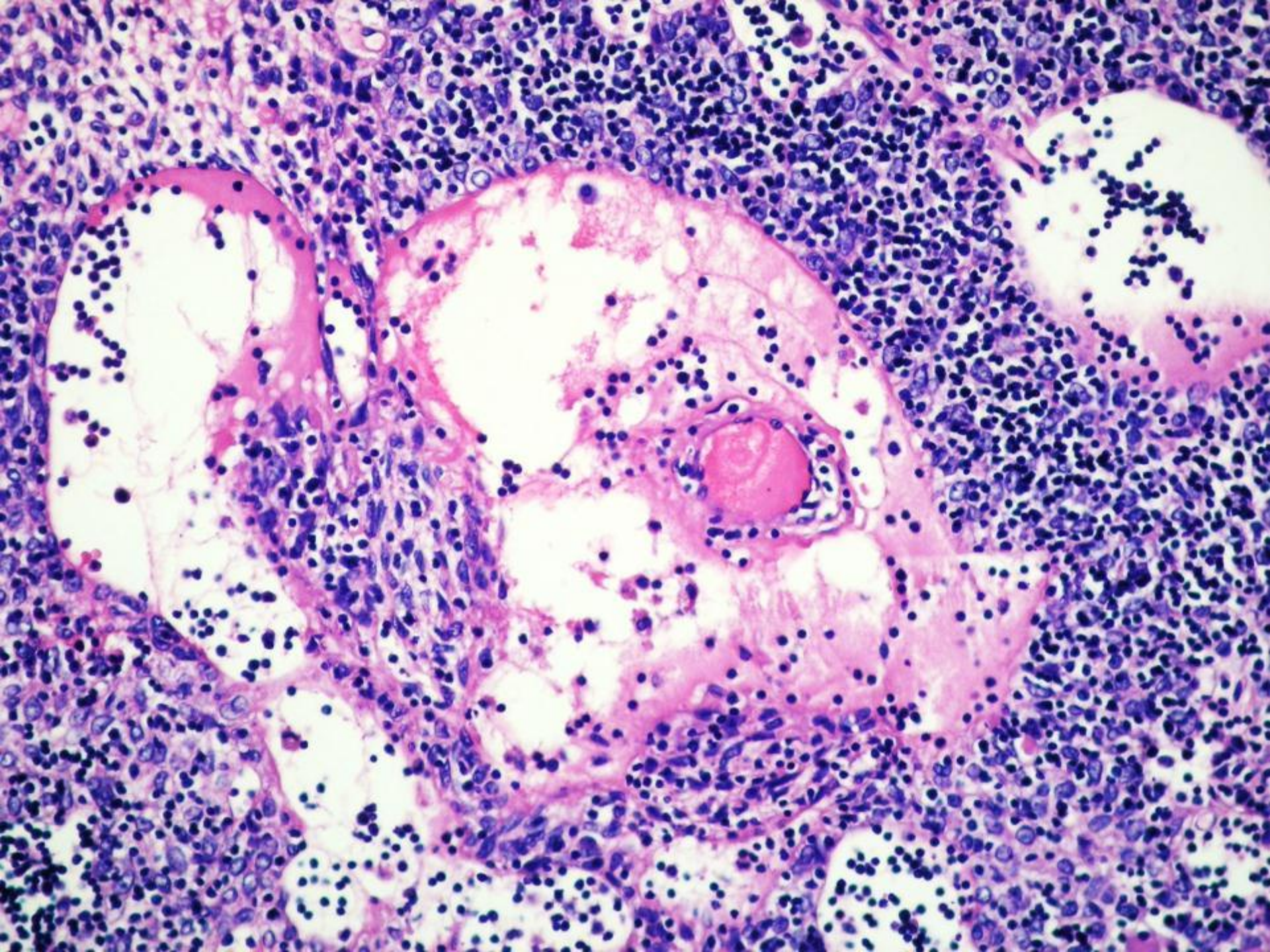
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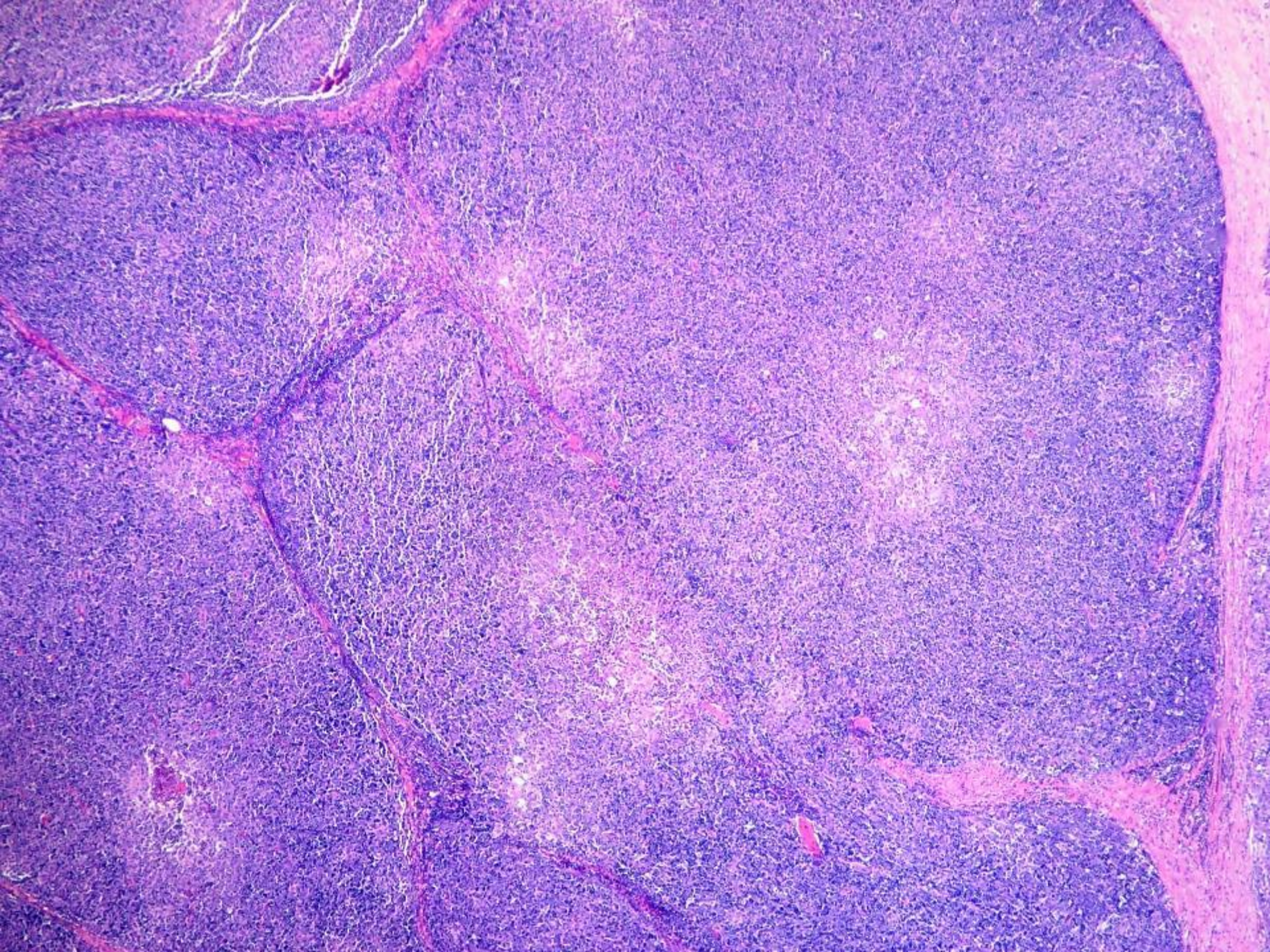


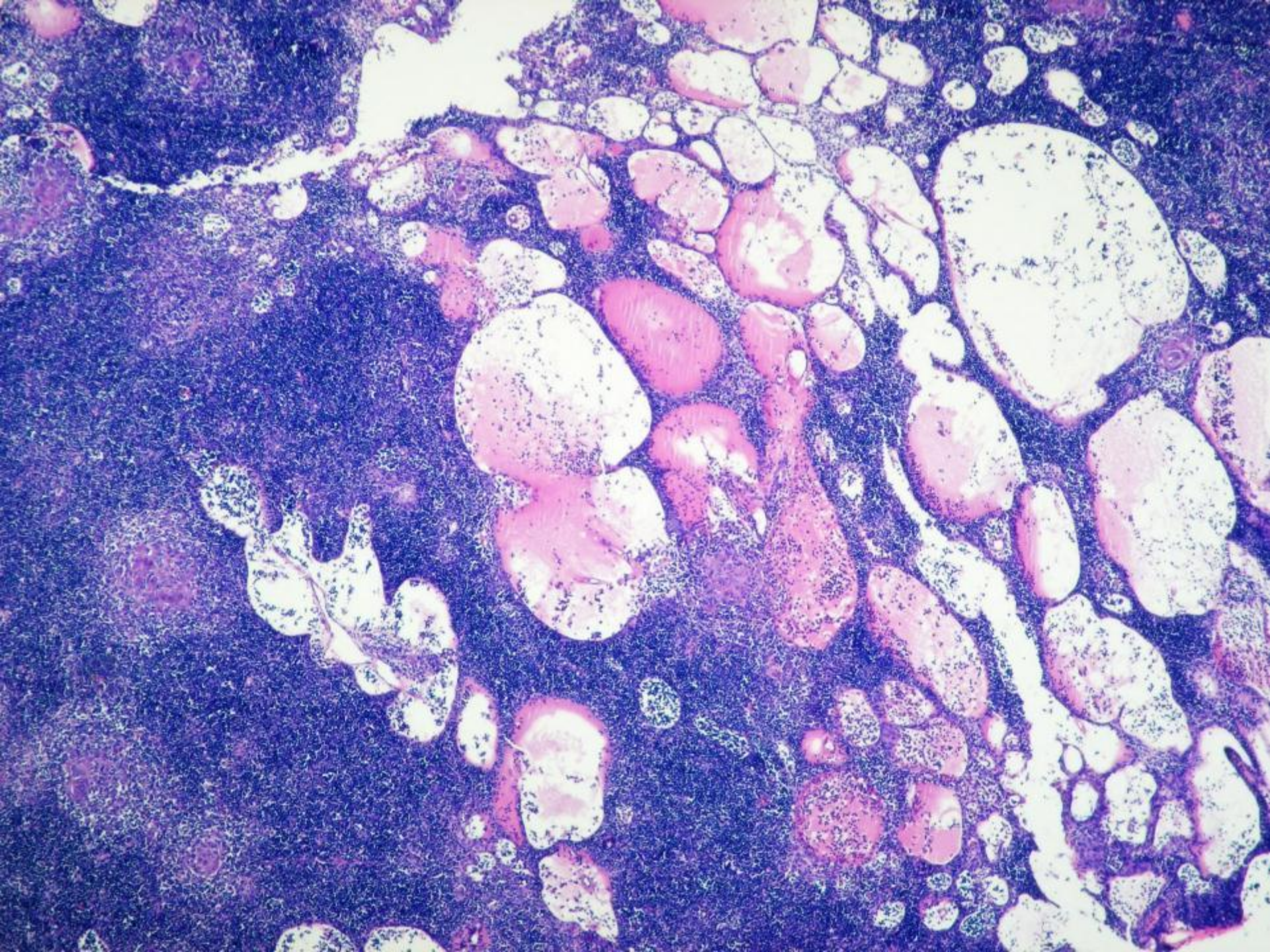
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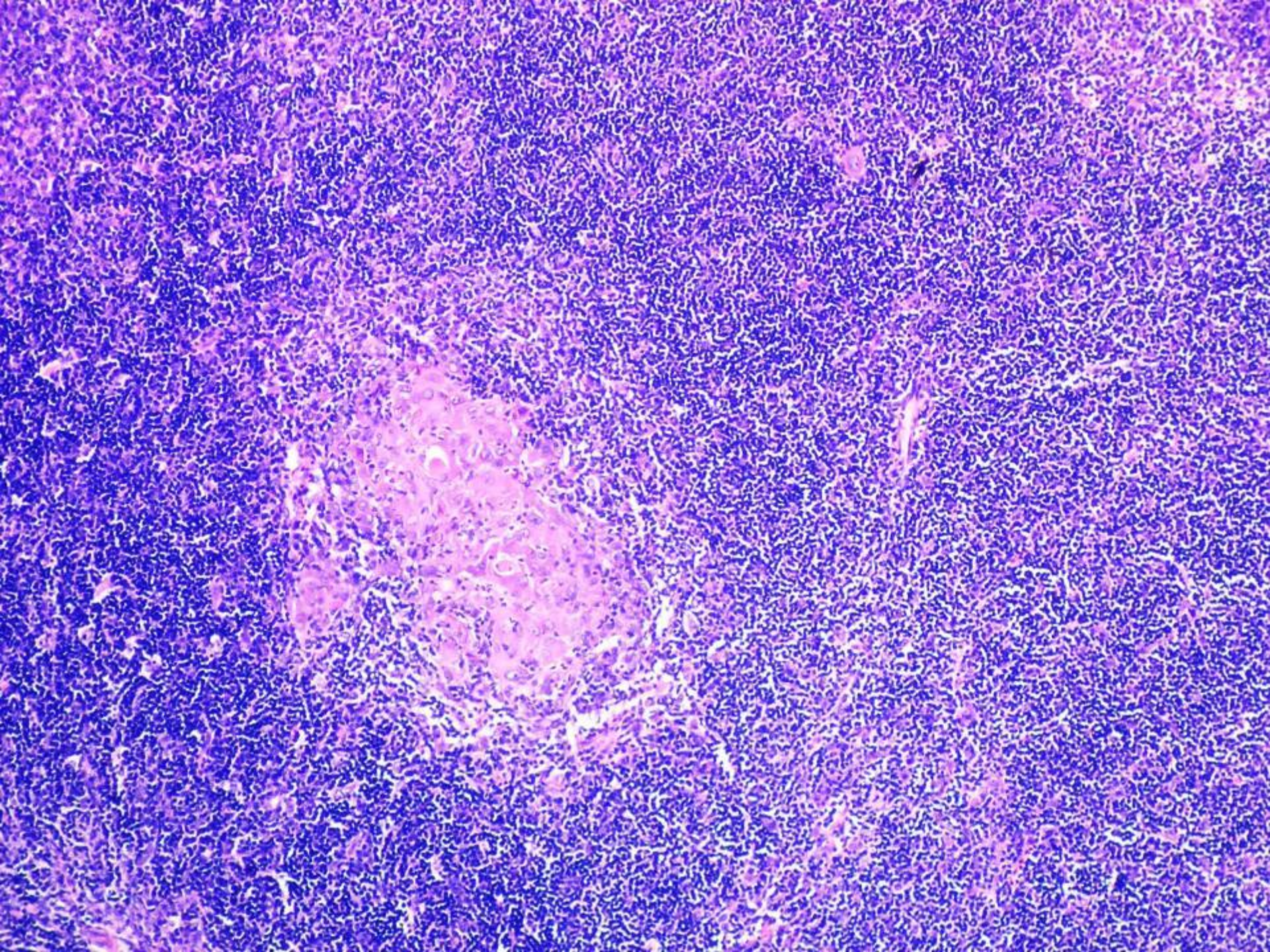


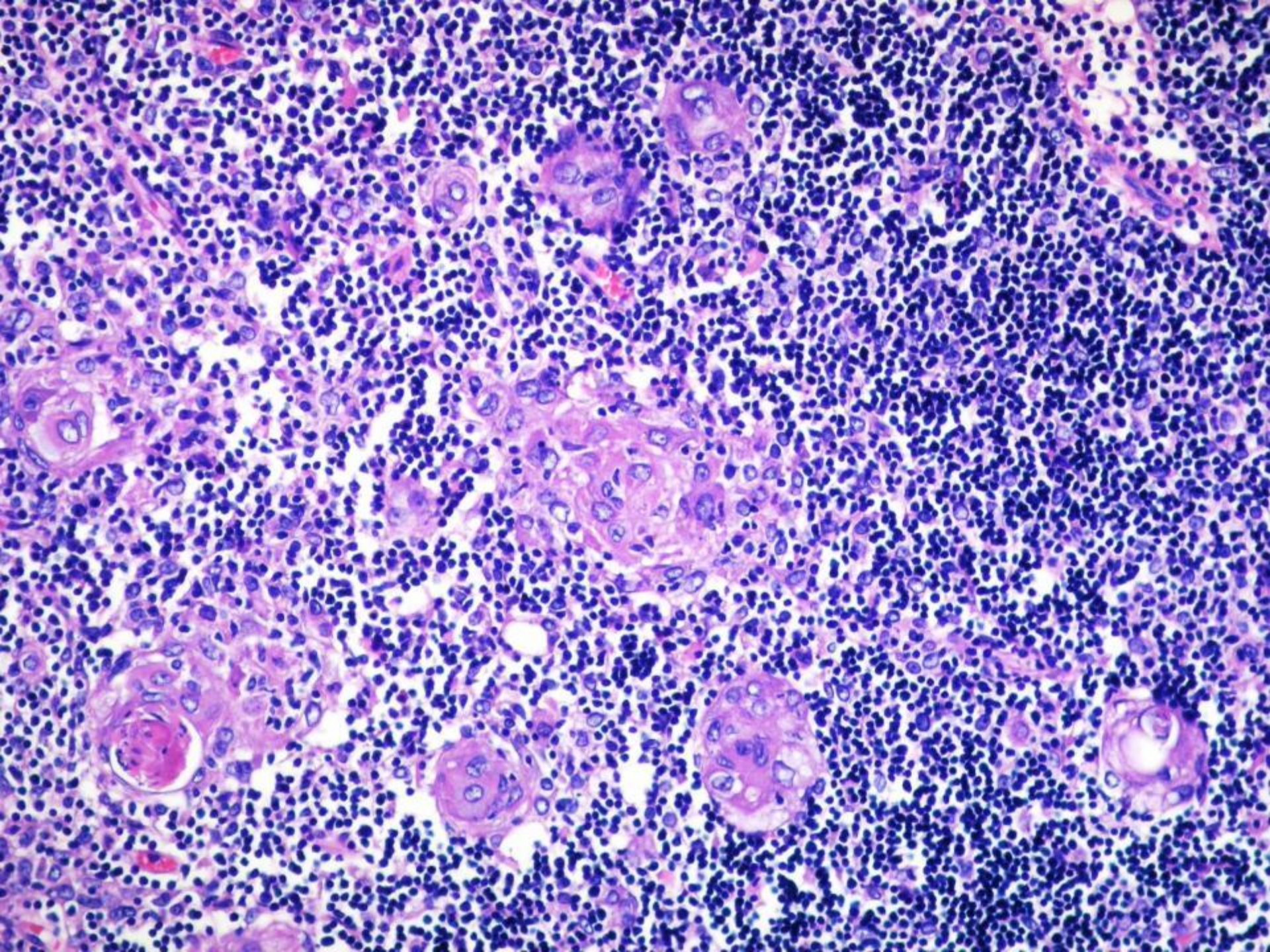
AE1/AE3

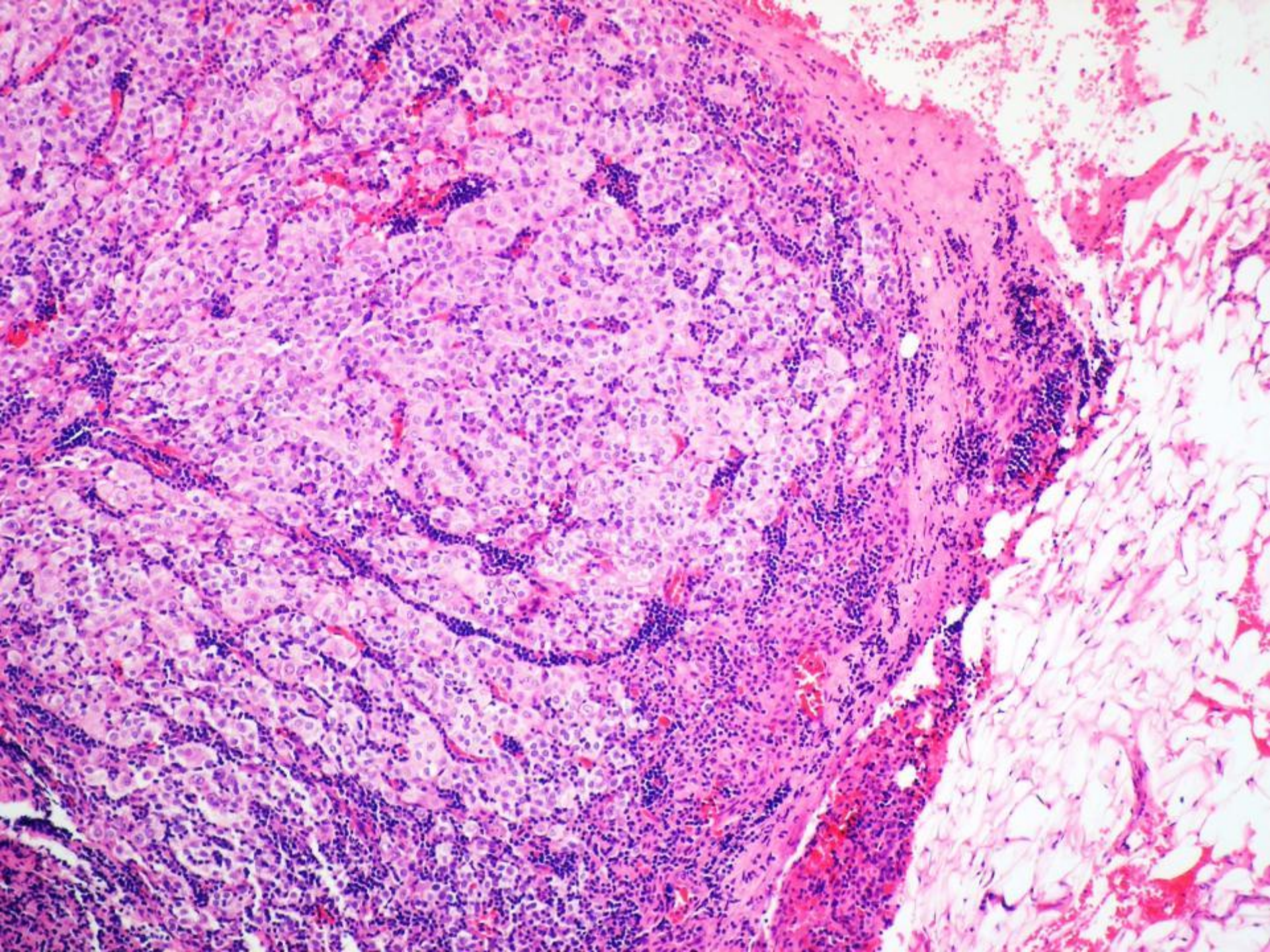


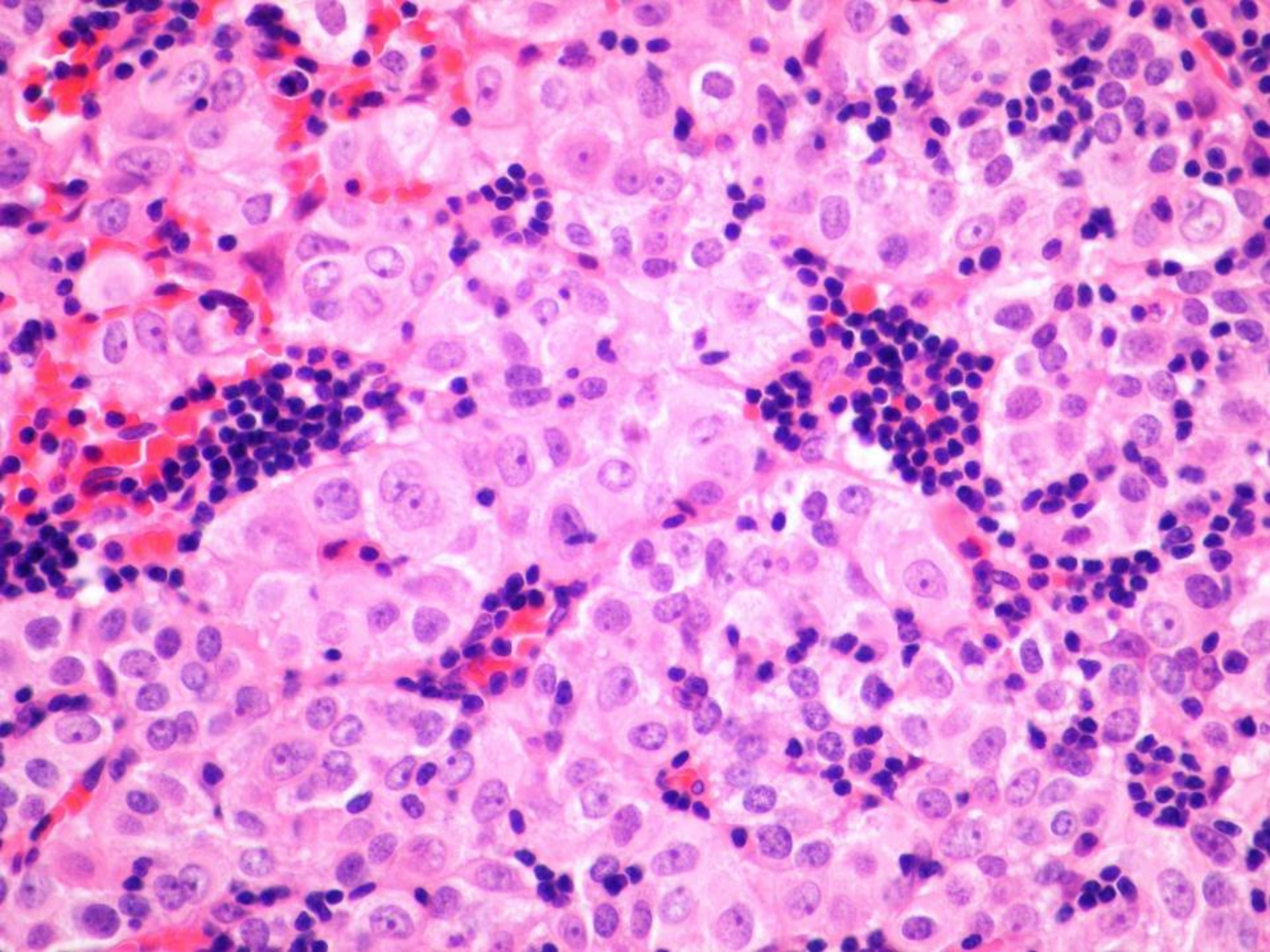


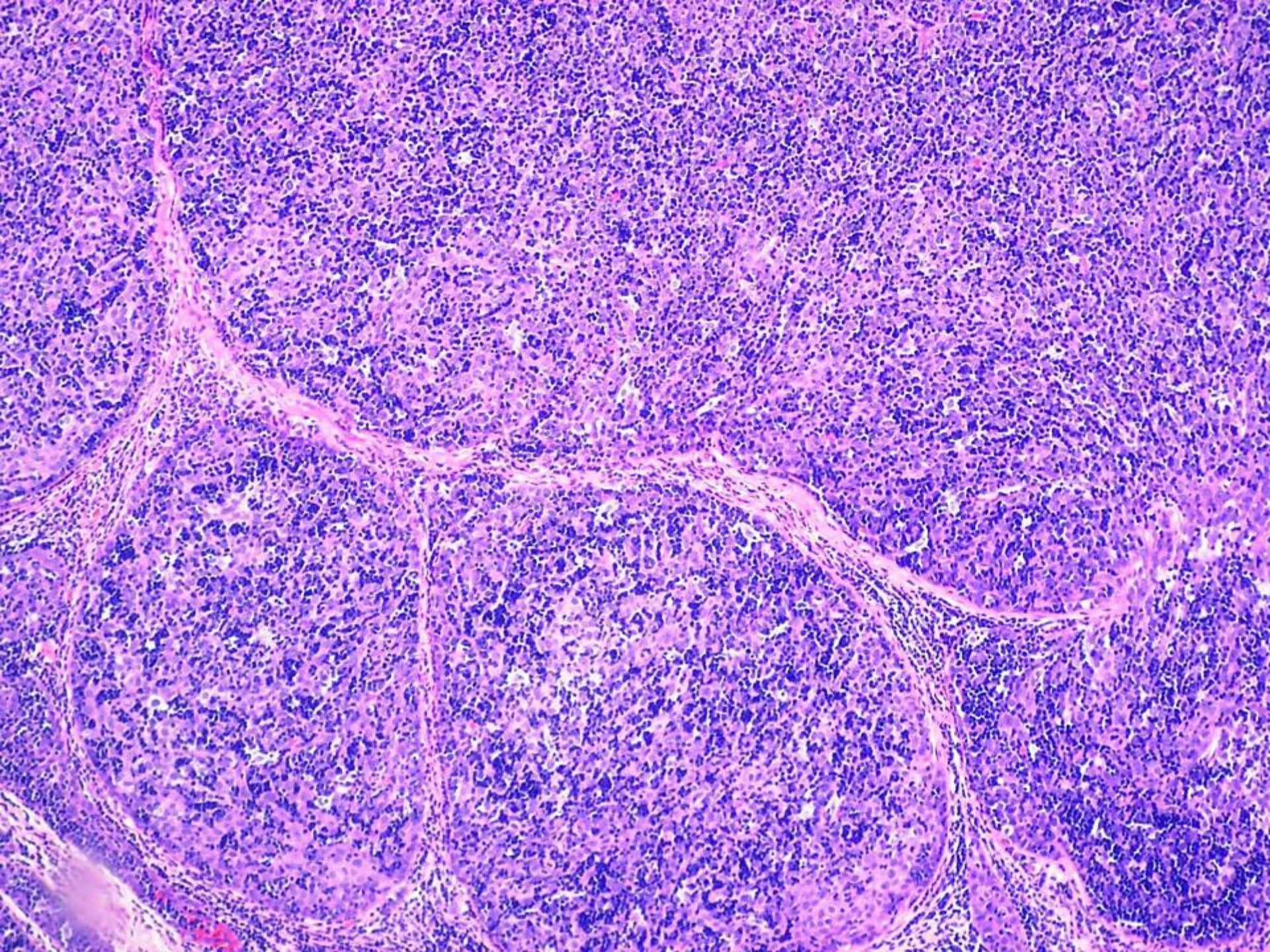


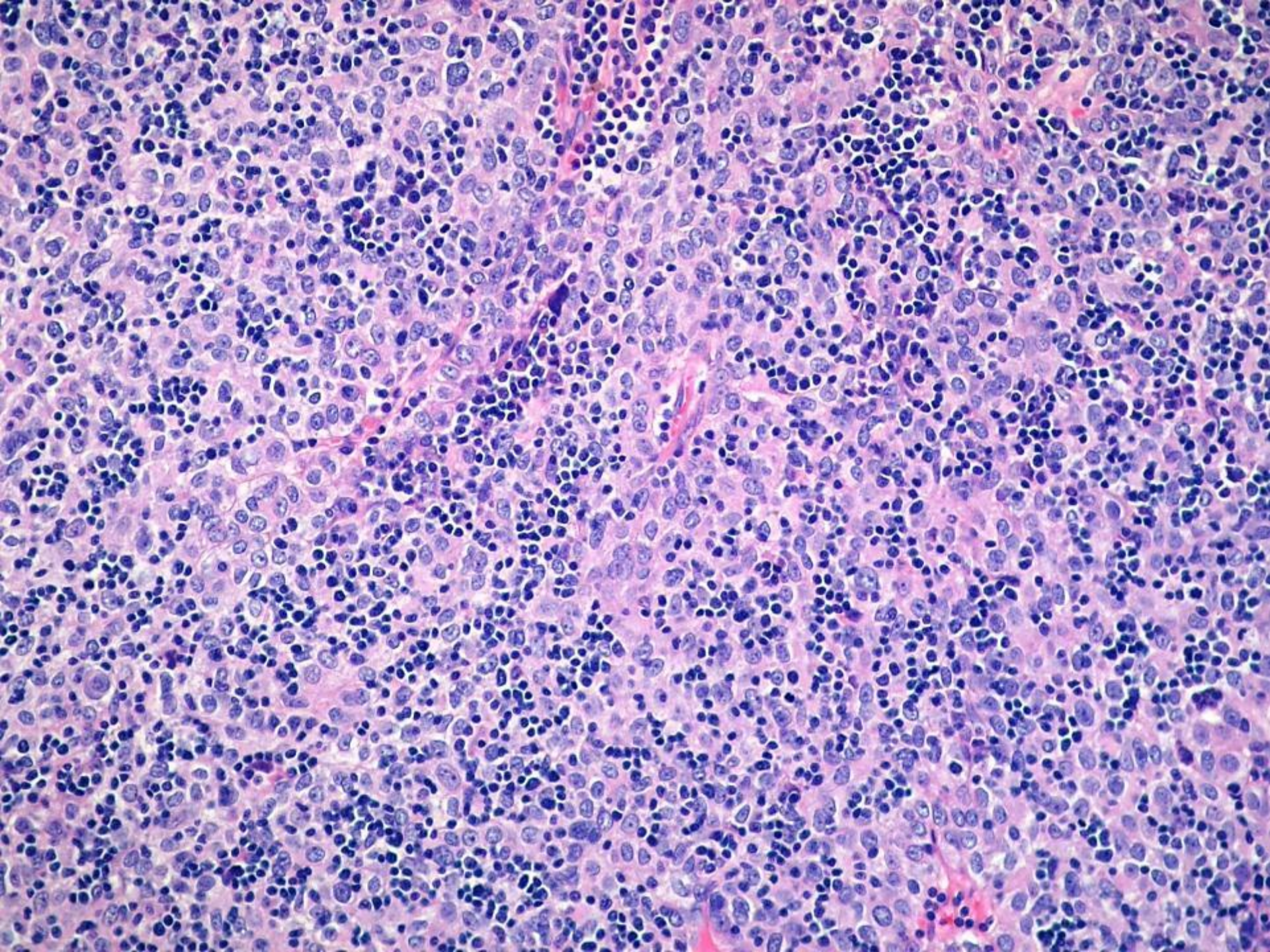


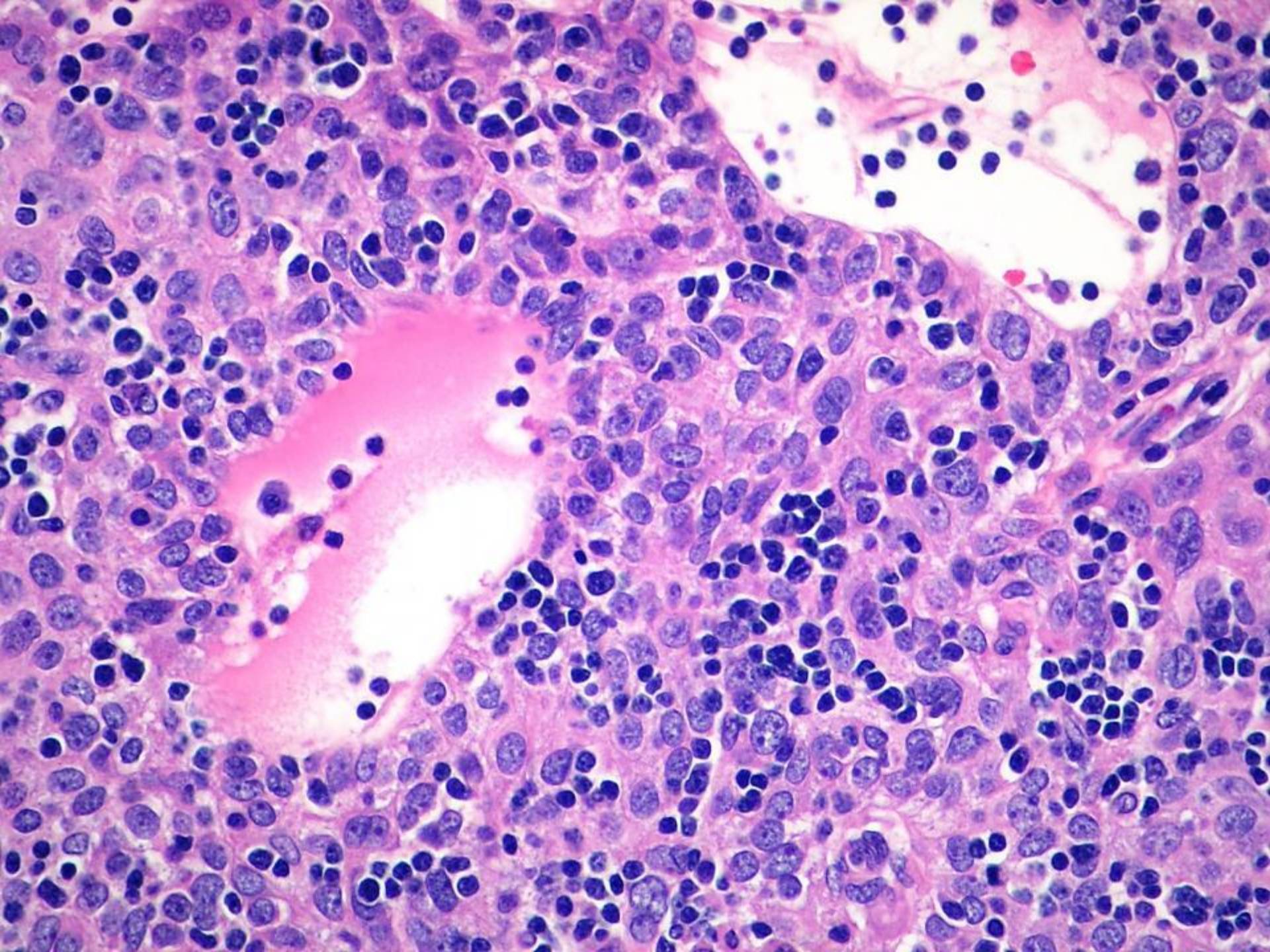


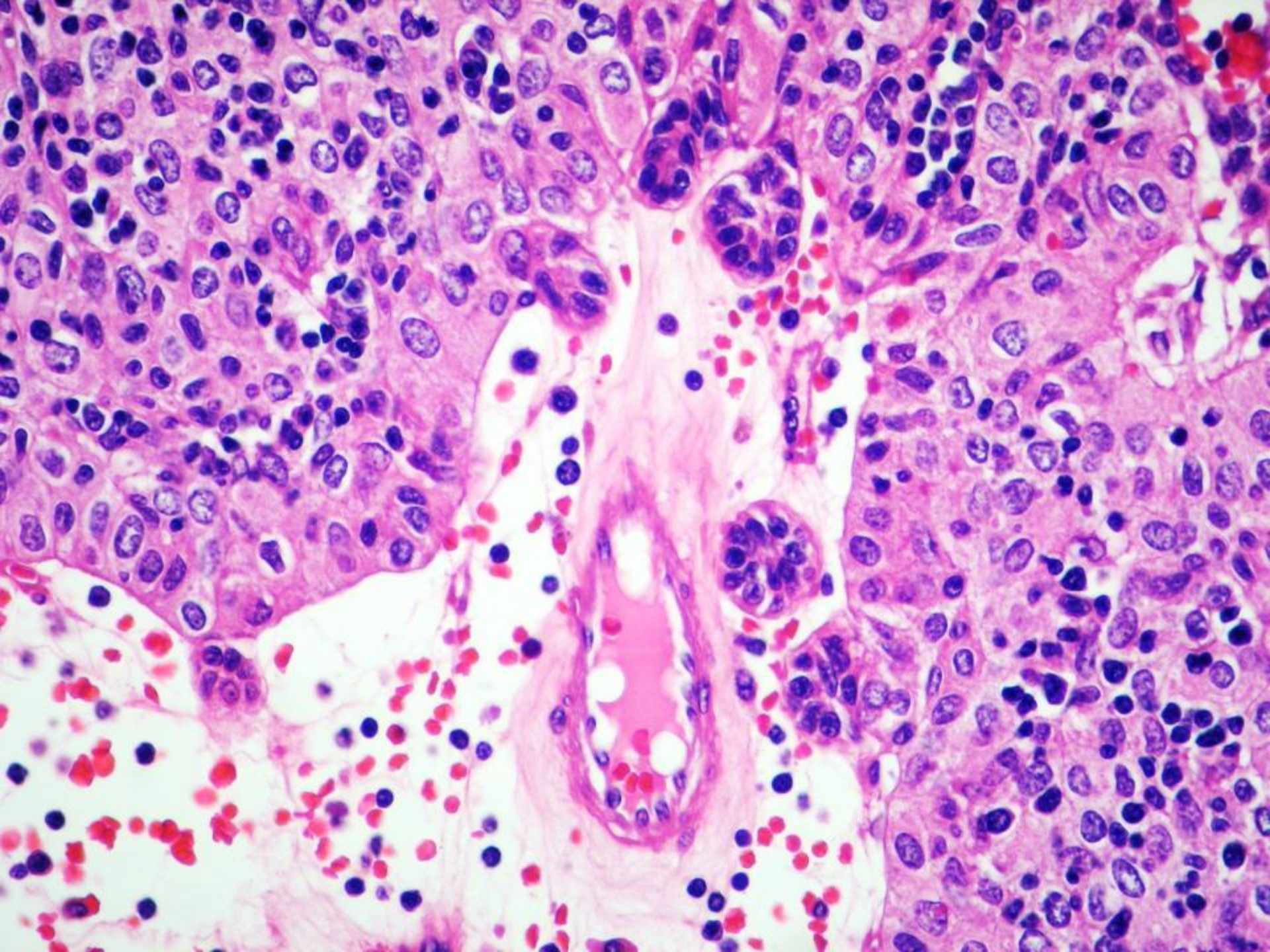


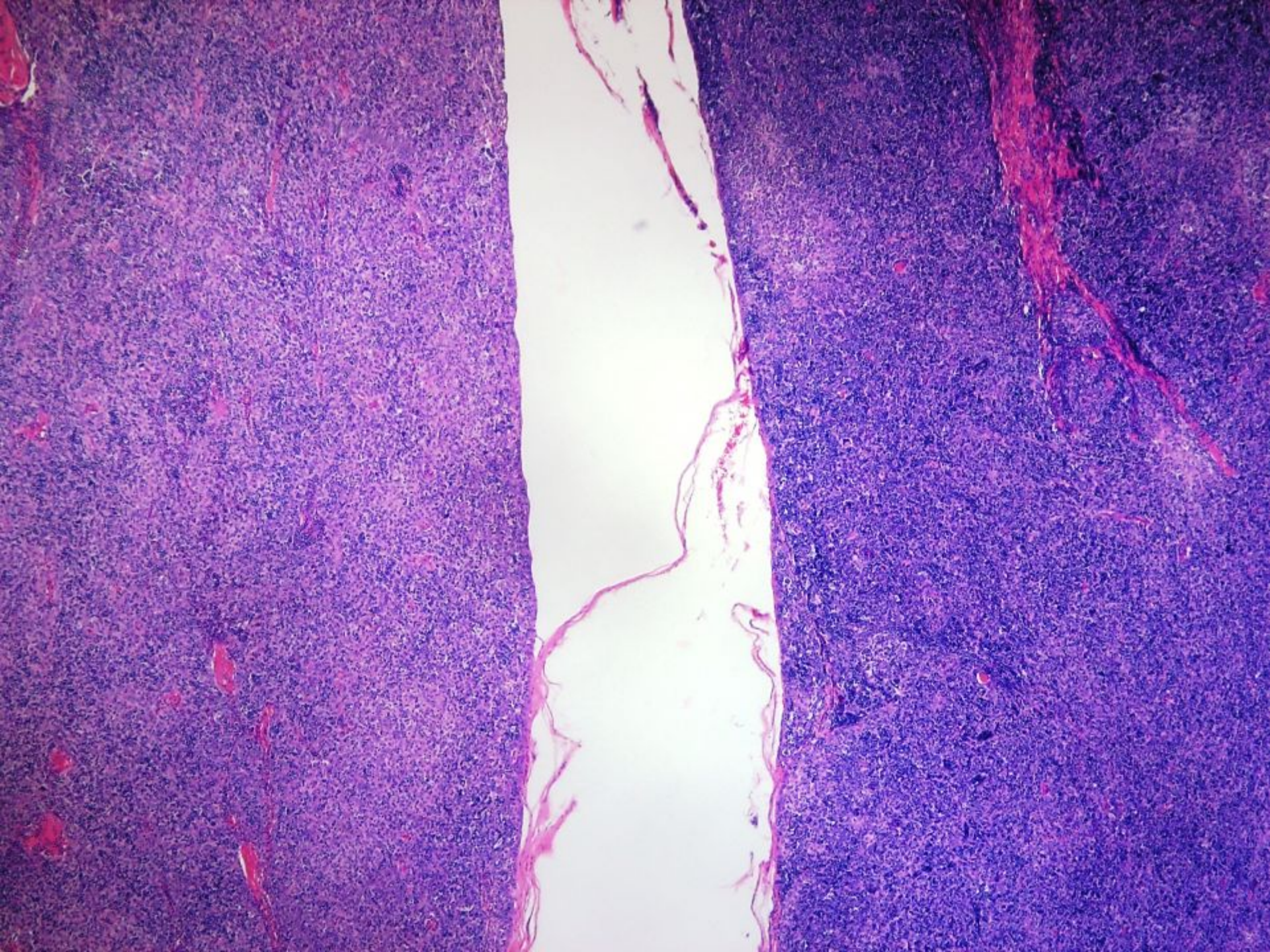














Timoma AB

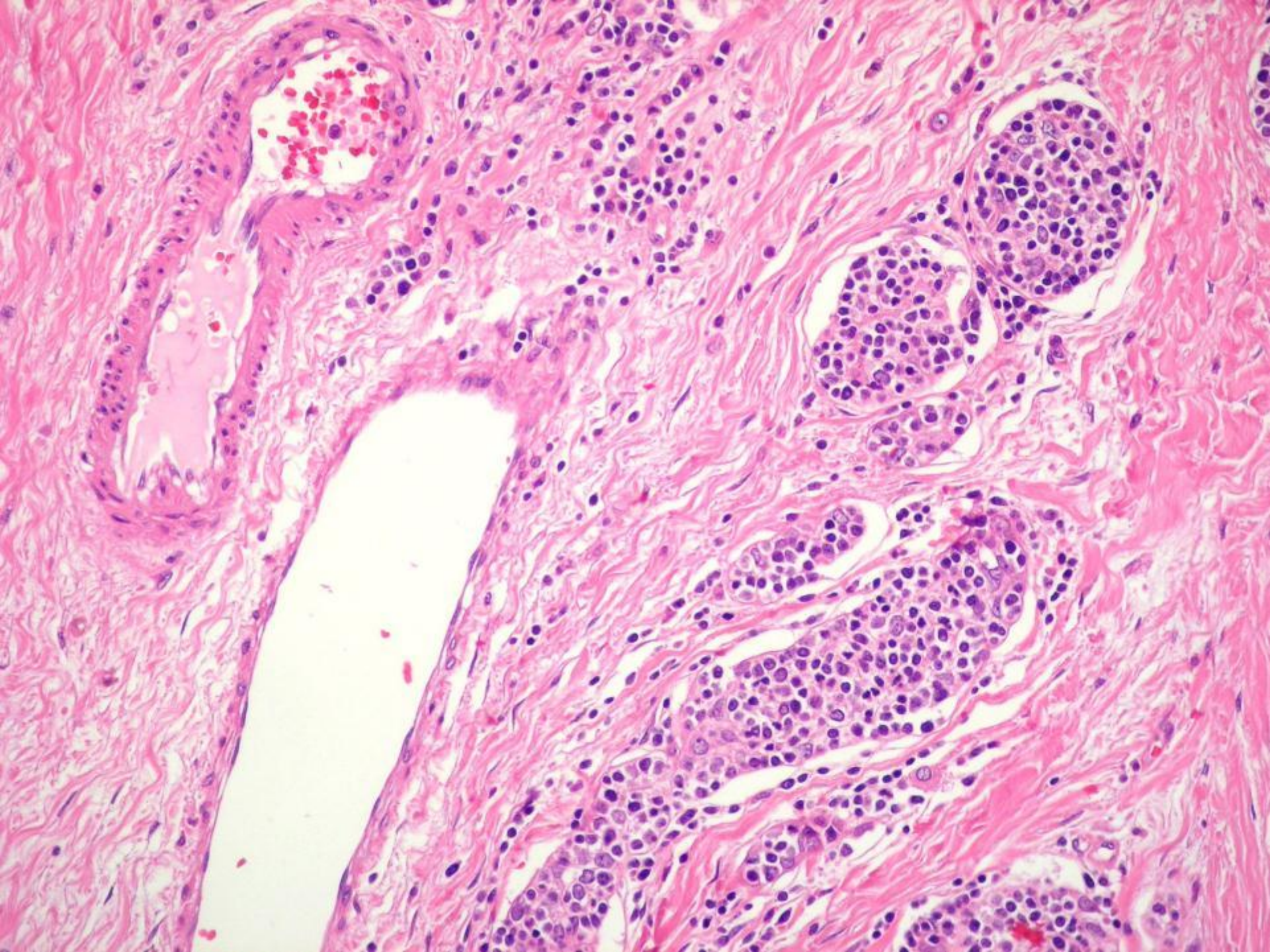


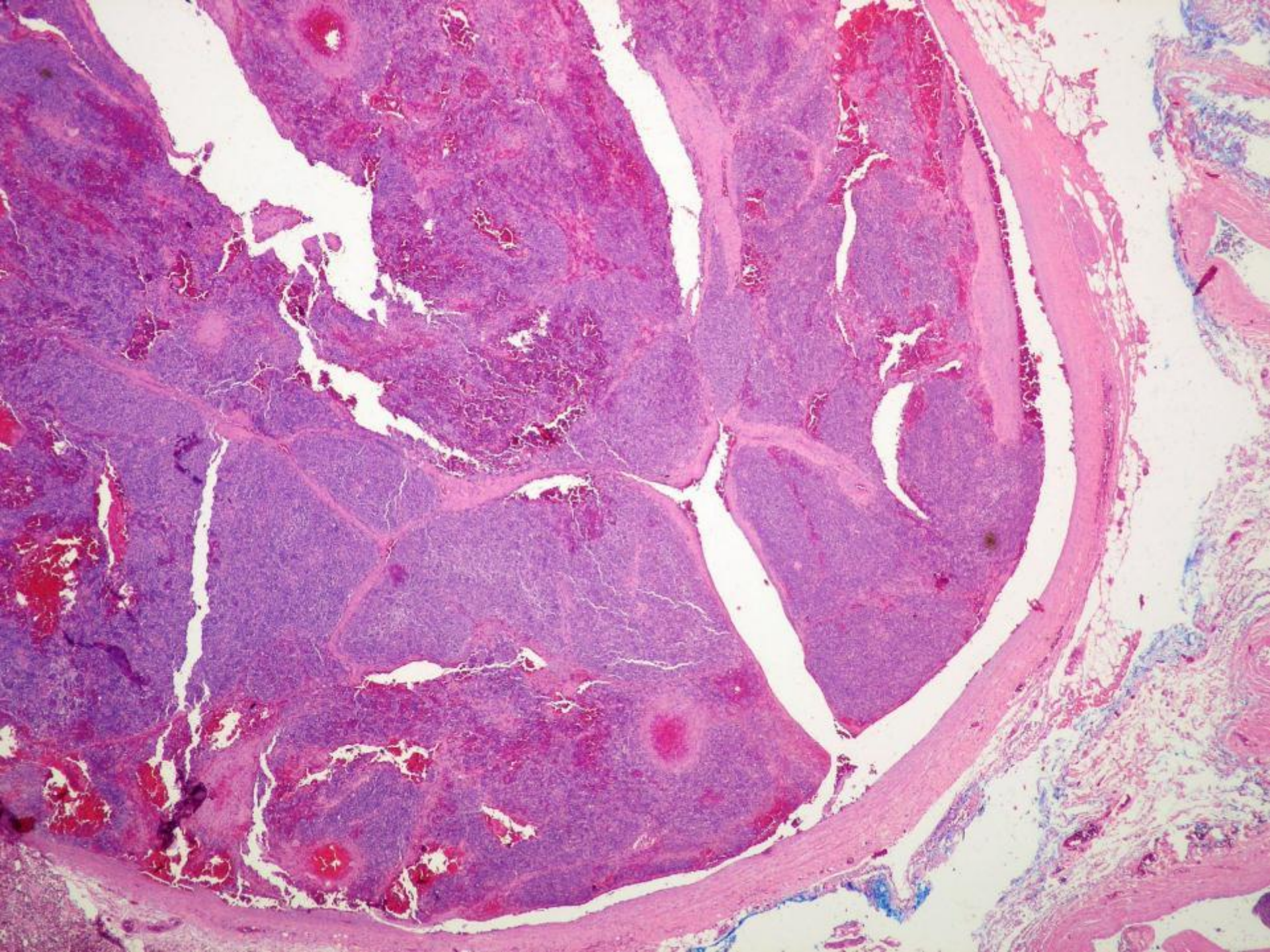
- Reporte de timomas con múltiples patrones histológicos (>50%)
- Recomendación:
subtipo predominante
todos los subtipos menores (incrementos del 10%)



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- Los subtipos histológicos más frecuentes de Timoma pueden comportarse en forma agresiva







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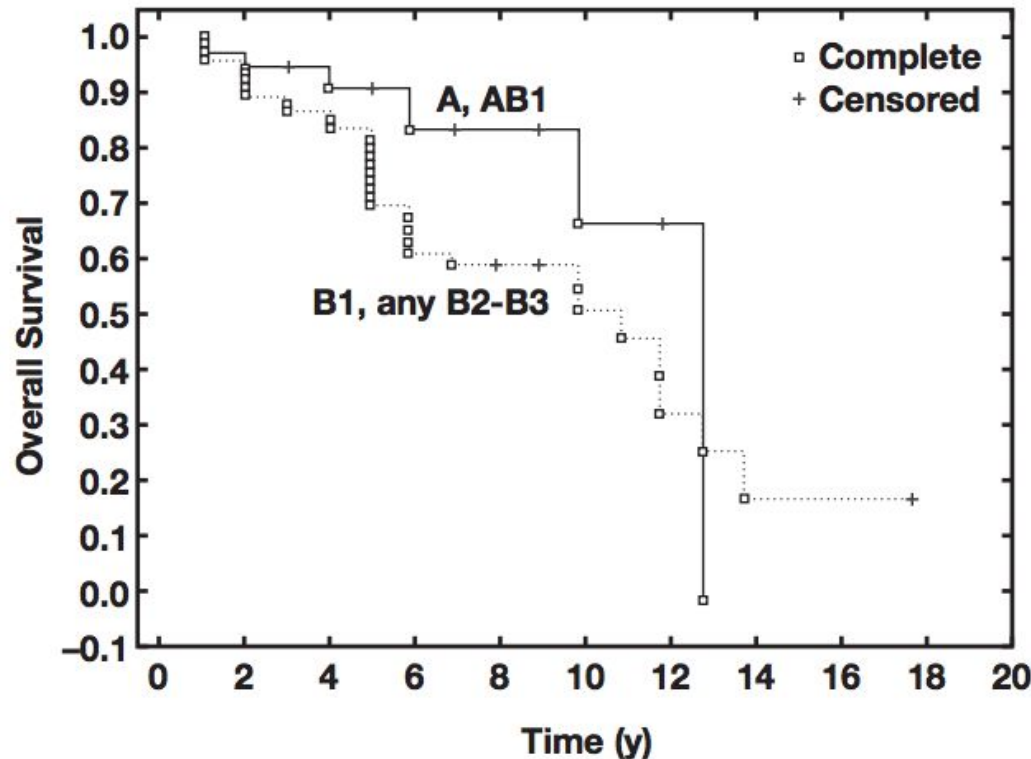


Figure 2 Comparison of histologic subtyping for types A and AB1 vs B1, B2, and B3 and overall survival (Kaplan-Meier analysis; cumulative proportion surviving, $n = 231$). $P = .226$ (statistically not significant).

Thymomas I: a clinicopathologic correlation of 250 cases with emphasis on the World Health Organization schema. American journal of clinical pathology. 2012; 137:444–450



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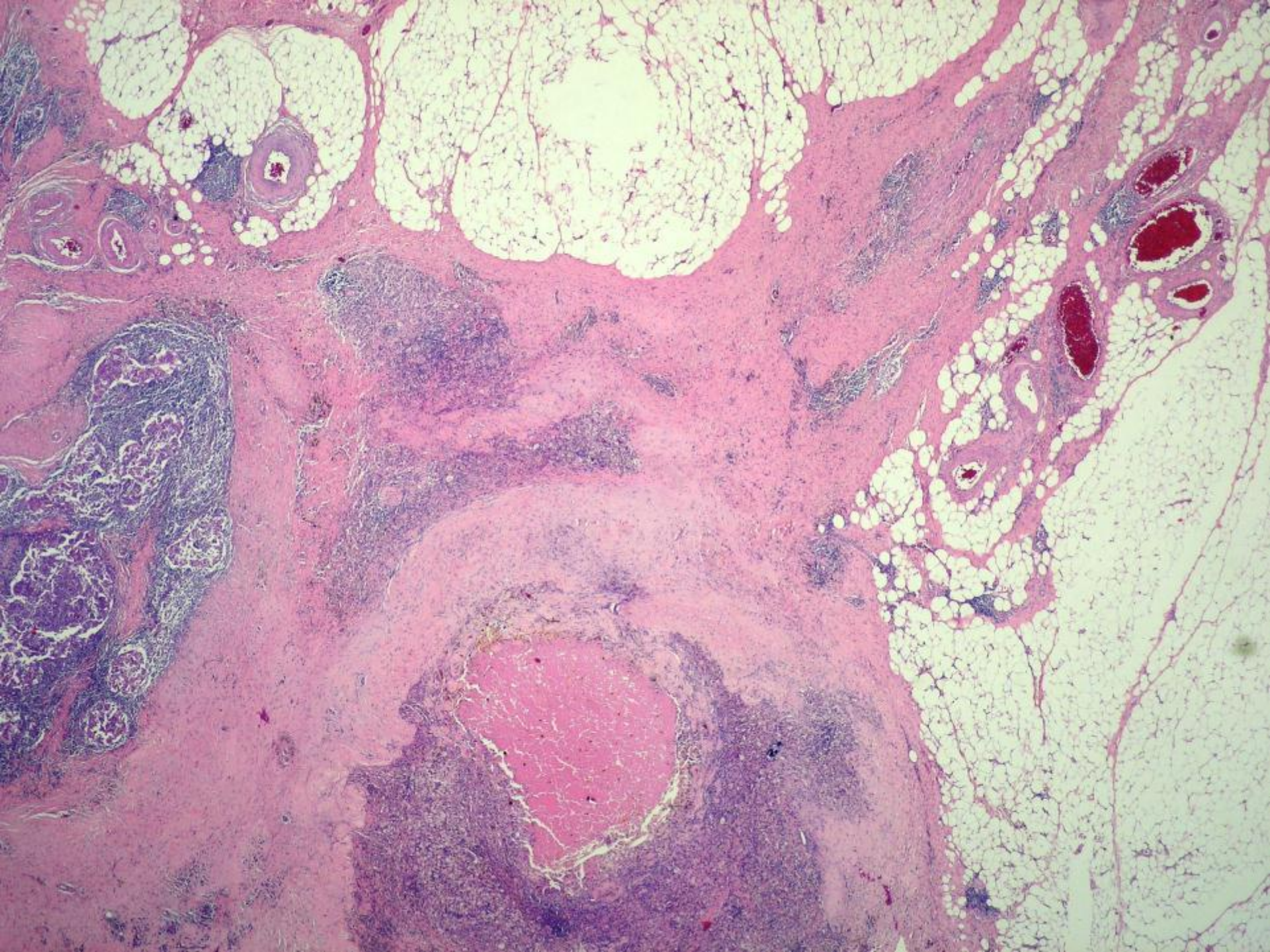
Carcinoma Tímico

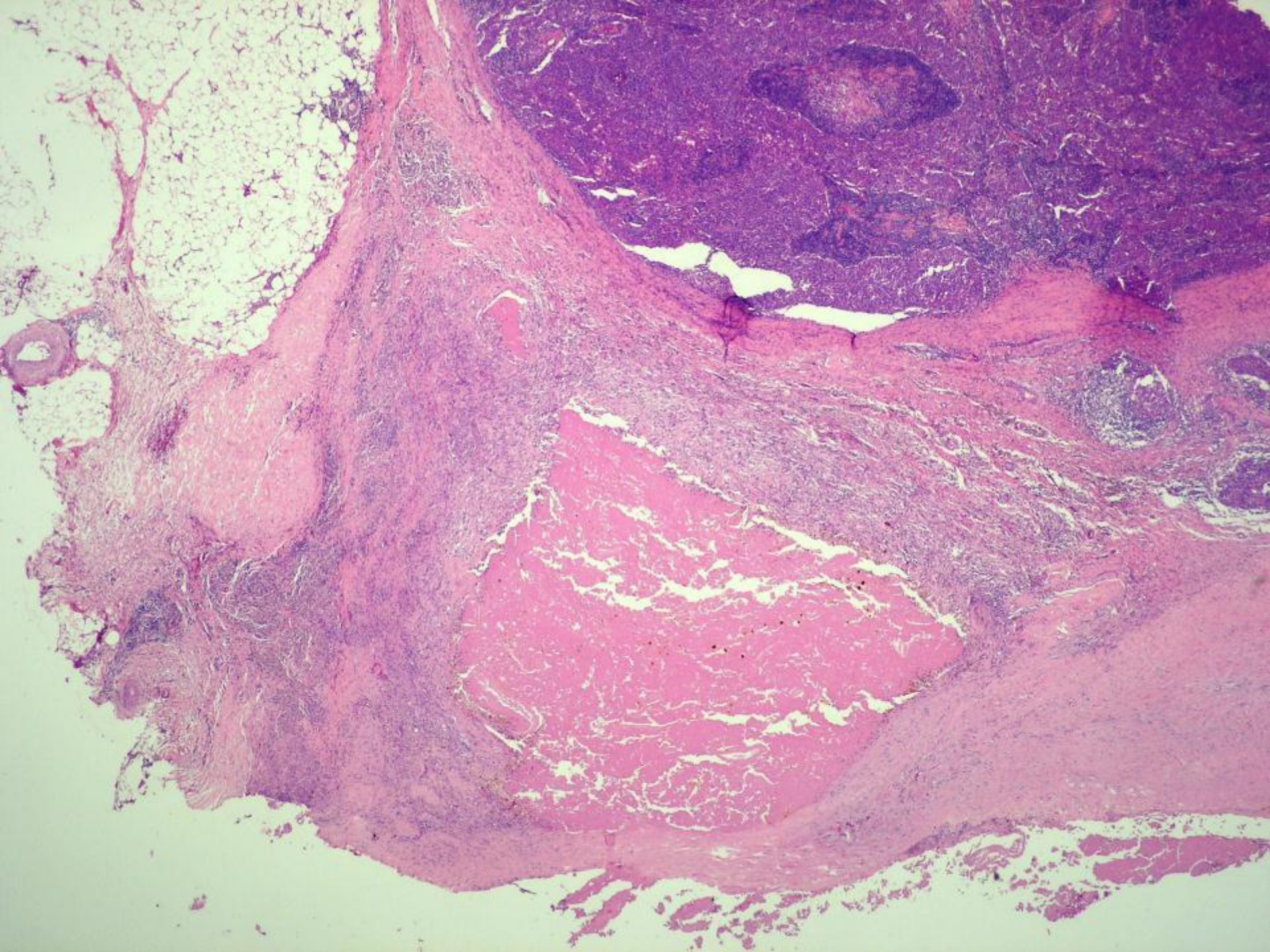
- Sincrónico o metacrónico con timoma
- Asociación con quistes tímicos multiloculares
- No asociado a síndromes paraneoplásicos

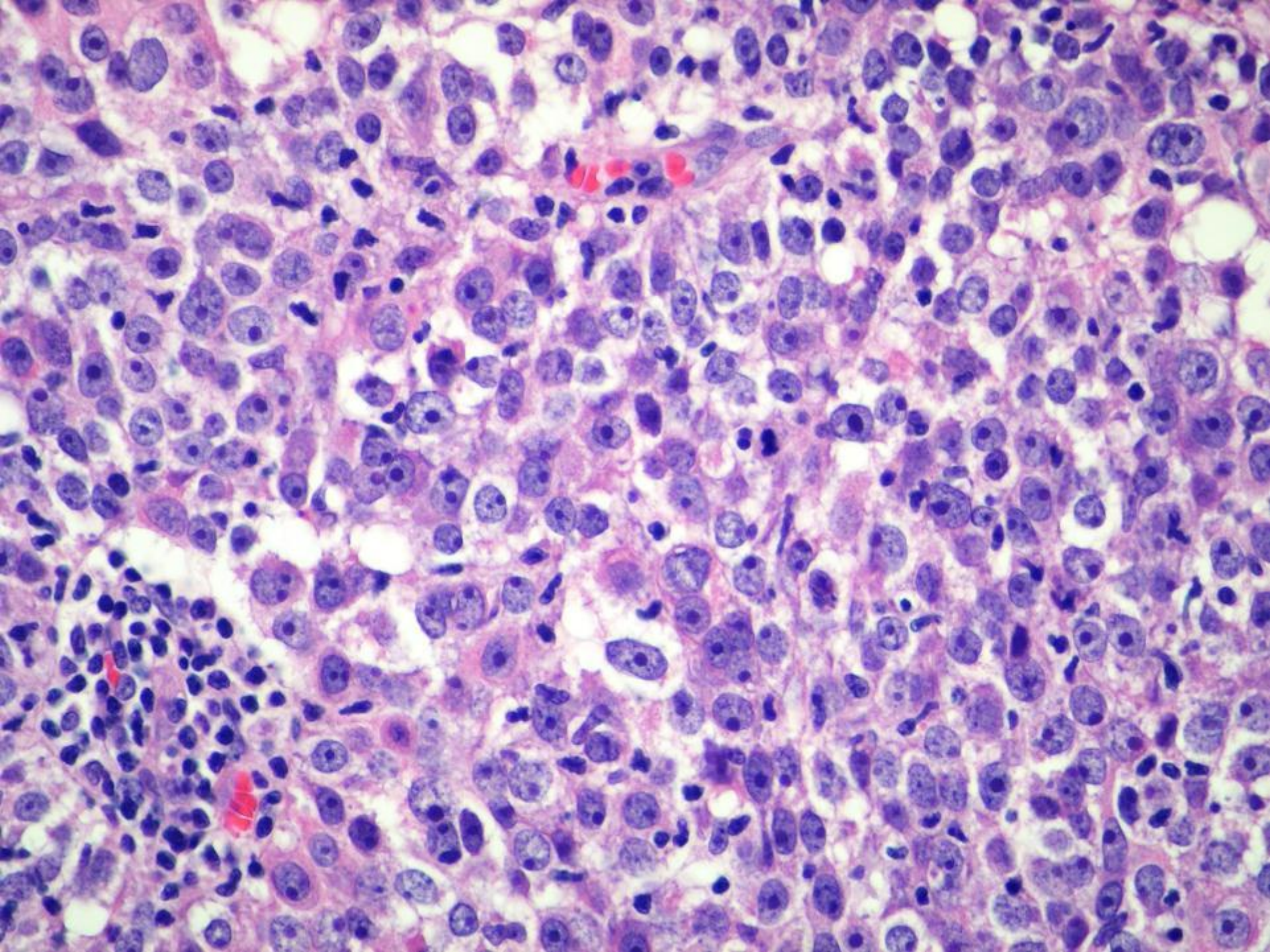
Subtypes of thymic carcinomas according to WHO^[1]

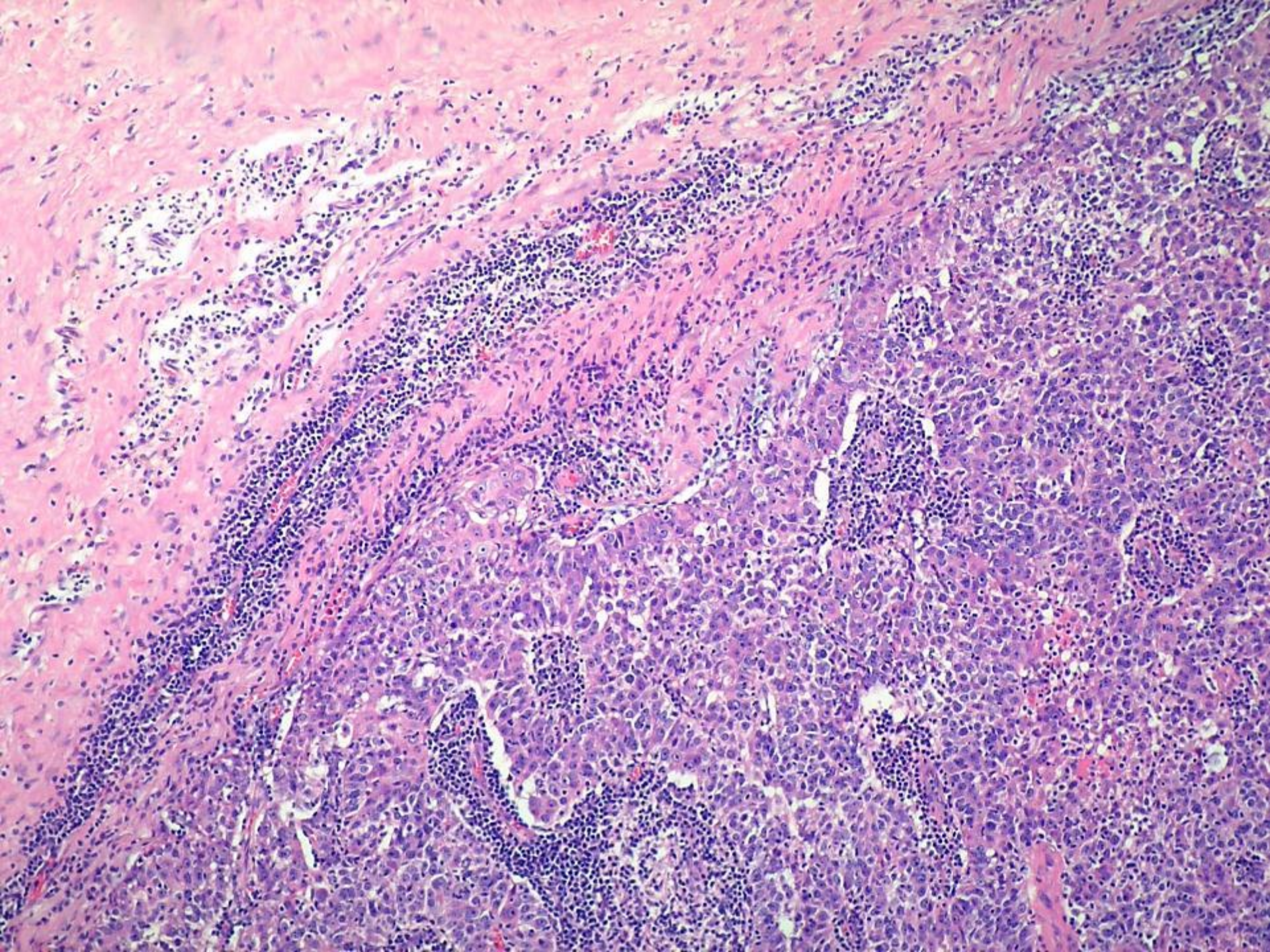
WHO Subtype
▪ Squamous cell carcinoma
▪ Basaloid carcinoma
▪ Mucoepidermoid carcinoma
▪ Lymphoepithelioma-like carcinoma
▪ Sarcomatoid carcinoma
▪ Clear cell carcinoma
▪ Adenocarcinoma: • Papillary adenocarcinoma • Thymic carcinoma with adenoid cystic carcinoma-like features • Mucinous adenocarcinoma • Adenocarcinoma, NOS
▪ NUT carcinoma
▪ Undifferentiated carcinoma
▪ Other rare thymic carcinoma: • Adenosquamous carcinoma • Hepatoid carcinoma • Thymic carcinoma, NOS
▪ Combined thymic carcinoma

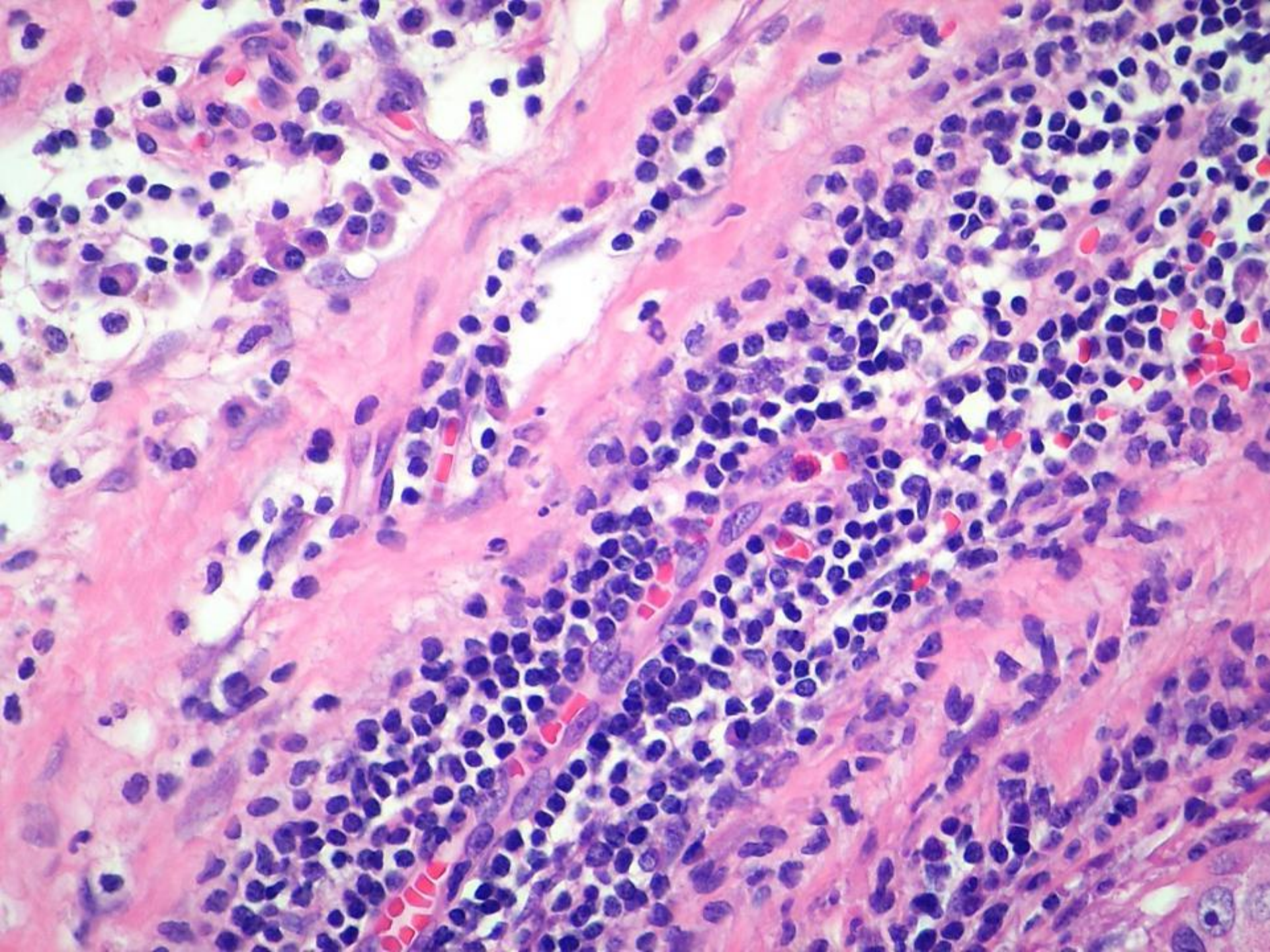
WHO: World Health Organization; NOS: not otherwise specified; NUT: nuclear protein of the testis.













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TUMOR MEDIASTINICO

DIAGNOSTICOS DIFERENCIALES

- TUMOR EPITELIAL TIMICO
- LINFOMA
- TUMOR GERMINAL
- METASTASIS



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TUMOR EPITELIAL TIMICO

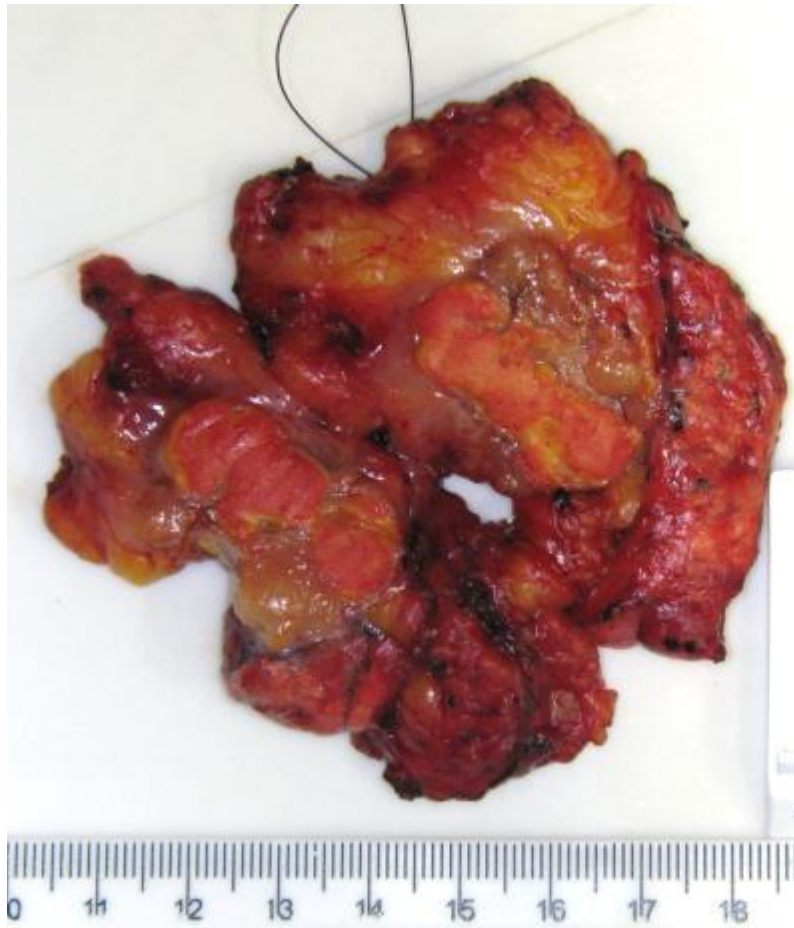
TIMOMA

CARCINOMA TIMICO





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Diagnósticos diferenciales:

Timoma vs Carcinoma tímico:

- 15% de ca. Tímicos encapsulados
- Timomas invasores en órganos vecinos
- Arquitectura organoide vs Patrón infiltrativo
- Atipia citológica
- Infiltrado linfoide (TdT vs cél T y B maduras)
- Marcadores inmunohistoquímicos

Marcadores inmunohistoquímicos para la caracterización de timomas y carcinomas típicos de difícil diagnóstico

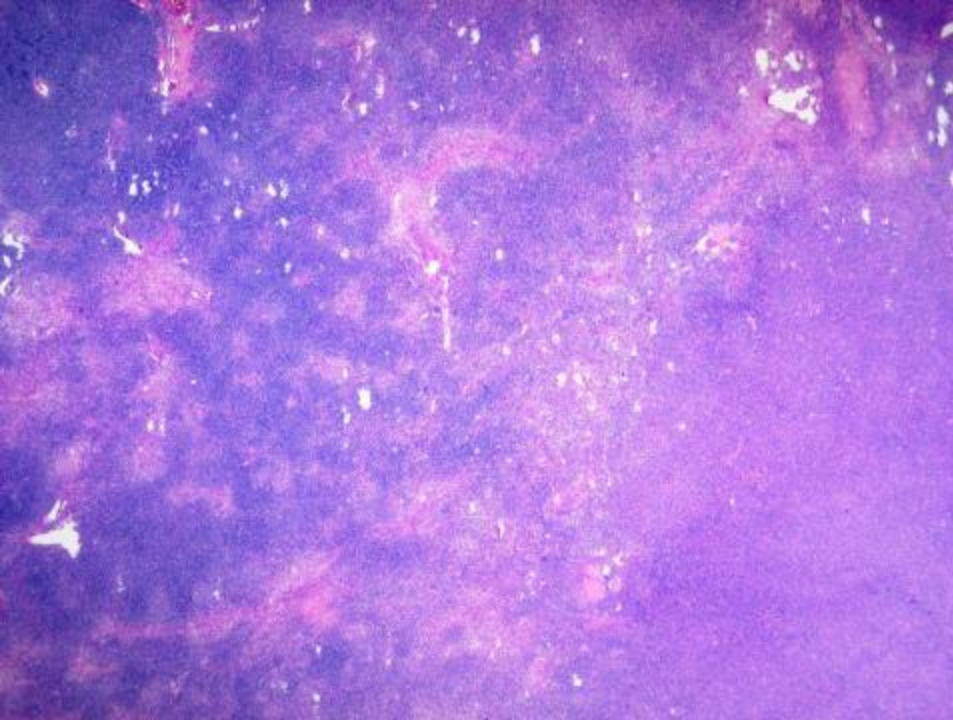


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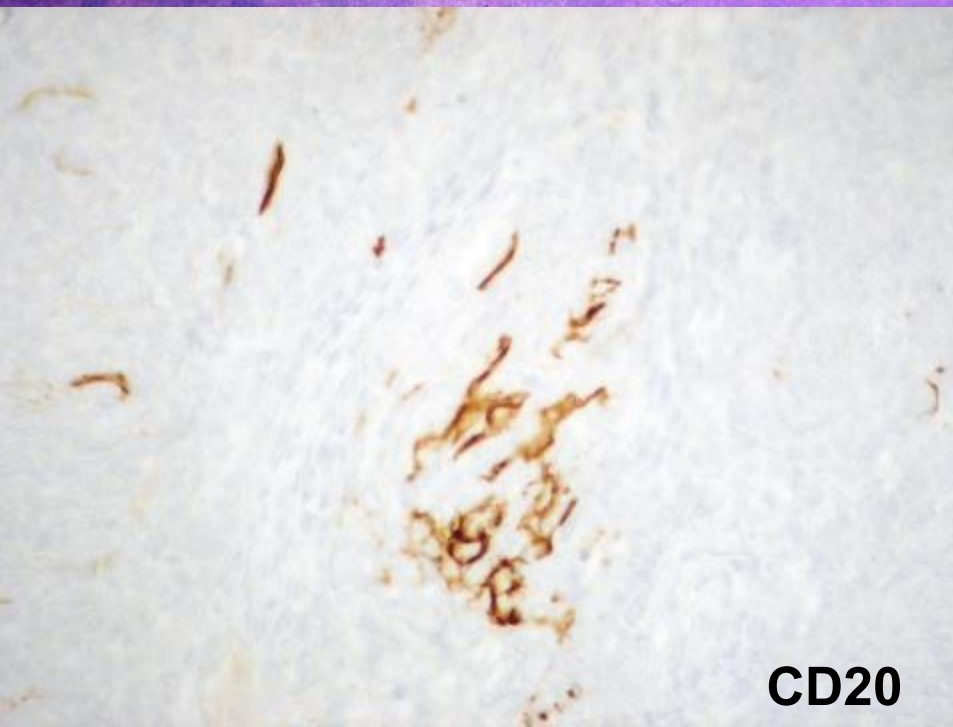
Marker	Cellular and subcellular targets of mediastinal tumors
Cytokeratins	Epithelial cells of normal thymus, thymomas ^a , thymic carcinomas, neuroendocrine tumors, many germ cell tumors, rare sarcomas and dendritic cell tumors; metastases to the mediastinum
Cytokeratin 19	Epithelial cells of normal thymus, thymomas ^a and thymic carcinomas
Cytokeratin 20	Negative in normal thymus and thymomas. May be positive in rare thymic adenocarcinomas, teratomas or metastases
P63	Nuclei of normal and neoplastic thymic epithelial cells, squamous epithelial cells (e.g. in teratoma, metastasis), primary mediastinal large B-cell lymphoma
P40	Nuclei of normal and neoplastic thymic epithelial cells, squamous epithelial cells (e.g. in teratoma; metastasis)
TdT	Immature T cells of normal thymus, >90% of thymomas and neoplastic T cells of T lymphoblastic lymphoma
CD5	Immature and mature T cells of thymus and >90% of thymomas Neoplastic T cells of many T lymphoblastic lymphomas Epithelial cells in 70% of thymic carcinomas ^b
CD20	Normal and neoplastic B cells Epithelial cells in 50% of cases of type A and AB thymoma
CD117	Epithelial cells in 80% of thymic carcinomas Neoplastic cells in most seminomas

^aBeware of rare cytokeratin-negative thymomas (that typically maintain expression of p63/p40)²¹;

^bbeware of adenocarcinoma metastases to the mediastinum that can be CD5+ as well



CK19



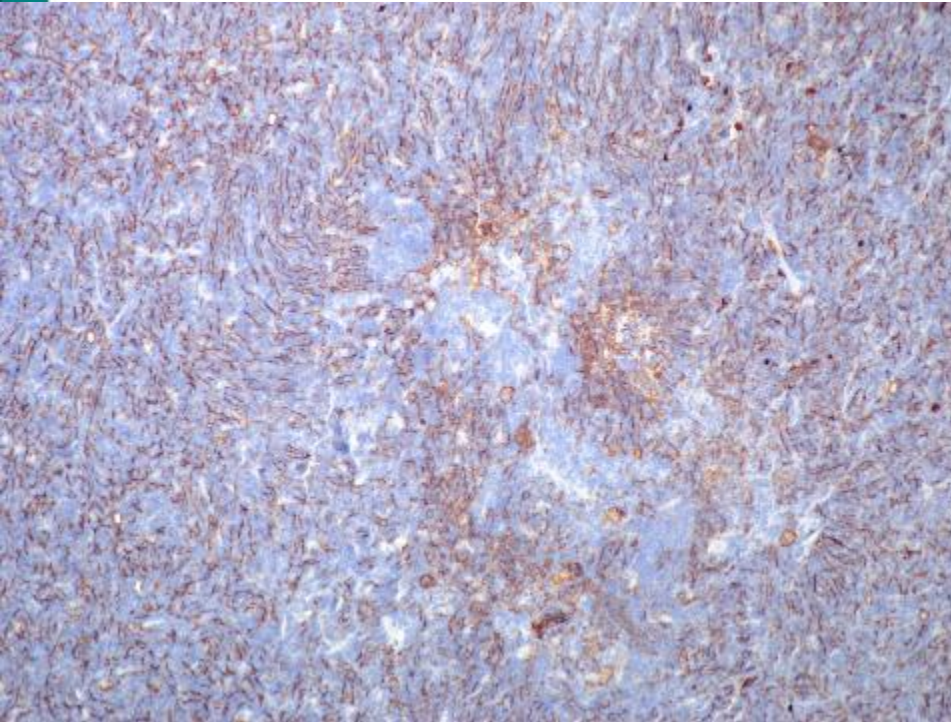
CD20



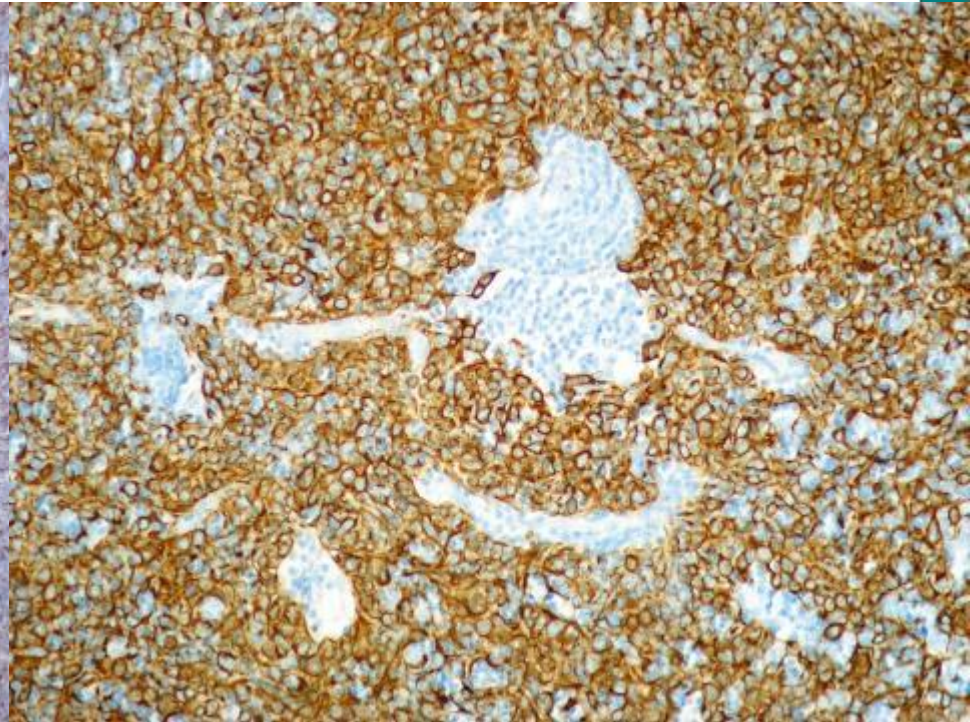
Tdt



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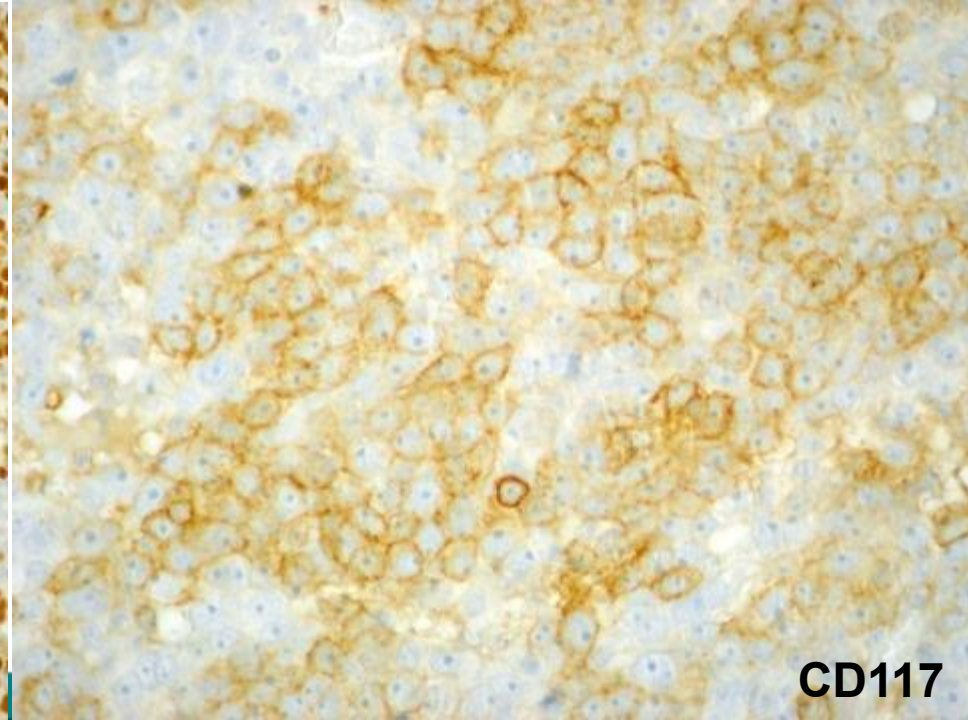
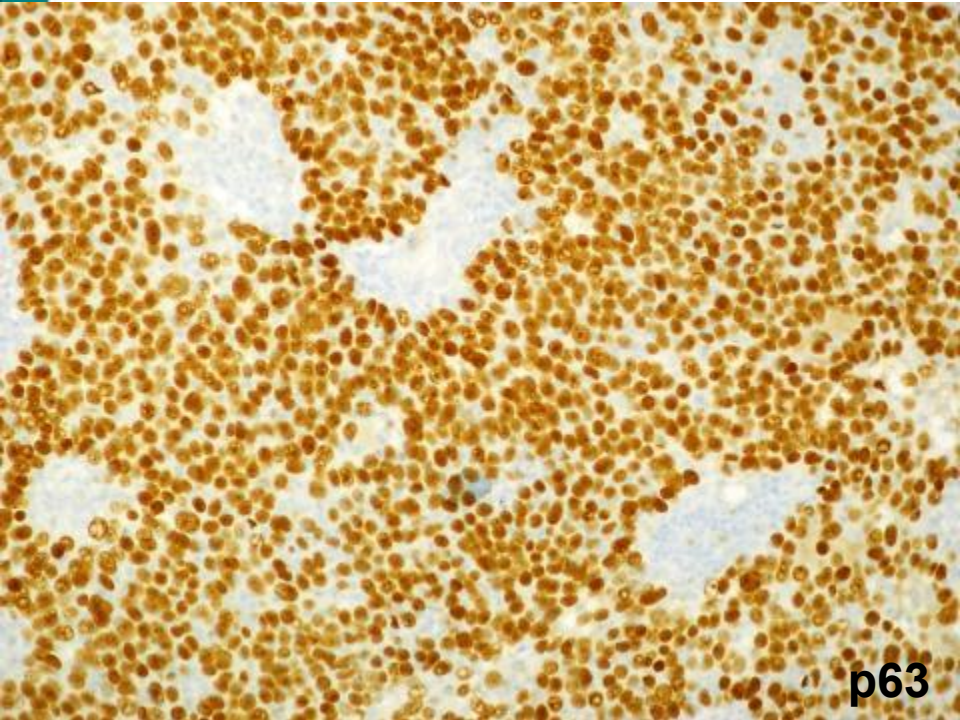
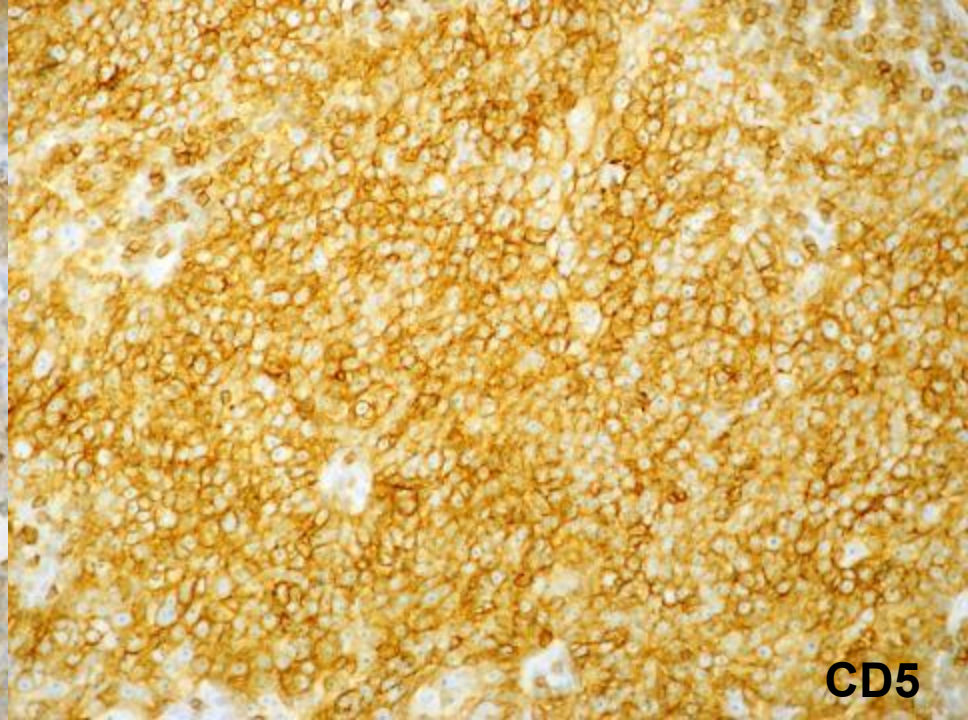
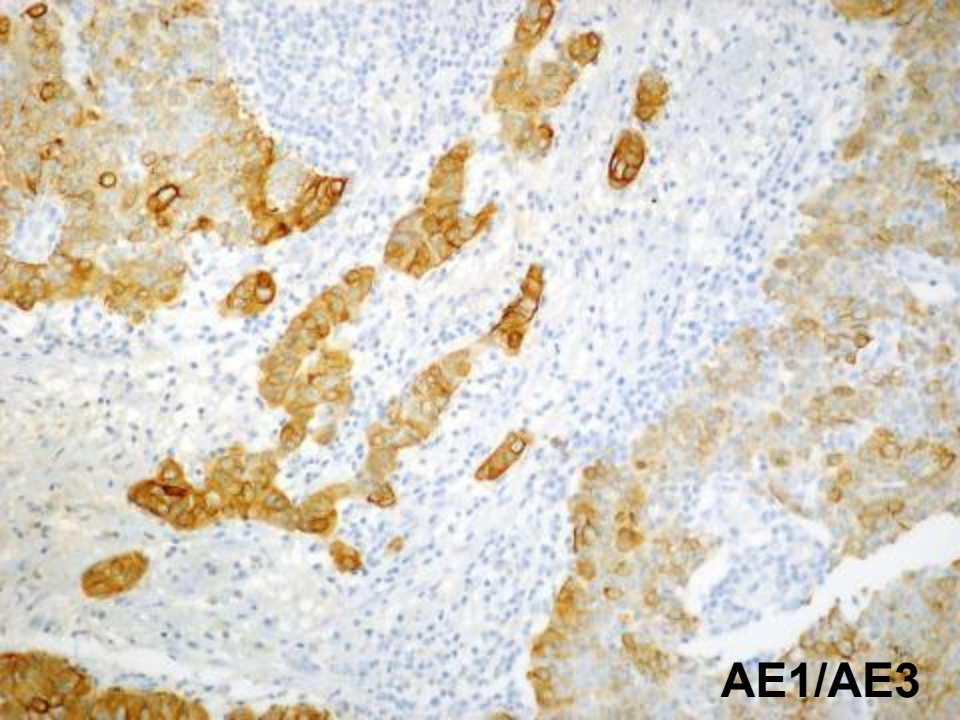


Timoma B1



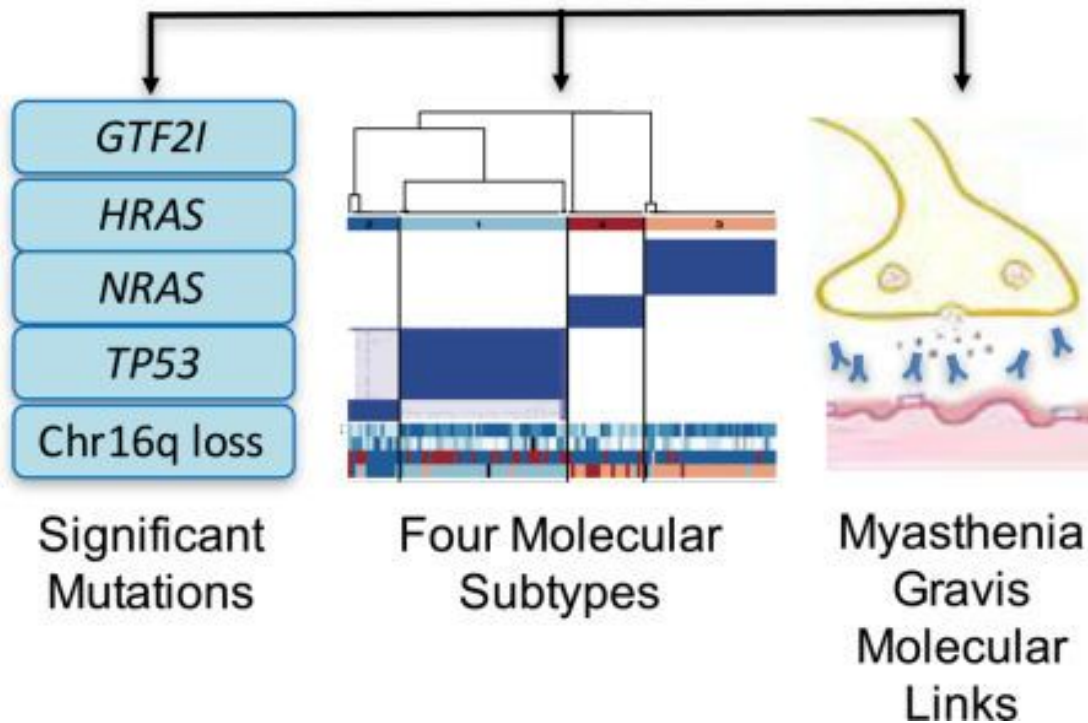
Timoma B3

AE1/AE3





Thymic Epithelial Tumors





Immunostains aiding in the distinction between thymic carcinoma and metastasis ^[2,4]		
Immunostain	Thymic carcinoma (percent positive cases)	Metastasis (percent positive cases)
CD5	20 to 100	0 to 34 [*]
CD117	60 to 87	20 to 100 [¶]
CD5 and CD117	54 to 65	0 ^Δ
CD205	52 to 76	4 to 27
FoxN1	59	13
PAX8	0 to 80 [◇]	0 to 33 ^{Δ◇}
PAX8 and CD117	69	0
PAX8 and CD5	46	0

CAM: cell adhesion molecule; CK: creatine kinase; PAX8: paired box 8; CD: cluster of differentiation; Bcl: B-cell lymphoma; TTF-1: transcription termination factor 1; TdT: terminal deoxynucleotidyl transferase; MAML2: mastermind-like transcriptional coactivator 2; NUT: nuclear protein of the testis; BRD4: bromodomain-containing 4; FoxN1: forkhead box N1; SP19: chymotrypsin-like serine protease.

^{*} Adenocarcinoma of gastrointestinal tract, breast, lung, gynecologic organs, epithelioid sarcoma, mesothelioma, urothelial carcinoma; **clone dependent**.

[¶] Squamous cell carcinoma of lung, gastrointestinal stromal tumor, germ cell tumors.

^Δ Squamous cell carcinomas of lung (clone SP19, clone not provided in other study).^[6,7]

[◇] Clone dependent (0 for monoclonal PAX8, 58 to 69% [thymic carcinoma] and 2.4 to 6% [lung carcinomas] for polyclonal PAX8).^[2]

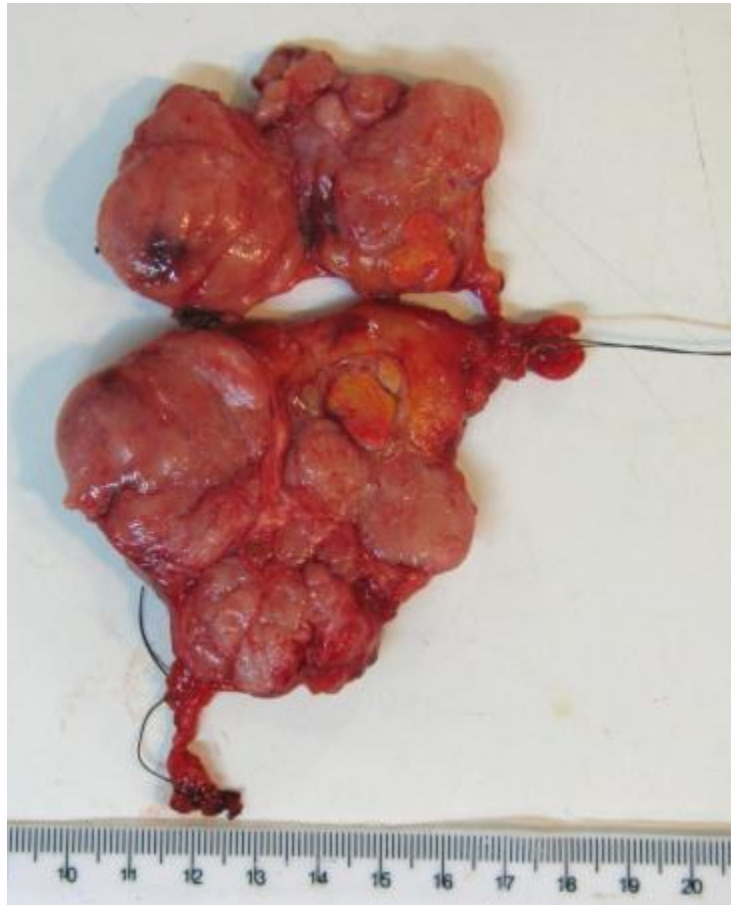


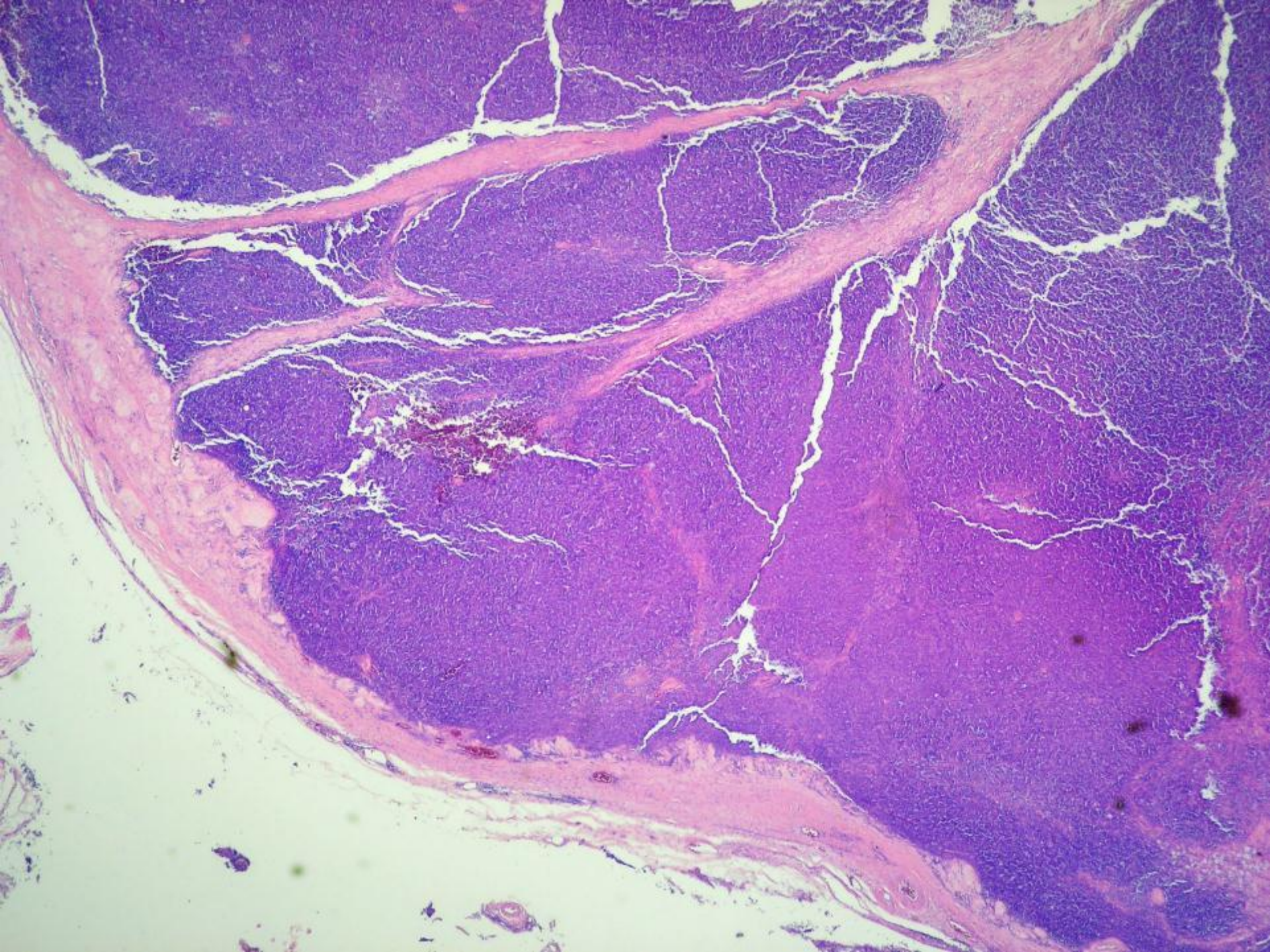
Protocolo del CAP para examen y reporte de Tumores epiteliales tímicos (piezas quirúrgicas)

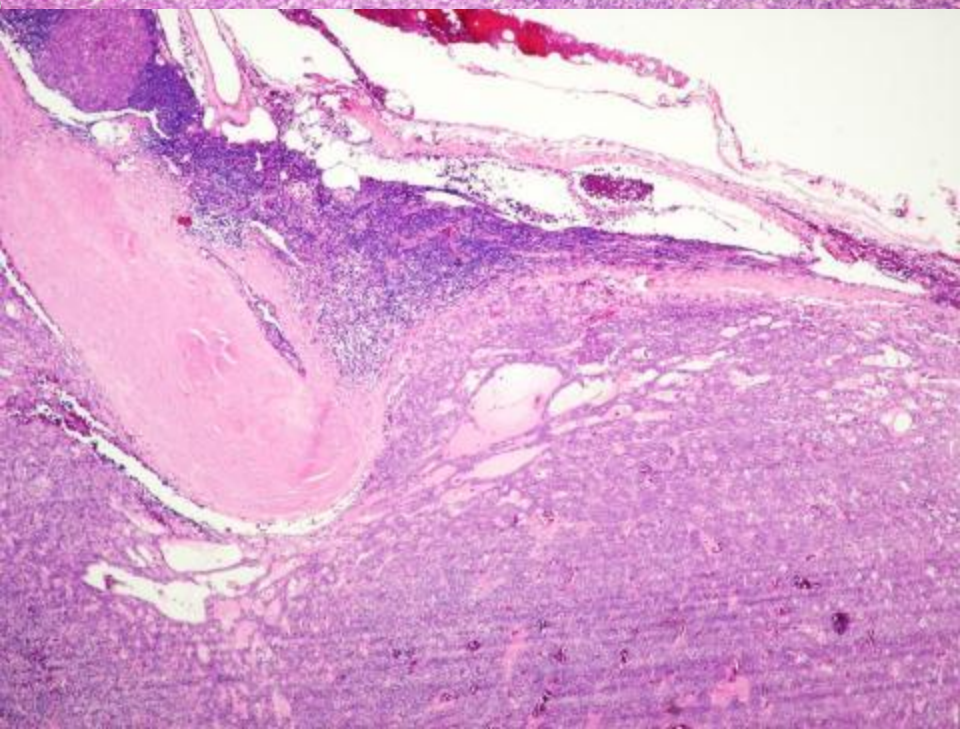
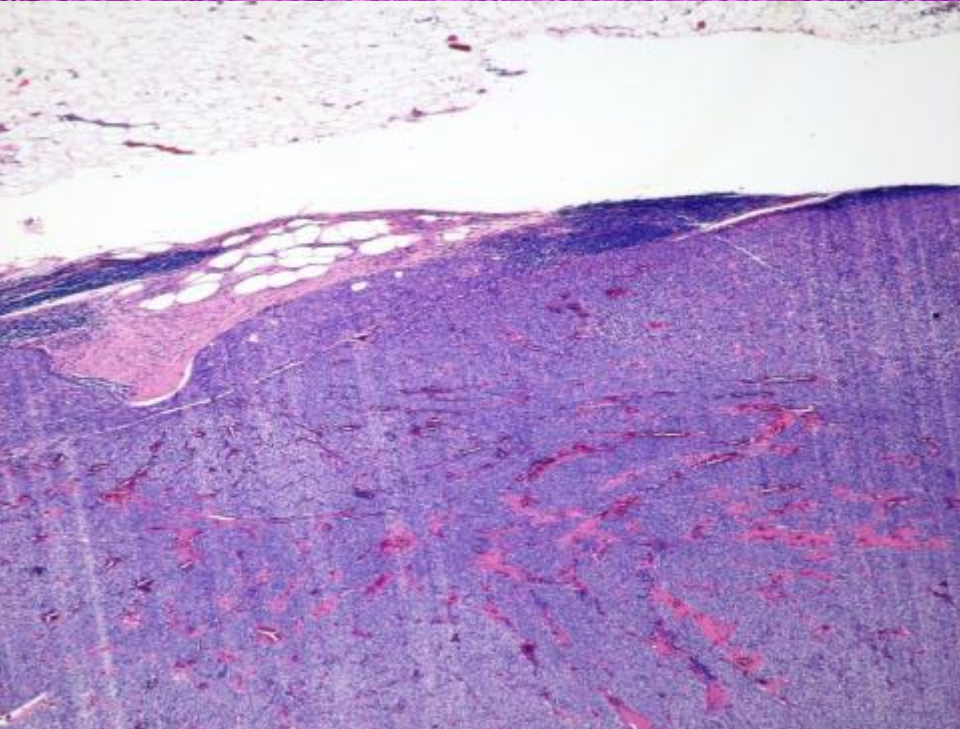
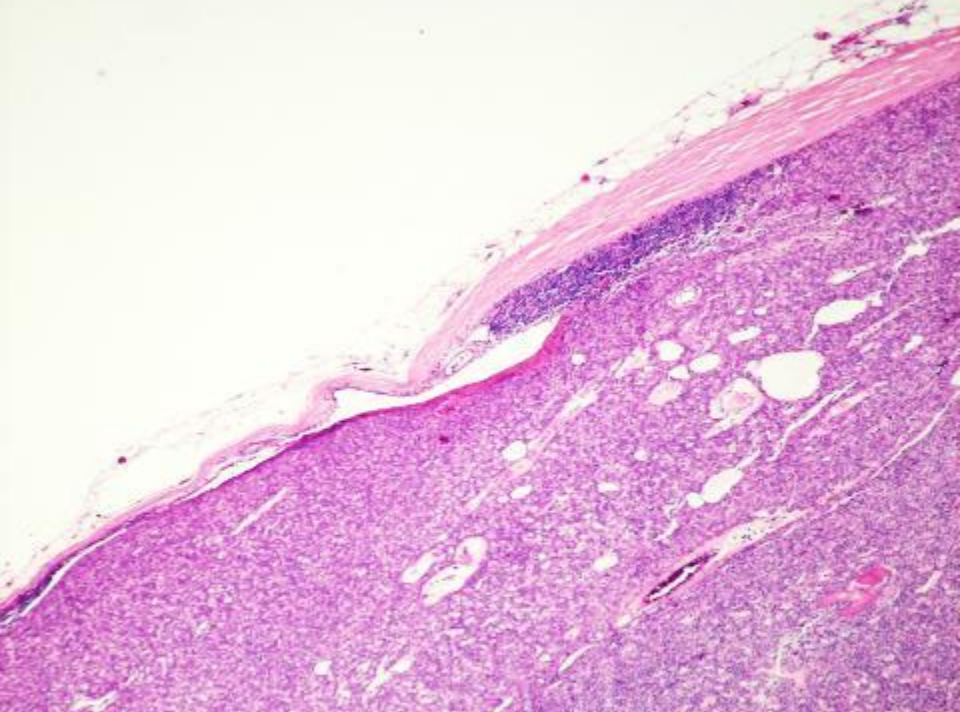
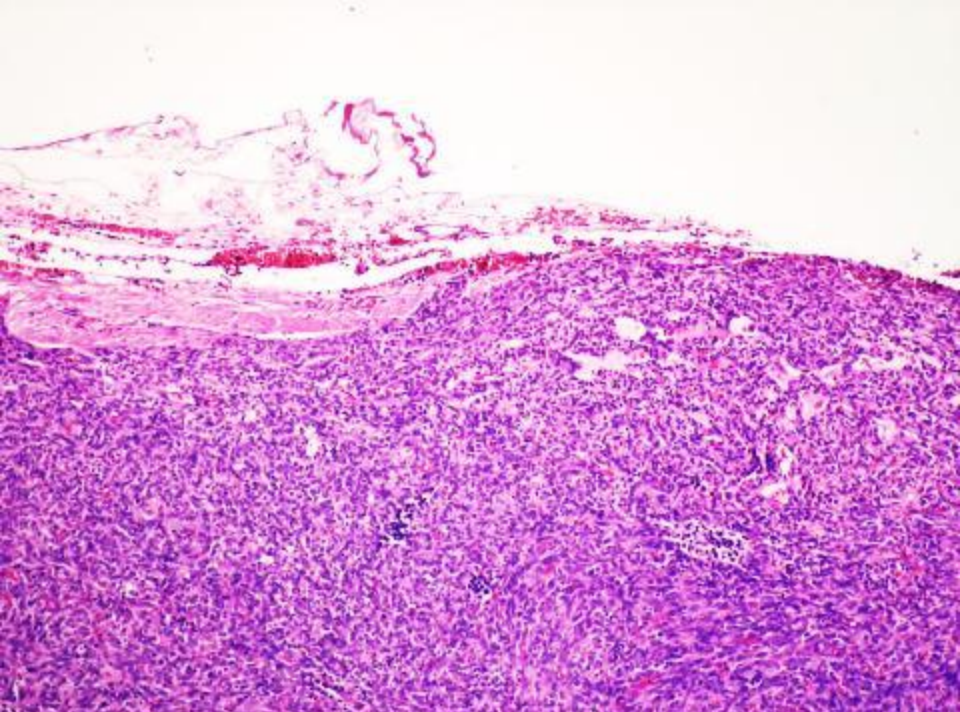
- ✓ Tamaño tumoral
- ✓ Tipo histológico
- Invasión transcapsular
- Márgenes quirúrgicos
- Respuesta a tratamiento pre-quirúrgico
- Invasión linfovascular
- ✓ Compromiso de linfonodos regionales
- Etapificación
- ✓ Hallazgos histopatológicos adicionales

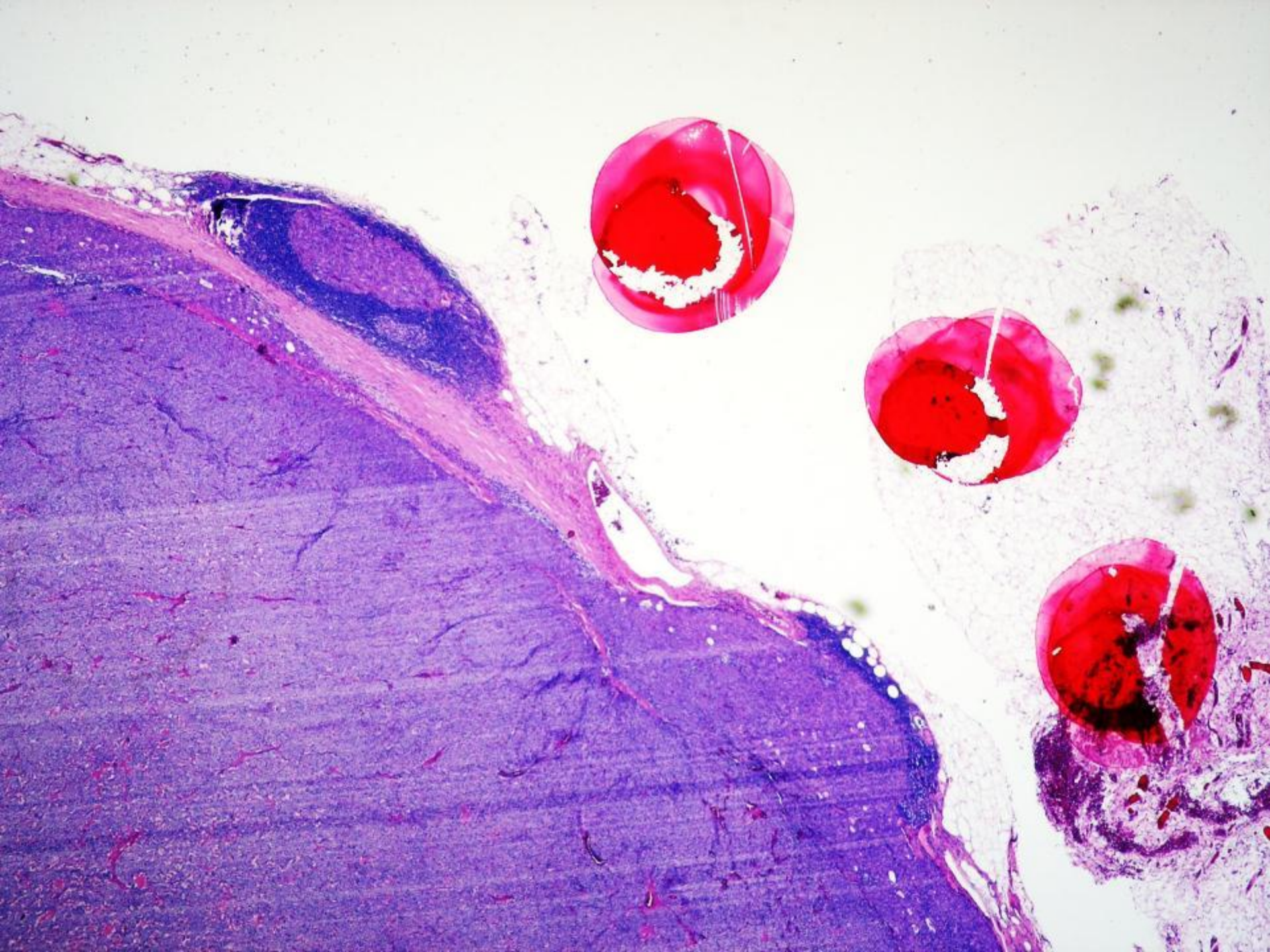


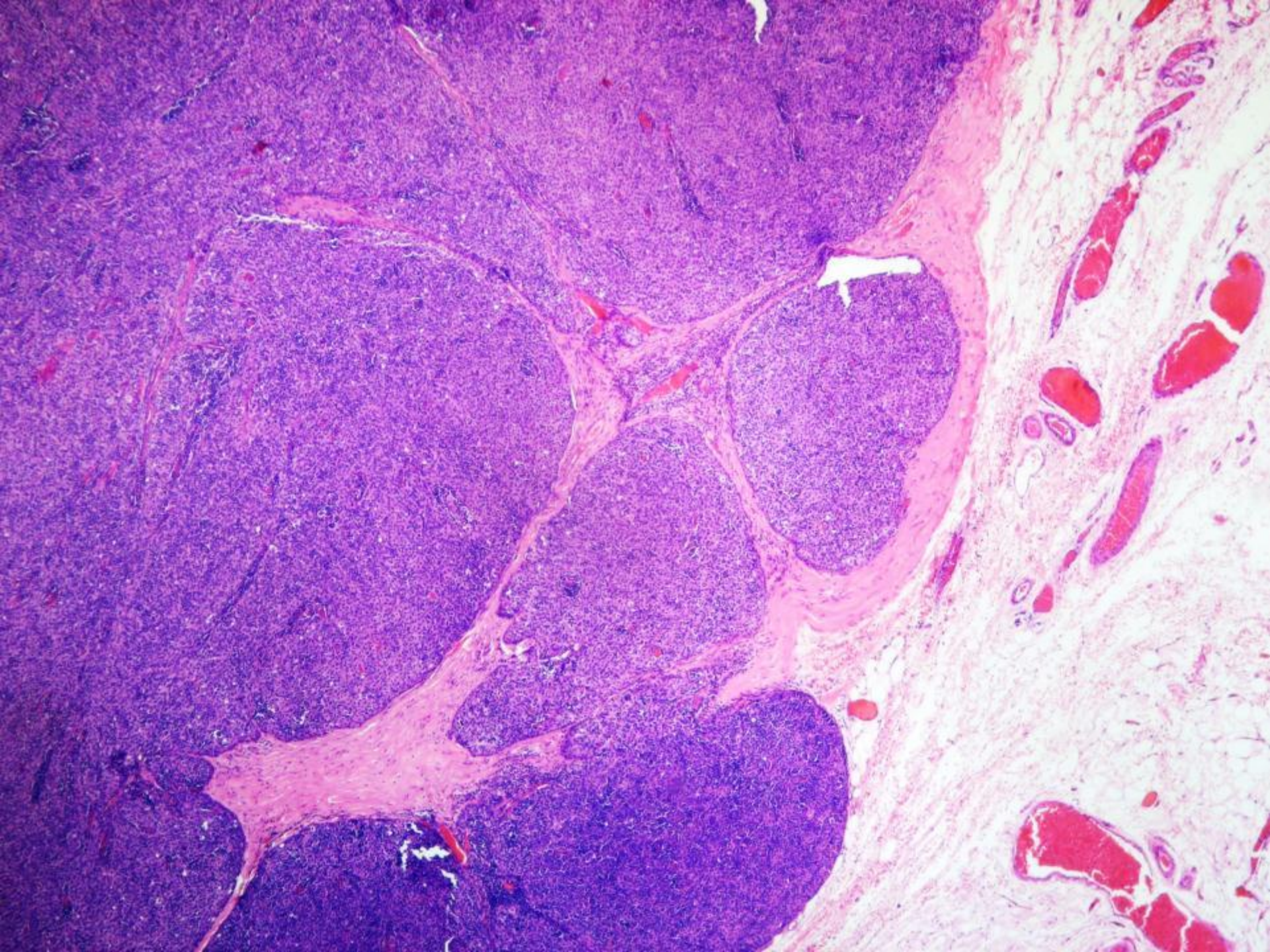
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Protocolo del CAP para examen y reporte de Tumores epiteliales tímicos (piezas quirúrgicas)

- ✓ Tamaño tumoral
- ✓ Tipo histológico
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- ✓ Respuesta a tratamiento pre-quirúrgico
- ✓ Invasión linfovascular
- ✓ Compromiso de linfonodos regionales
- Etapificación
- ✓ Hallazgos histopatológicos adicionales



- Margen: tejido cortado o disecado (peritumoral o en estructuras vecinas)

≠

- Pleura mediastínica
- Pericardio
- Vena cava superior
- Cápsula tumoral

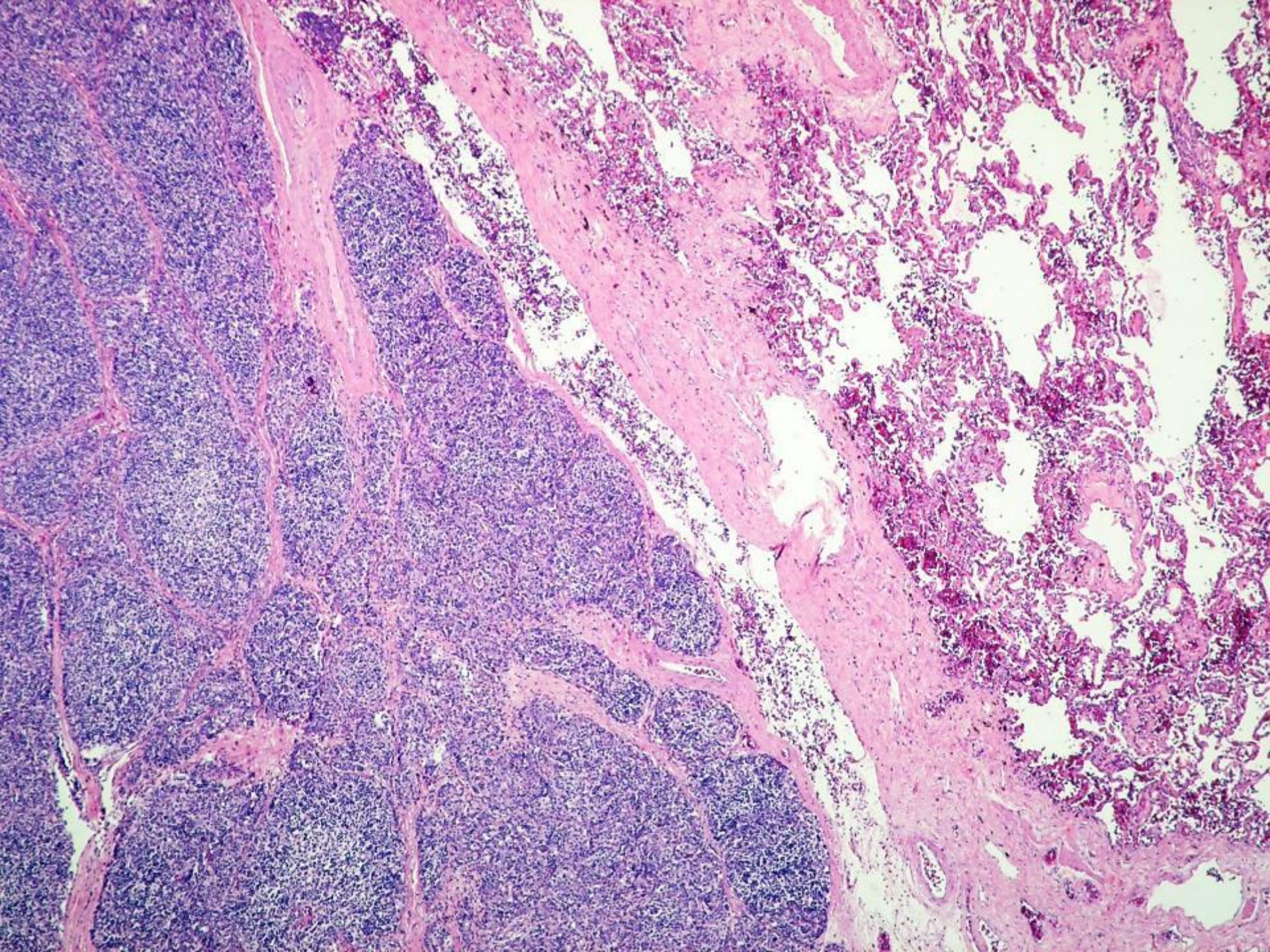


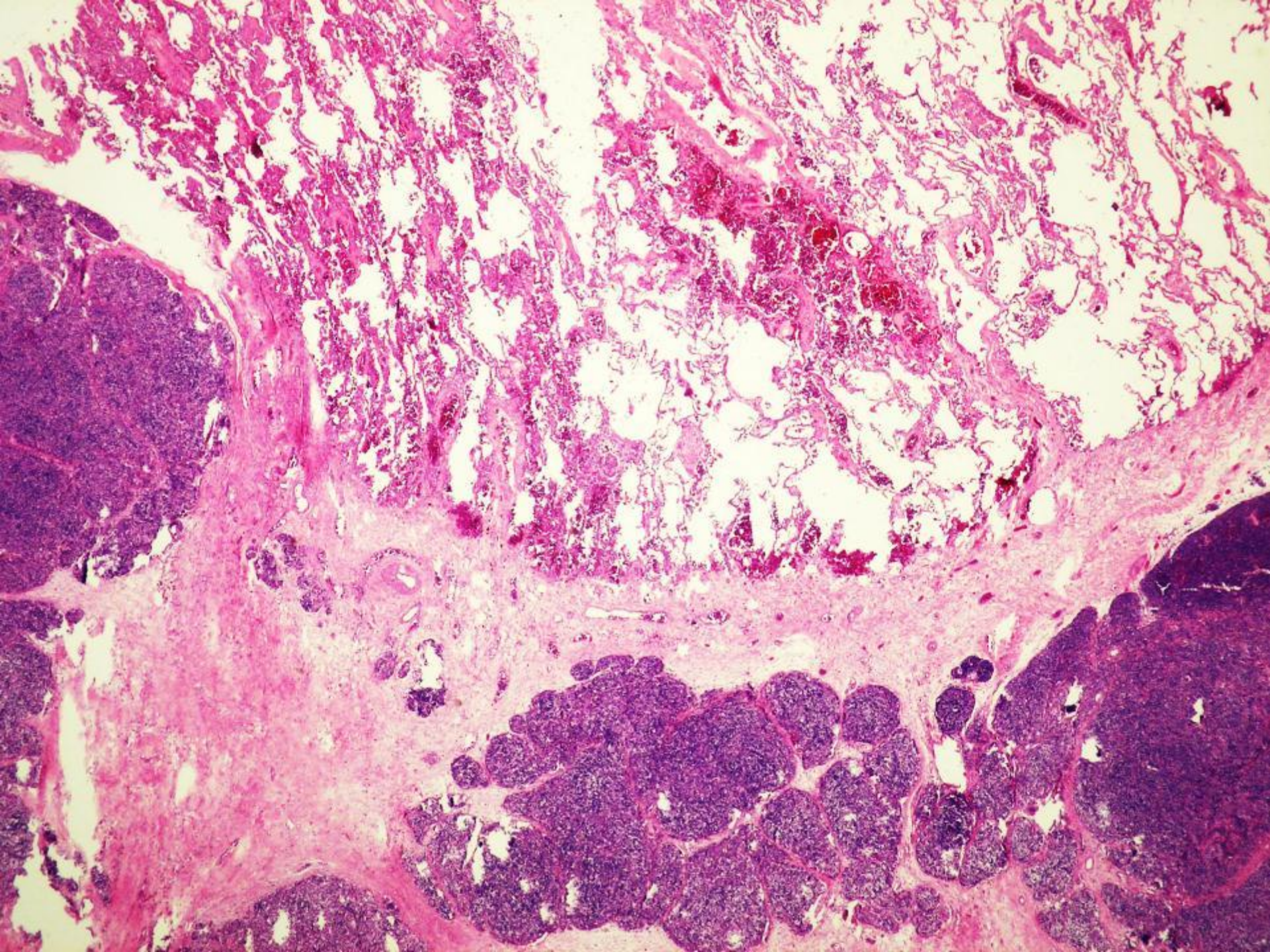




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Protocolo del CAP para examen y reporte de Tumores epiteliales tímicos (piezas quirúrgicas)

- ✓ Tamaño tumoral
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- ✓ Invasión linfovascular
- ✓ Compromiso de linfonodos regionales
- Etapificación
- ✓ Hallazgos histopatológicos adicionales



Cancer. 1981 Dec 1;48(11):2485-92.

Follow-up study of thymomas with special reference to their clinical stages.

Masaoka A, Monden Y, Nakahara K, Tanioka T.

Abstract

Follow-up data were obtained for 96 cases of thymoma. The one-year survival rate was 84.3%, the three-year 77.1%, the five-year 74.1%, and the ten-year 57.1%. The five-year survival rate of total resection group was 88.9%; that of non-radically treated group was 44.4%. Clinical stages were defined: Stage I--macroscopically encapsulated and microscopically no capsular invasion, Stage II--1. macroscopic invasion into surrounding fatty tissue of mediastinal pleura, or 2. microscopic invasion into capsule; Stage III--macroscopic invasion into neighboring organ; Stage IVa--pleural or pericardial dissemination; Stage IVb--lymphogenous or hematogenous metastasis. Five-year survival rates of each clinical stage were 92.6% in Stage I, 85.7% in Stage II, 69.6% in Stage III, and 50% in Stage IV. Recurrence after total resection was found in six of 69 cases. Seven of 13 patients treated by subtotal resection survived more than five years with postoperative radiotherapy.

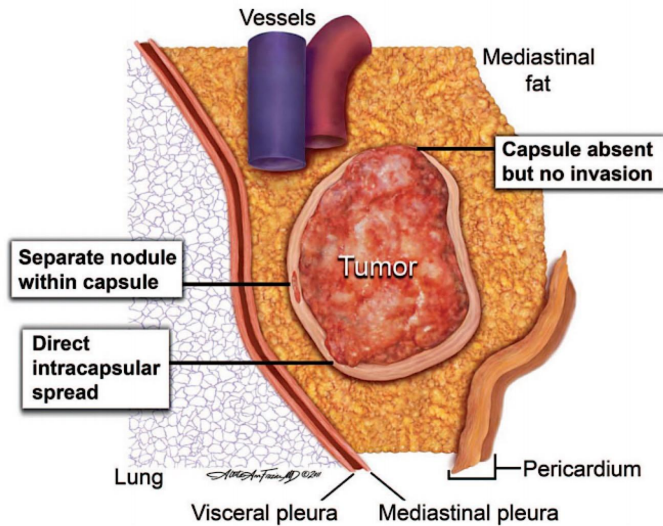
TABLE 1. Masaoka-Koga Staging System

Stage	Definition
I	Grossly and microscopically completely encapsulated tumor
IIa	Microscopic transcapsular invasion
b	Macroscopic invasion into thymic or surrounding fatty tissue, or grossly adherent to but not breaking through mediastinal pleura or pericardium
III	Macroscopic invasion into neighboring organ (i.e., pericardium, great vessel, or lung)
IVa	Pleural or pericardial metastases
b	Lymphogenous or hematogenous metastasis

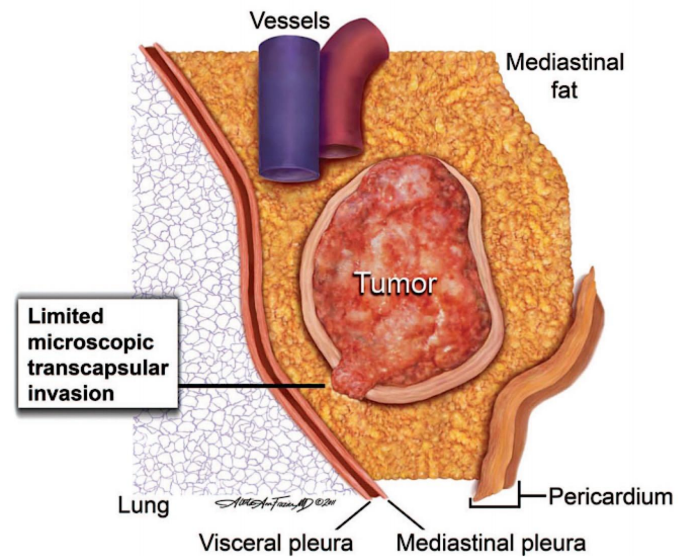
Adapted from *Pathol Int* 1994;44:359–367.

The Masaoka-Koga stage classification for thymic malignancies and definition of terms. *J Thorac Oncol.* 2011;6(7 Suppl 3);S1710-S1716.

Stage I

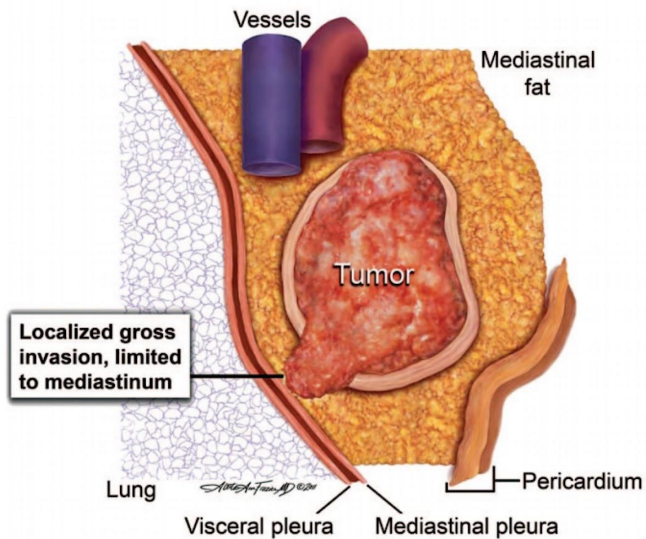


Stage IIa



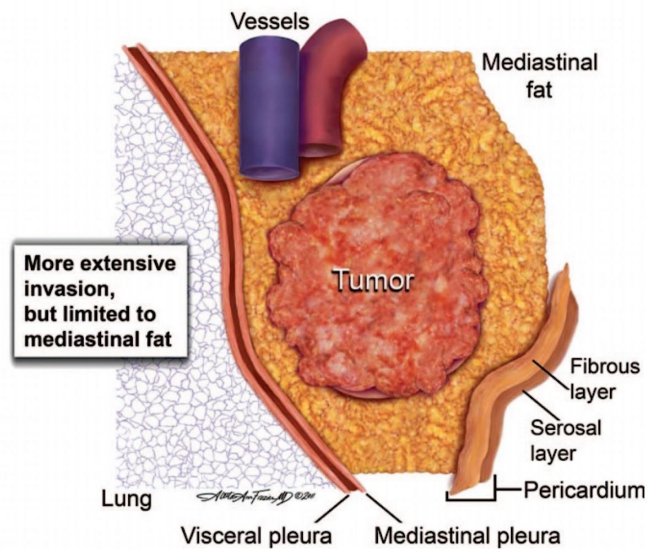
A

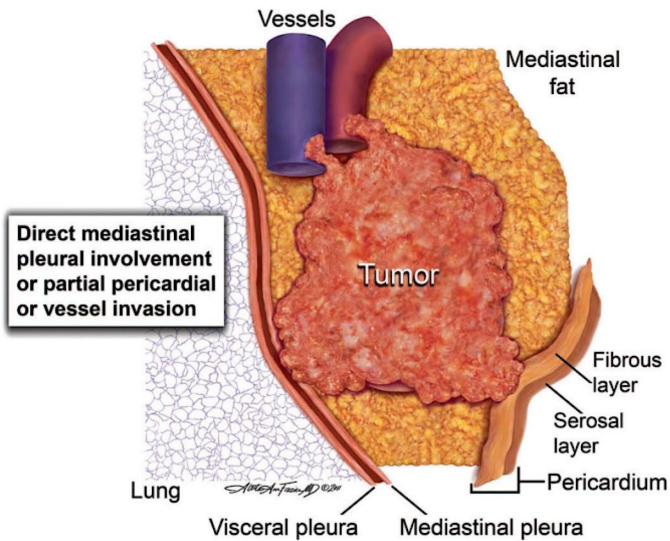
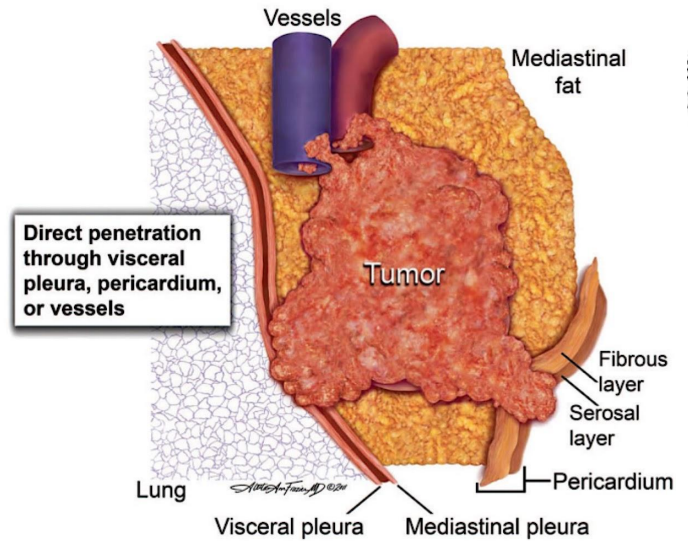
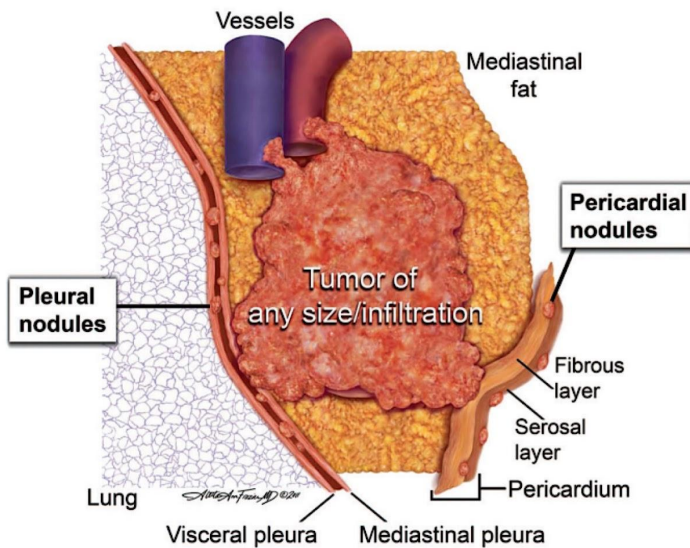
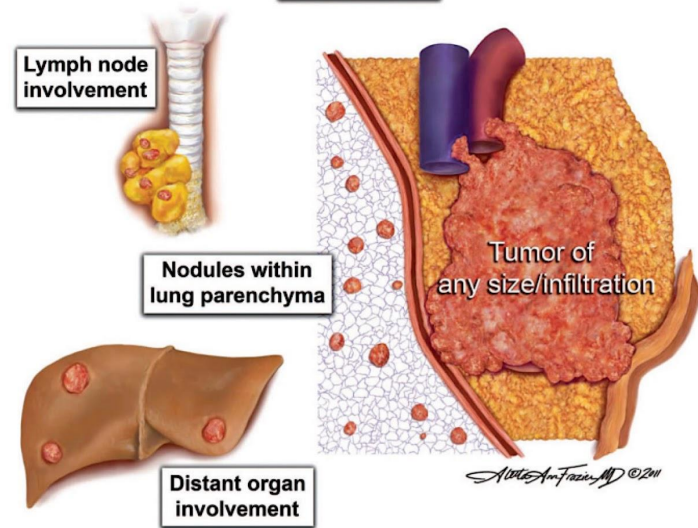
Stage IIb



B

Stage IIb



A**Stage III****B****Stage III****A****Stage IVa****B****Stage IVb**

Primary tumor (T)*[¶]

T category	T description
TX	Primary tumor cannot be assessed
T0	No evidence of primary tumor
T1	Tumor encapsulated or extending into the mediastinal fat; may involve the mediastinal pleura
T1a	Tumor with no mediastinal pleura involvement
T1b	Tumor with direct invasion of mediastinal pleura
T2	Tumor with direct invasion of the pericardium (either partial or full thickness)
T3	Tumor with direct invasion into any of the following: Lung, brachiocephalic vein, superior vena cava, phrenic nerve, chest wall, or extrapericardial pulmonary artery or veins
T4	Tumor with invasion into any of the following: Aorta (ascending, arch, or descending), arch vessels, intrapericardial pulmonary artery, myocardium, trachea, esophagus

* Involvement must be microscopically confirmed in pathological staging, if possible.

¶ T categories are defined by "levels" of invasion; they reflect the highest degree of invasion regardless of how many other (lower-level) structures are invaded. T1, level 1 structures: thymus, anterior mediastinal fat, mediastinal pleura; T2, level 2 structures: pericardium; T3, level 3 structures: lung, brachiocephalic vein, superior vena cava, phrenic nerve, chest wall, hilar pulmonary vessels; T4, level 4 structures: aorta (ascending, arch, or descending), arch vessels, intrapericardial pulmonary artery, myocardium, trachea, esophagus.

Regional lymph nodes (N)^Δ

N category	N description
NX	Regional lymph nodes cannot be assessed
N0	No regional lymph node metastasis
N1	Metastasis in anterior (perithymic) lymph nodes
N2	Metastasis in deep intrathoracic or cervical lymph nodes

Δ Involvement must be microscopically confirmed in pathological staging, if possible.

Distant metastasis (M)

M category	M description
M0	No pleural, pericardial, or distant metastasis
M1	Pleural, pericardial, or distant metastasis
M1a	Separate pleural or pericardial nodule(s)
M1b	Pulmonary intraparenchymal nodule or distant organ metastasis

Prognostic stage groups

The T, N, and M categories are organized into stage groups, as shown in the table. This schema was developed based primarily on outcomes; in the lower stages, recurrence rates in patients with complete resections were judged most relevant, whereas in higher stages, survival in all patients, regardless of resection status, was weighed more heavily. Practical applicability and clinical implications also were considered. Differences among the stage groups were subjected to statistical analysis and generally were found to have a stepwise progression toward worse survival in multiple patient cohorts (eg, R0, R-any[◊]).

When T is...	And N is...	And M is...	Then the stage group is...
T1a,b	N0	M0	I
T2	N0	M0	II
T3	N0	M0	IIIA
T4	N0	M0	IIIB
Any T	N1	M0	IVA
Any T	N0, N1	M1a	IVA
Any T	N2	M0, M1a	IVB
Any T	Any N	M1b	IVB

◊ R0: no residual tumor; R-any: any type of resection (no residual tumor, microscopic residual tumor, or macroscopic residual tumor at the primary cancer site or regional nodal sites).

TABLE 1. T Descriptors

Category	Definition (Involvement of) ^{a,b}
T1	
a	Encapsulated or unencapsulated, with or without extension into mediastinal fat
b	Extension into mediastinal pleura
T2	Pericardium
T3	Lung, brachiocephalic vein, superior vena cava, chest wall, phrenic nerve, hilar (extrapericardial) pulmonary vessels
T4	Aorta, arch vessels, main pulmonary artery, myocardium, trachea, or esophagus

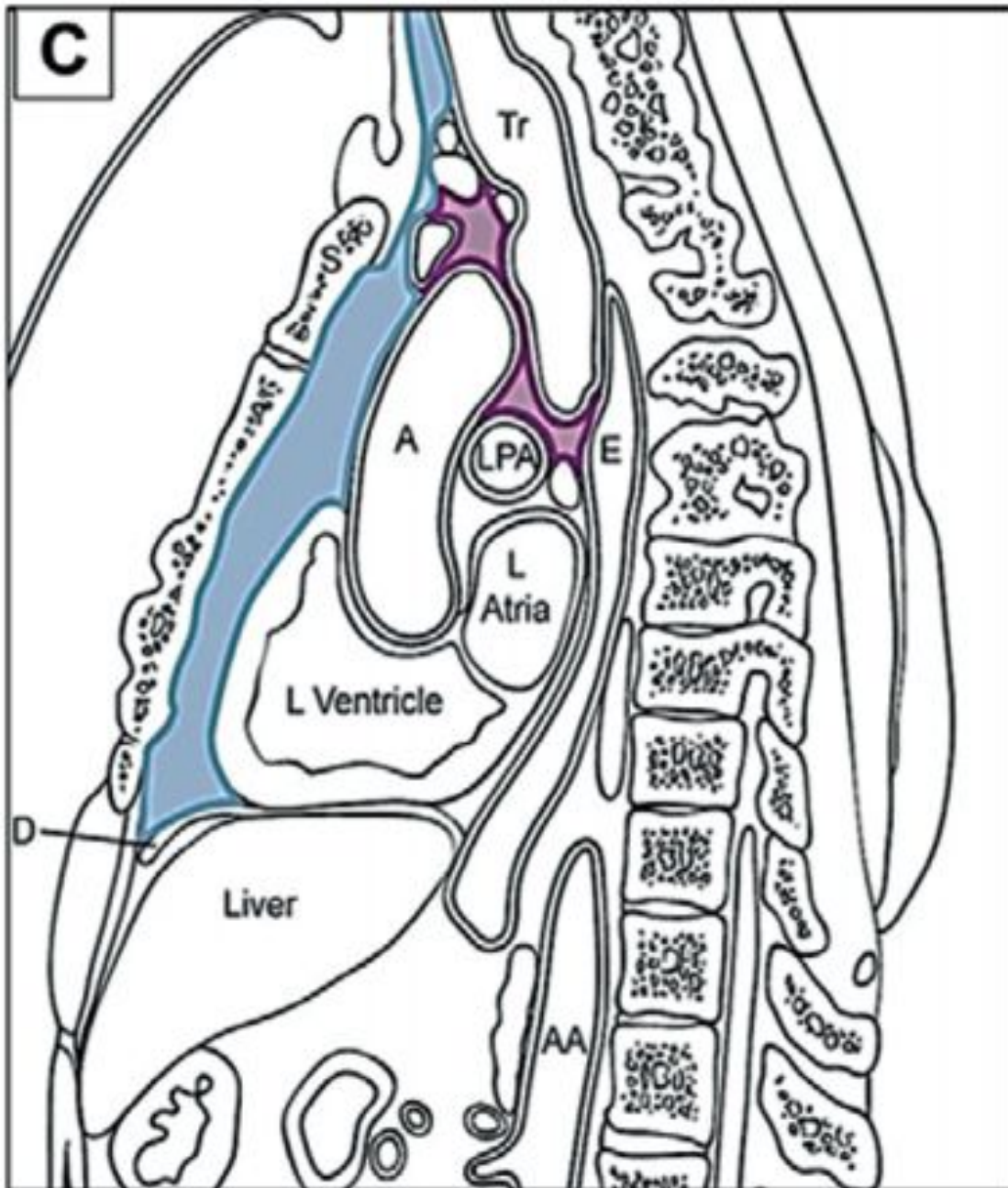
TABLE 2. N and M Descriptors

Category	Definition (Involvement of) ^a
N0	No nodal involvement
N1	Anterior (perithymic) nodes
N2	Deep intrathoracic or cervical nodes
M0	No metastatic pleural, pericardial, or distant sites
M1	
a	Separate pleural or pericardial nodule(s)
b	Pulmonary intraparenchymal nodule or distant organ metastasis

^aInvolvement must be pathologically proven in pathologic staging.

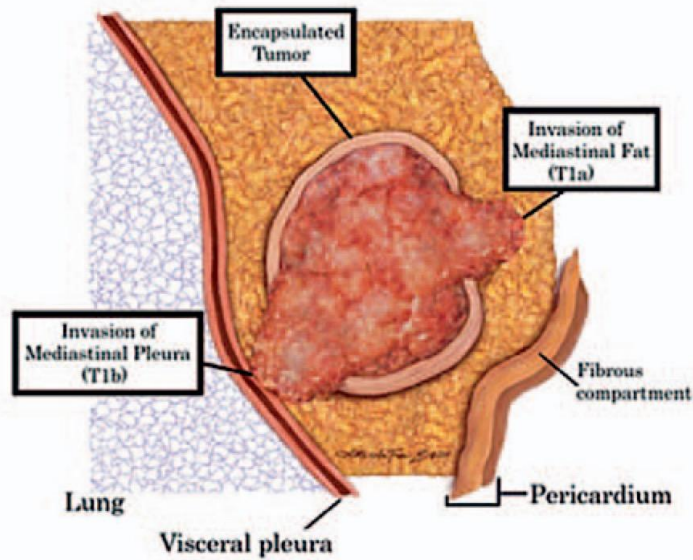
TABLE 3. Stage Grouping

Stage	T	N	M
I	T1	N0	M0
II	T2	N0	M0
IIIa	T3	N0	M0
IIIb	T4	N0	M0
IVa	T any	N1	M0
	T any	N0,1	M1a
IVb	T any	N2	M0,1a
	T any	N any	M1b

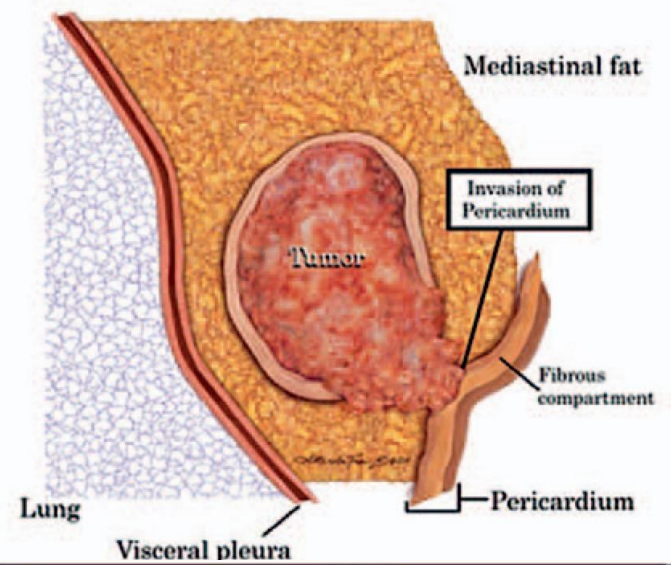


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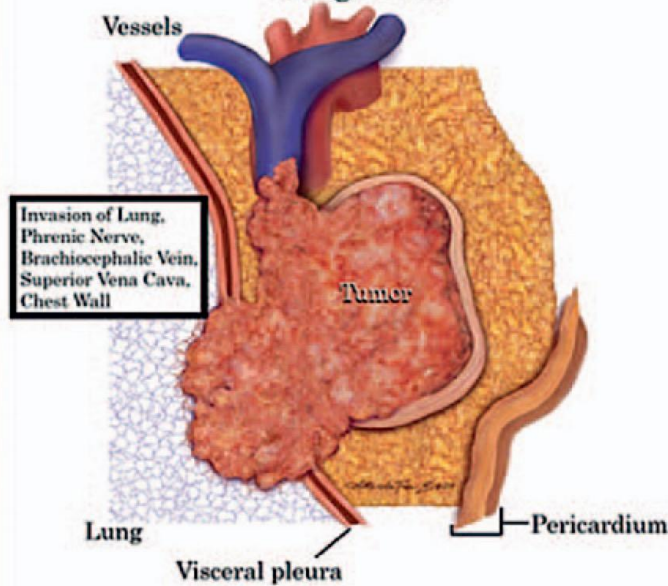
Stage I



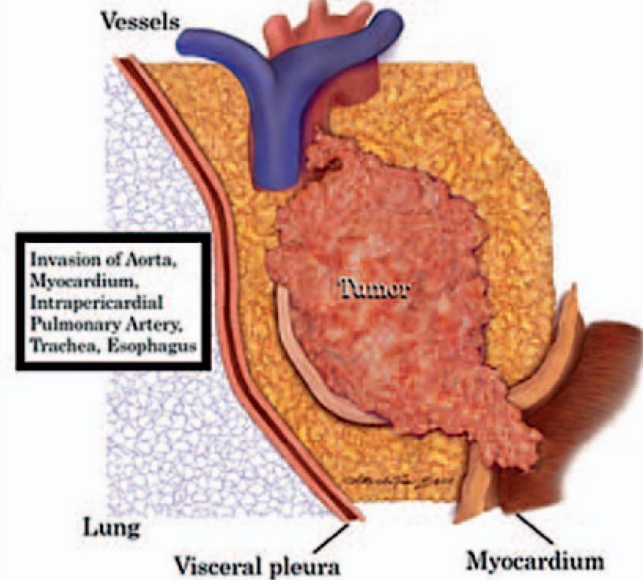
Stage II

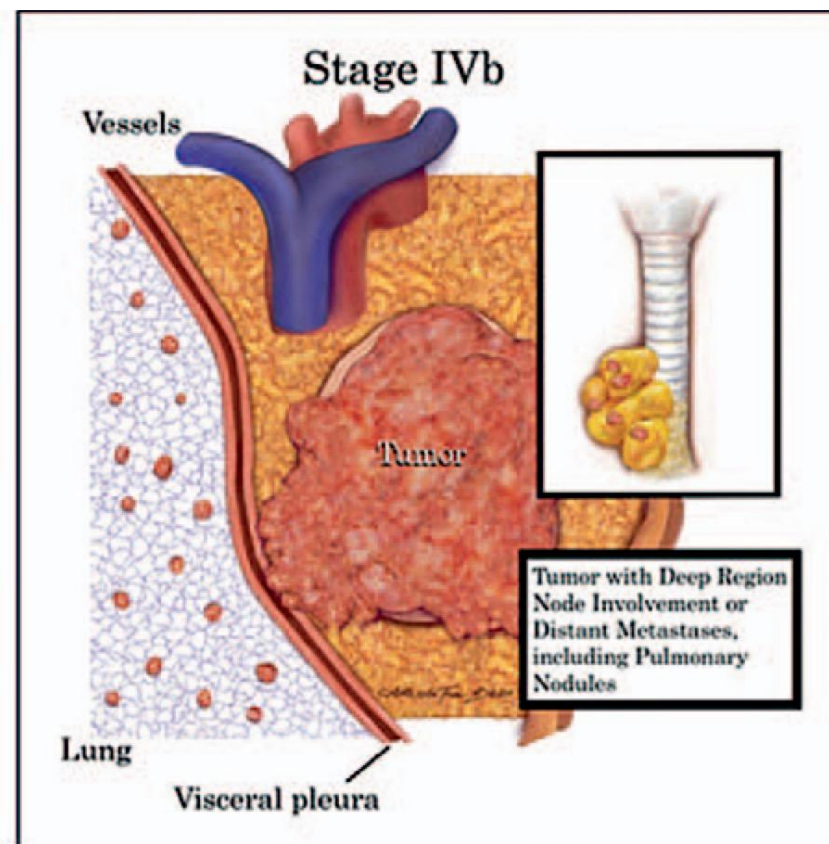
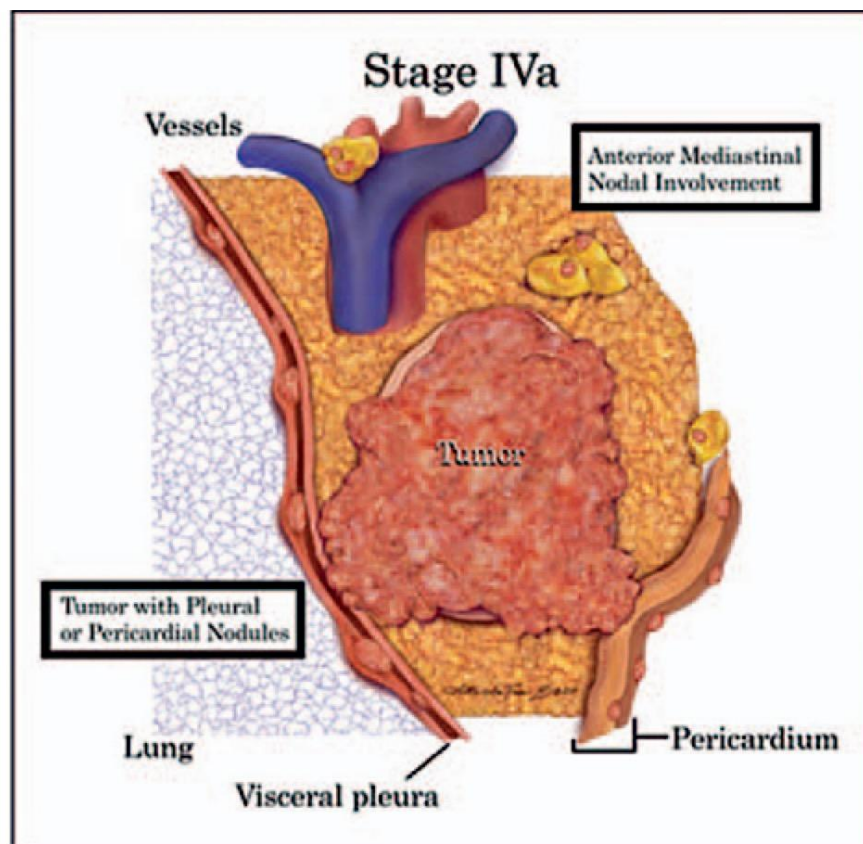


Stage IIIa



Stage IIIb





The IASLC/ITMIG Thymic Epithelial Tumors Staging Project: proposal for an evidence-based stage classification system for the forthcoming (8th) edition of the TNM classification of malignant tumors. J Thorac Oncol. 2014;9(9 Suppl 2):S65-S72.

Efficacy of chest computed tomography prediction of the pathological TNM stage of thymic epithelial tumours[†]

Darin B. White^a, Megan J. Hora^a, Sarah M. Jenkins^b, Randolph S. Marks^c, Yolanda I. Garces^d,
Stephen D. Cassivi^e and Anja C. Roden^{f,*}

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^c Division of Medical Oncology, Department of Oncology, Mayo Clinic Rochester, Rochester, MN, USA

^d Department of Radiation-Oncology, Mayo Clinic Rochester, Rochester, MN, USA

^e Division of Thoracic Surgery, Department of Surgery, Mayo Clinic Rochester, Rochester, MN, USA

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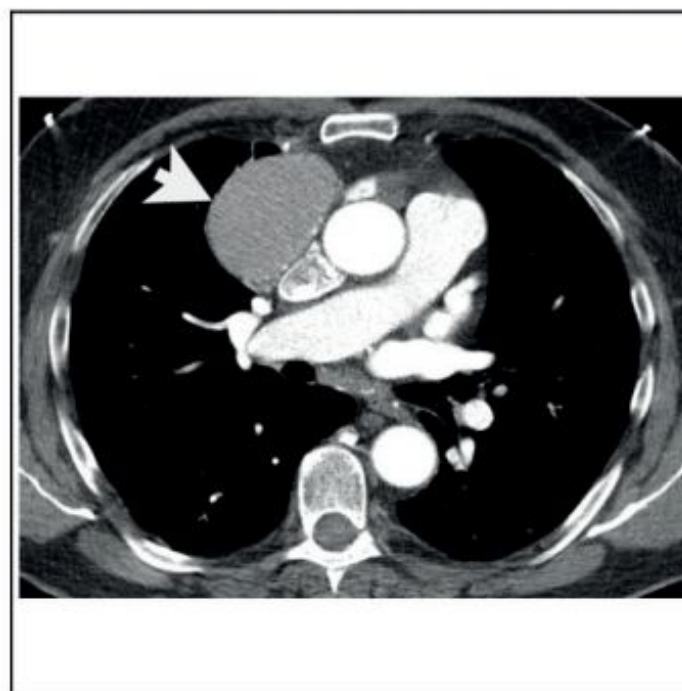
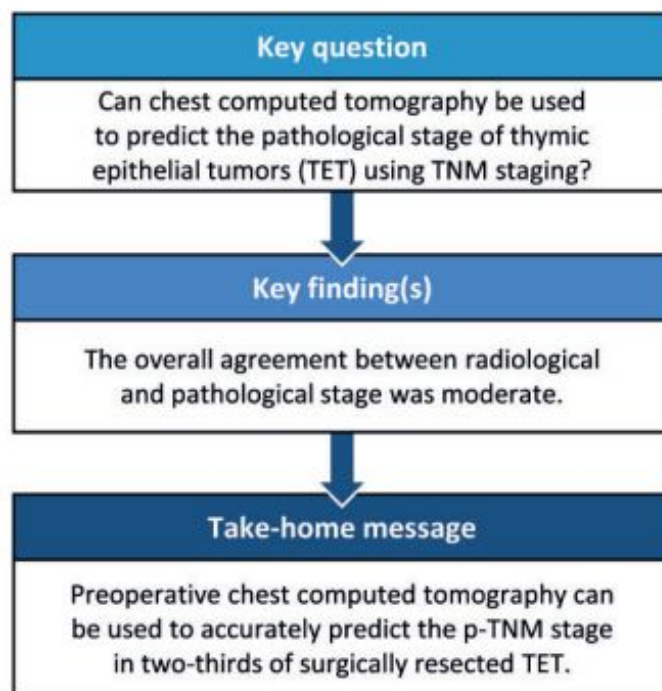


Table 3: Radiological versus pathological TNM and modified Masaoka staging (N = 60)

		Radiology							Agreement between r-stage and p-stage Percent agreement (kappa)	Radiology, N (%) Overstage p-stage Understage p-stage
		TNM staging							66.7 (0.46)	12 (20.0) 8 (13.3)
Pathology	Number of cases	I	II	IIIA	IIIB	IVA	IVB	Total		
	0/X ^a	0	0	2	0	0	0	2		
	I	31	2	0	1	0	3	37		
	II	0	0	0	1	0	0	1		
	IIIA ^b	3	2	2	0	0	1	8		
	IIIB	0	0	0	0	0	0	0		
	IVA	0	3	0	0	3	2	8		
	IVB	0	0	0	0	0	4	4		
	Total	34	7	4	2	3	10	60		
		Modified Masaoka staging							46.7 (0.30)	12 (20.0) 20 (33.3)
		I	II	III	IVA	IVB	Total			
	0/X ^a	0	0	2	0	0	2			
	I	15	1	0	0	2	18			
	II	14	1	3	0	1	19			
	IIIA ^b	2	1	5	0	2	10			
	IVA	0	0	0	1	1	2			
	IVB	0	0	3	0	6	9			
	Total	31	3	13	1	12	60			

Bolded numbers indicate the number of cases with the same stage by pathology and radiology.

^aStage '0' for TNM staging and stage 'X' for the modified Masaoka staging.

^bFor the modified Masaoka staging, stage III was not further subdivided.

TNM: tumour, node and metastasis.

Conclusiones



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- ✓ Timomas y carcinomas tímicos son neoplasias epiteliales poco frecuentes y malignas
- ✓ Información detallada de la pieza quirúrgica para adecuado procesamiento
- ✓ Diagnóstico patológico principalmente por características microscópicas
- ✓ Inmunohistoquímica con rol complementario
- ✓ Timomas con múltiples patrones histológicos

Conclusiones



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- ✓ Nuevo sistema de etapificación TNM común para TET
- ✓ Factores pronósticos multifactoriales
- ✓ Diagnósticos diferenciales con otros tumores primarios o metastásicos en el mediastino
- ✓ Correlación clínico-radiológica



Gracias!