

BIOPSIA DE MEDULA OSEA EN LOS LINFOMAS

Sergio Serrano

Hospital del Mar-UAB

BIOPSIA DE MEDULA OSEA EN LOS LINFOMAS

- **Extensión de la enfermedad**
- **Respuesta al tratamiento**
- **Diagnóstico**

BIOPSIA DE MEDULA OSEA EN LOS LINFOMAS

- **Estudio morfológico convencional**
- **Estudio inmunohistoquímico**
- **Citometría de flujo**
- **Técnicas de biología molecular**
- **FISH**

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- **Citometría de flujo**
- **Técnicas de biología molecular**
- **FISH**

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9 Blue



igh1852_F11_11.fsa

11 Blue



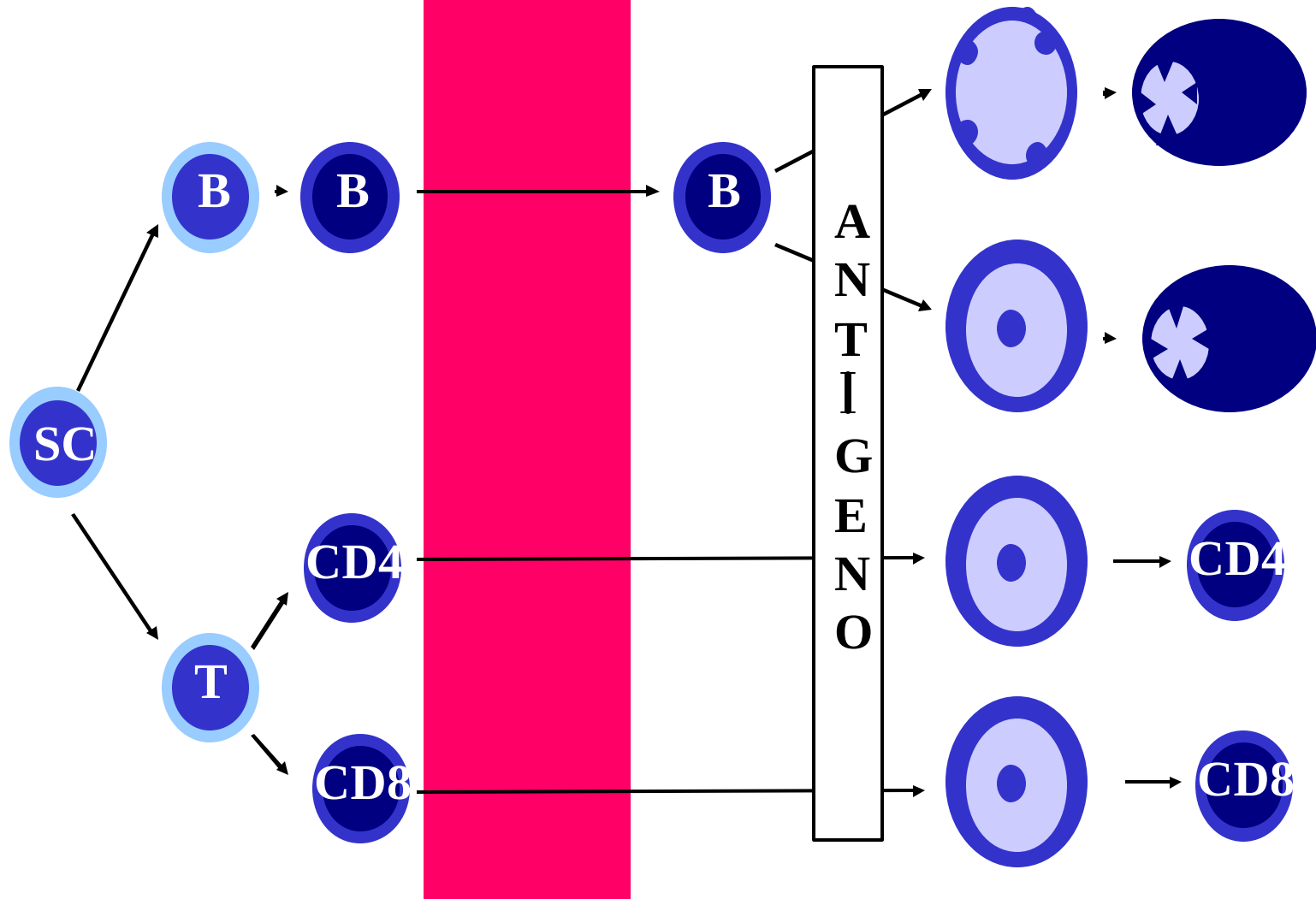
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- **FISH**

O. L. PRIMARIOS

SANGRE

O. L. SECUNDARIOS



L. C. Precursoras

L. C. Periféricas

L B FRECUENCIA AFECTACIÓN

LLC 60-90%

Manto 55-95%

Linfoplasmacítico 80%

Z.Marginal (bazo) 80%

Folicular 50-60%

Burkitt 50-60%

Célula B grande 25%

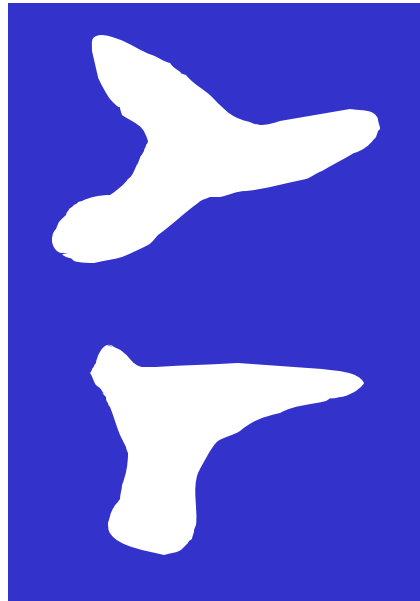
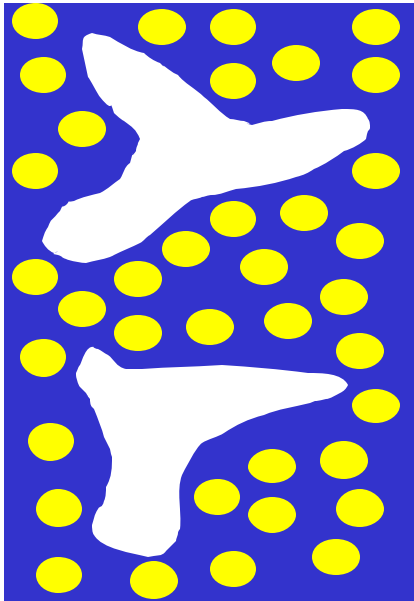
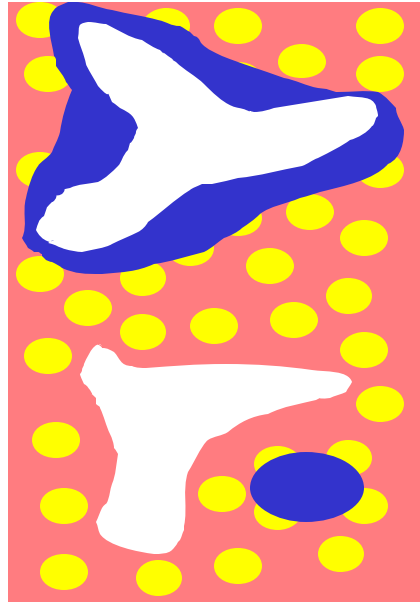
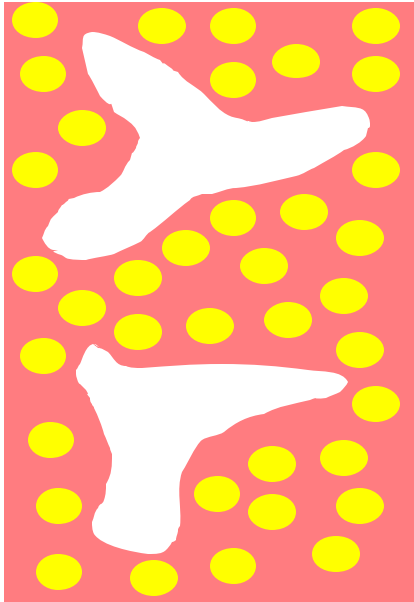
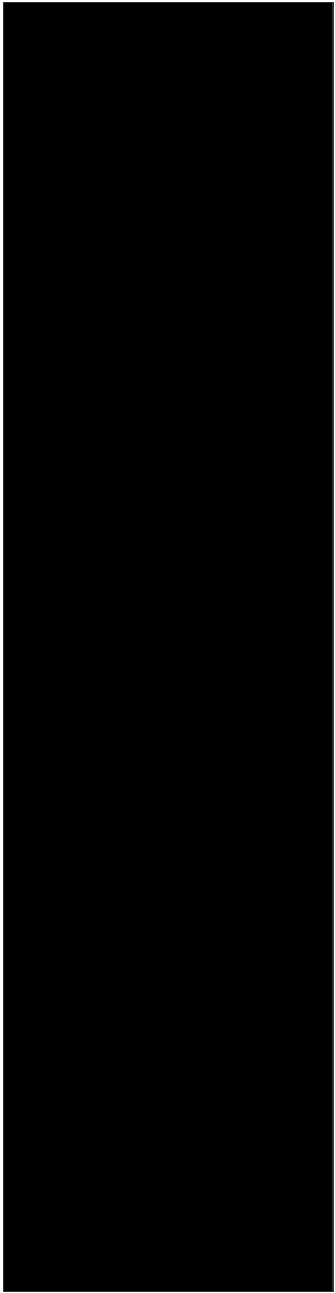
Hodgkin 5-10%

L T FRECUENCIA DE AFECTACIÓN

??? Hepatoesplénico	100%
T periférico no especificado	50-80%
Angioinmunoblástico	50-80%
Linfoblástico	50-60%
Micosis fungoides	25%
Anaplásico células grandes	20%

PATRONES DE INFILTRACION

- Focal al azar**
- Focal paratrabecular**
- Intersticial**
- Difuso**
- Intrasinusoidal**



L B PATRONES DE INFILTRACION

LLC

FA, INT, D

Manto

FA, FP, INT, D

Linfoplasmacítico

FA, INT, D

Z. Marginal (bazo)

FA, INT, D, IS

Folicular

FP, FA, D

Burkitt

INT, D

Célula B grande

FA, D

L T PATRONES DE INFILTRACION

??? Hepatoesplénico	IS
T periférico no especificado	FA, D
Angioinmunoblástico	FA, D
Linfoblástico	INT, D
Micosis fungoides	FA, D
Anaplásico células grandes	FA, INT, D

- **LINFOMAS B**

- **LINFOMAS T**

- **LINFOMA DE HODGKIN**

L B FRECUENCIA AFECTACIÓN

LLC

60-90%

Manto

55-95%

Linfoplasmacítico

80%

Z.Marginal (bazo)

80%

Folicular

50-60%

Burkitt

50-60%

Célula B grande

25%

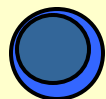
Hodgkin

5-10%

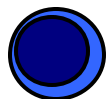
REORDENAMIENTO

HIPERMUTACION

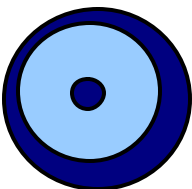
LCPB



LLCB
LM



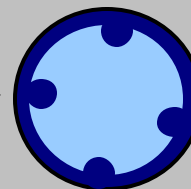
LCBG



L BURKITT



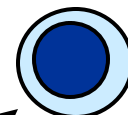
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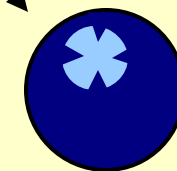
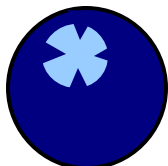
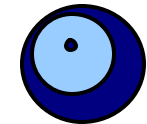
LCCF



LZM
LLCB



LCLP



MIELOMA

L B PATRONES DE INFILTRACION

LLC

Manto

Linfoplasmacítico

Z. Marginal (bazo)

Folicular

Burkitt

Célula B grande

FA, INT, D

FA, FP, INT, D

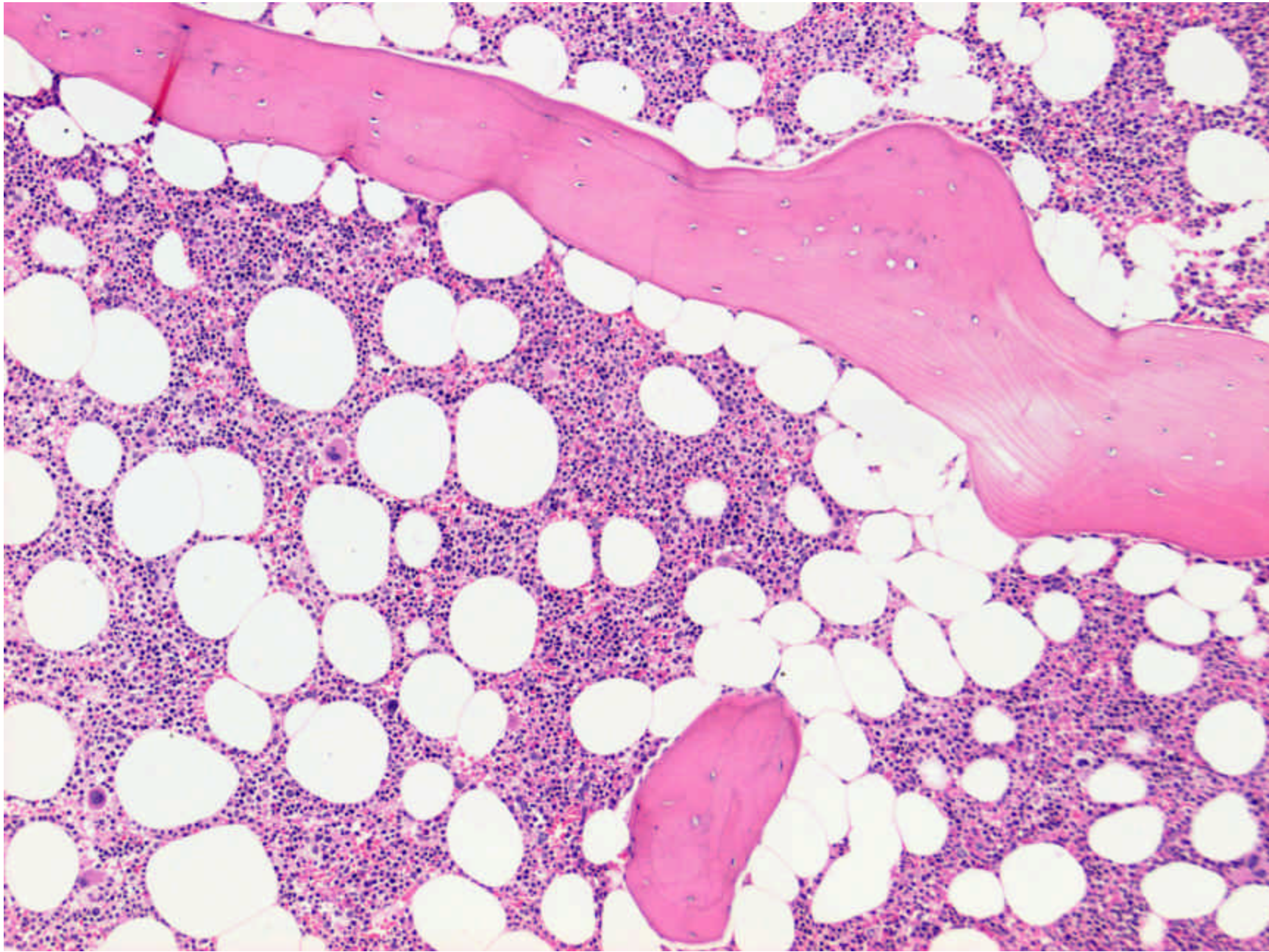
FA, INT, D

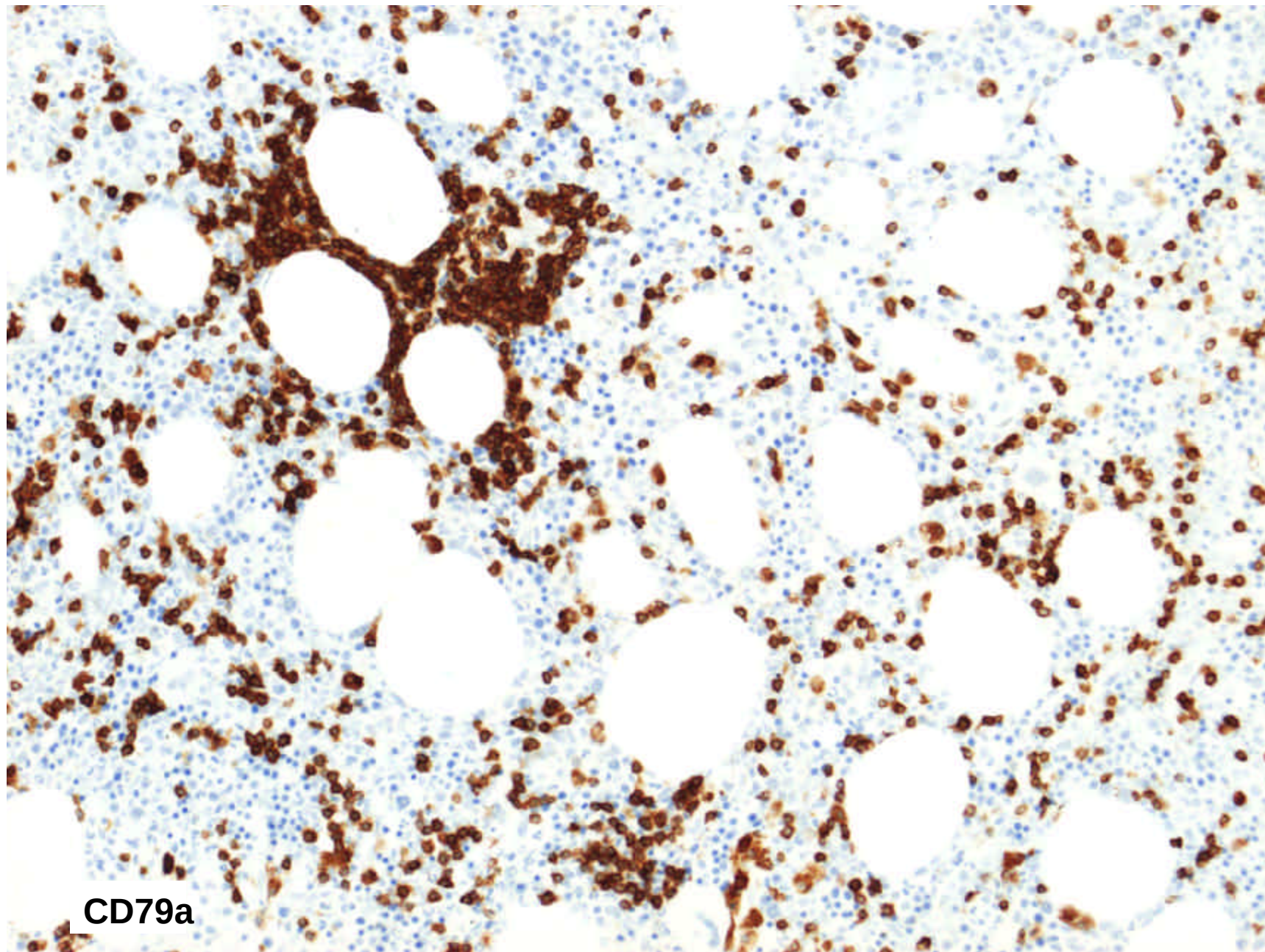
FA, INT, D, IS

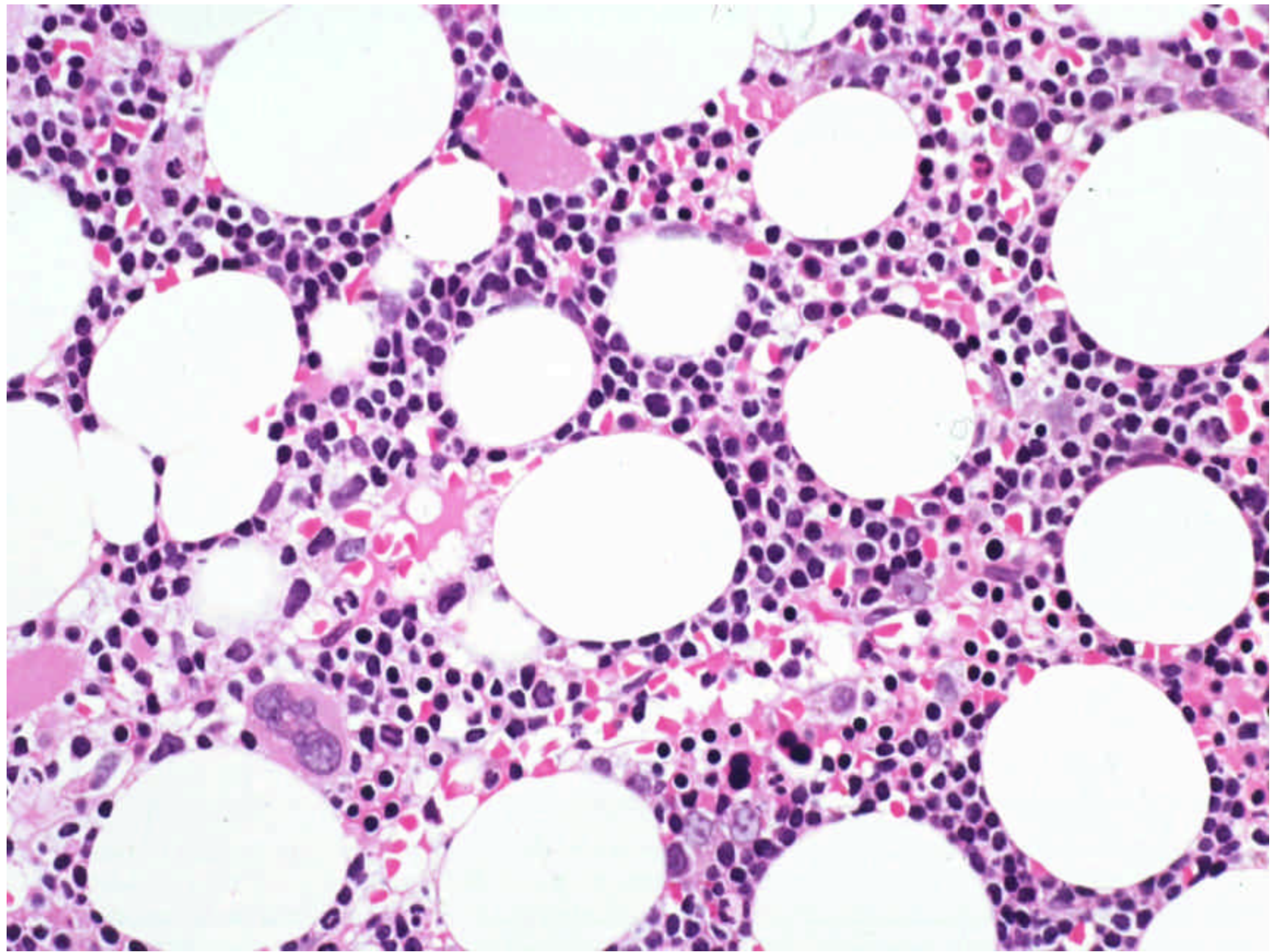
FP, FA, D

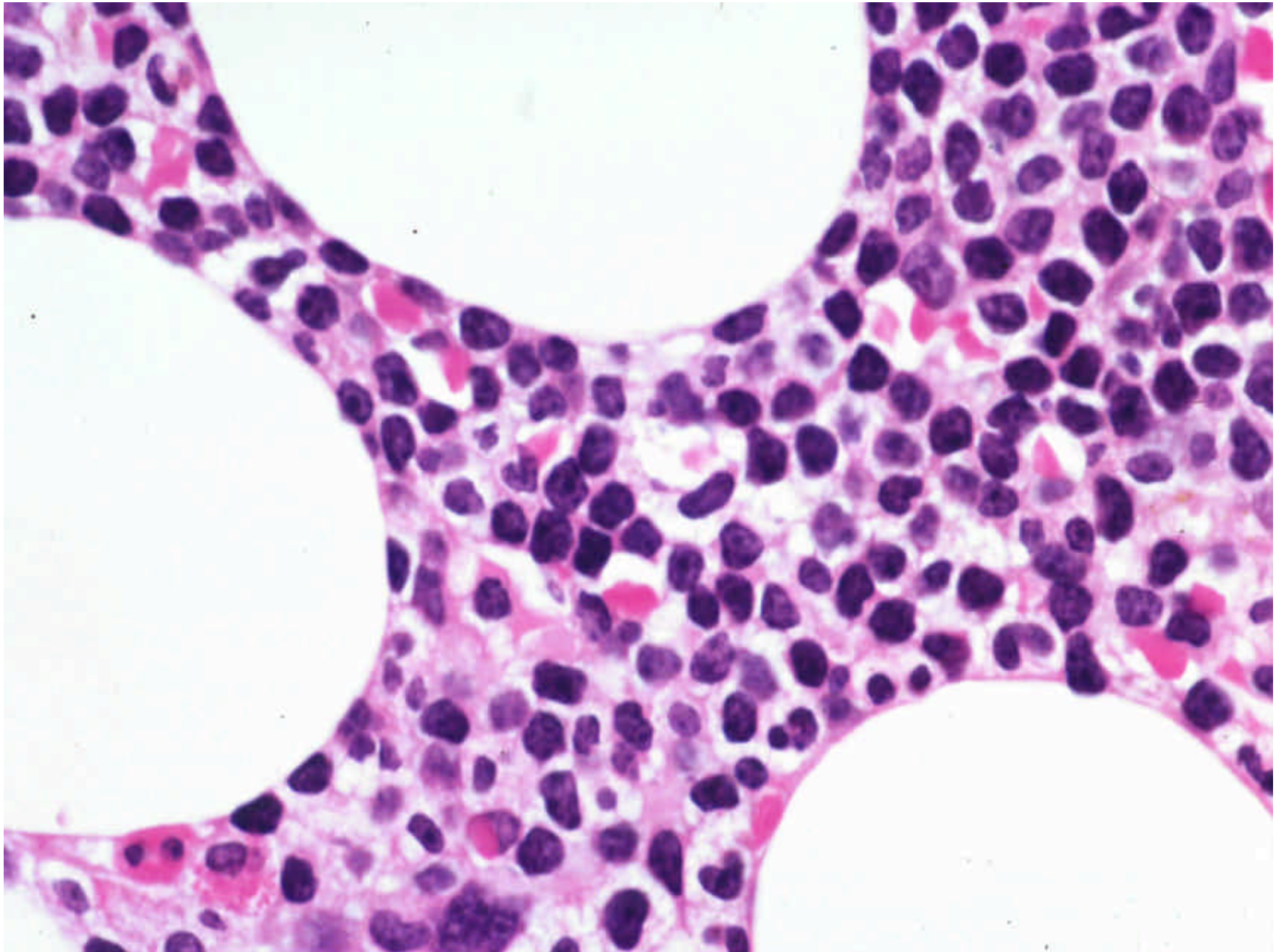
INT, D

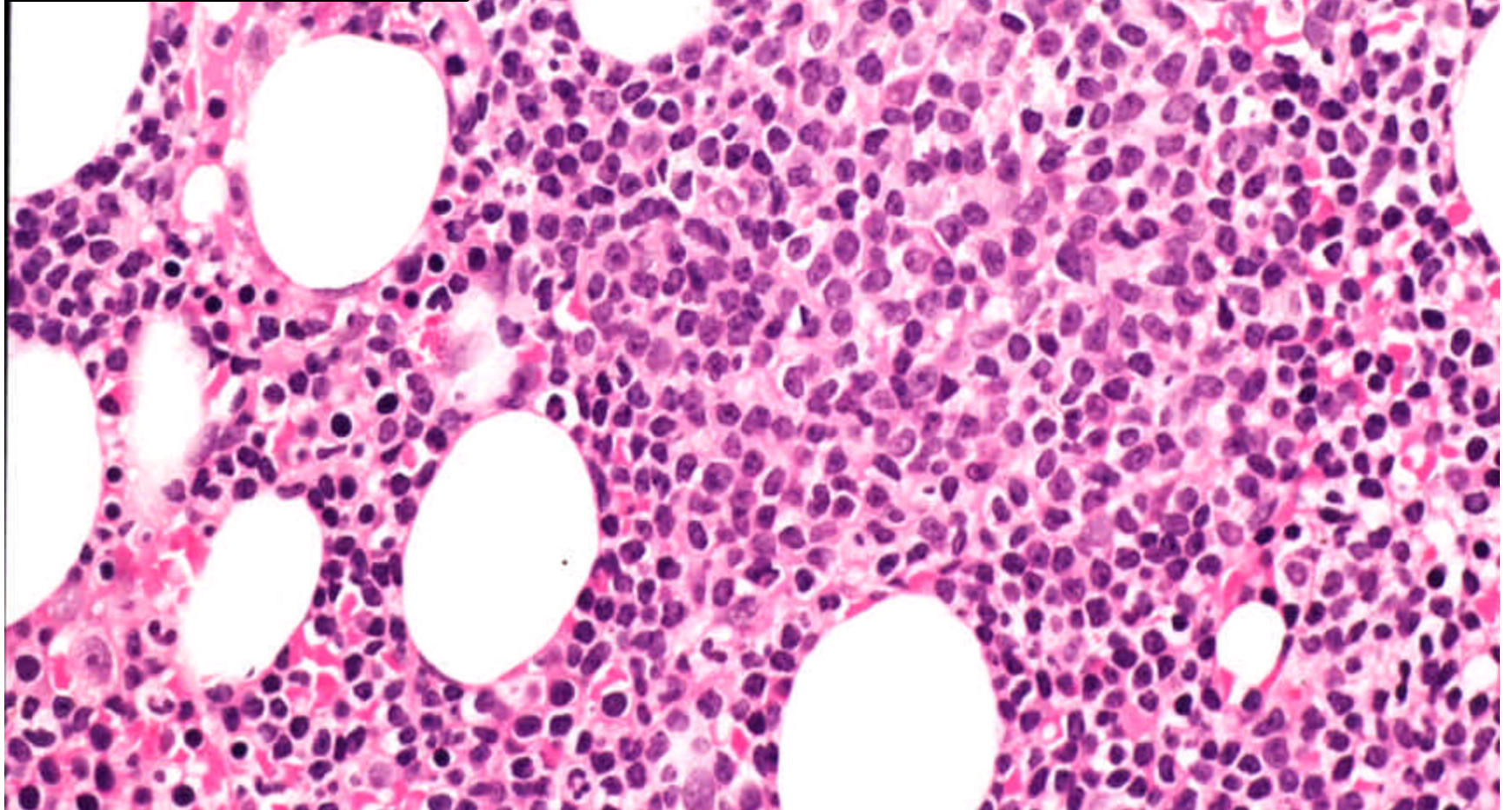
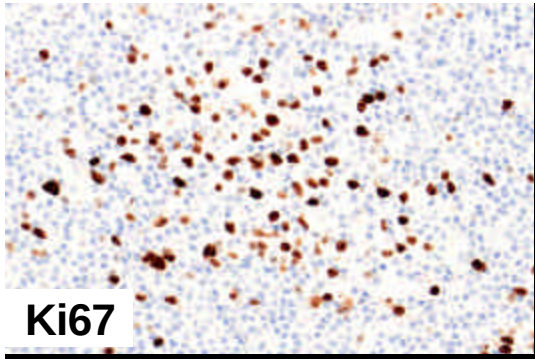
FA, D

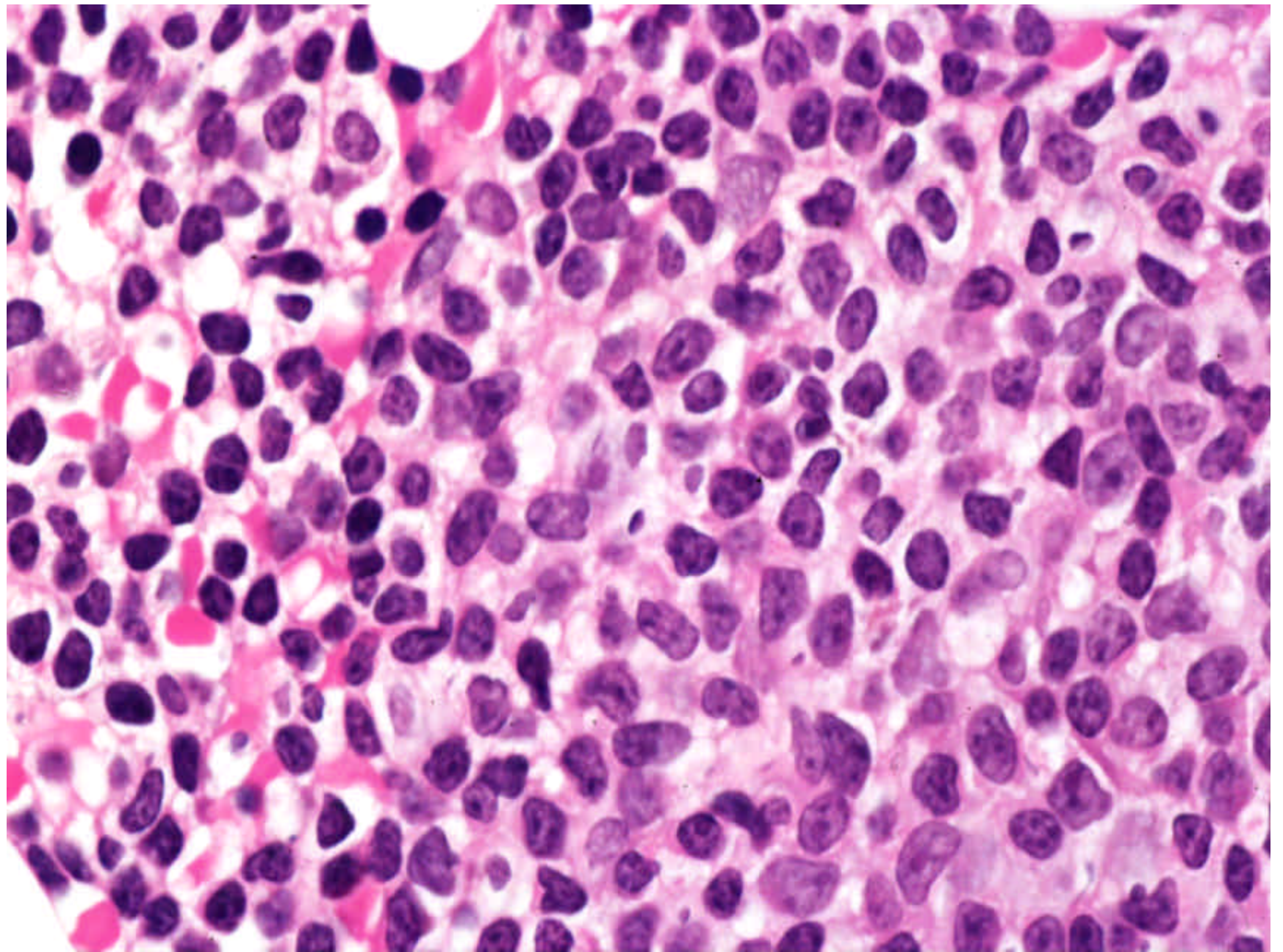


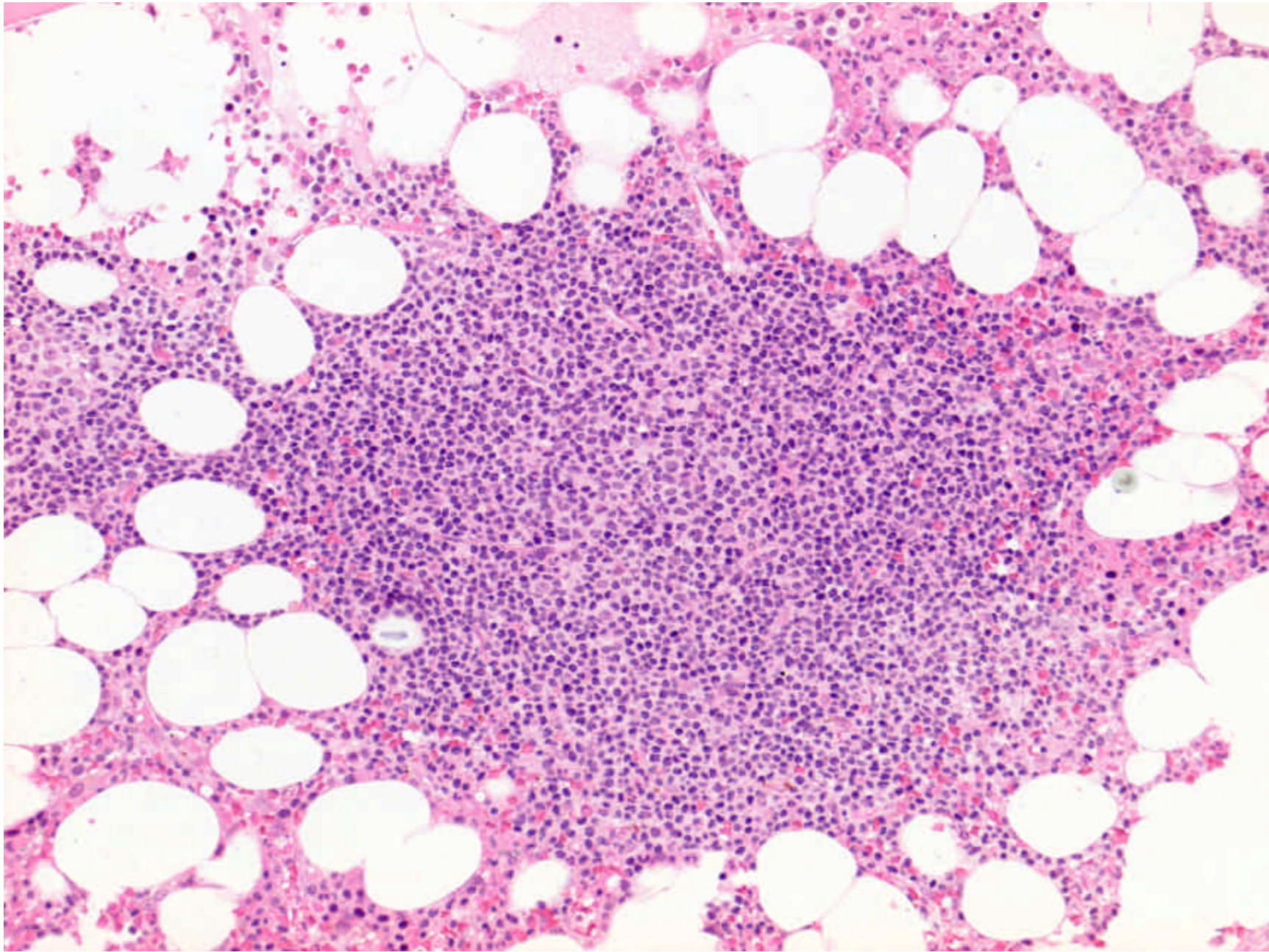


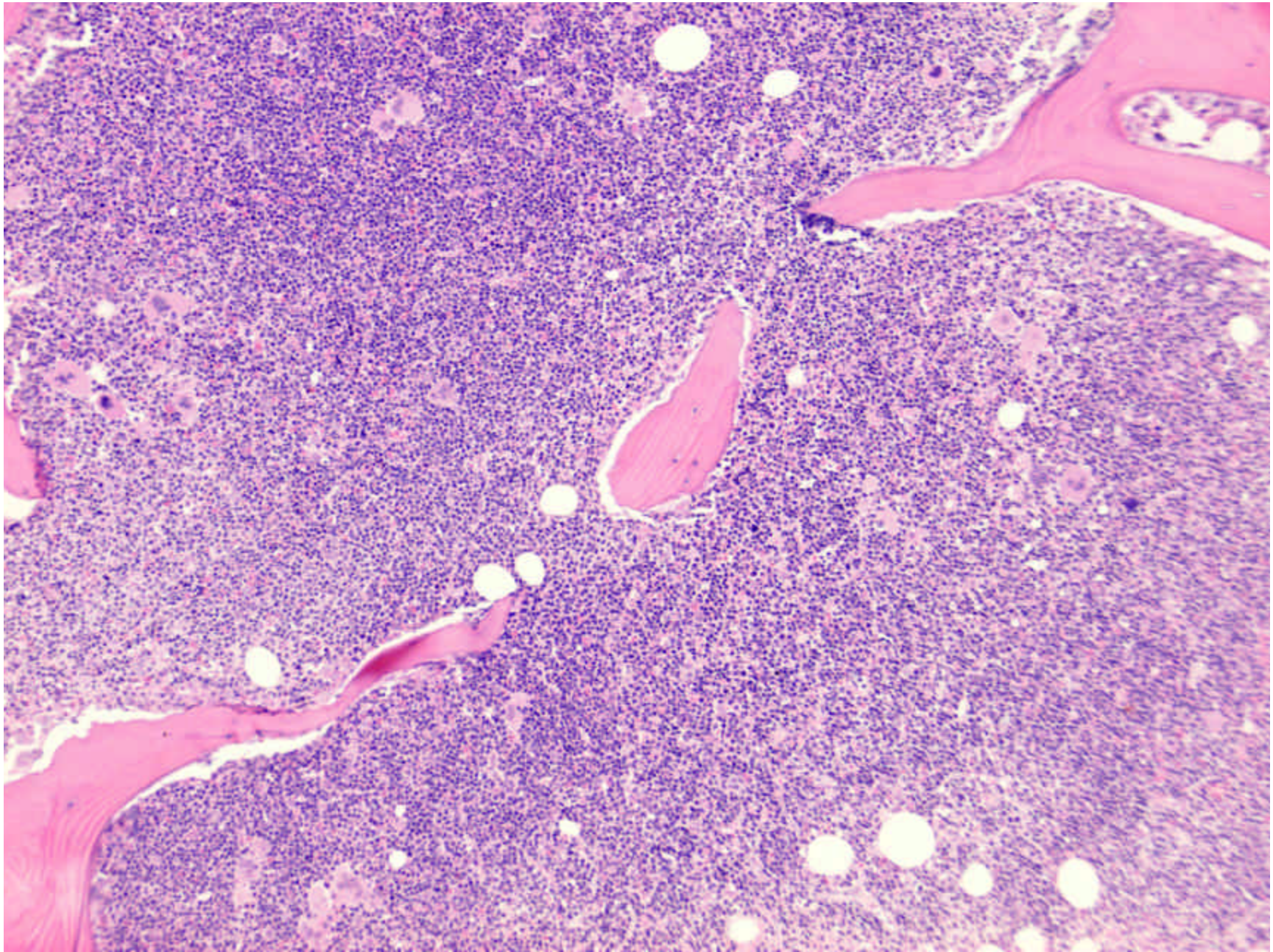




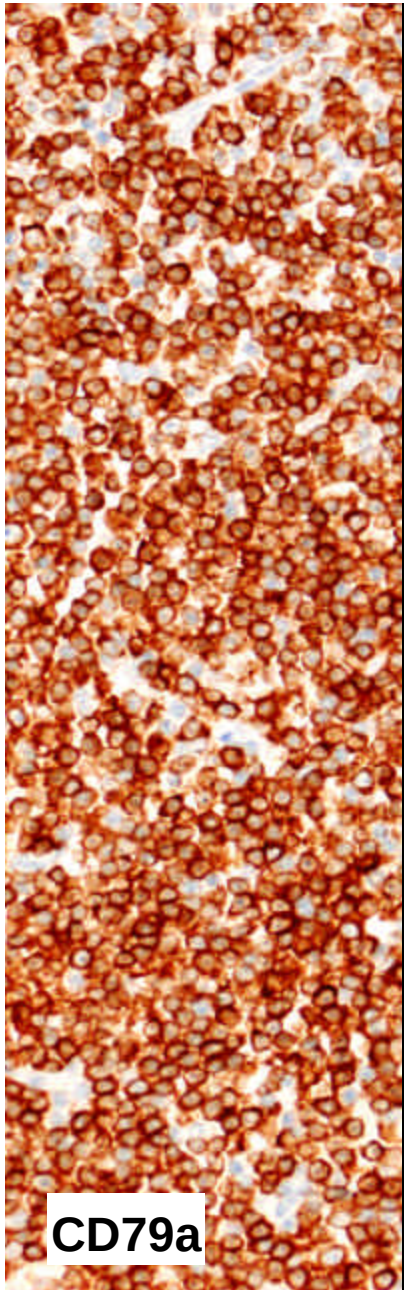




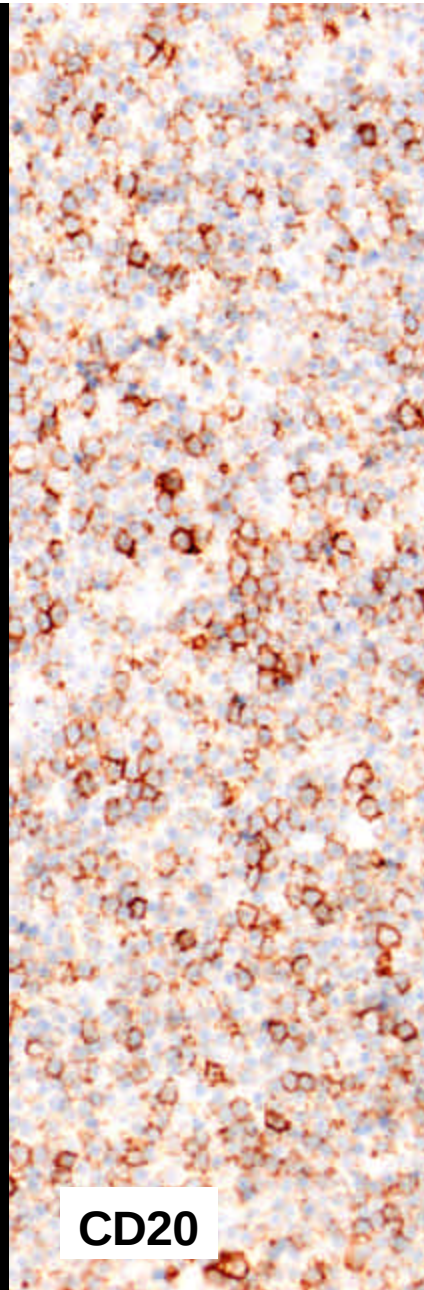




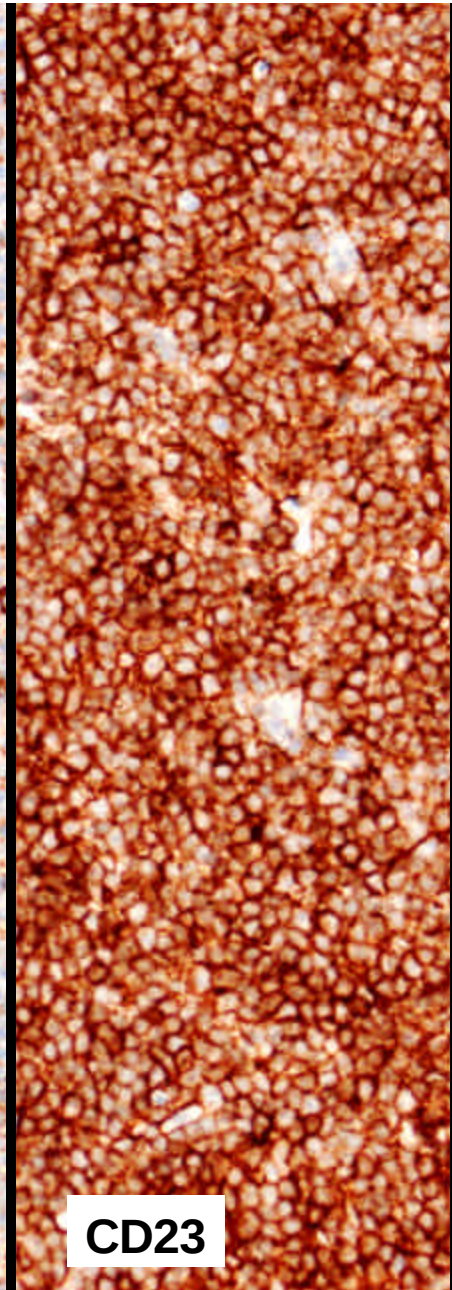
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LLCB	+	+ _{debil}	+/-	-	+	-	+/-	+/-
LM	+	+	-	-	+	-	+	+/-
LCCF	+	+	-/+	+/-	+/-	+	-	-
LZM	+	+	-	-/+	+	-	-	+/-
LZME	+	+	-	-	+	-	-	-
LCLP	+	+	-	-	+	-	-	+/-
LCBG	+	+	-/+	-/+	+/-	+/-	-/+	-/+
L.Burkitt	+	+	-	+	-	+	-	+



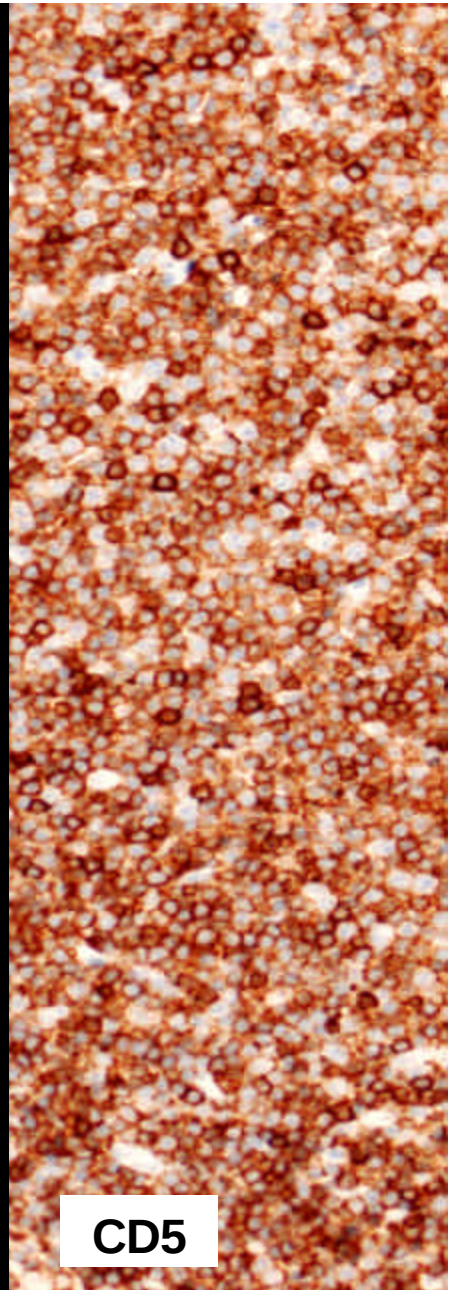
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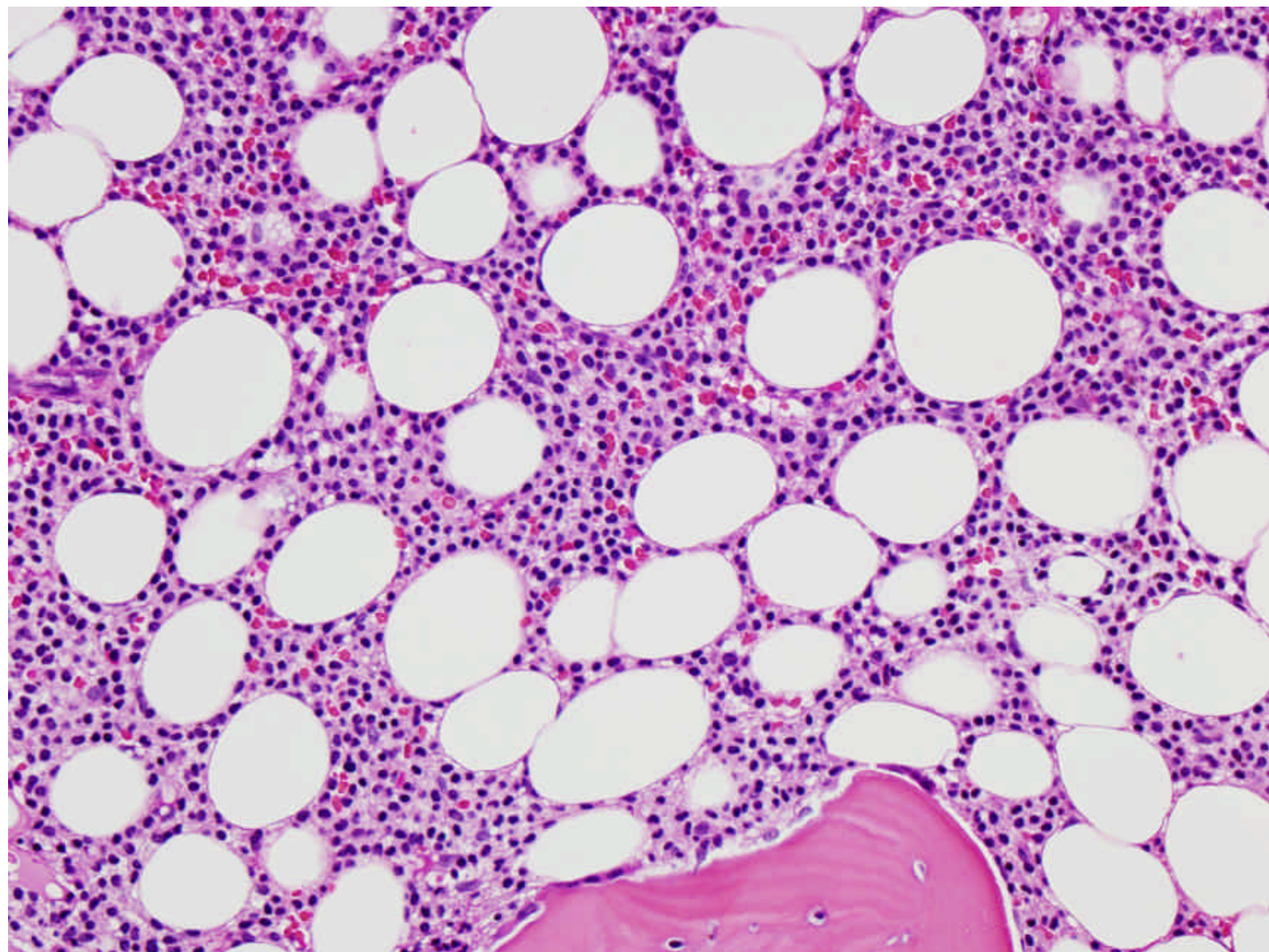
CD20

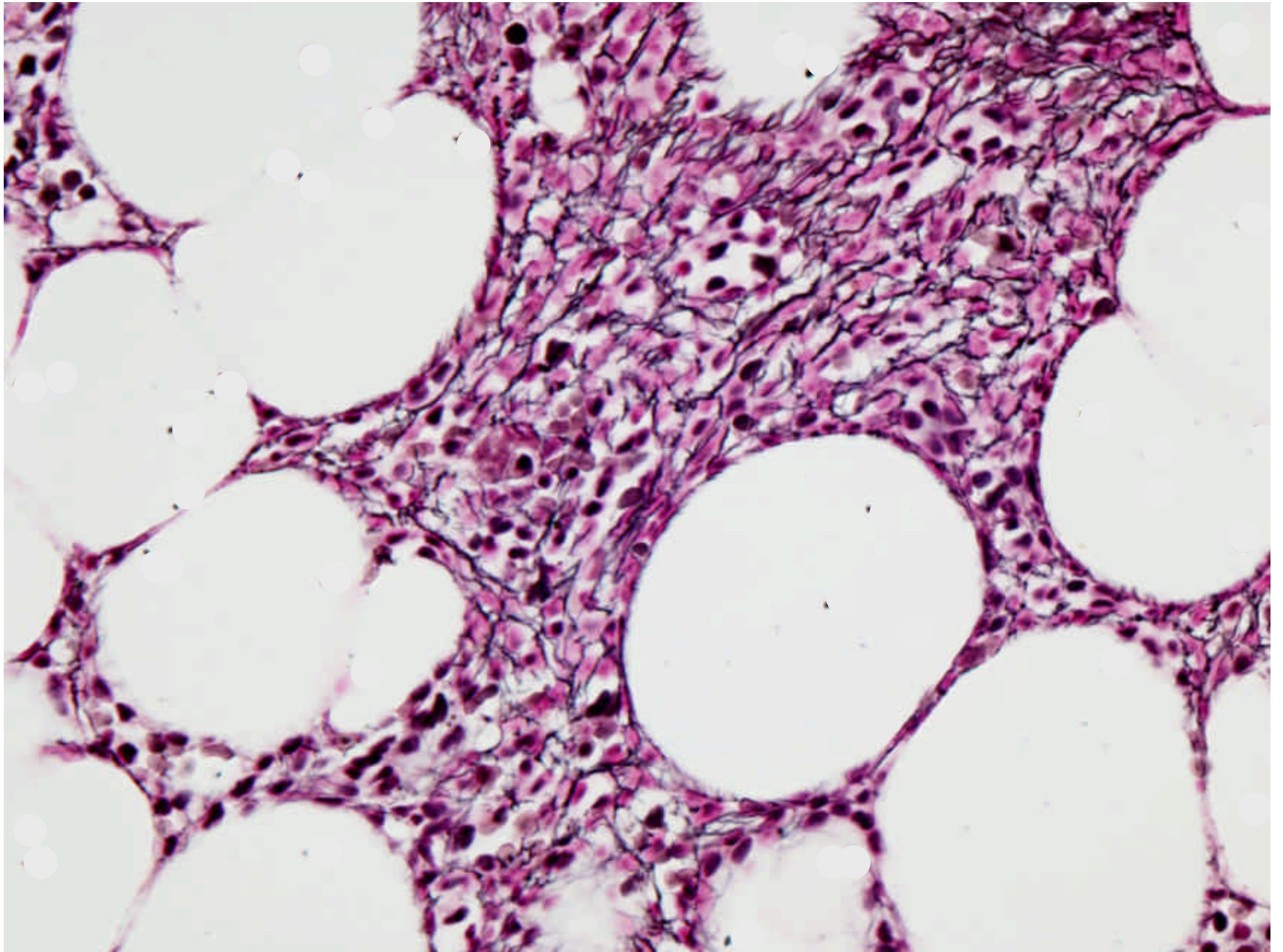


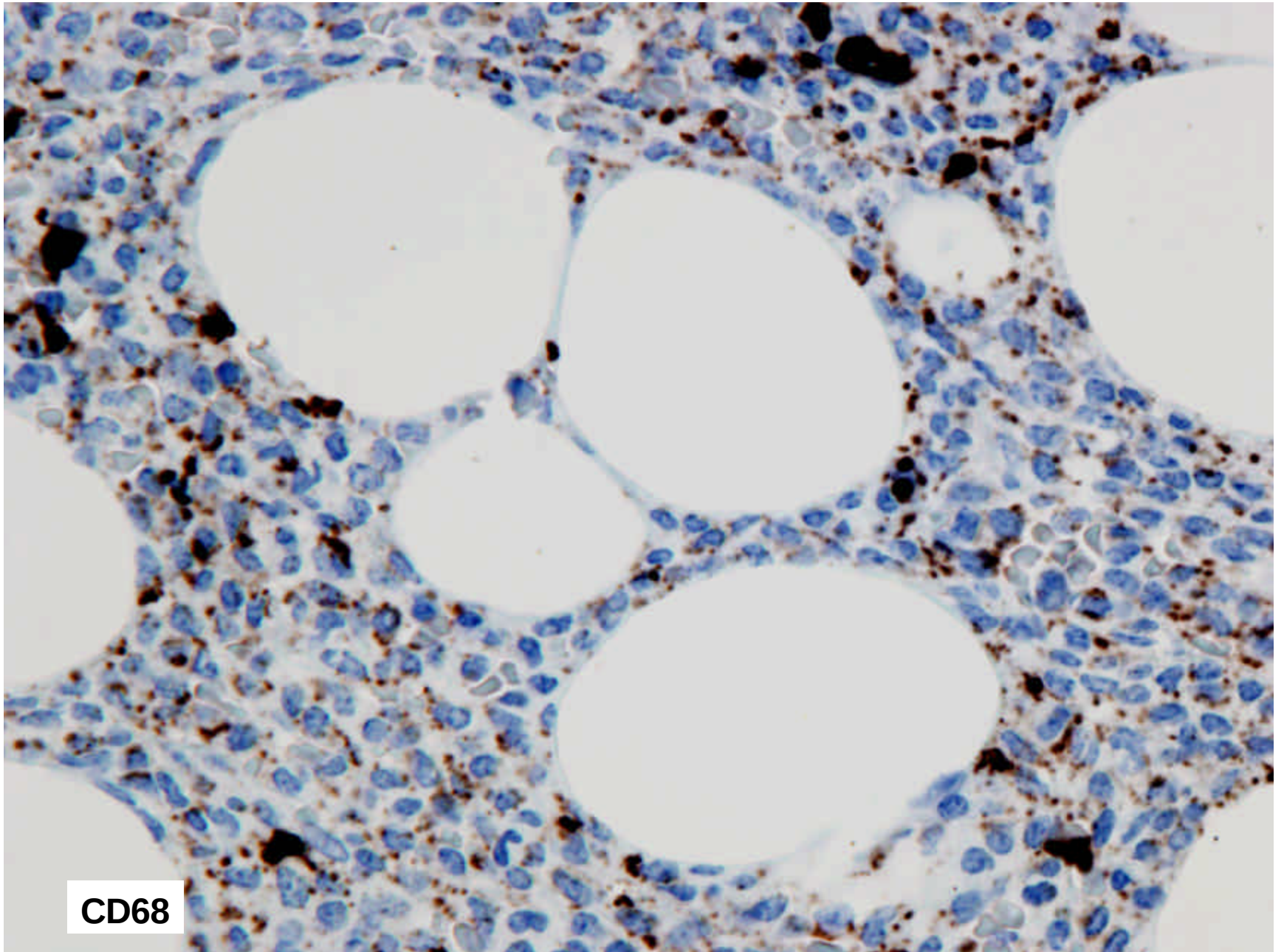
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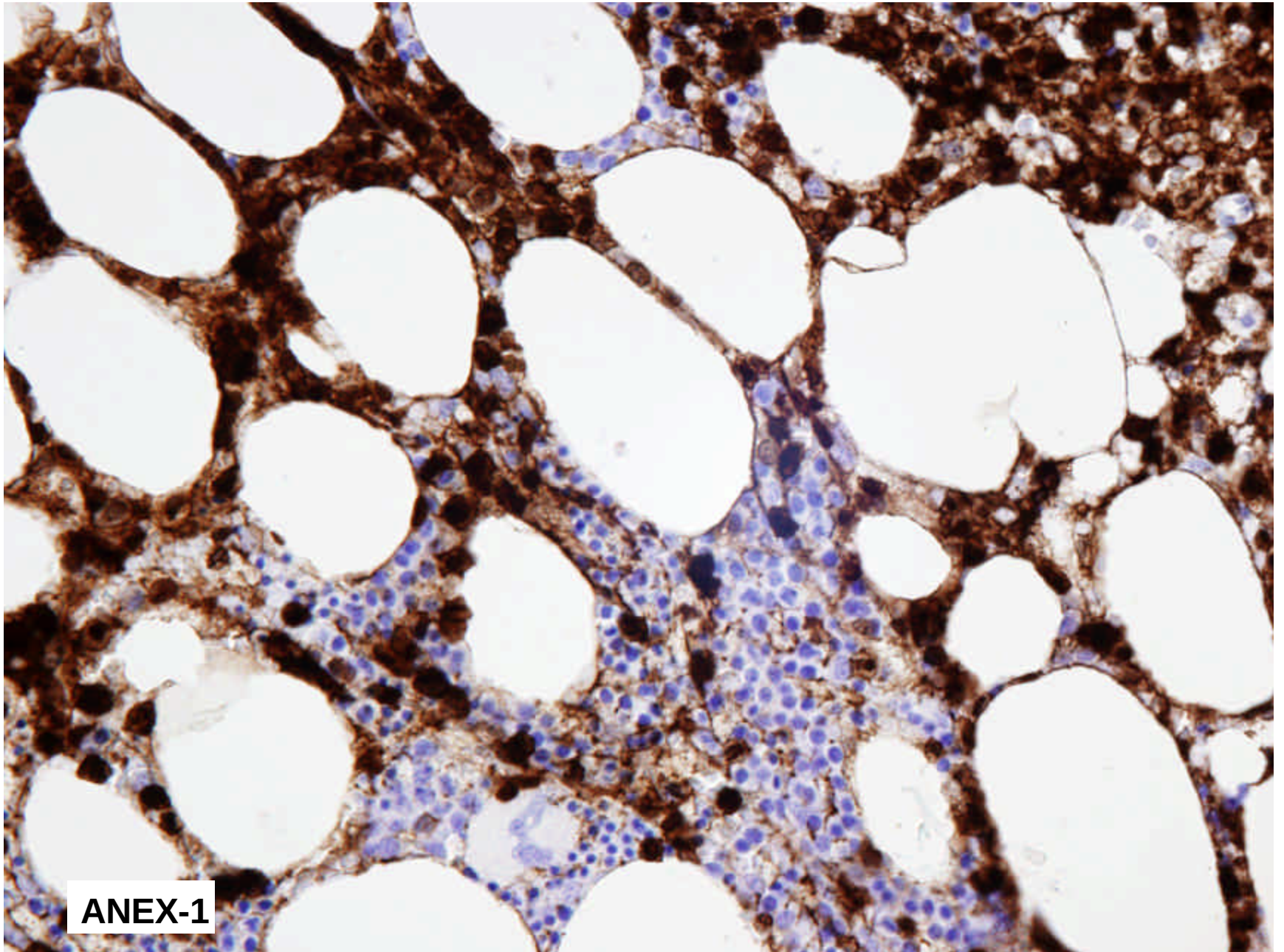
CD5







CD68



ANEX-1

L B FRECUENCIA AFECTACIÓN

LLC **60-90%**

Manto **55-95%**

Linfoplasmacítico **80%**

Z.Marginal (bazo) **80%**

Folicular **50-60%**

Burkitt **50-60%**

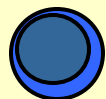
Célula B grande **25%**

Hodgkin **5-10%**

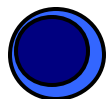
REORDENAMIENTO

HIPERMUTACION

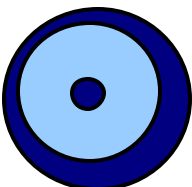
LCPB



LLCB
LM



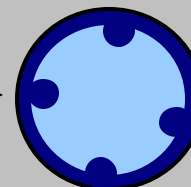
LCBG



L BURKITT



LCBG



LCCF

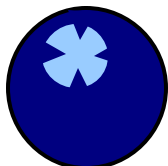


LZM
LLCB

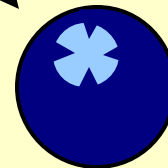


LM

LCLP



MIELOMA



L B PATRONES DE INFILTRACION

LLC

FA, INT, D

Manto

FA, FP, INT, D

Linfoplasmacítico

FA, INT, D

Z. Marginal (bazo)

FA, INT, D, IS

Folicular

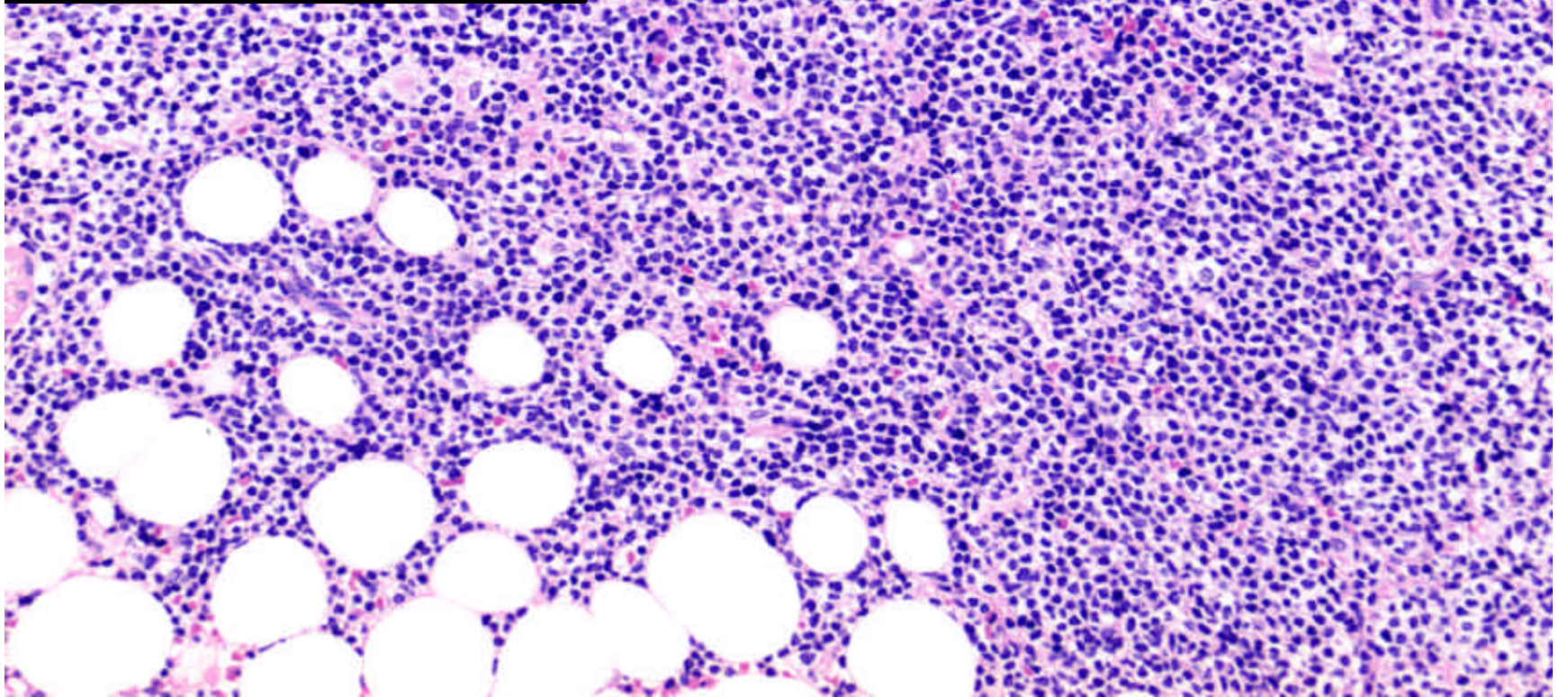
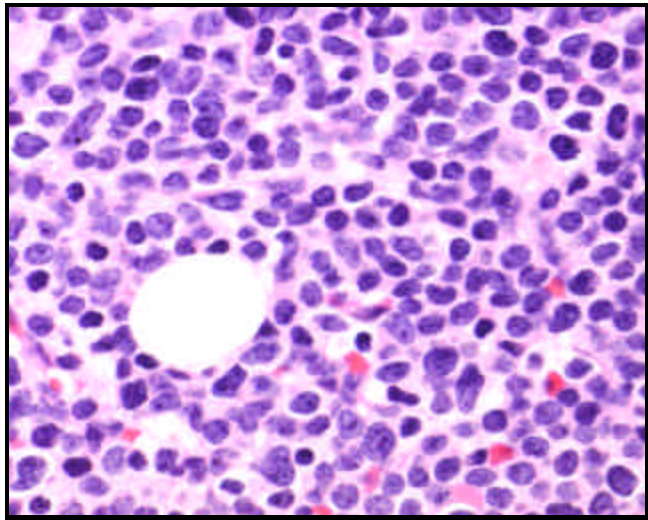
FP, FA, D

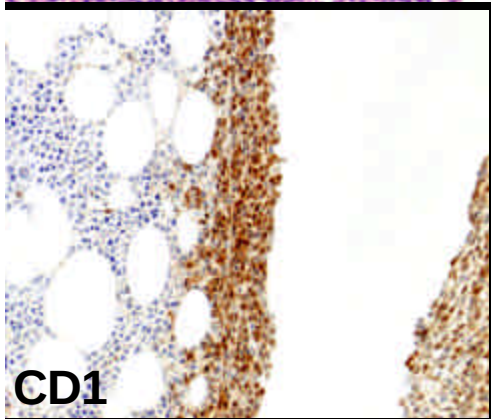
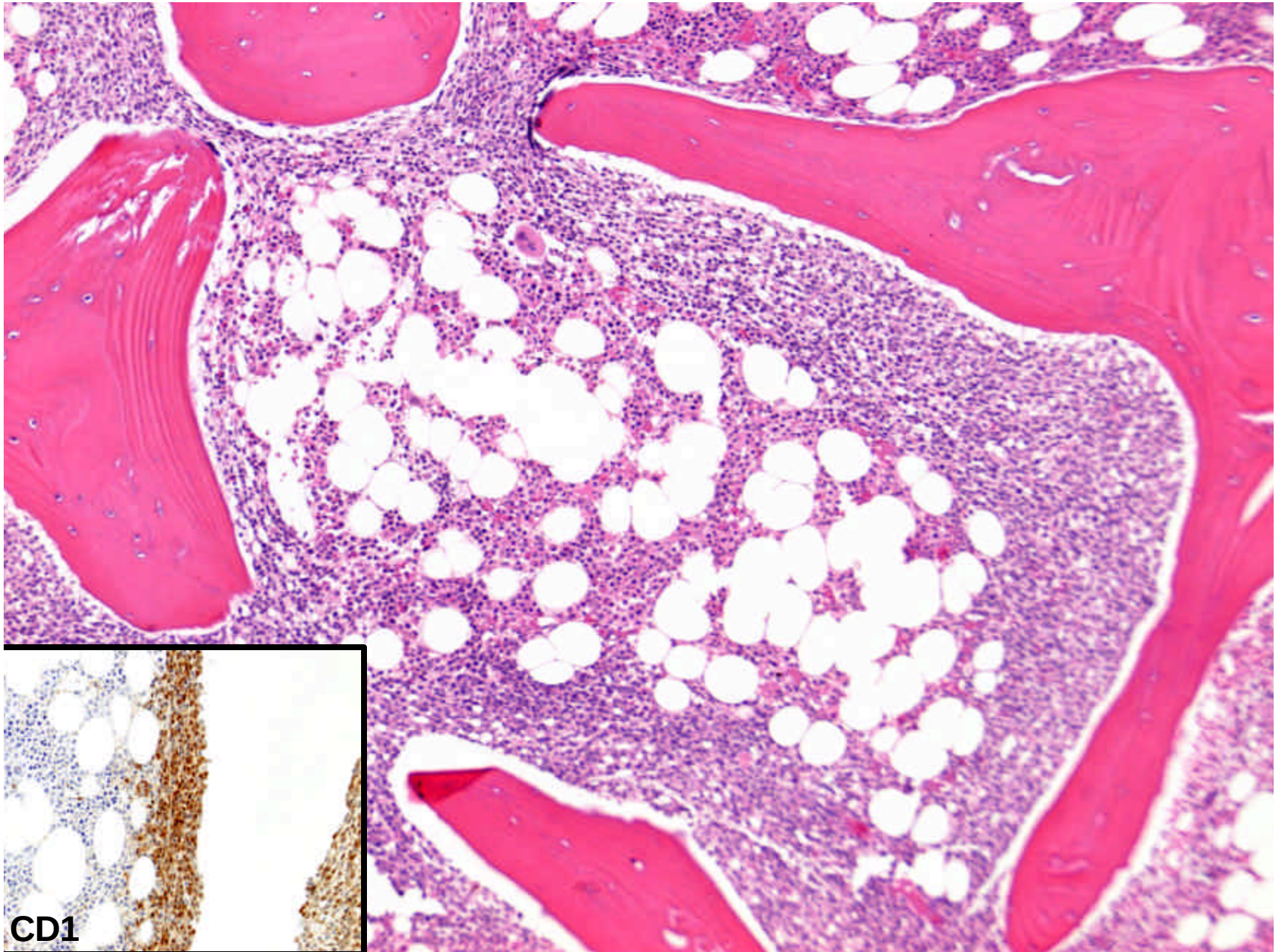
Burkitt

INT, D

Célula B grande

FA, D





CD1

	CD79	CD20	CD23	CD10	BCL-2	BCL-6	CD5	CD43
LLCB	+	+ _{debil}	+/-	-	+	-	+/-	+/-
LM	+	+	-	-	+	-	+/-	+/-
LCCF	+	+	-/+	+/-	+/-	+	-	-
LZM	+	+	-	-/+	+	-	-	+/-
LZME	+	+	-	-	+	-	-	-
LCLP	+	+	-	-	+	-	-	+/-
LCBG	+	+	-/+	-/+	+/-	+/-	-/+	-/+
L.Burkitt	+	+	-	+	-	+	-	+

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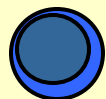
Célula B grande **25%**

Hodgkin **5-10%**

REORDENAMIENTO

HIPERMUTACION

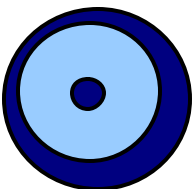
LCPB



LLCB
LM



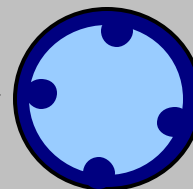
LCBG



L BURKITT



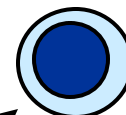
LCBG



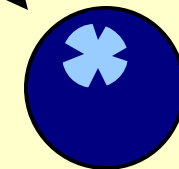
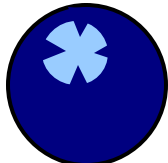
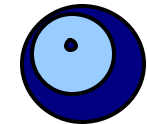
LCCF



LZM
LLCB



LCLP



MIELOMA

L B PATRONES DE INFILTRACION

LLC

FA, INT, D

Manto

FA, FP, INT, D

Linfoplasmacítico

FA, INT, D

Z. Marginal (bazo)

FA, INT, D, IS

Folicular

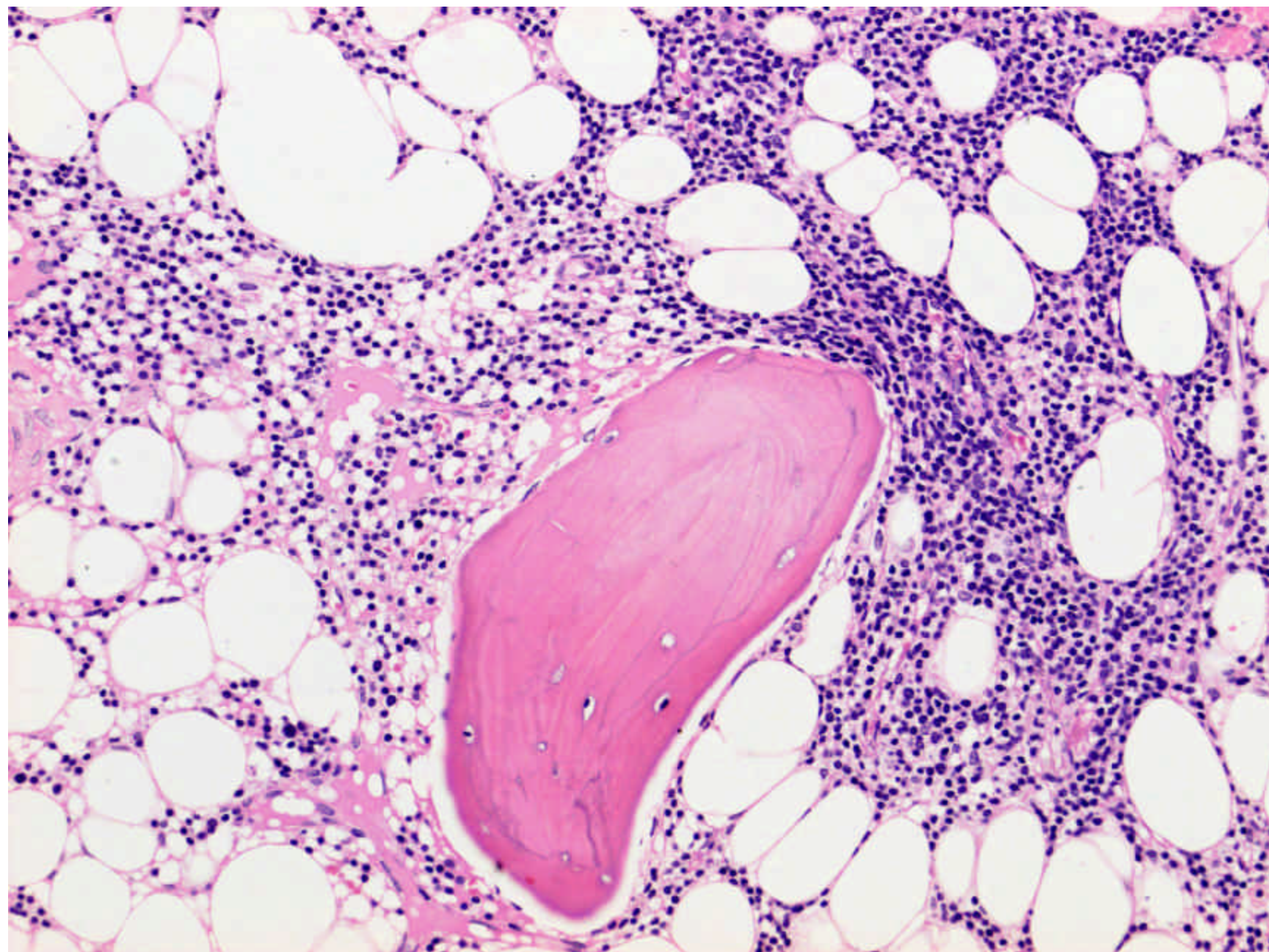
FP, FA, D

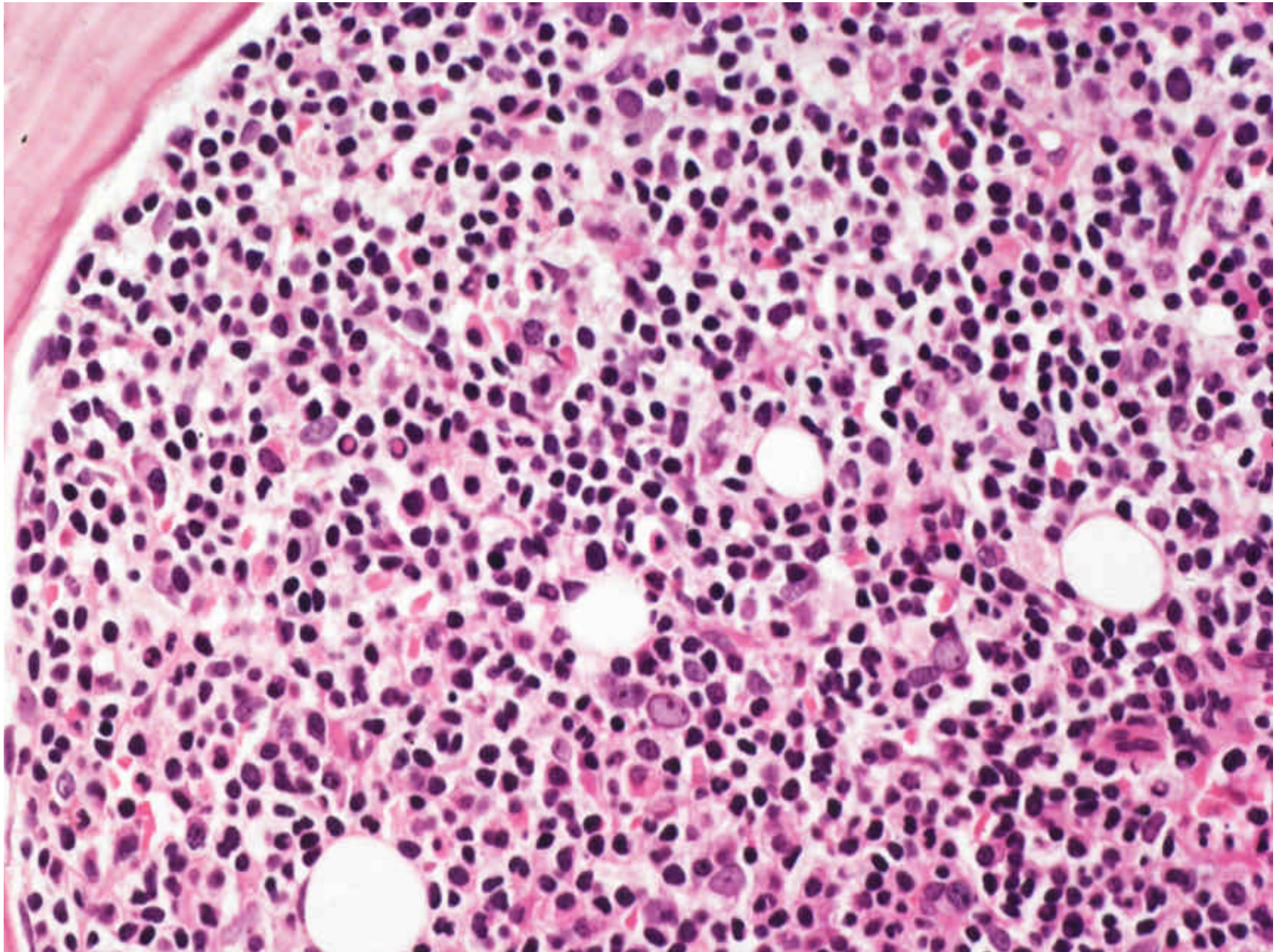
Burkitt

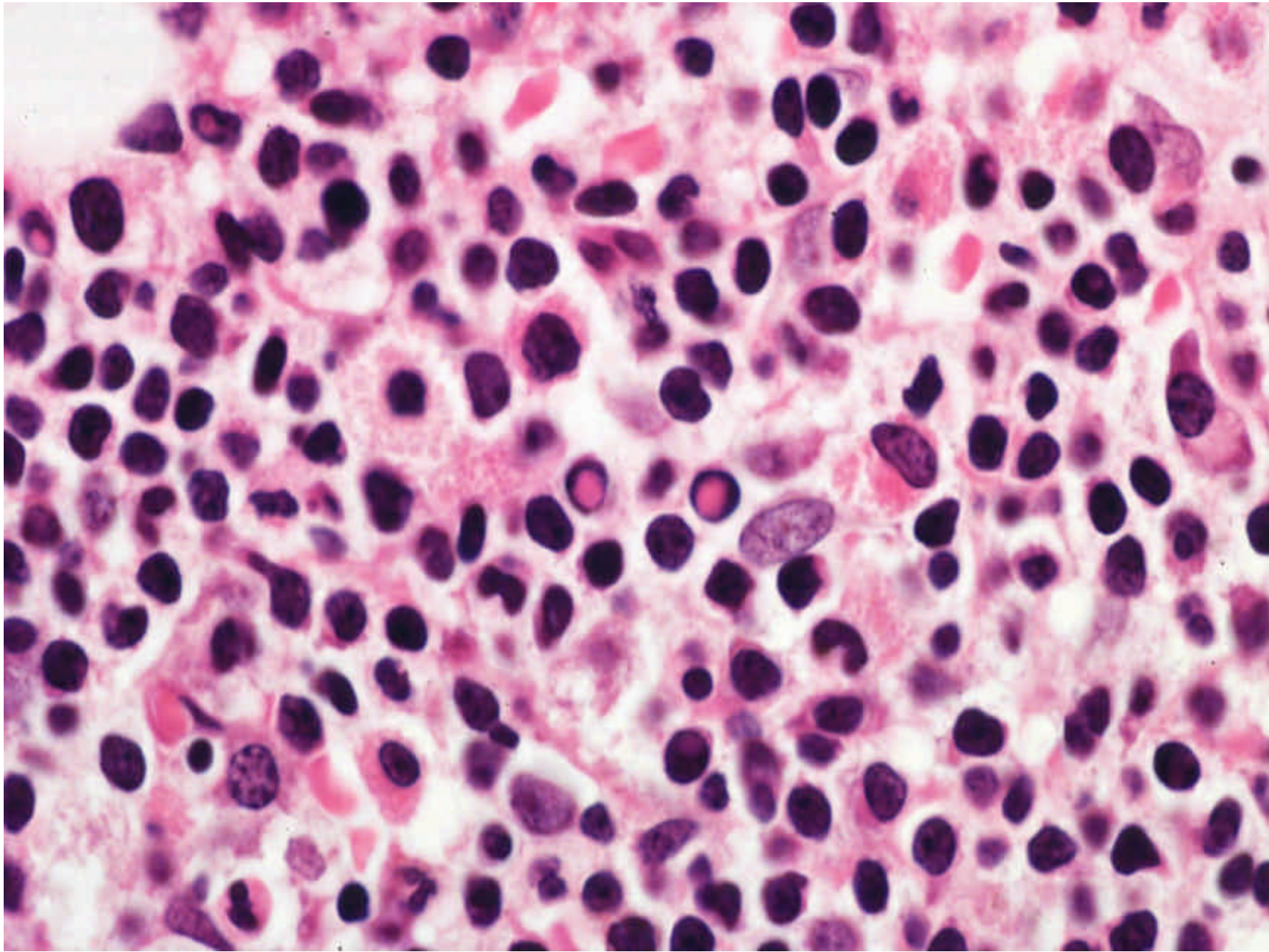
INT, D

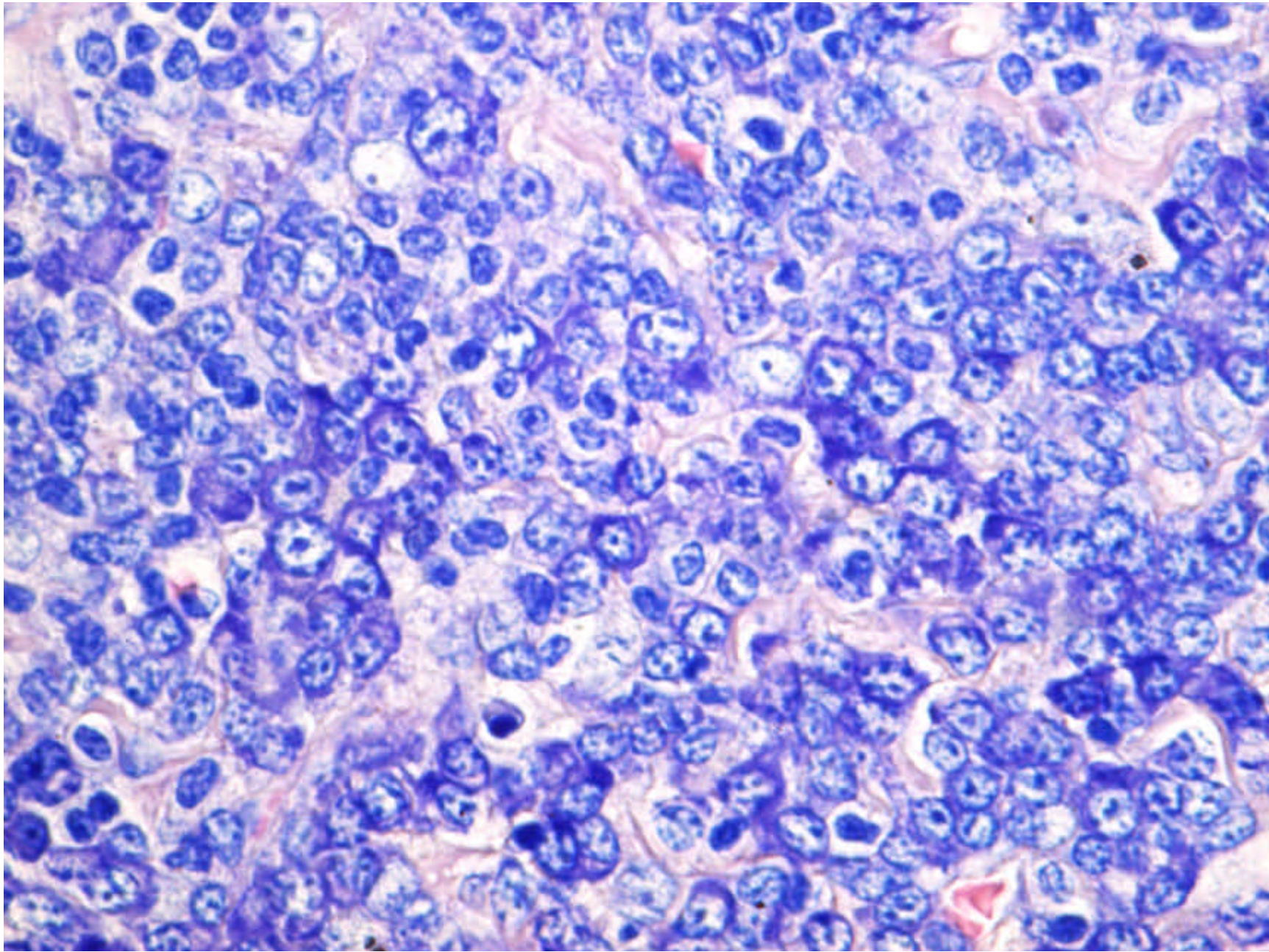
Célula B grande

FA, D

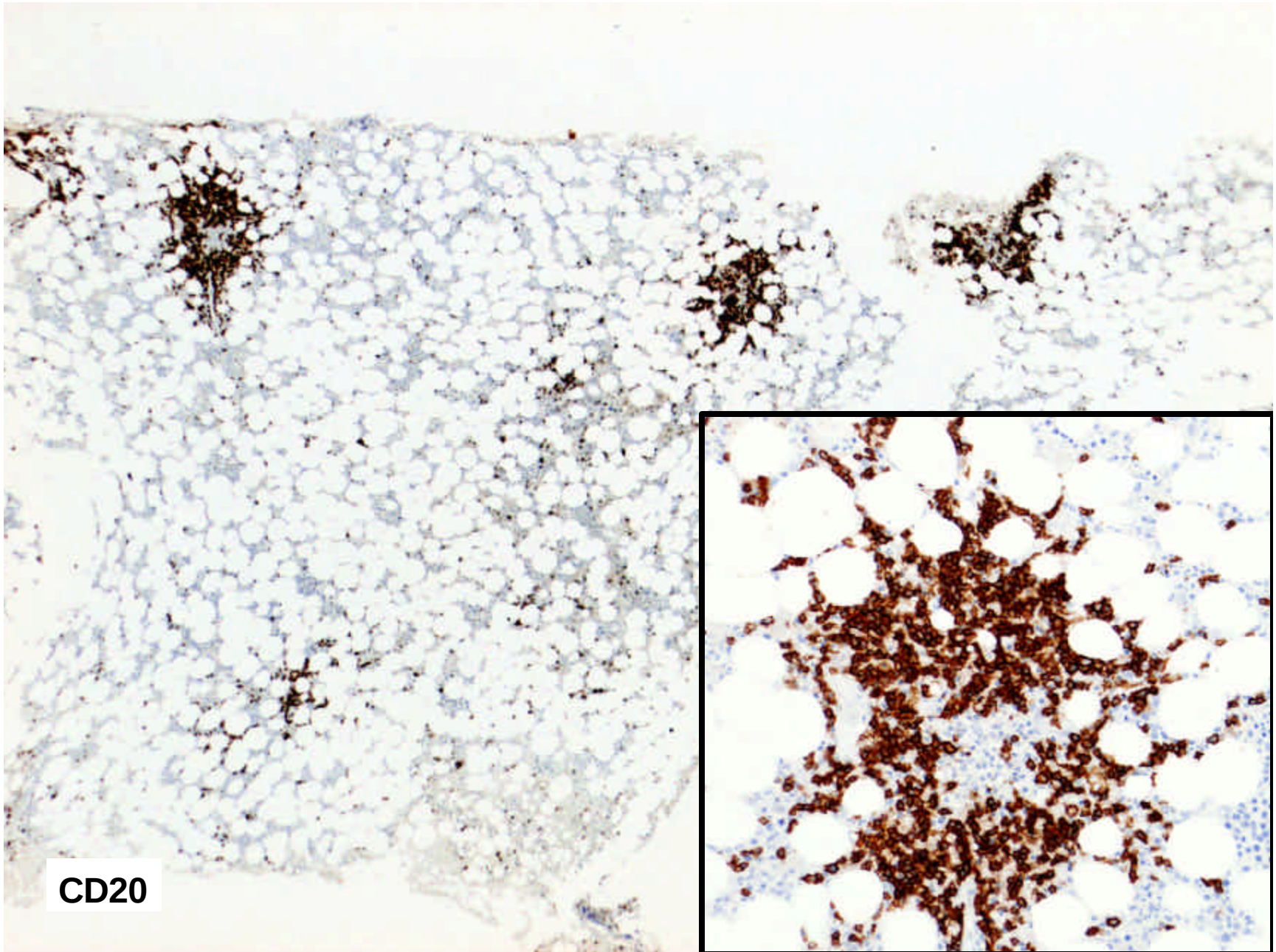




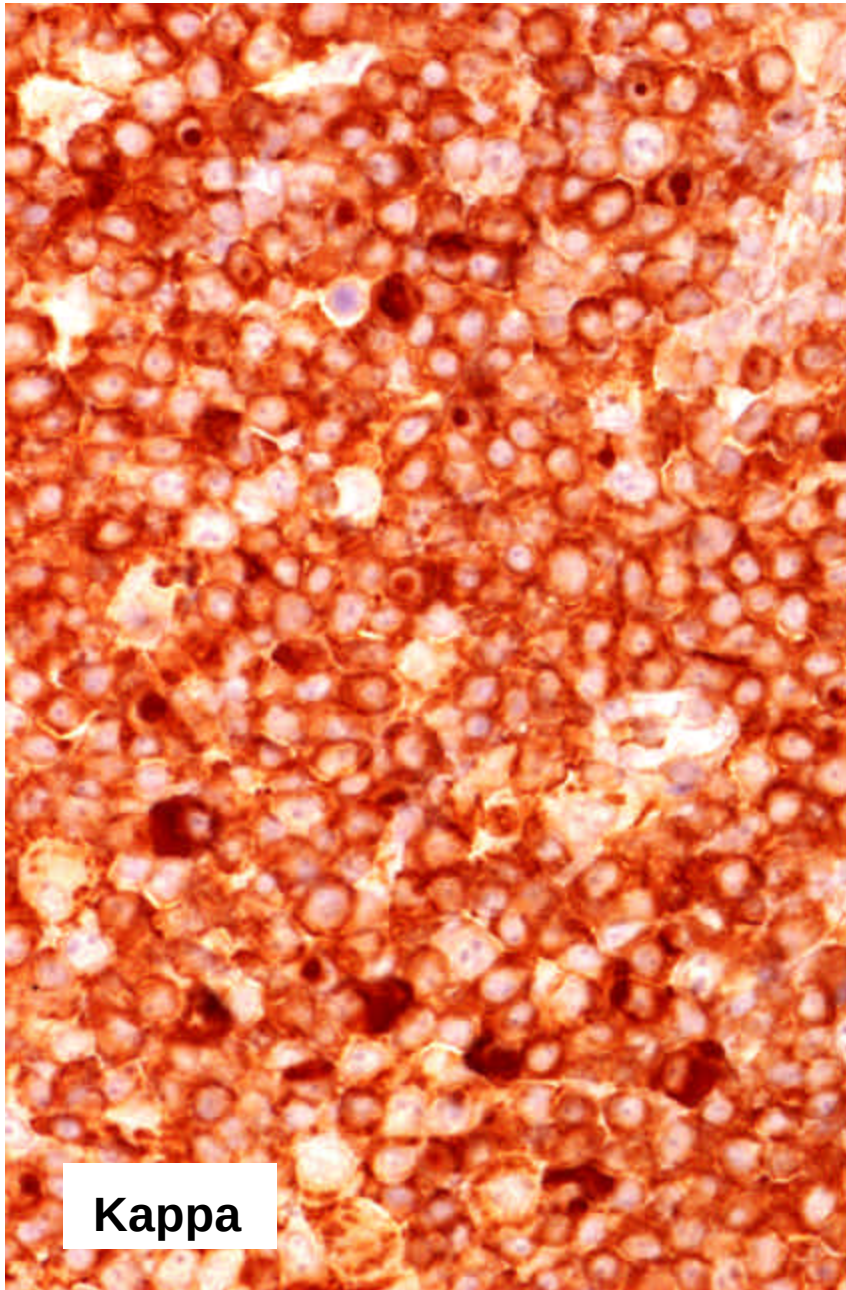




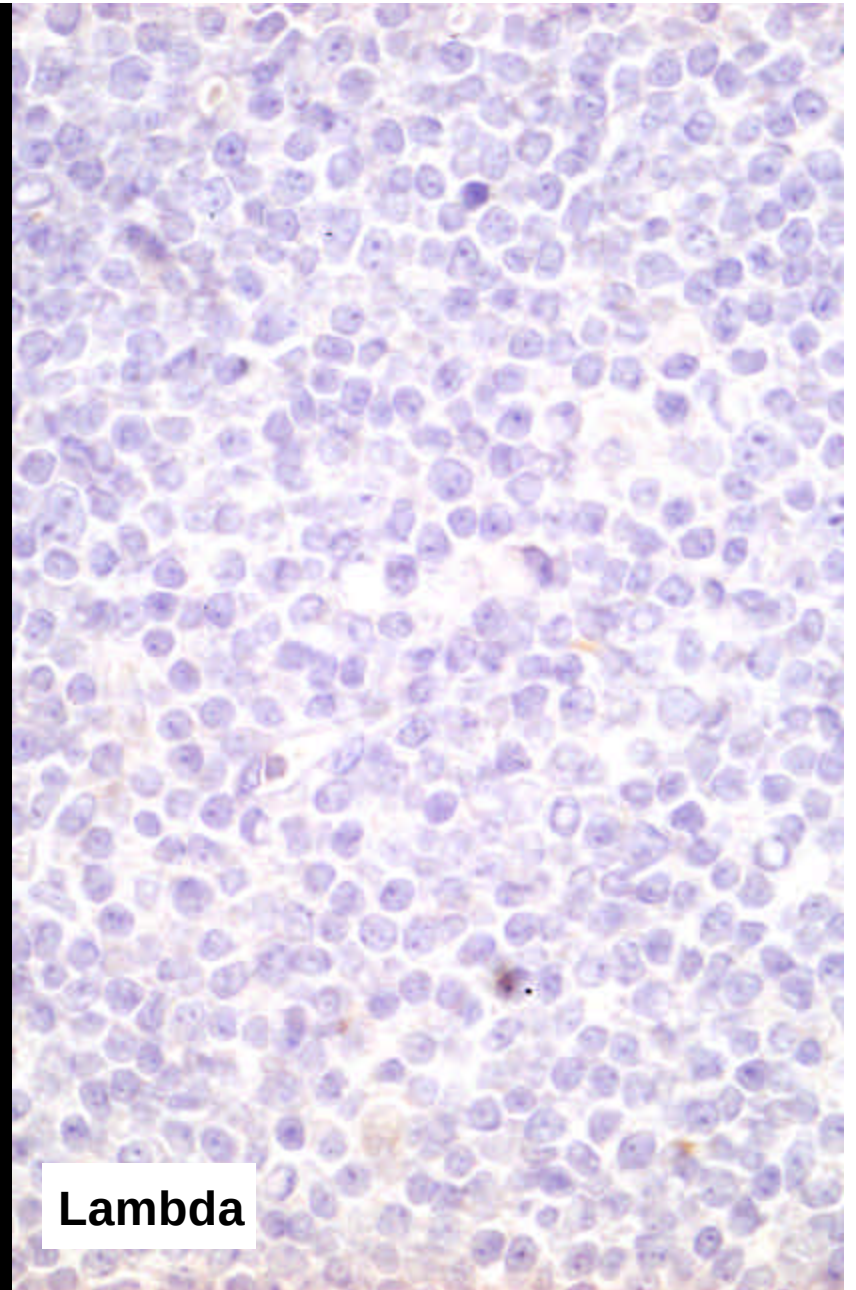
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LLCB	+	+ _{debil}	+/-	-	+	-	+/-	+/-
LM	+	+	-	-	+	-	+/-	+/-
LCCF	+	+	-/+	+/-	+/-	+	-	-
LZM	+	+	-	-/+	+	-	-	+/-
LZME	+	+	-	-	+	-	-	-
LCLP	+	+	-	-	+	-	-	+/-
LCBG	+	+	-/+	-/+	+/-	+/-	-/+	-/+
L.Burkitt	+	+	-	+	-	+	-	+



CD20



Kappa



Lambda

L B FRECUENCIA AFECTACIÓN

LLC 60-90%

Manto 55-95%

Linfoplasmacítico 80%

Z.Marginal (bazo) 80%

Folicular 50-60%

Burkitt 50-60%

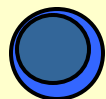
Célula B grande 25%

Hodgkin 5-10%

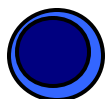
REORDENAMIENTO

HIPERMUTACION

LCPB

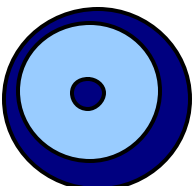


LLCB
LM



LZME

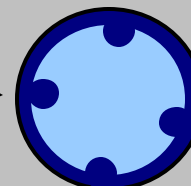
LCBG



L BURKITT



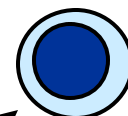
LCBG



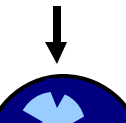
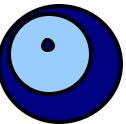
LCCF



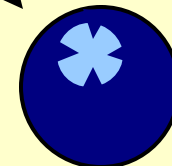
LLCB
LZM



LM
LZME



LCLP



MIELOMA

L B PATRONES DE INFILTRACION

LLC

FA, INT, D

Manto

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Linfoplasmacítico

FA, INT, D

Z. Marginal (bazo)

FA, INT, D, IS

Folicular

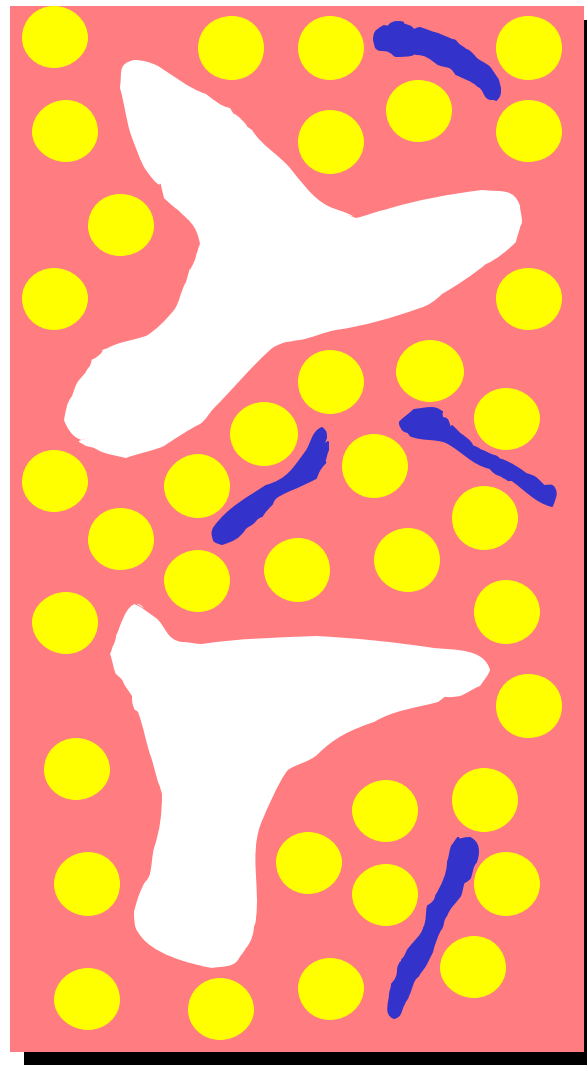
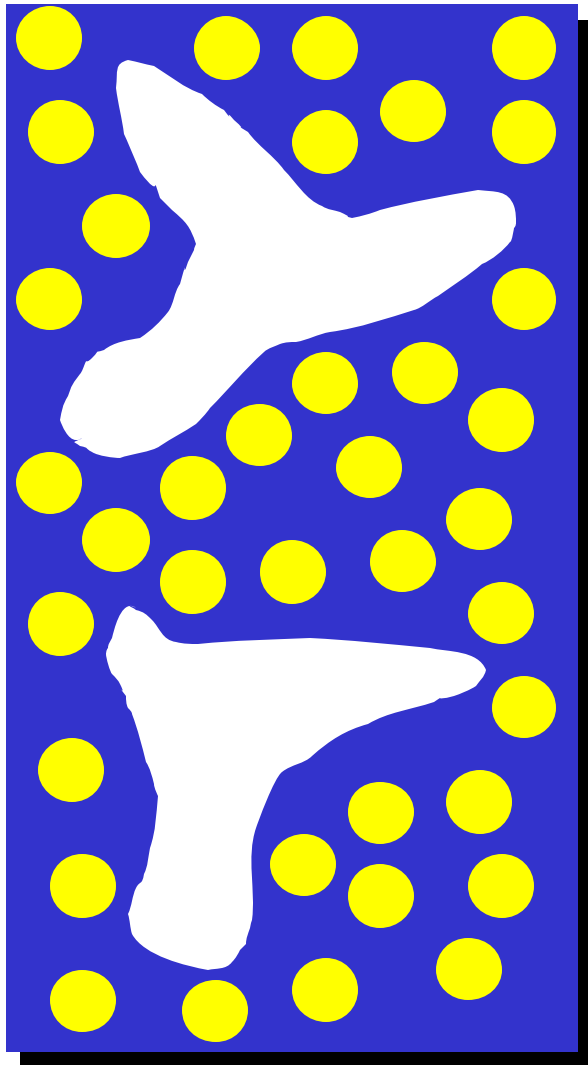
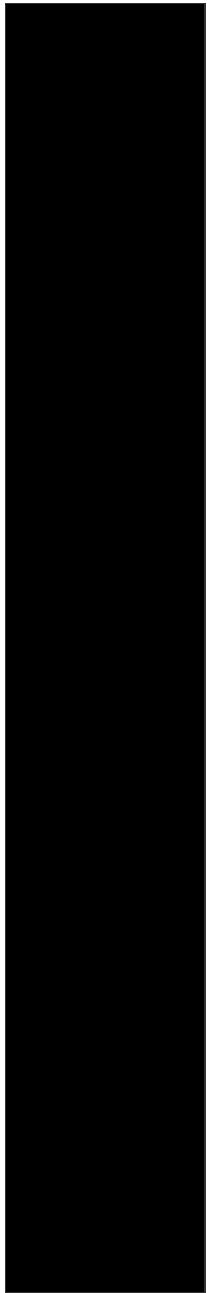
FP, FA, D

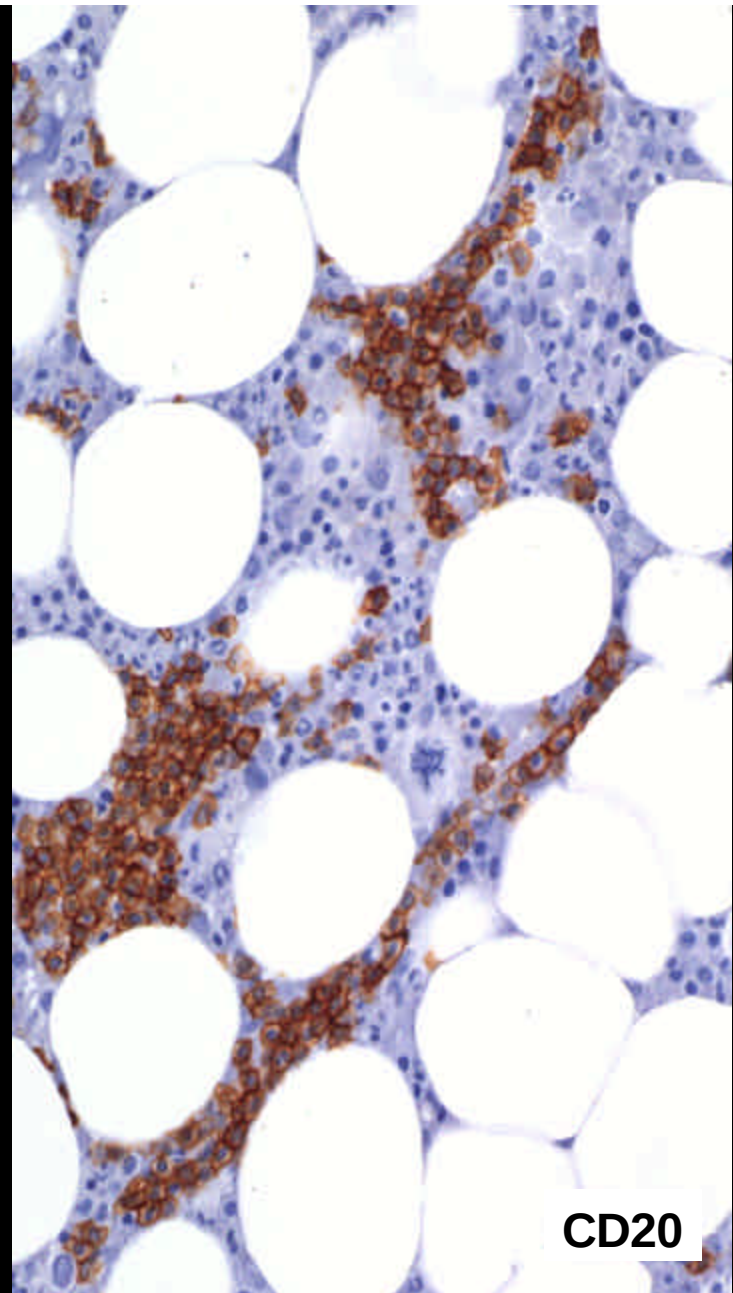
Burkitt

INT, D

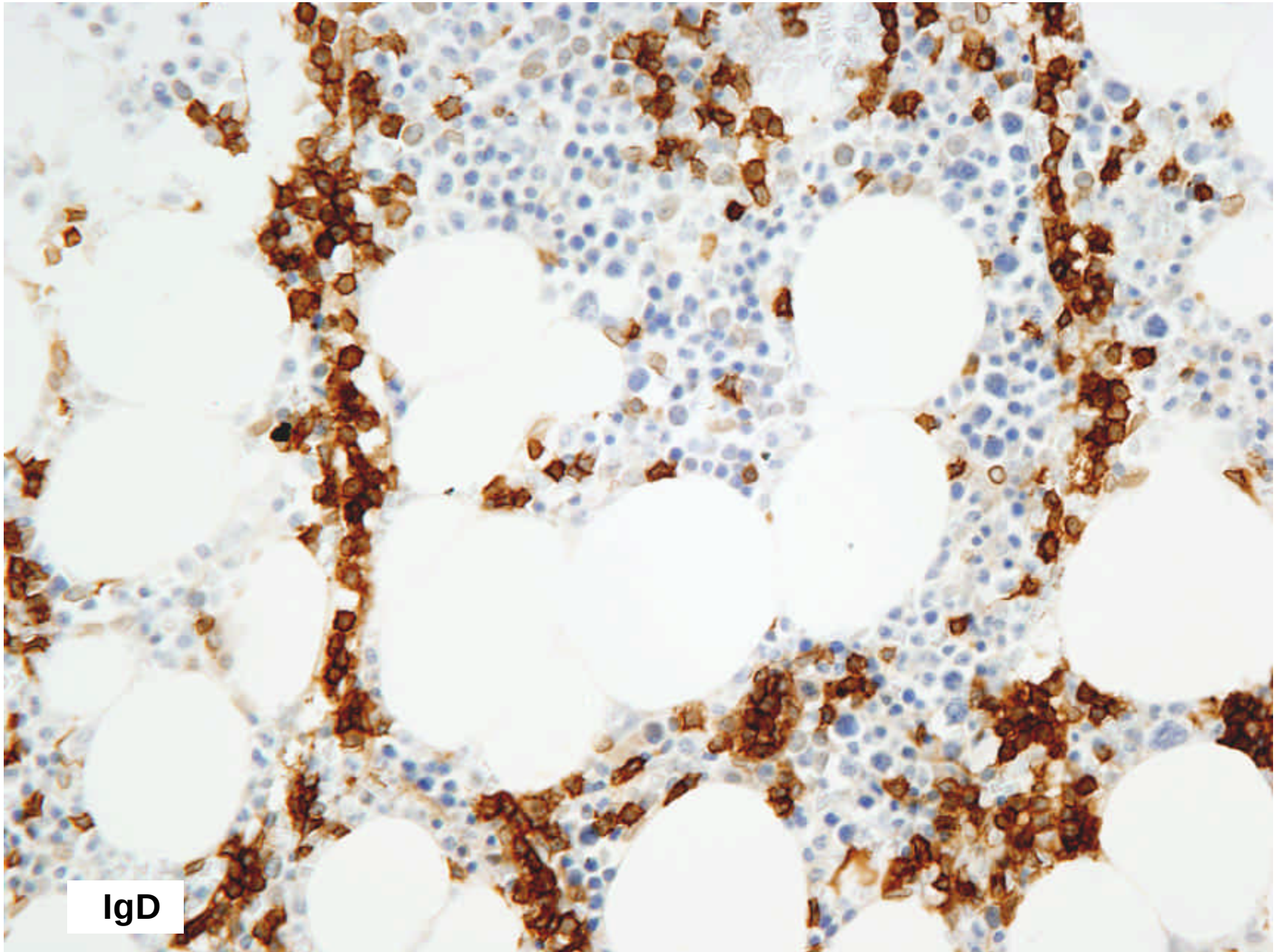
Célula B grande

FA, D

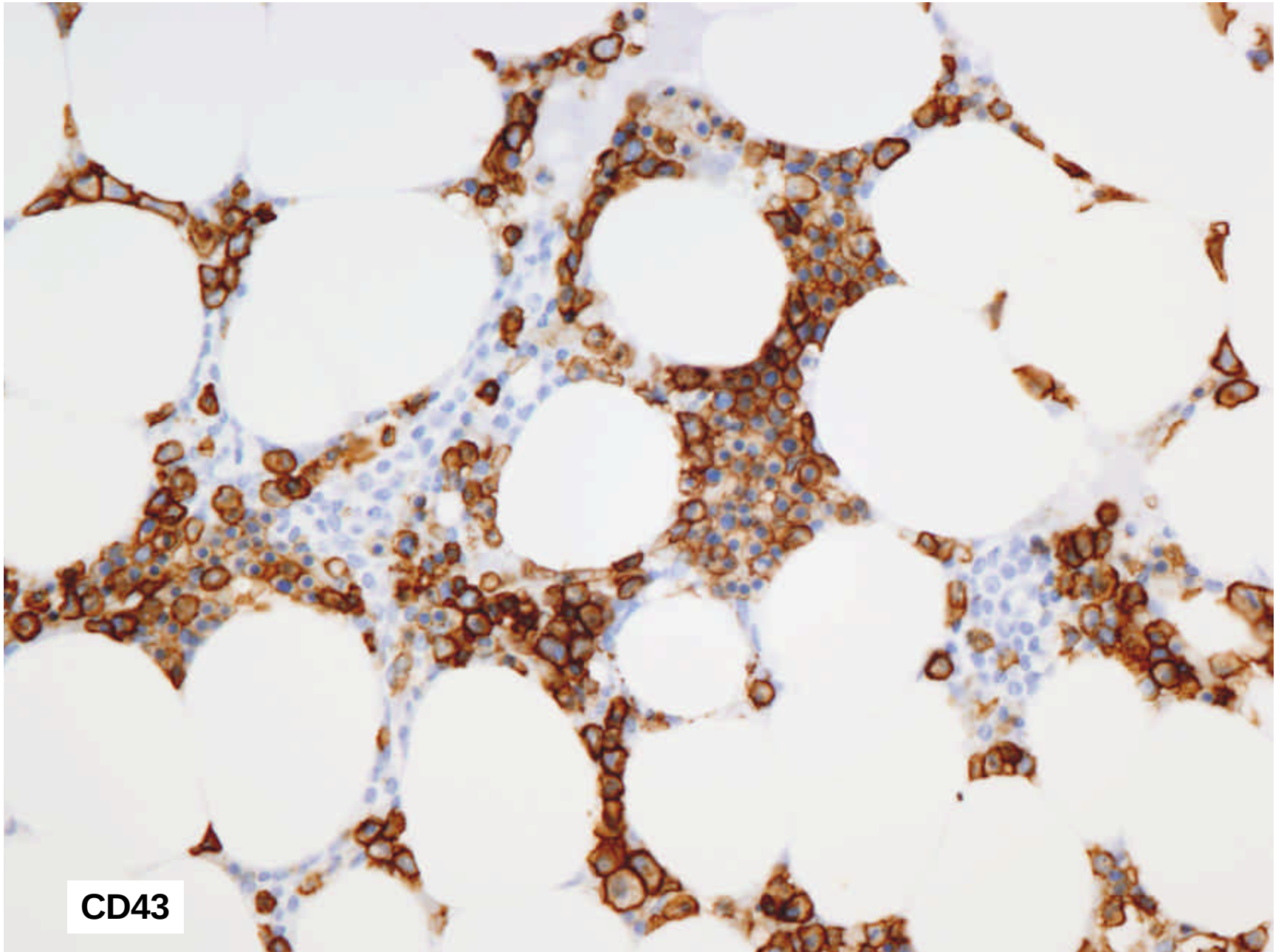




CD20



IgD

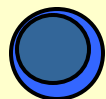


CD43

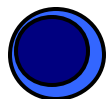
REORDENAMIENTO

HIPERMUTACION

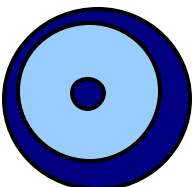
LCPB



LLCB
LM



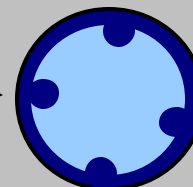
LCBG



L BURKITT



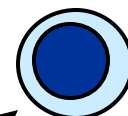
LCBG



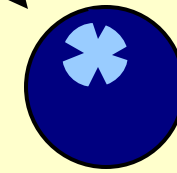
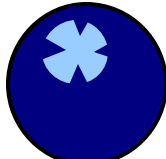
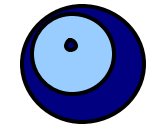
LCCF



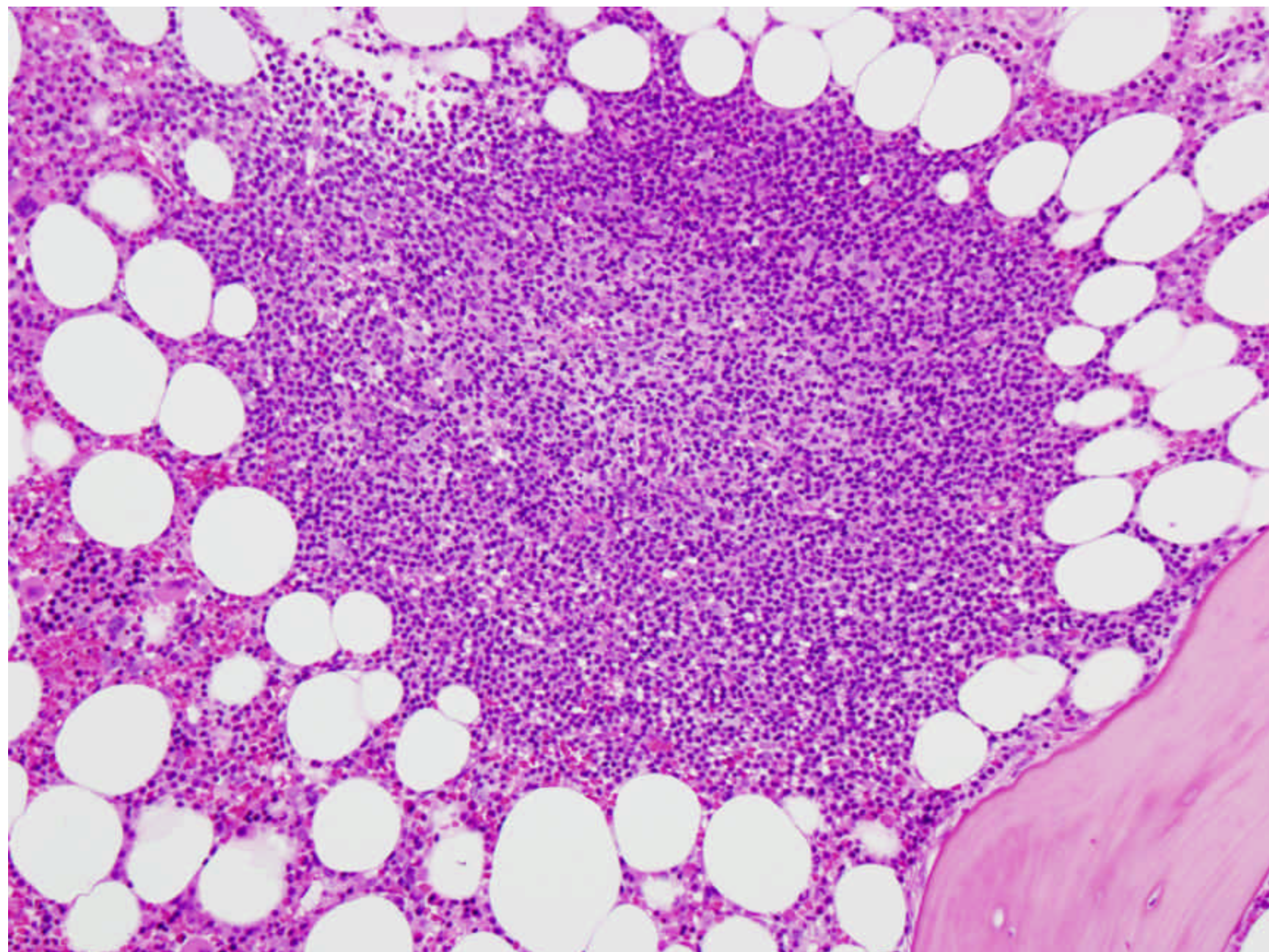
LZM
LLCB

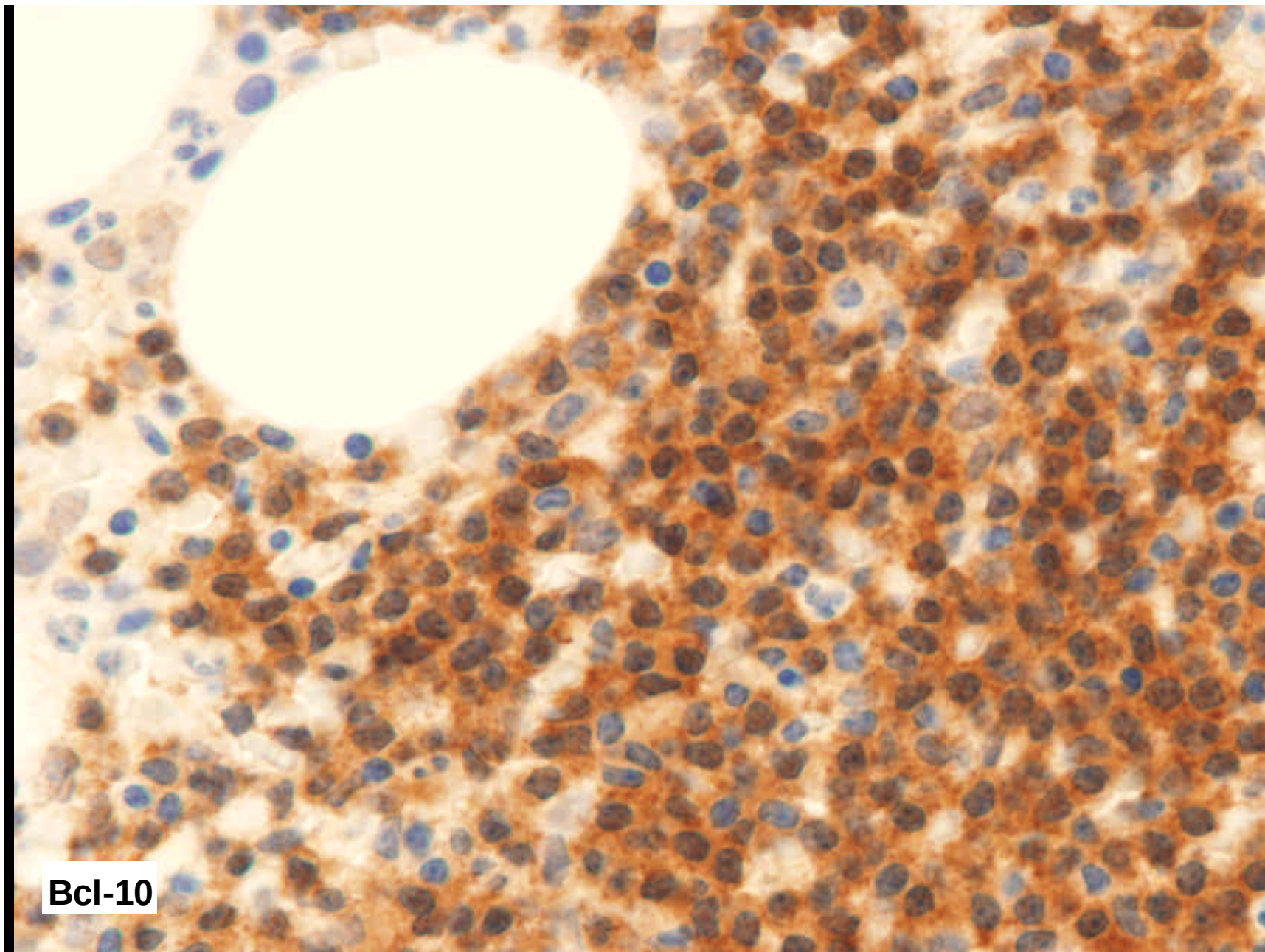


LCLP

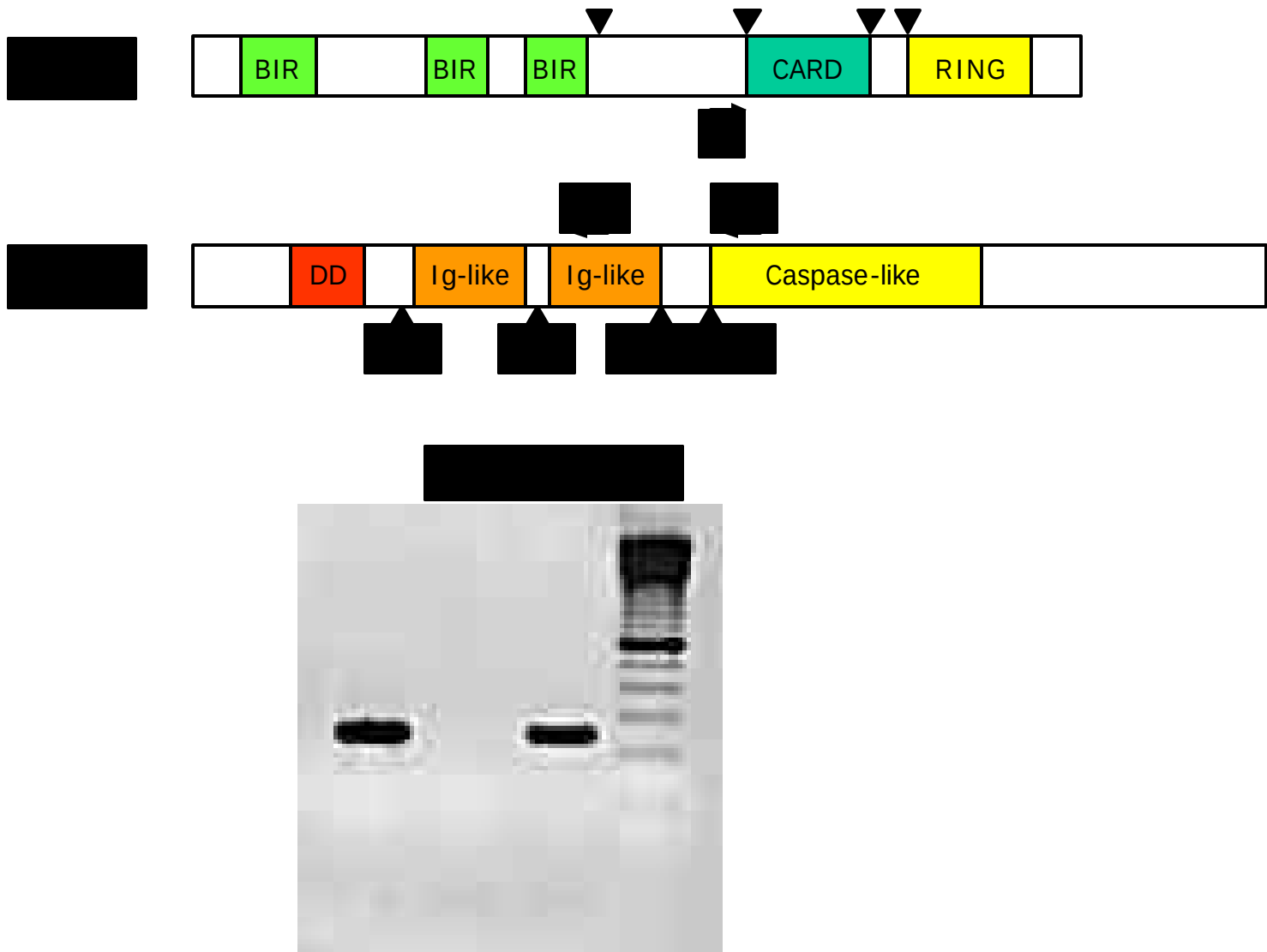


MIELOMA





Bcl-10



	CD79	CD20	CD23	CD10	BCL-2	BCL-6	CD5	CD43	IgD
LLCB	+	+ _{debil}	+/-	-	+	-	+/-	+/-	+
LM	+	+	-	-	+	-	+/-	+/-	+
LCCF	+	+	-/+	+/-	+/-	+	-	-	-
LZM	+	+	-	-/+	+	-	-	+/-	-
LZME	+	+	-	-	+	-	-	-	+
LCLP	+	+	-	-	+	-	-	+/-	-
LCBG	+	+	-/+	-/+	+/-	+/-	-/+	-/+	-
Burkitt	+	+	-	+	-	+	-	+	-

L B FRECUENCIA AFECTACIÓN

LLC 60-90%

Manto 55-95%

Linfoplasmacítico 80%

Z.Marginal (bazo) 80%

Folicular 50-60%

Burkitt 50-60%

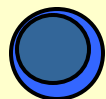
Célula B grande 25%

Hodgkin 5-10%

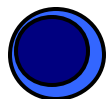
REORDENAMIENTO

HIPERMUTACION

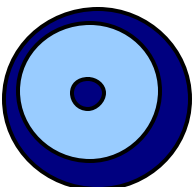
LCPB



LLCB
LM



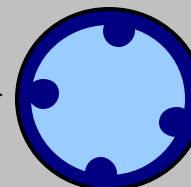
LCBG



L BURKITT



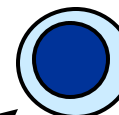
LCBG



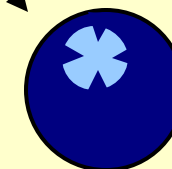
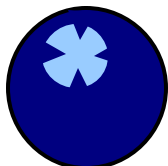
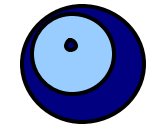
LCCF



LZM
LLCB



LCLP



MIELOMA

L B PATRONES DE INFILTRACION

LLC

FA, INT, D

Manto

FA, FP, INT, D

Linfoplasmacítico

FA, INT, D

Z. Marginal (bazo)

FA, INT, D, IS

Folicular

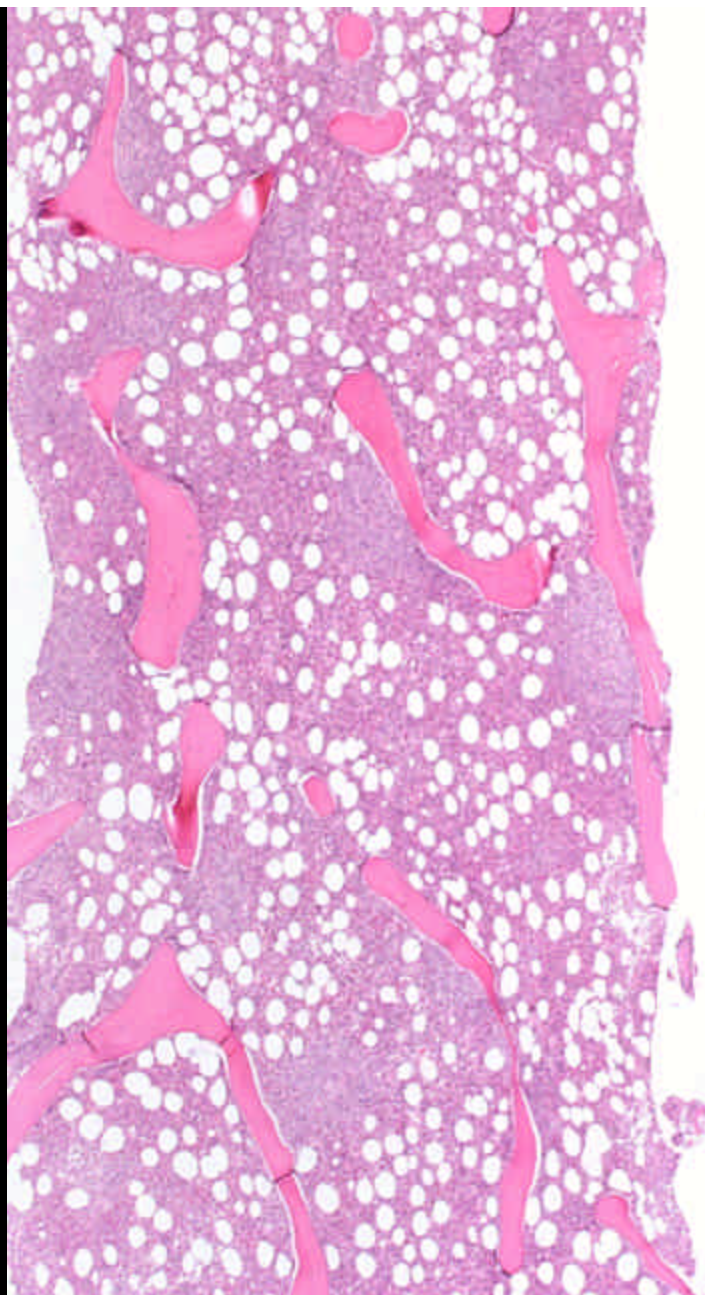
FP, FA, D

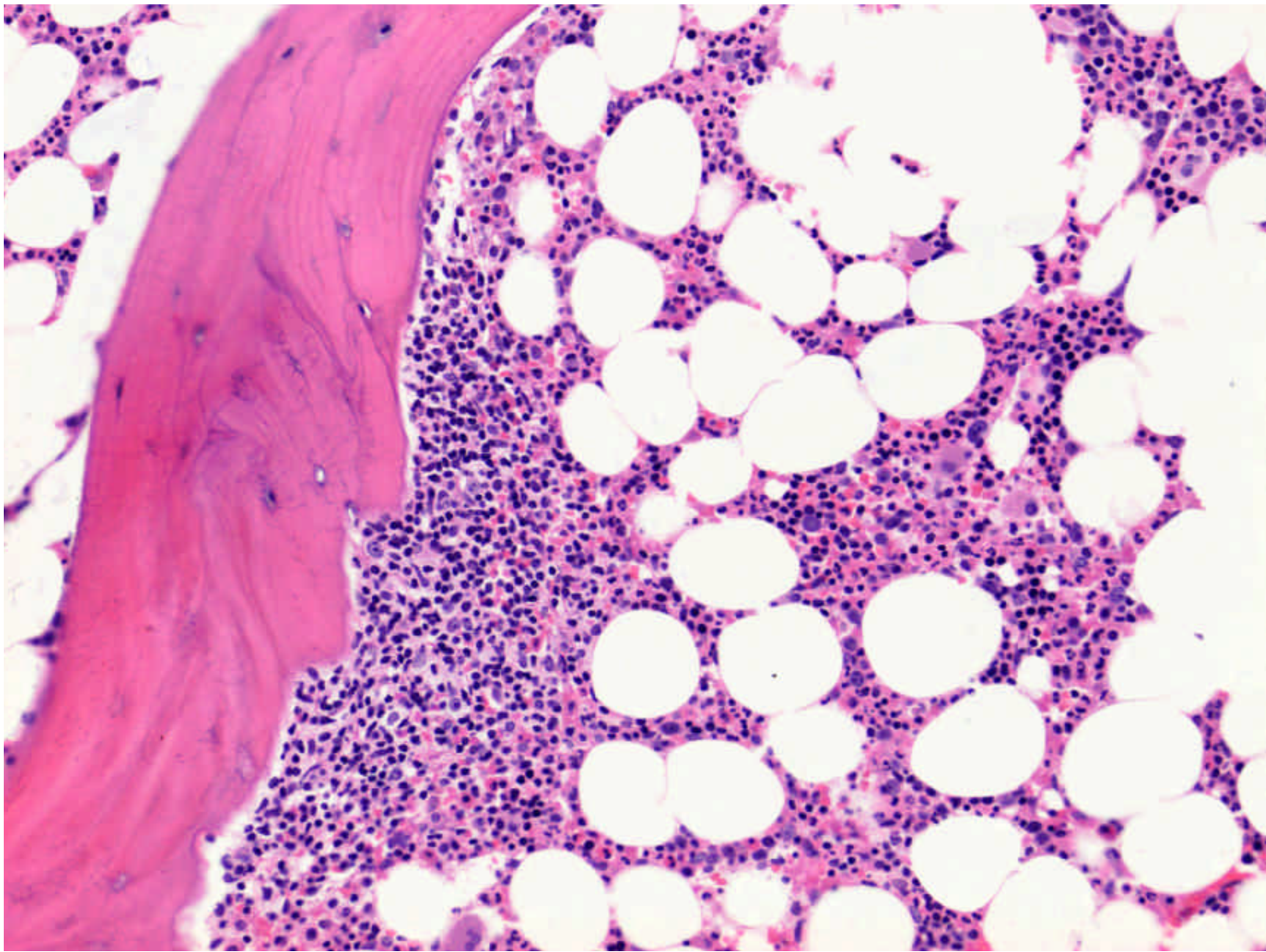
Burkitt

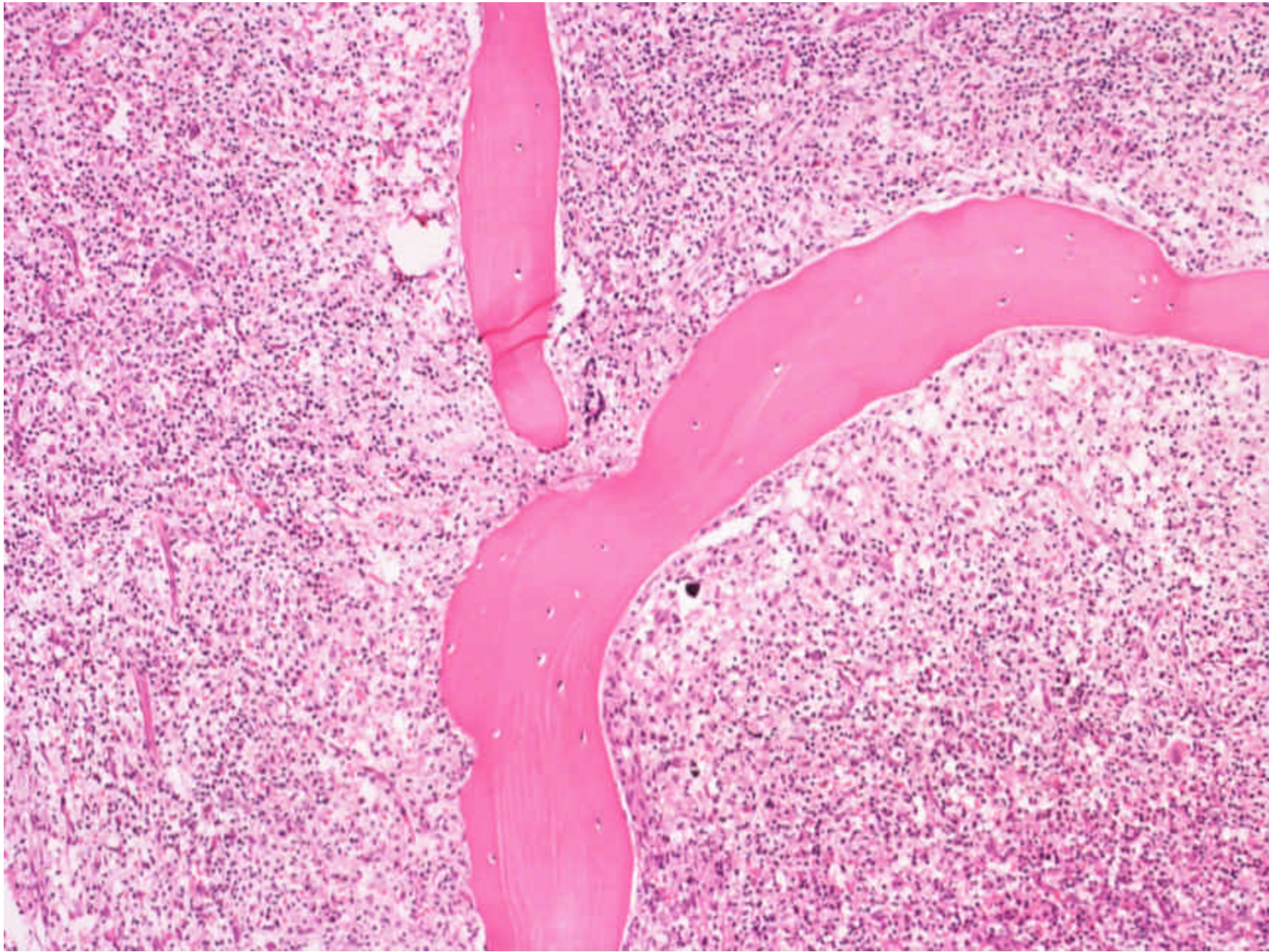
INT, D

Célula B grande

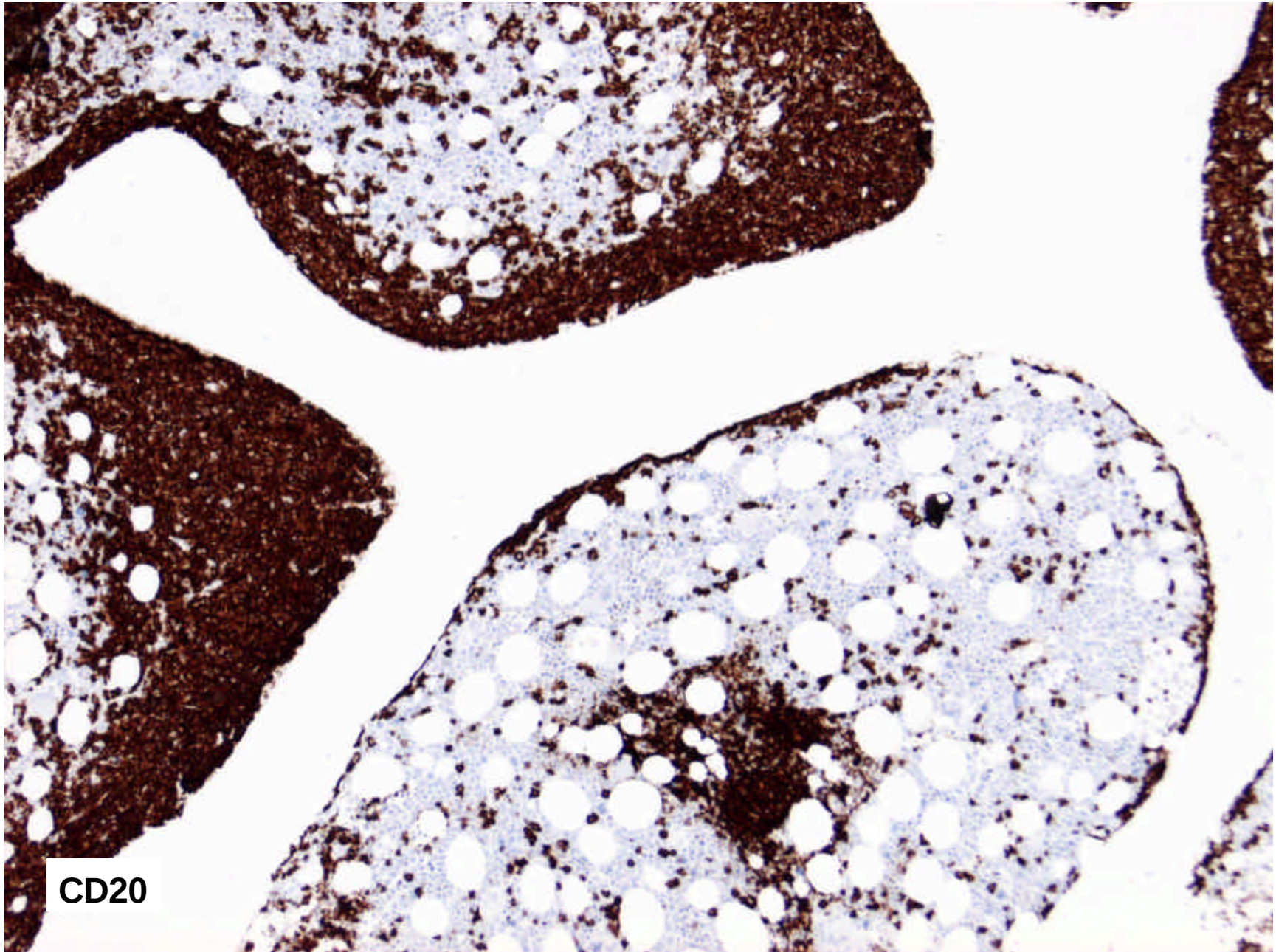
FA, D



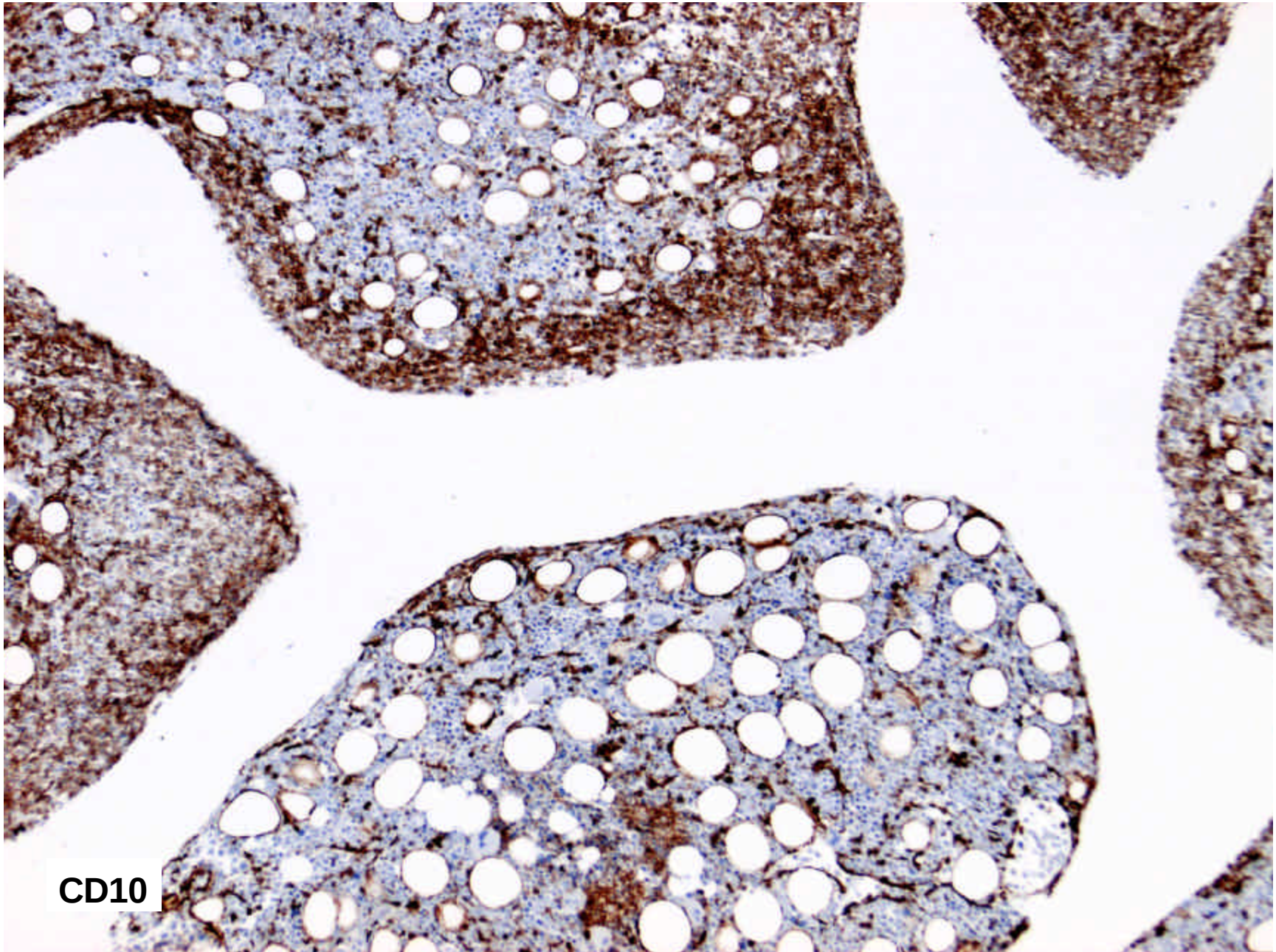




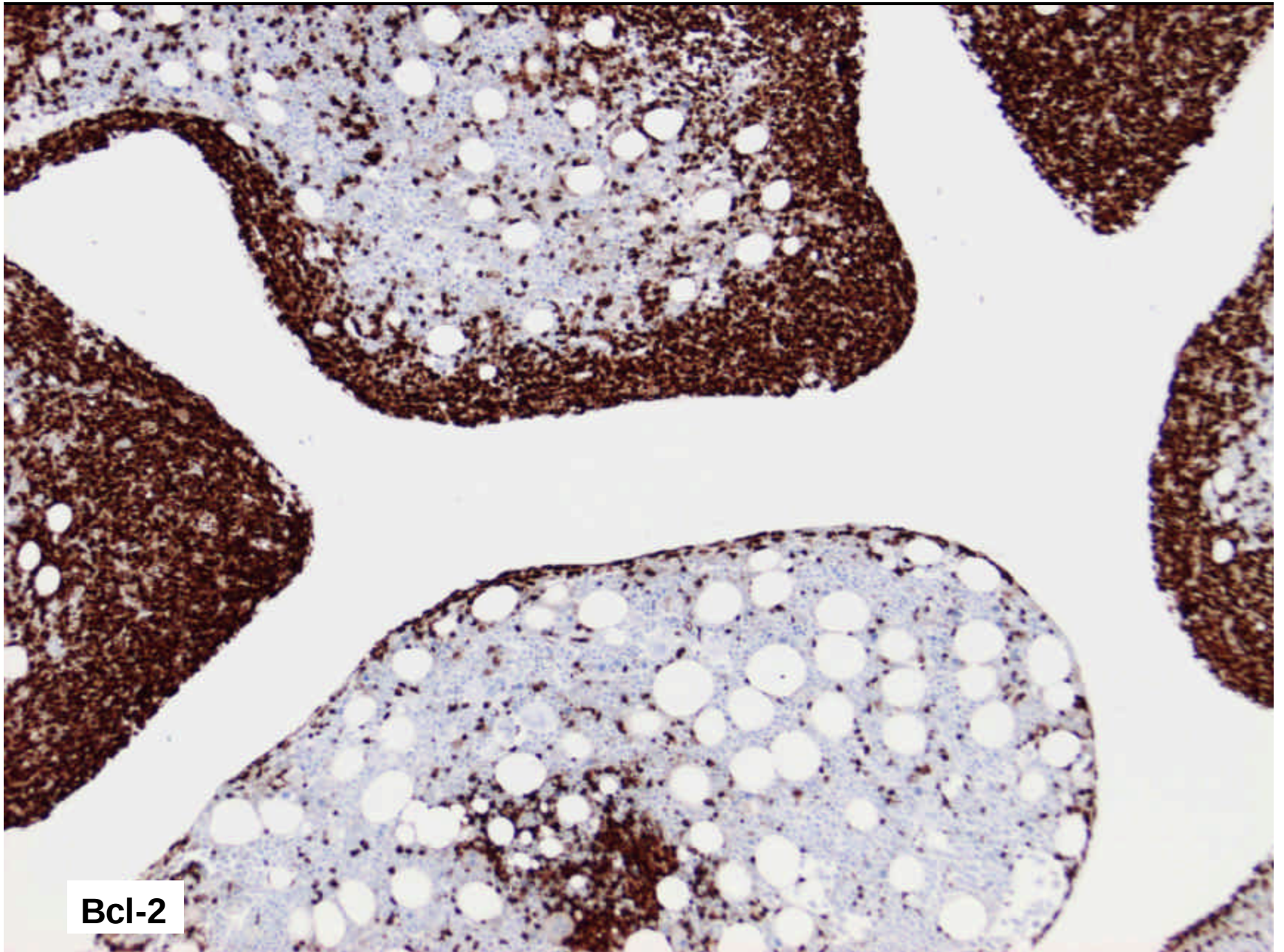
	CD79	CD20	CD23	CD10	BCL-2	BCL-6	CD5	CD43
LLCB	+	+ _{debil}	+/-	-	+	-	+/-	+/-
LM	+	+	-	-	+	-	+/-	+/-
LCCF	+	+	-/+	+/-	+/-	+	-	-
LZM	+	+	-	-/+	+	-	-	+/-
LZME	+	+	-	-	+	-	-	-
LCLP	+	+	-	-	+	-	-	+/-
LCBG	+	+	-/+	-/+	+/-	+/-	-/+	-/+
L.Burkitt	+	+	-	+	-	+	-	+



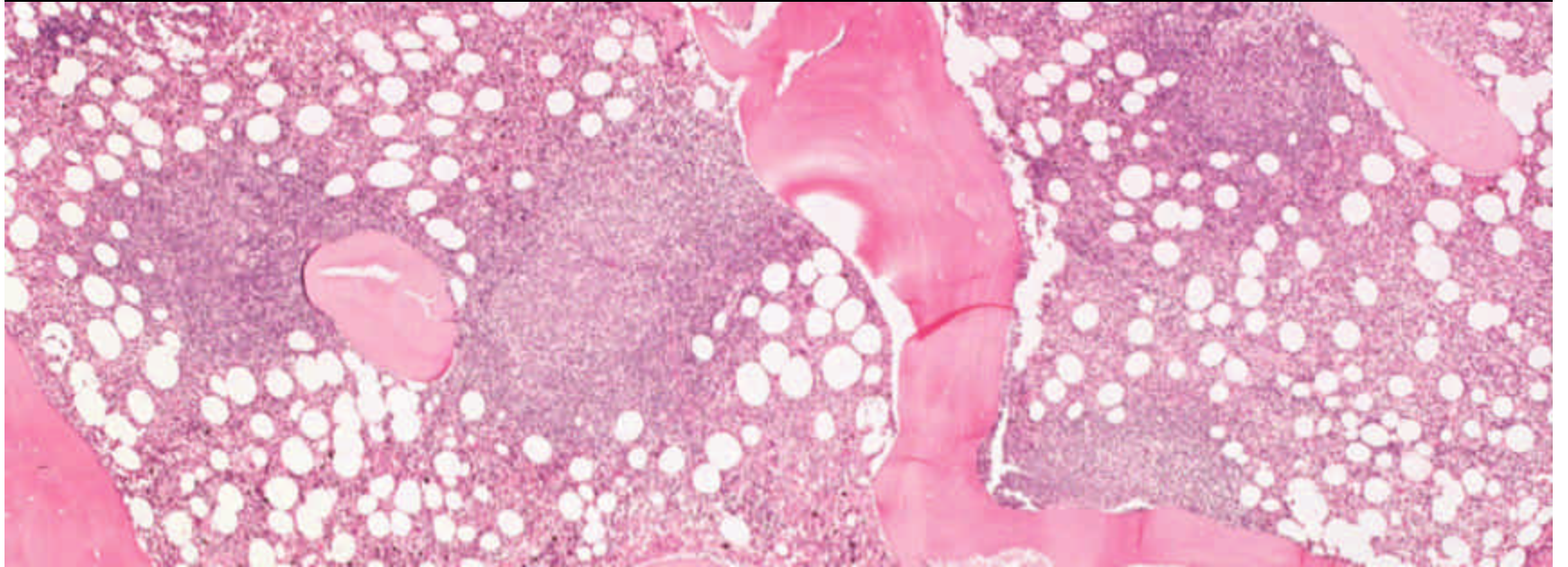
CD20

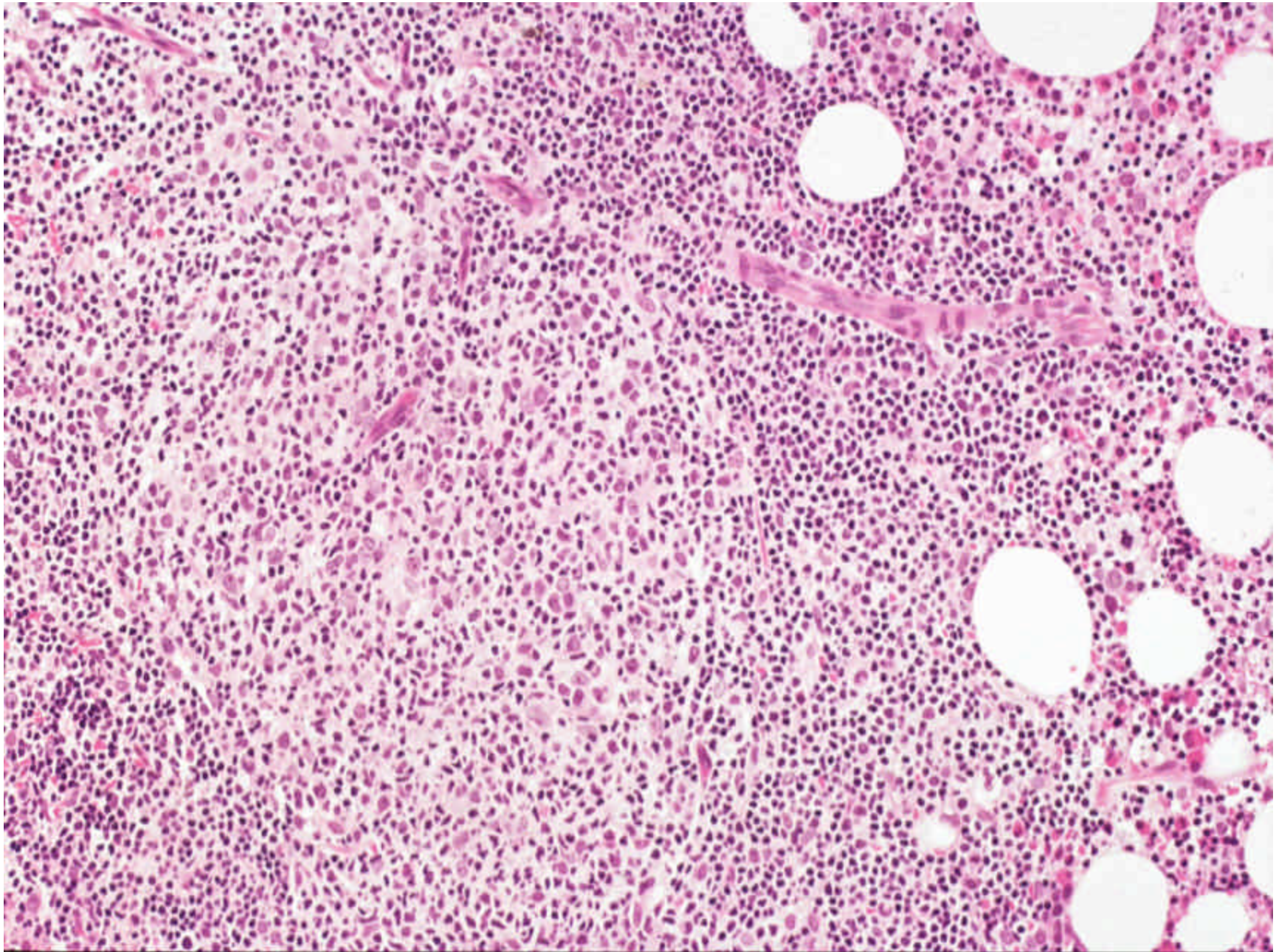


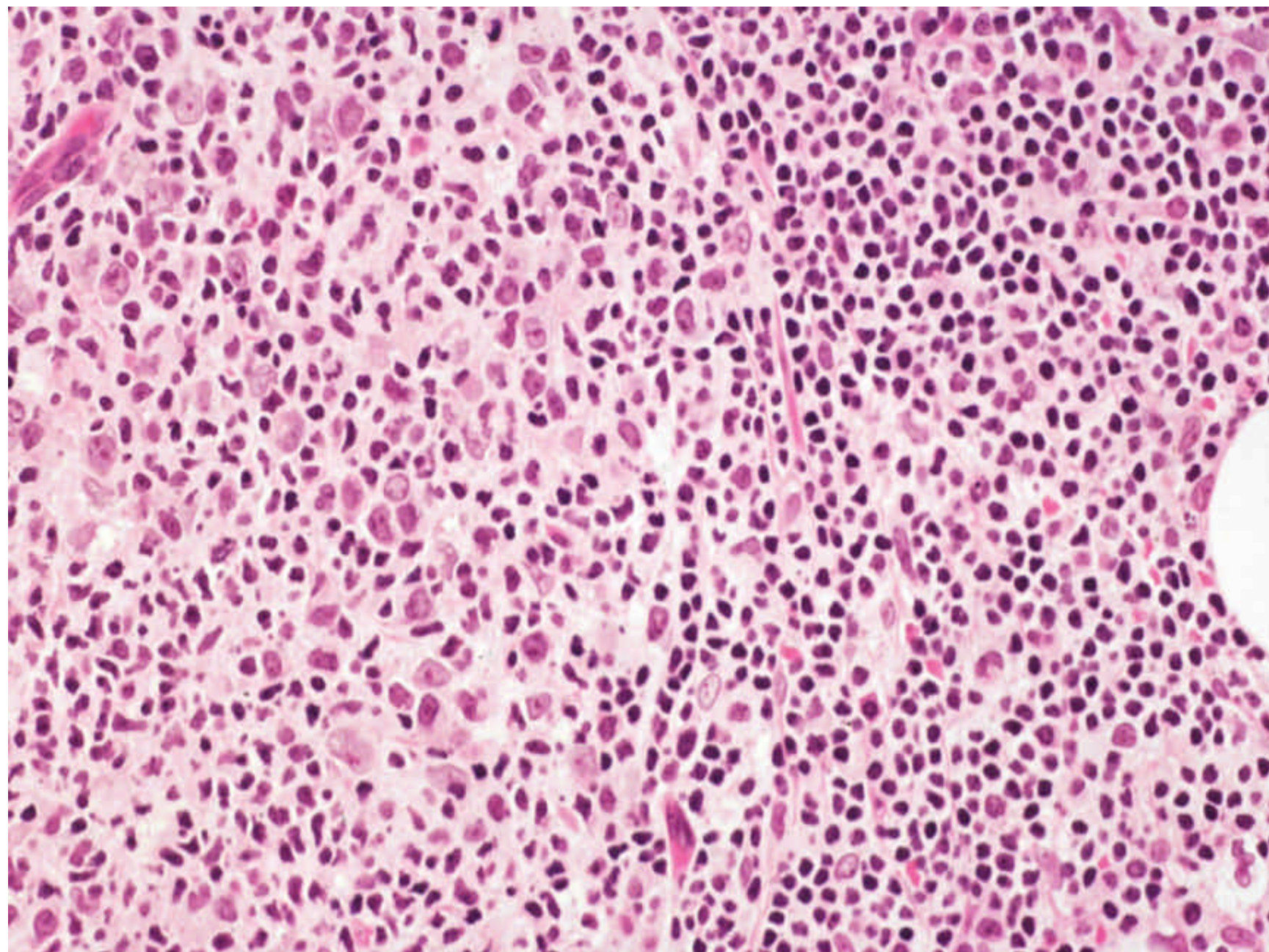
CD10

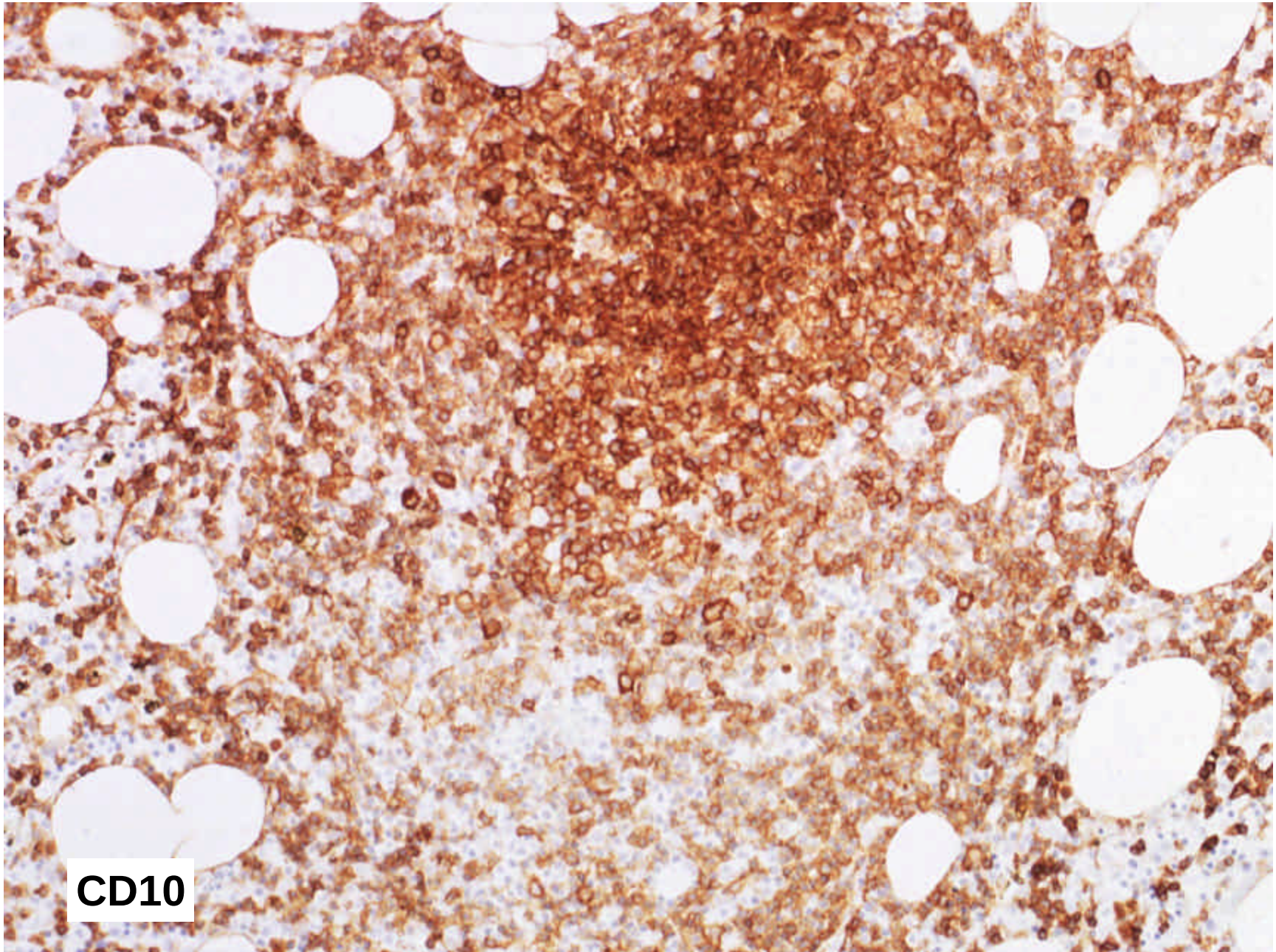


Bcl-2

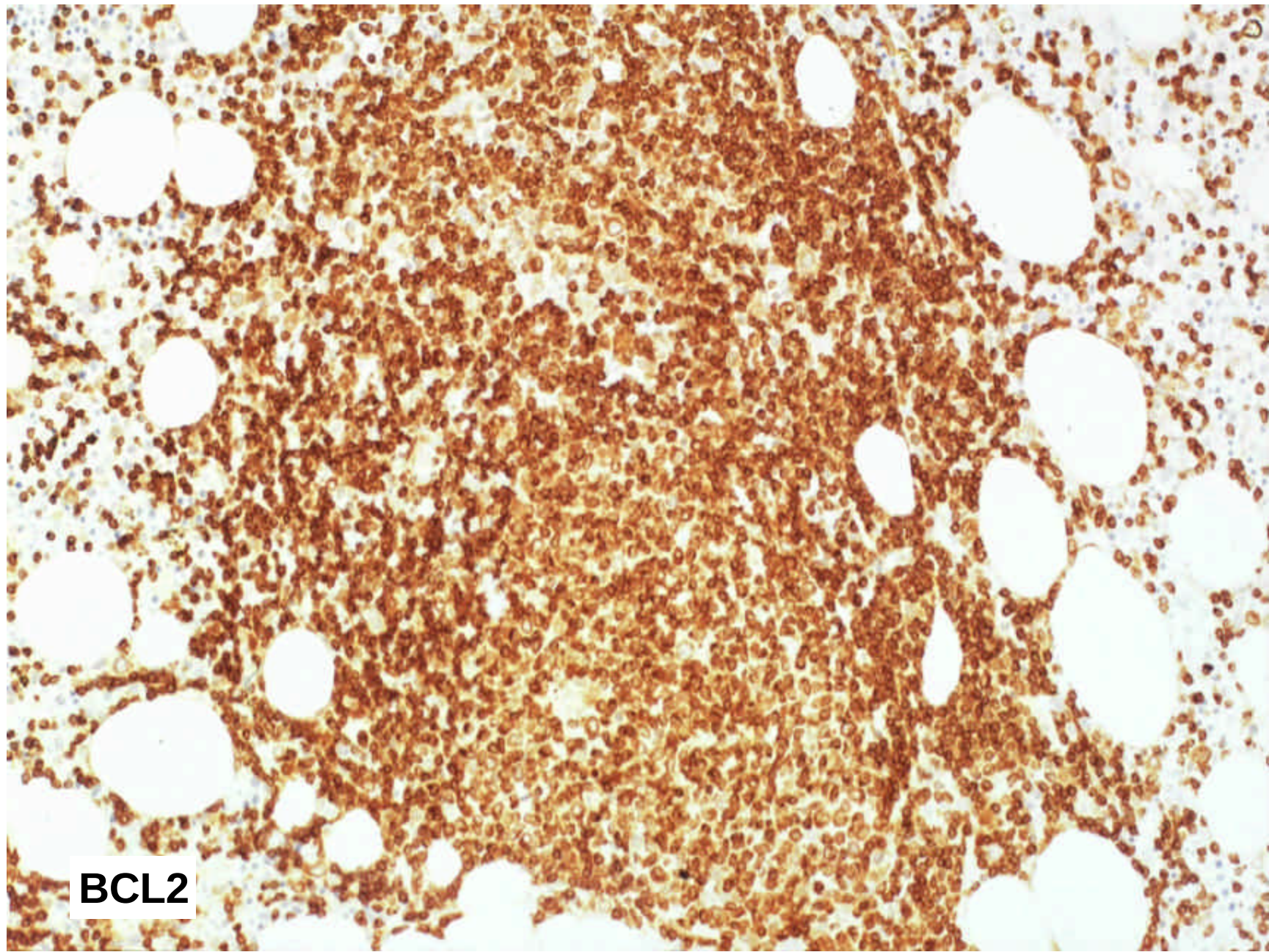




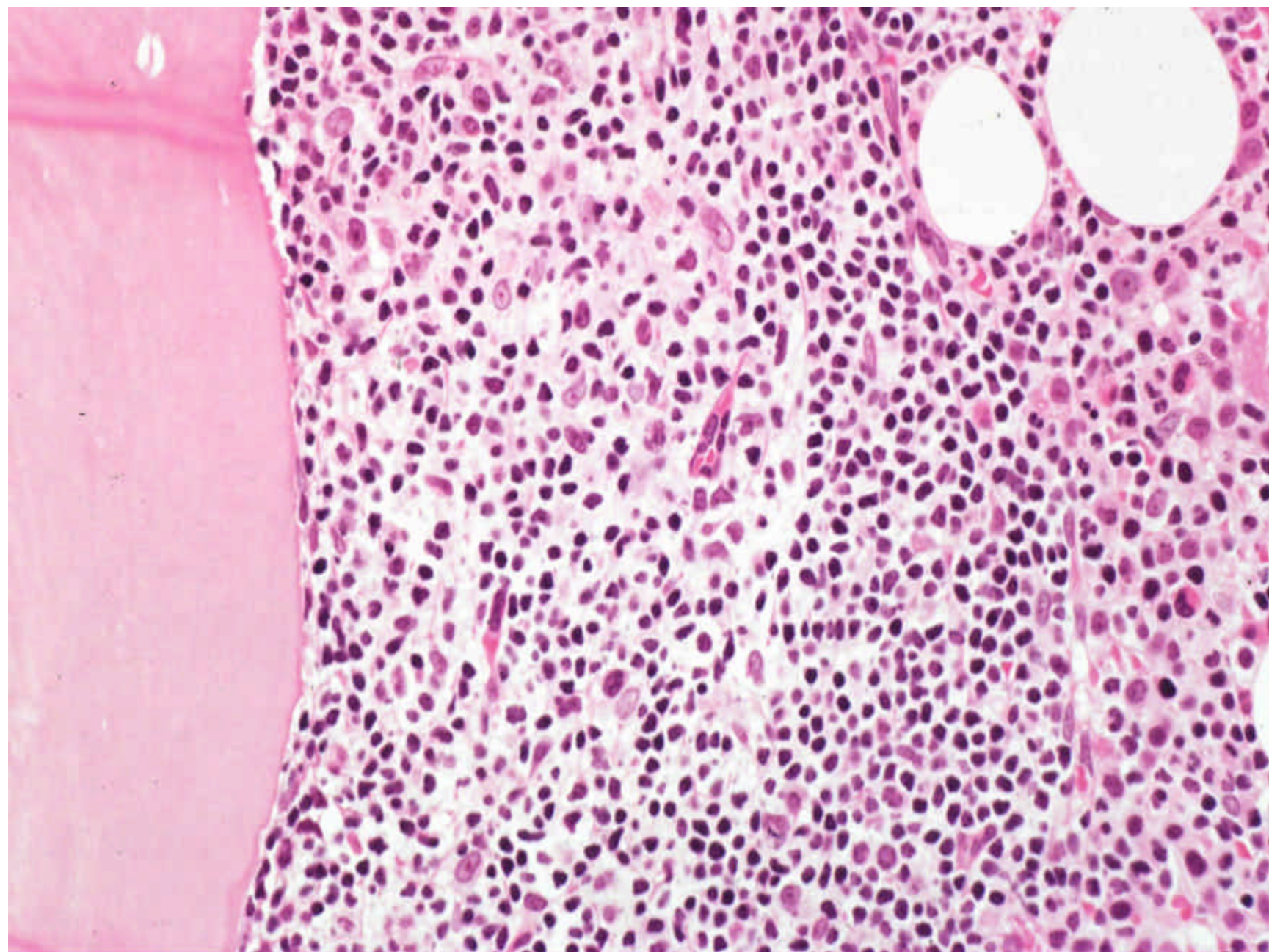




CD10



BCL2



L B FRECUENCIA AFECTACIÓN

LLC 60-90%

Manto 55-95%

Linfoplasmacítico 80%

Z.Marginal (bazo) 80%

Folicular 50-60%

Burkitt 50-60%

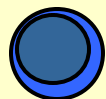
Célula B grande 25%

Hodgkin 5-10%

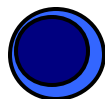
REORDENAMIENTO

HIPERMUTACION

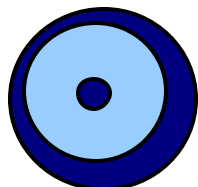
LCPB



LLCB
LM



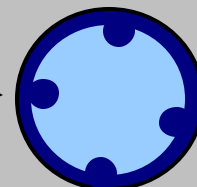
LCBG



L BURKITT



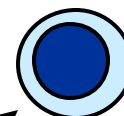
LCBG



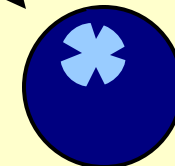
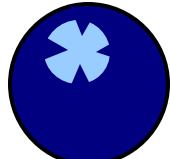
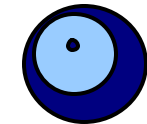
LCCF



LZM
LLCB



LCLP



MIELOMA

L B PATRONES DE INFILTRACION

LLC

FA, INT, D

Manto

FA, FP, INT, D

Linfoplasmacítico

FA, INT, D

Z. Marginal (bazo)

FA, INT, D, IS

Folicular

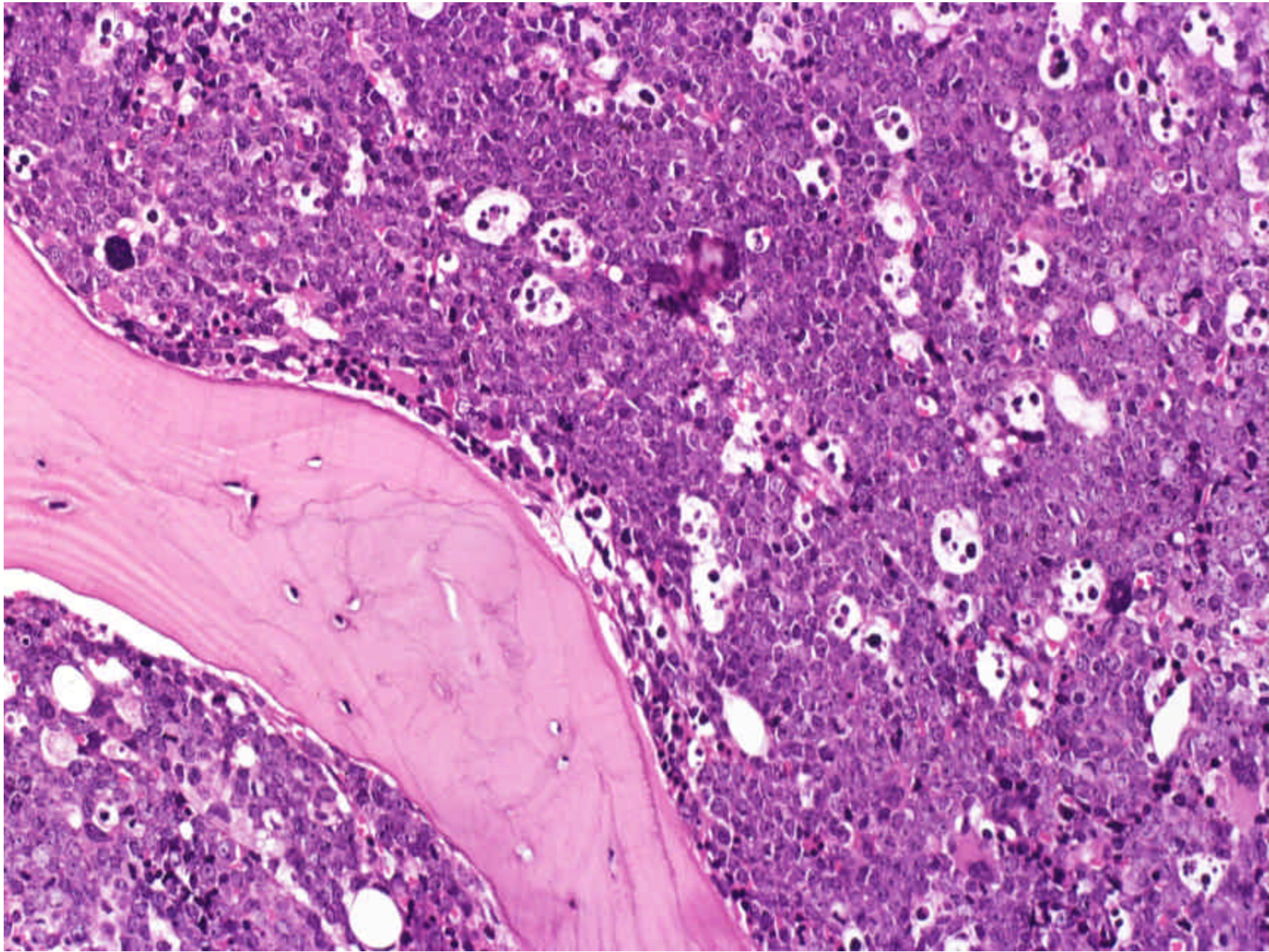
FP, FA, D

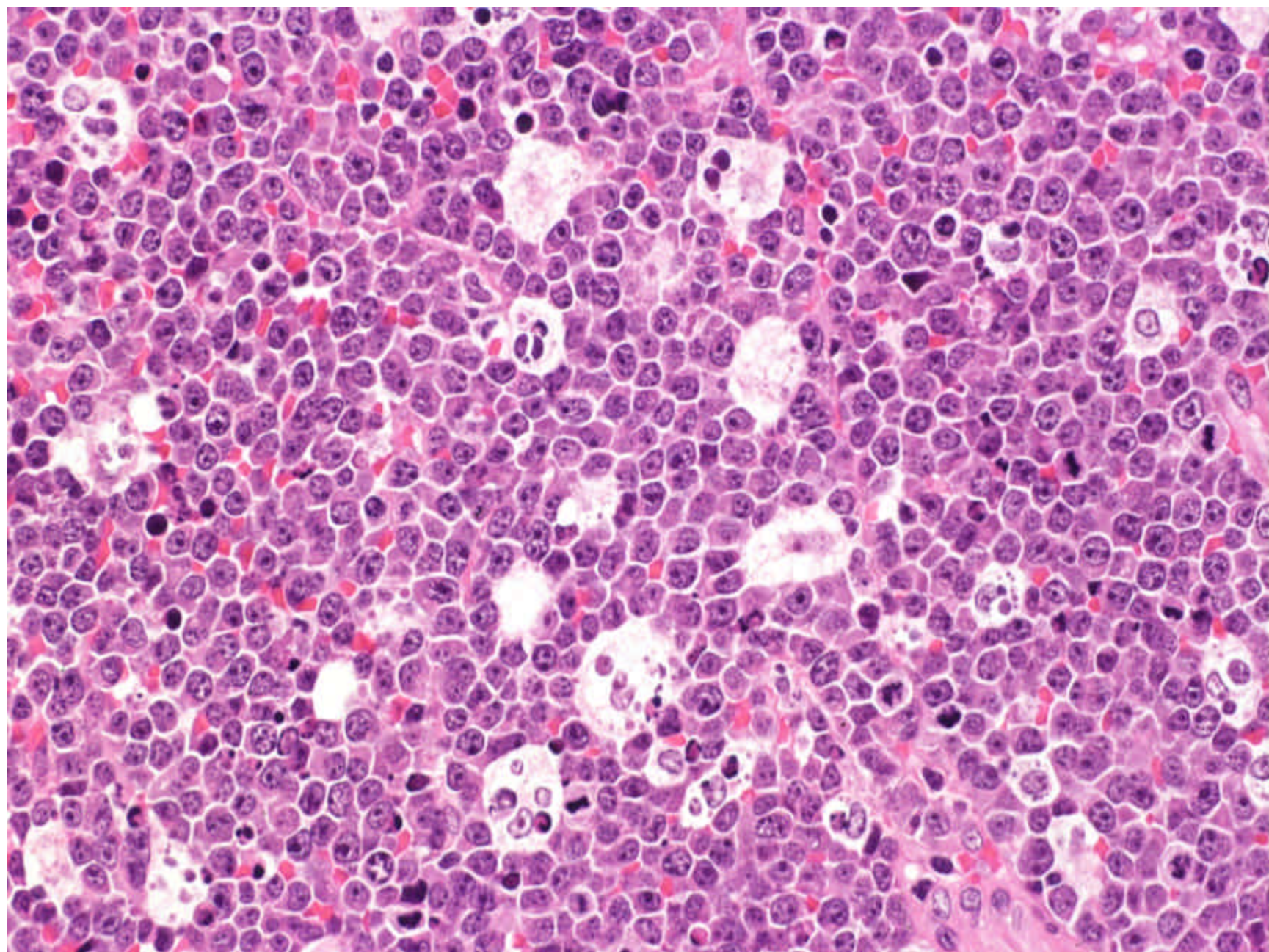
Burkitt

INT, D

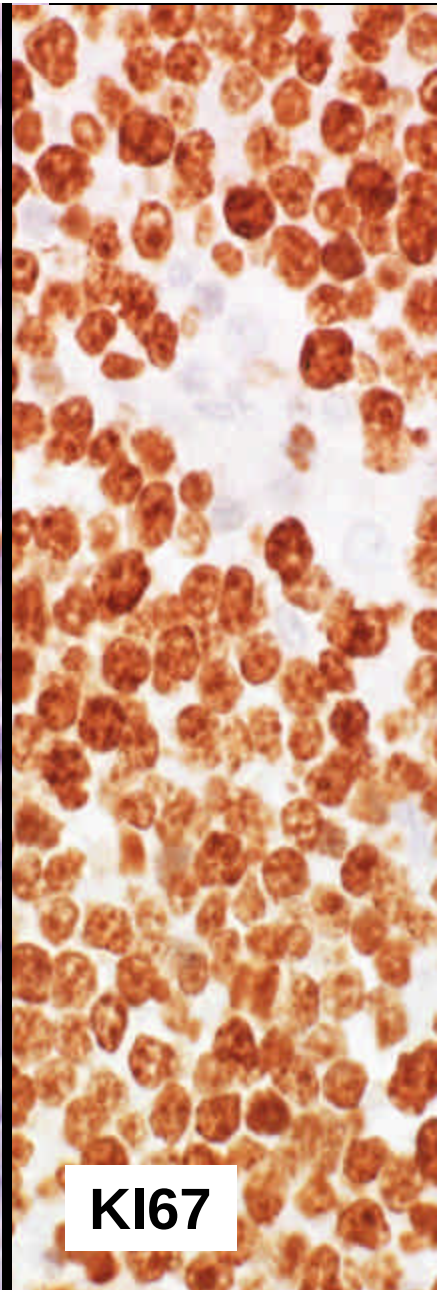
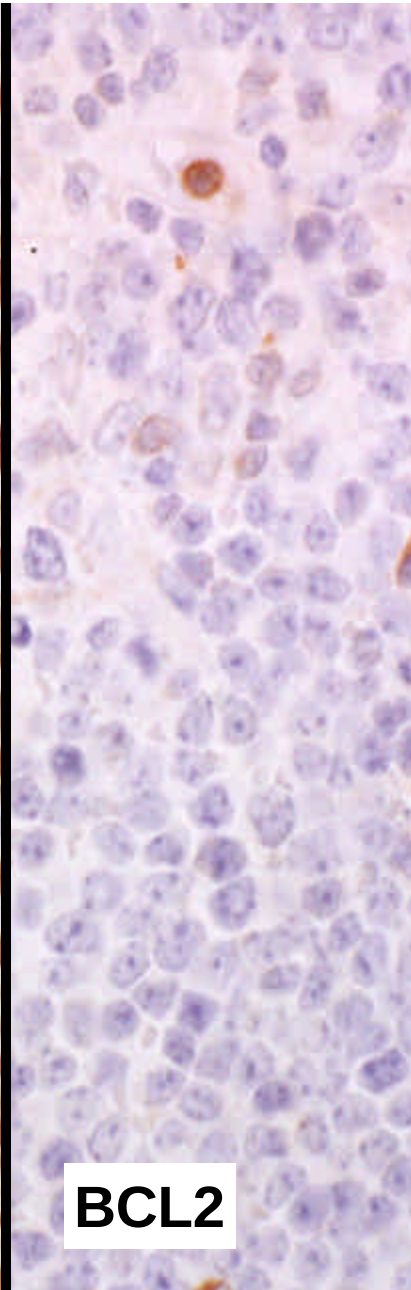
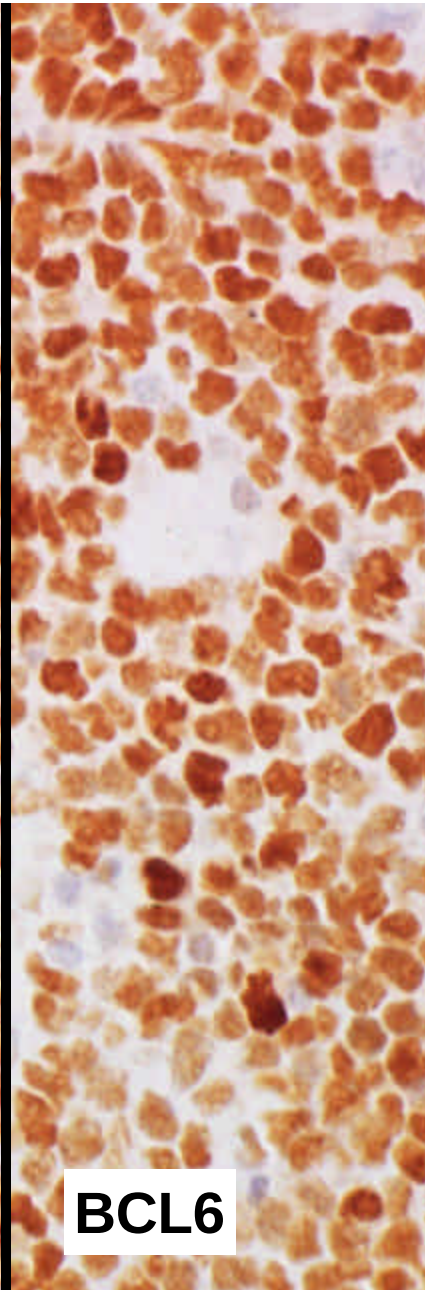
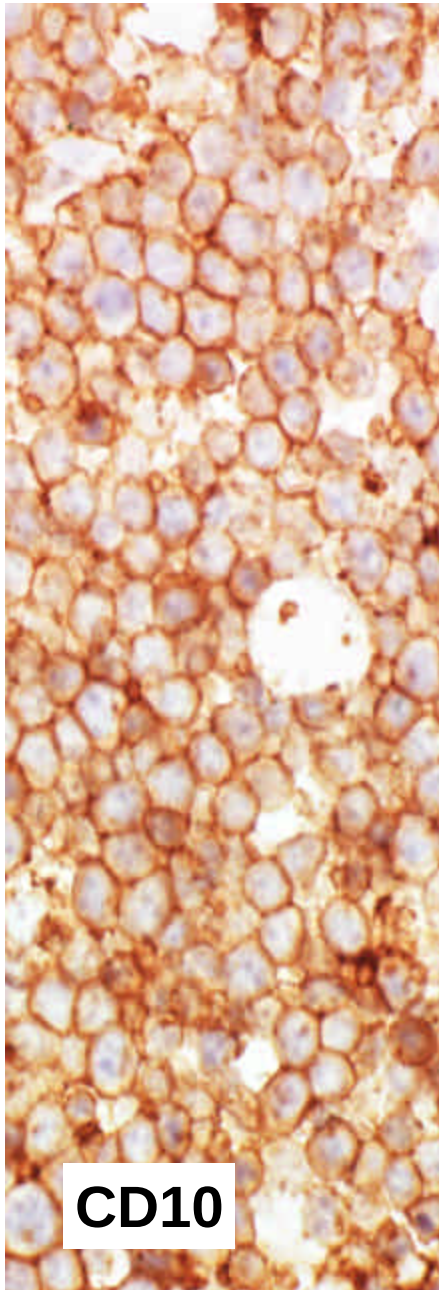
Célula B grande

FA, D





	CD79	CD20	CD23	CD10	BCL-2	BCL-6	CD5	CD43
LLCB	+	+ _{debil}	+/-	-	+	-	+/-	+/-
LM	+	+	-	-	+	-	+/-	+/-
LF	+	+	-/+	+/-	+/-	+	-	-
LZM	+	+	-	-/+	+	-	-	+/-
LZME	+	+	-	-	+	-	-	-
LCLP	+	+	-	-	+	+/-	-	+/-
LCBG	+	+	-/+	-/+	+/-	+	-/+	-/+
L.Burkitt	+	+	-	+	-	+	-	+



L B FRECUENCIA AFECTACIÓN

LLC 60-90%

Manto 55-95%

Linfoplasmacítico 80%

Z.Marginal (bazo) 80%

Folicular 50-60%

Burkitt 50-60%

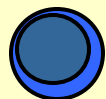
Célula B grande 25%

Hodgkin 5-10%

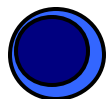
REORDENAMIENTO

HIPERMUTACION

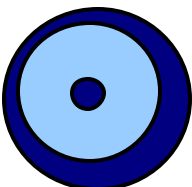
LCPB



LLCB
LM



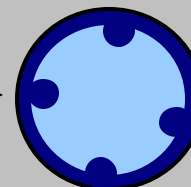
LCBG



L BURKITT



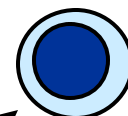
LCBG



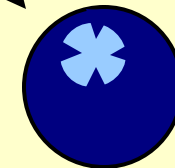
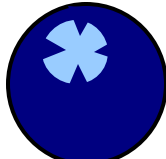
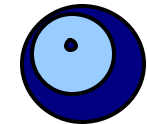
LCCF



LZM
LLCB



LCLP



MIELOMA

L B PATRONES DE INFILTRACION

LLC

FA, INT, D

Manto

FA*, INT, D

Linfoplasmacítico

FA, INT, D

Z. Marginal (bazo)

FA, INT, D, IS

Folicular

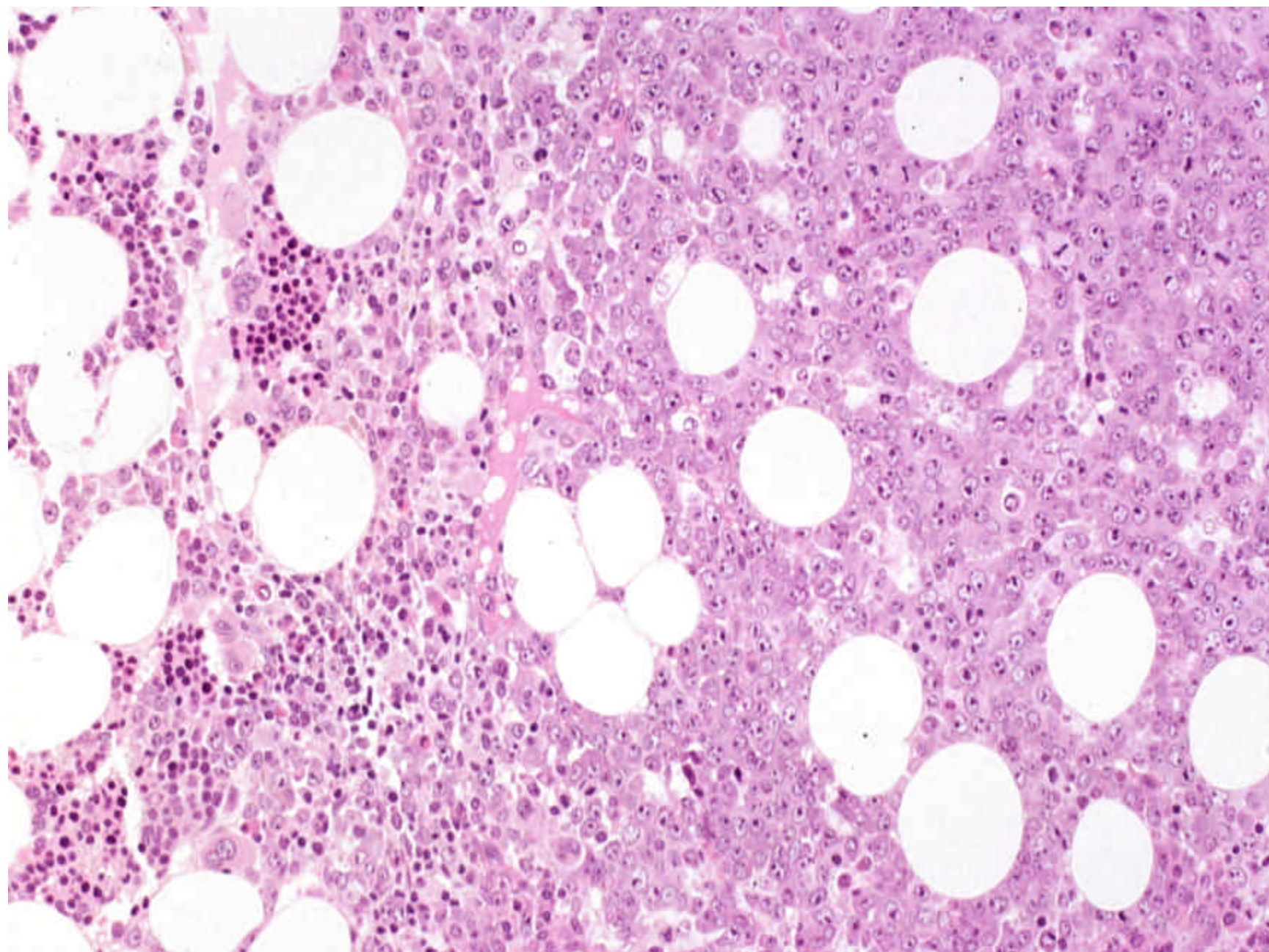
FP, D

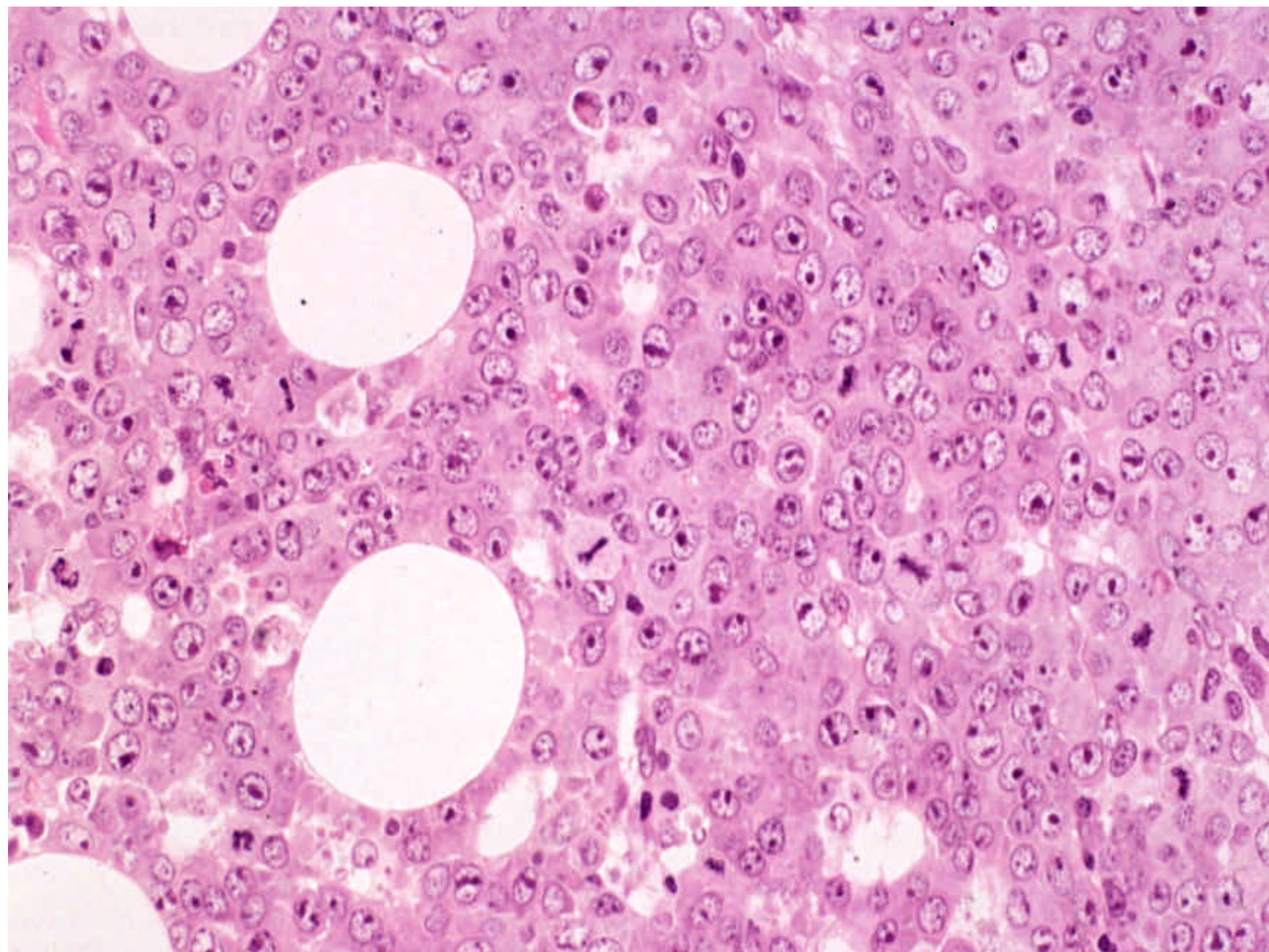
Burkitt

I, D

Célula B grande

FA, D

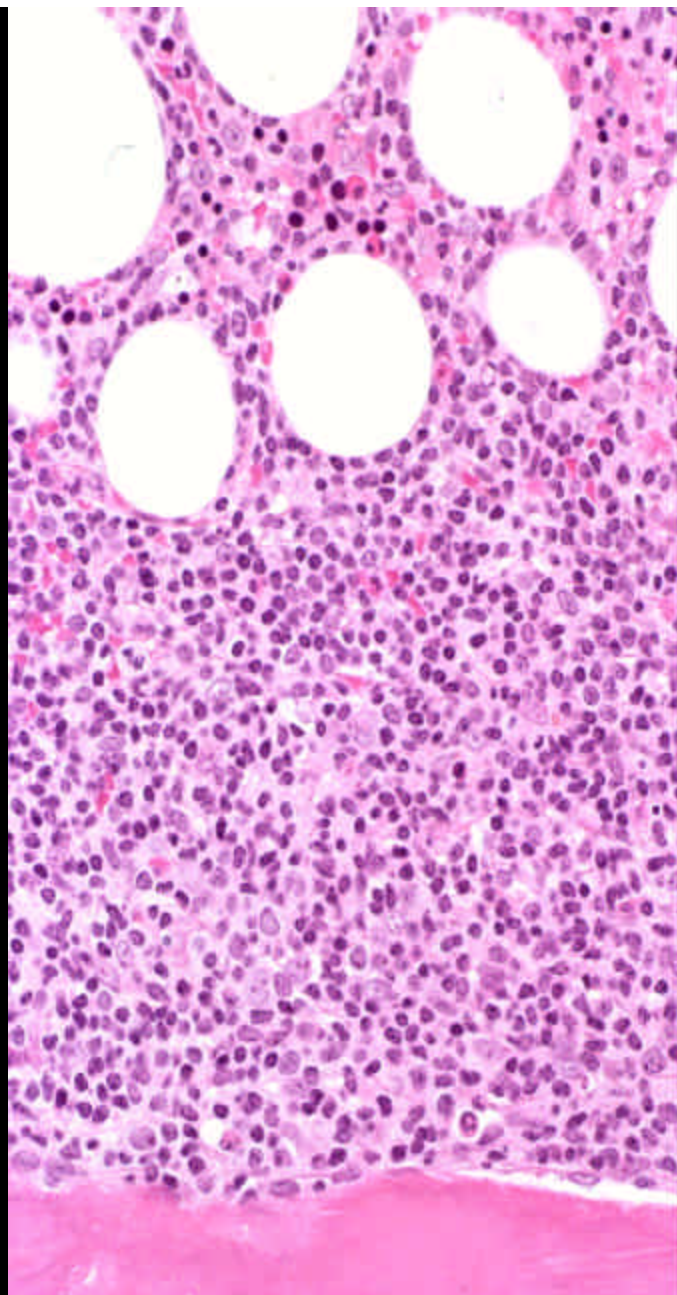
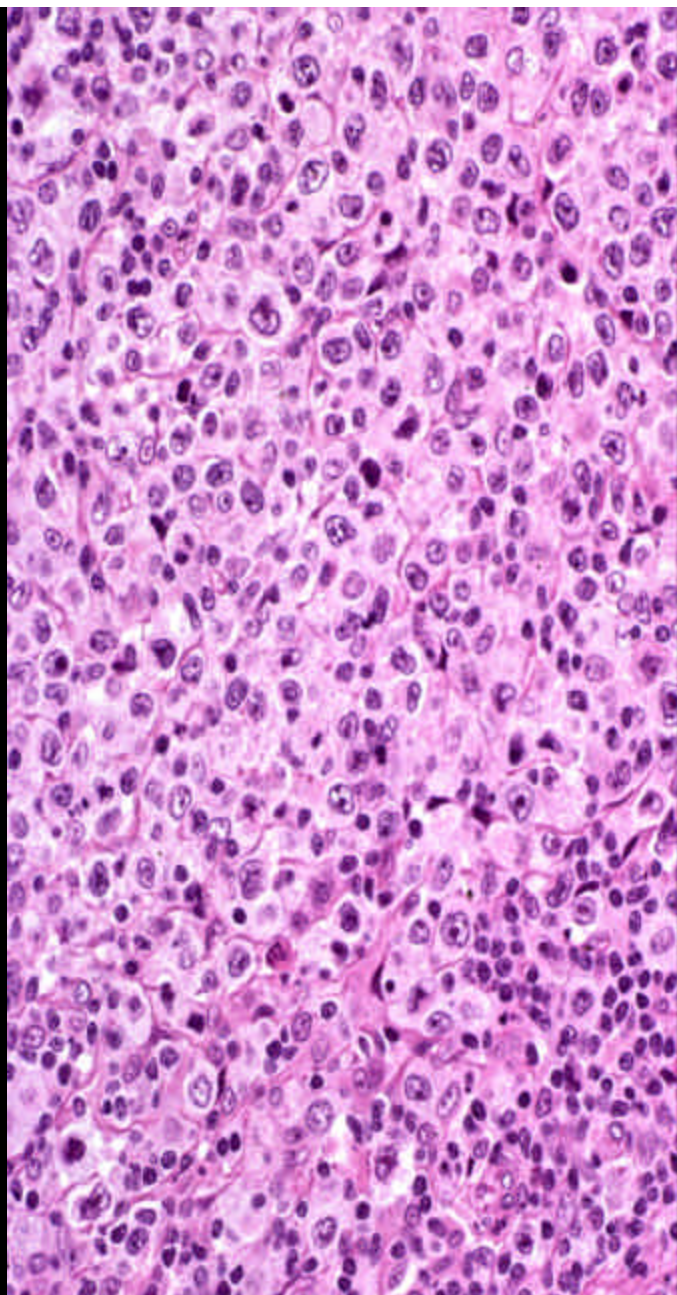


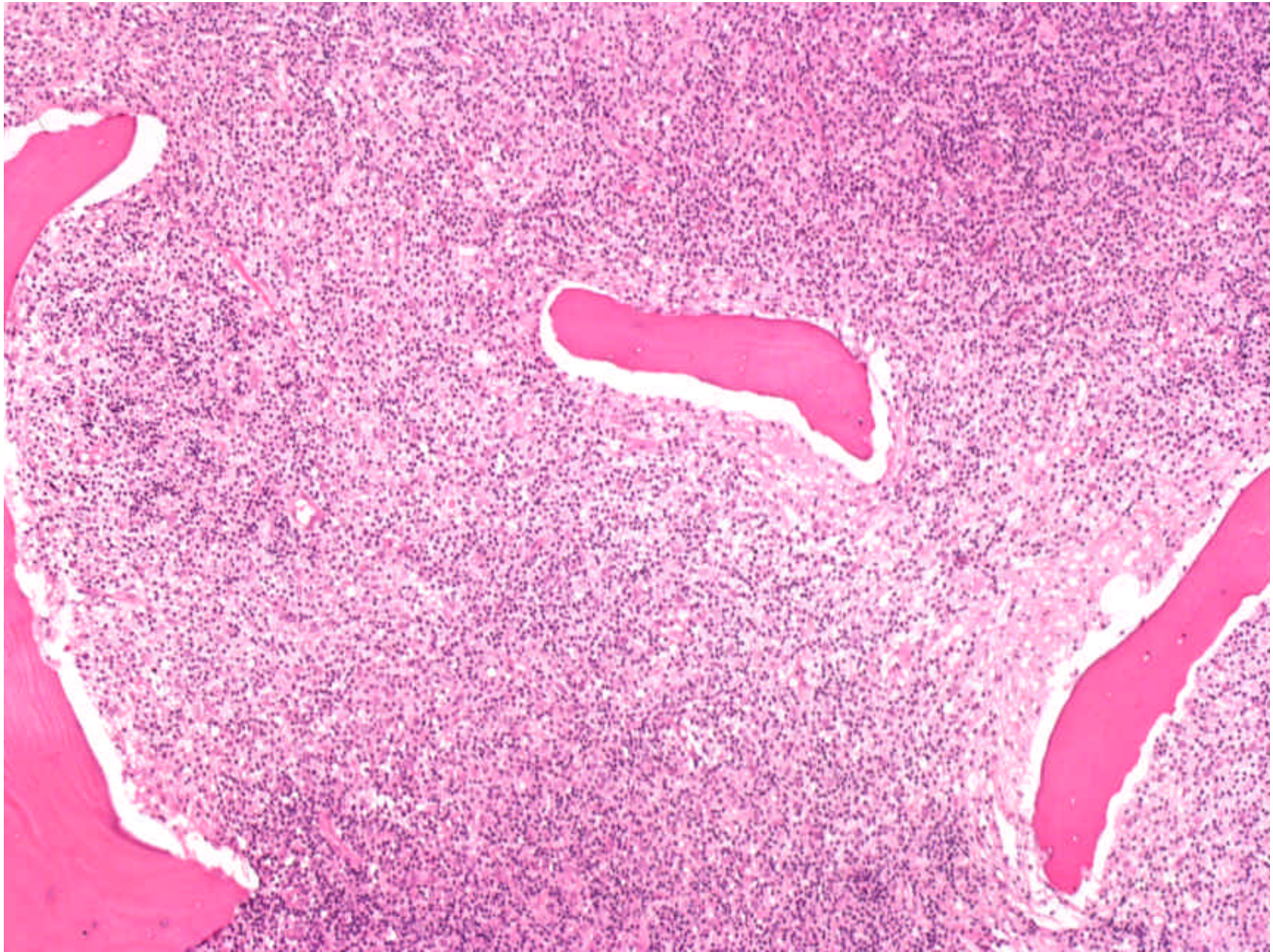


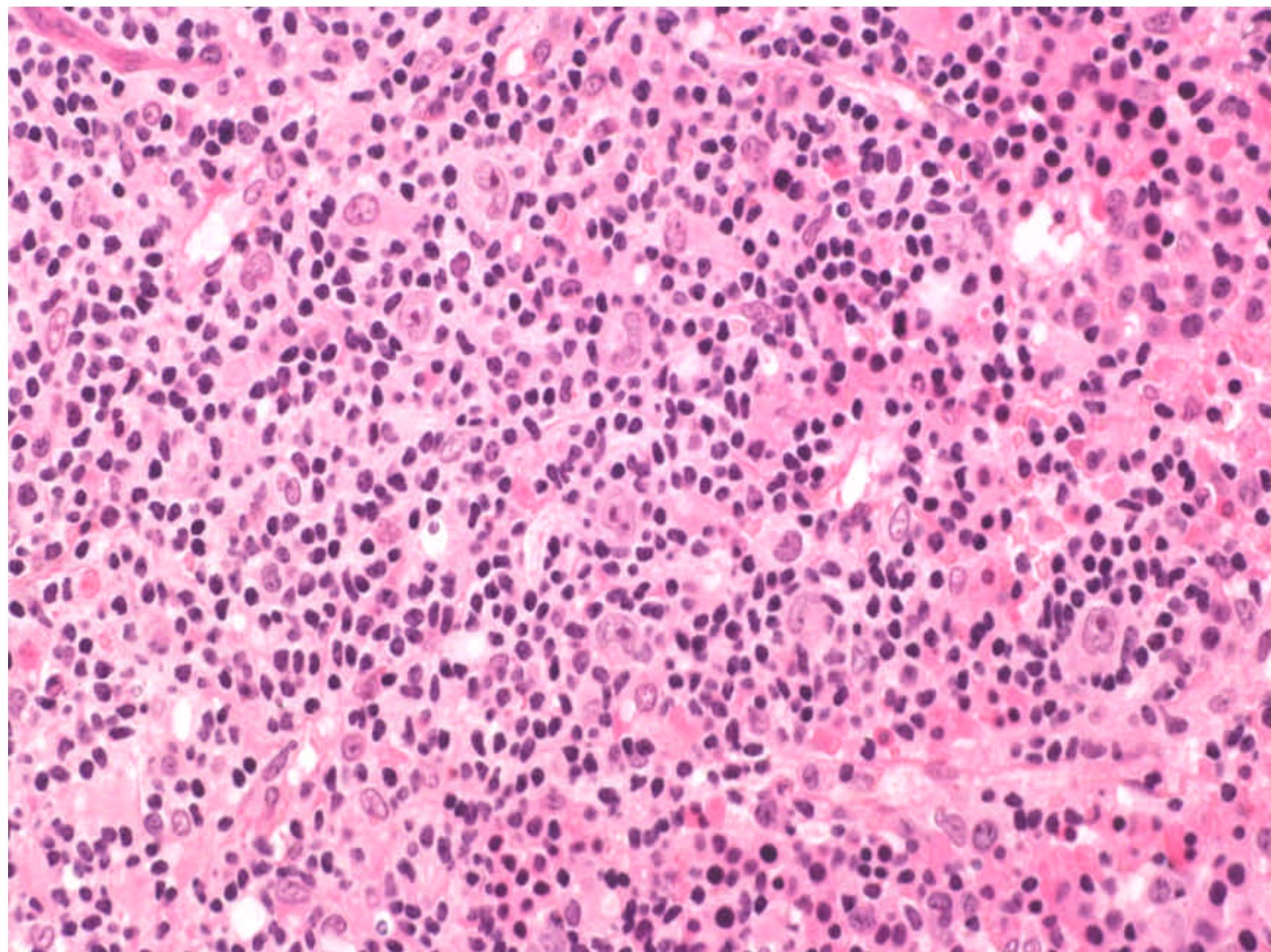
	CD79	CD20	CD23	CD10	BCL-2	BCL-6	CD5	CD43
LLCB	+	+ _{debil}	+/-	-	+	-	+	+
LM	+	+	-	-	+	-	+/-	+/-
LCCF	+	+	-/+	+/-	+/-	+	-	-
LZM	+	+	-	-	+	-	-	+/-
LCLP	+	+	-	-	+	-	-	+/-
LCBG	+	+	-/+	-/+	+/-	+/-	-/+	-/+
L.Burkitt	+	+	-	+	-	+	-	+

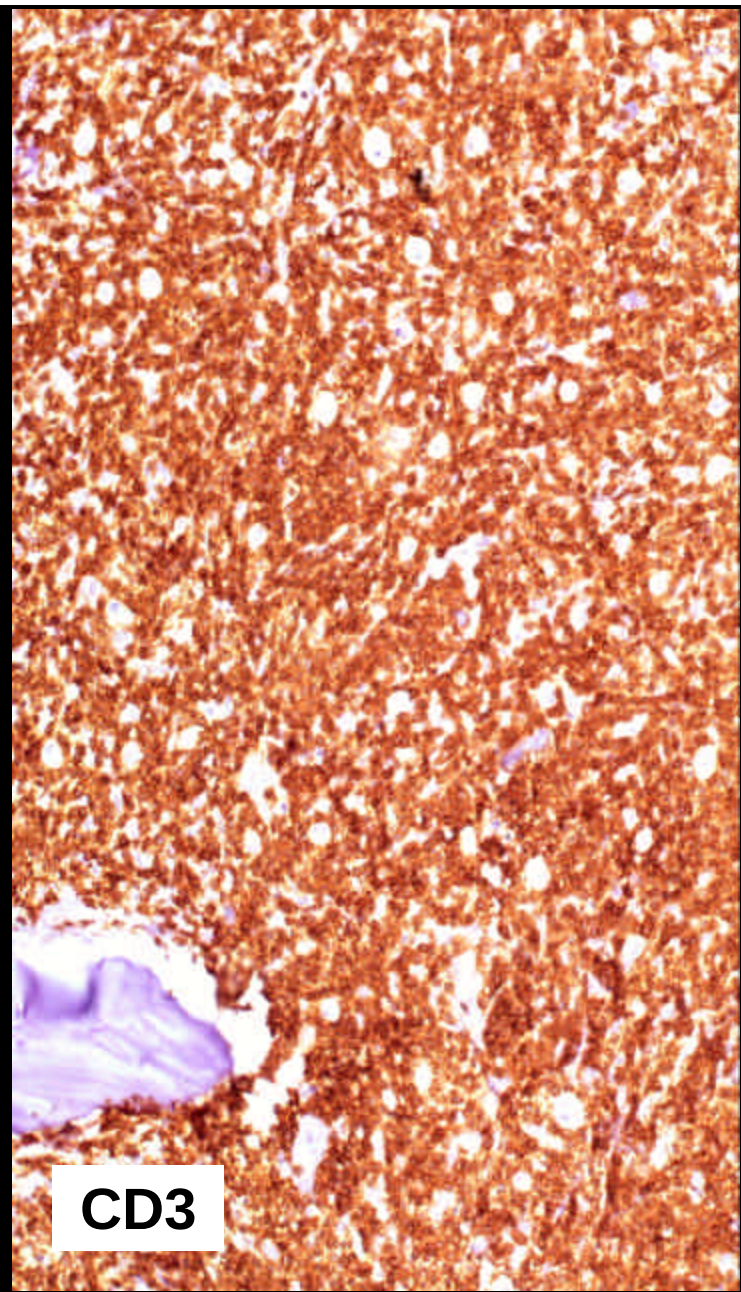
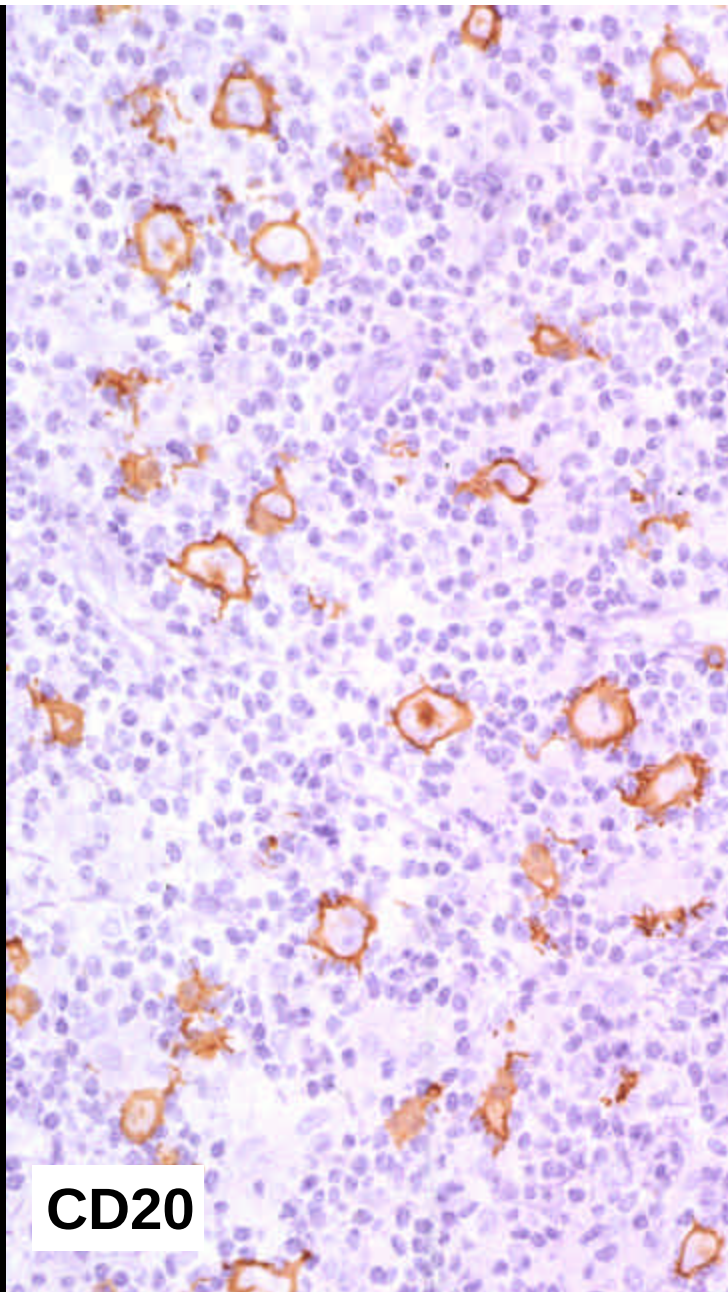
DISCREPANCIAS ENTRE LA MORFOLOGIA DEL LINFOMA EN EL GANGLIO LINFATICO Y EN LA MEDULA OSEA

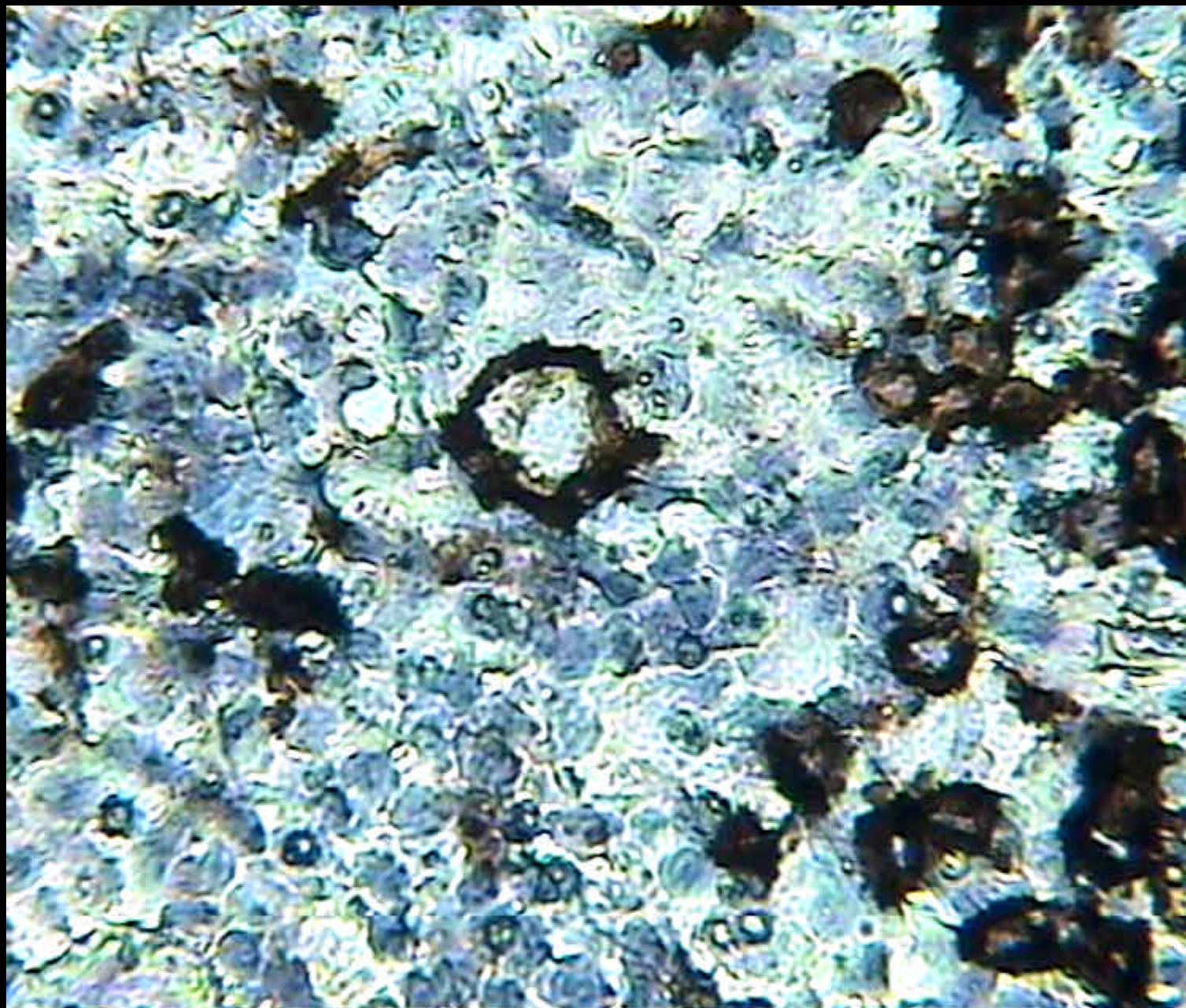
GANGLIO LINFATICO	MEDULA OSEA
Linfoma folicular	Infiltrados de centrocitos
Linfoma de cel B grande	

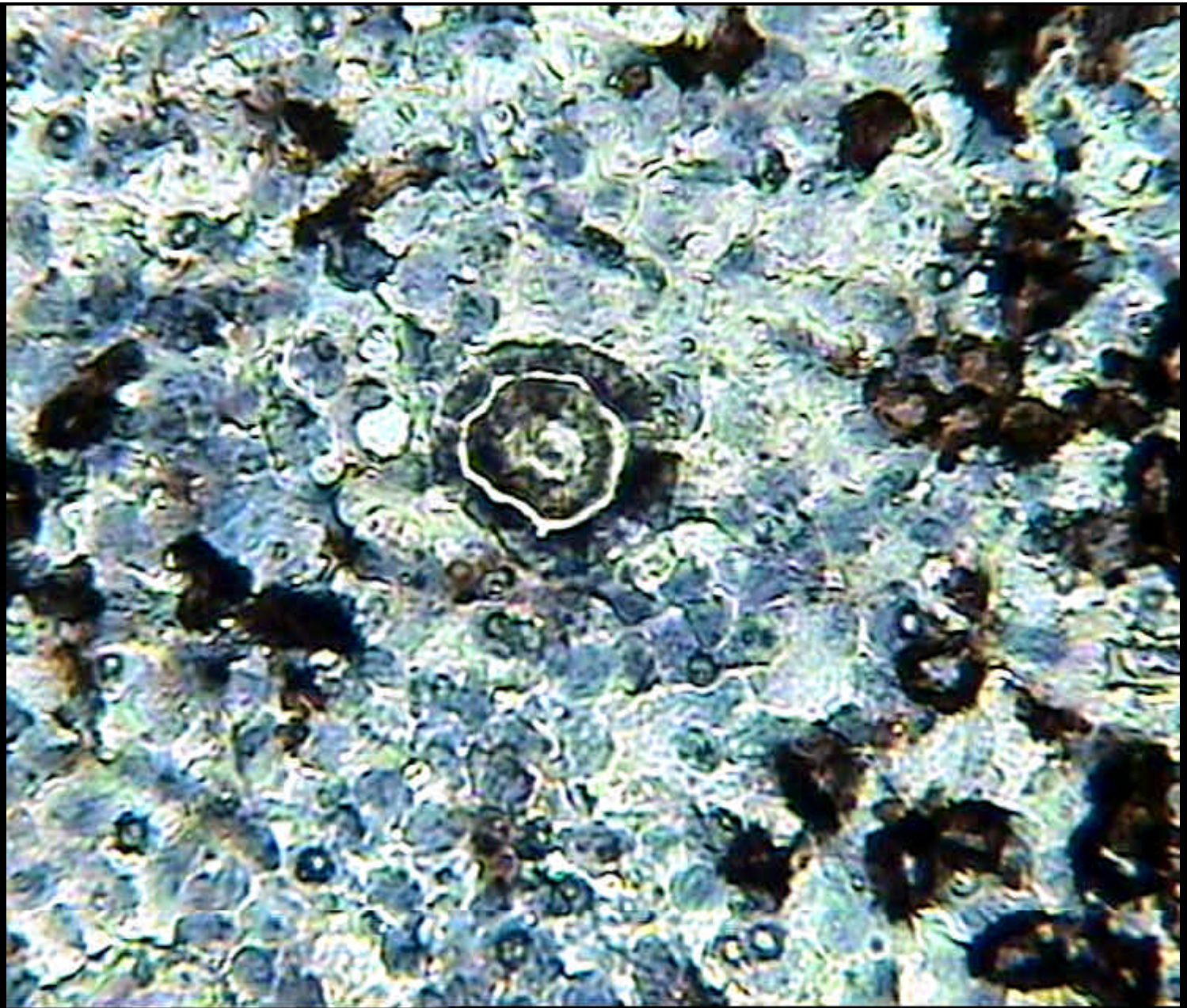


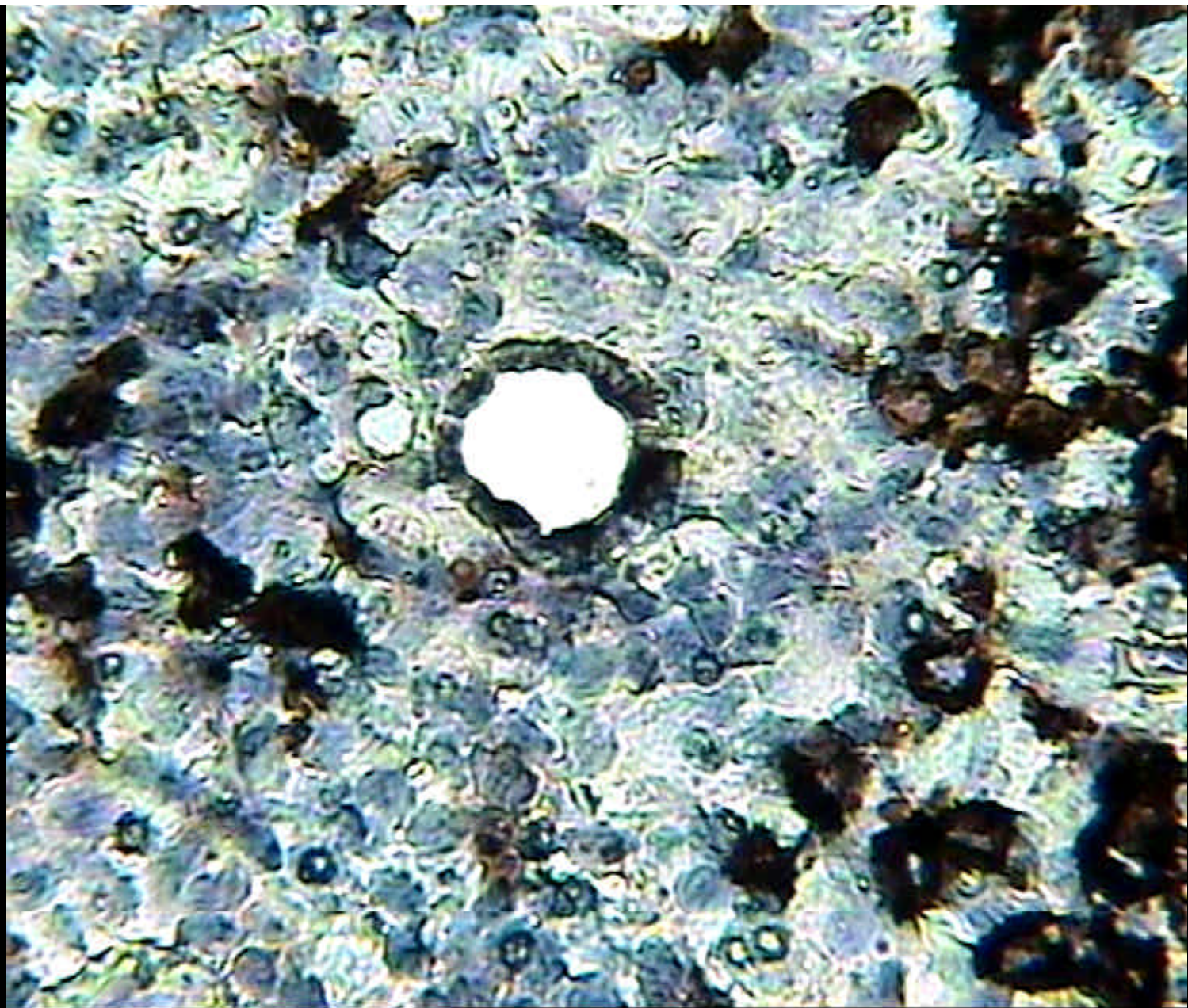


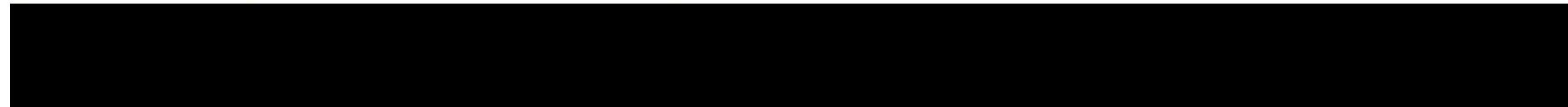
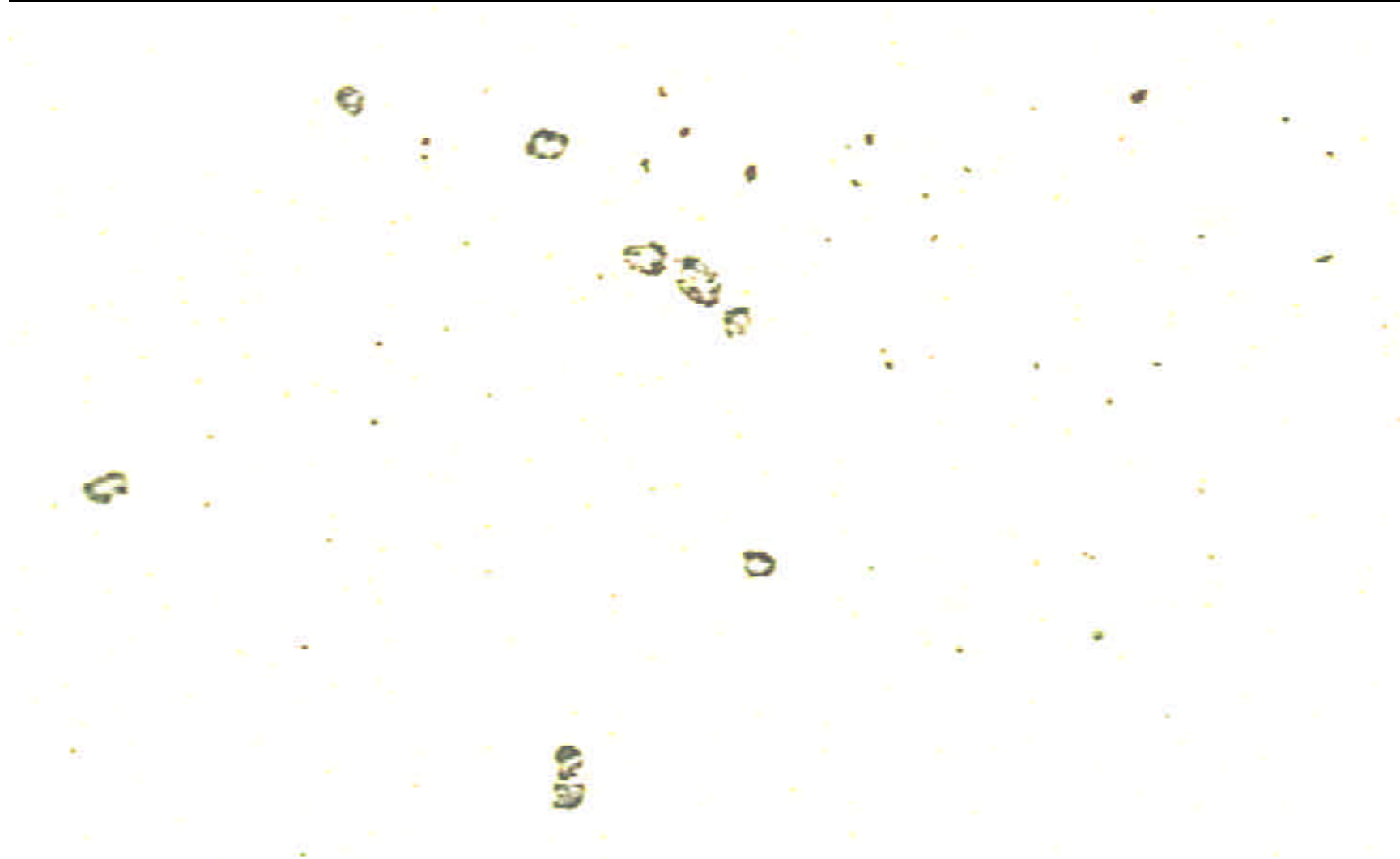










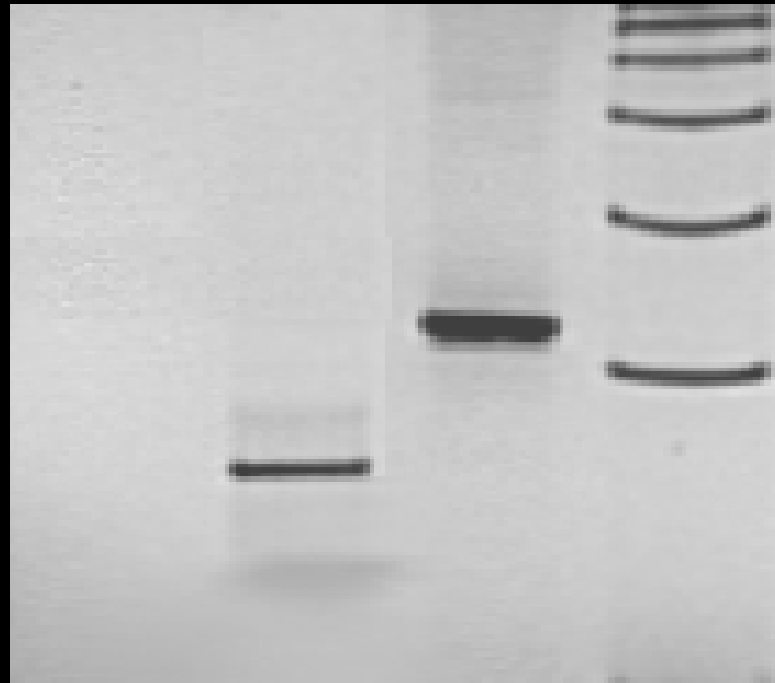


1

2

3

M





- **LINFOMAS B**
- **LINFOMAS T**
- **LINFOMA DE HODGKIN**

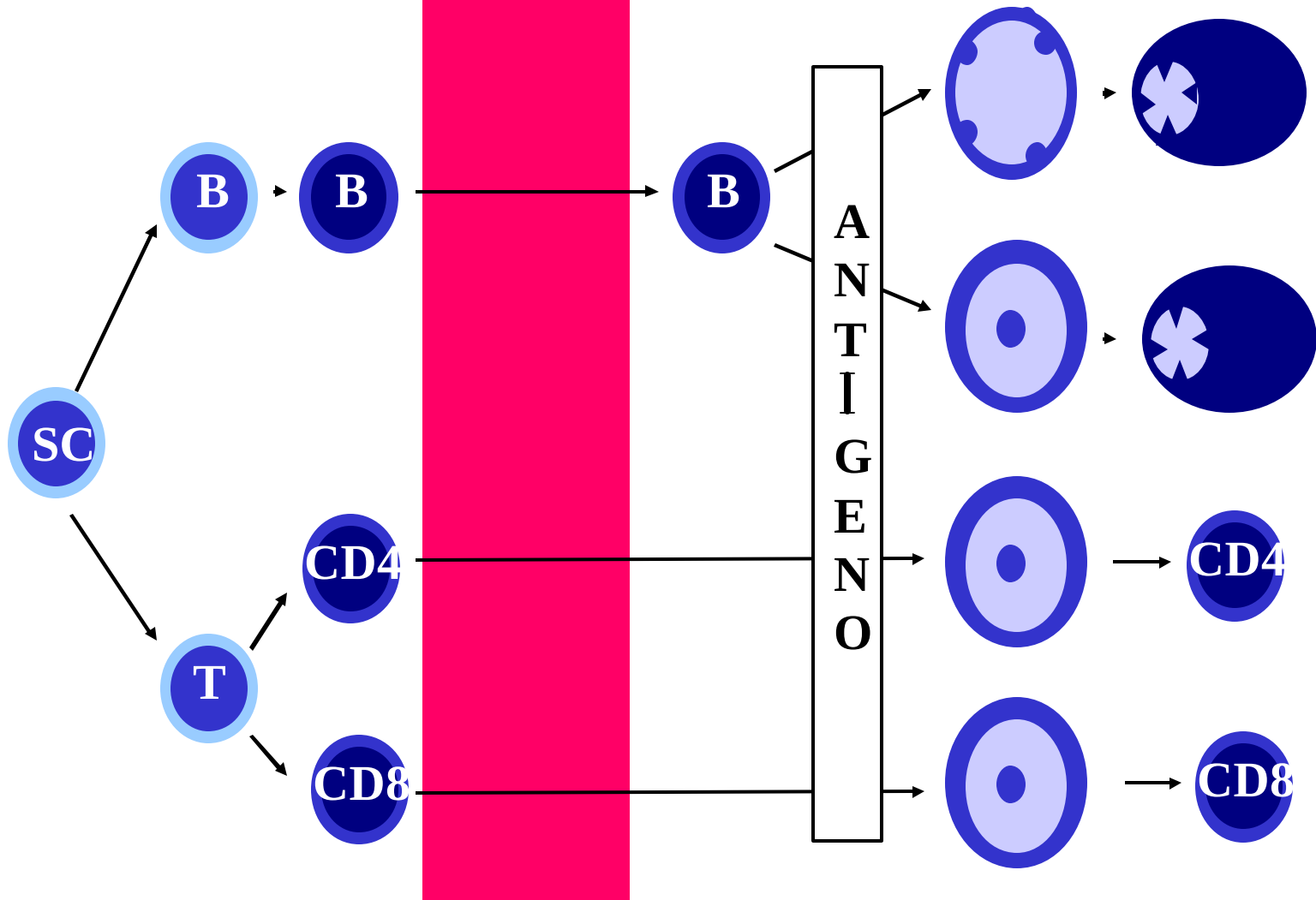
L T FRECUENCIA DE AFECTACIÓN

??? Hepatoesplénico	100%
T periférico no especificado	50-80%
Angioinmunoblástico	50-80%
Linfoblástico	50-60%
Micosis fungoides	25%
Anaplásico células grandes	20%

O. L. PRIMARIOS

SANGRE

O. L. SECUNDARIOS

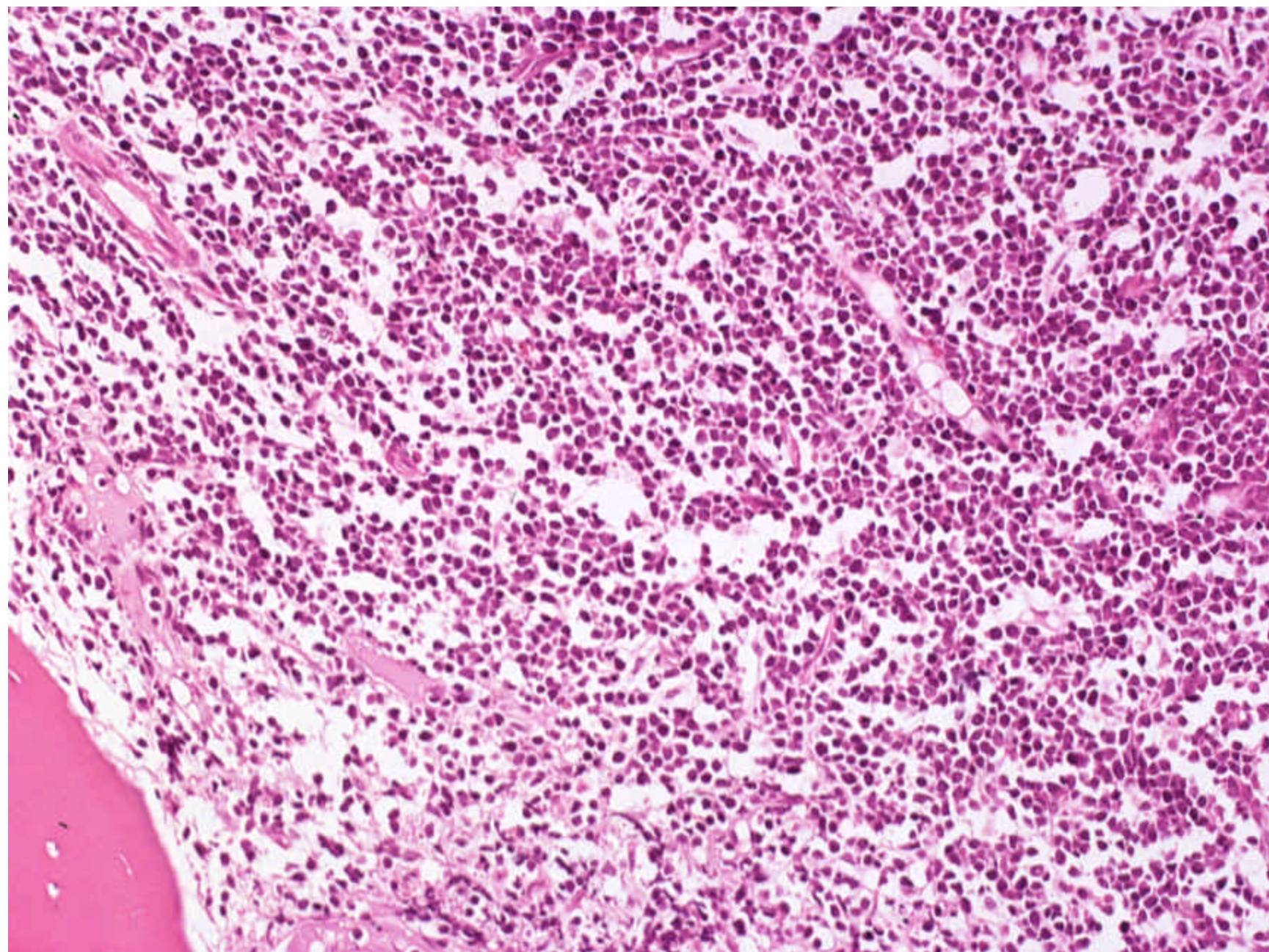


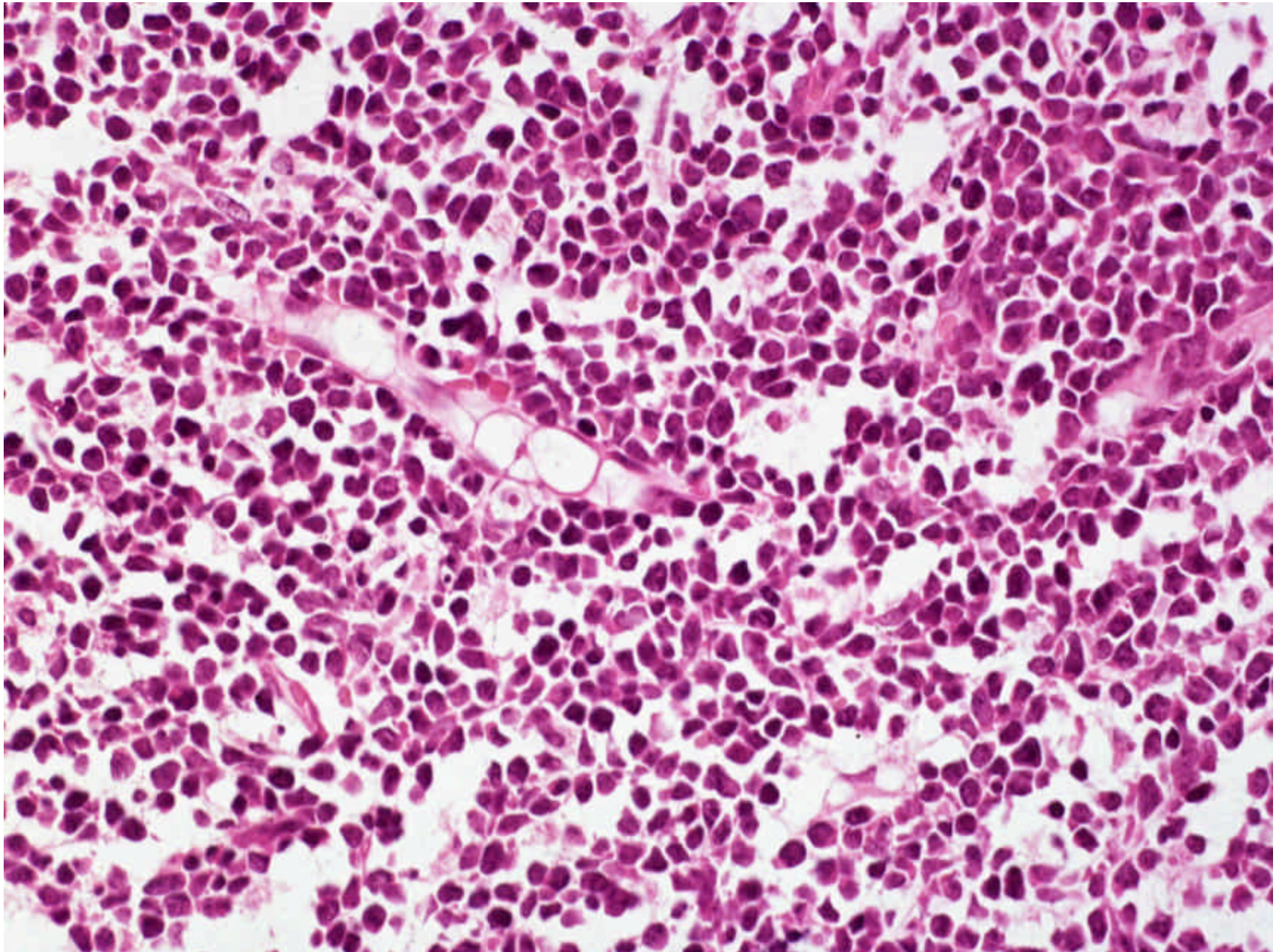
L. C. Precursoras

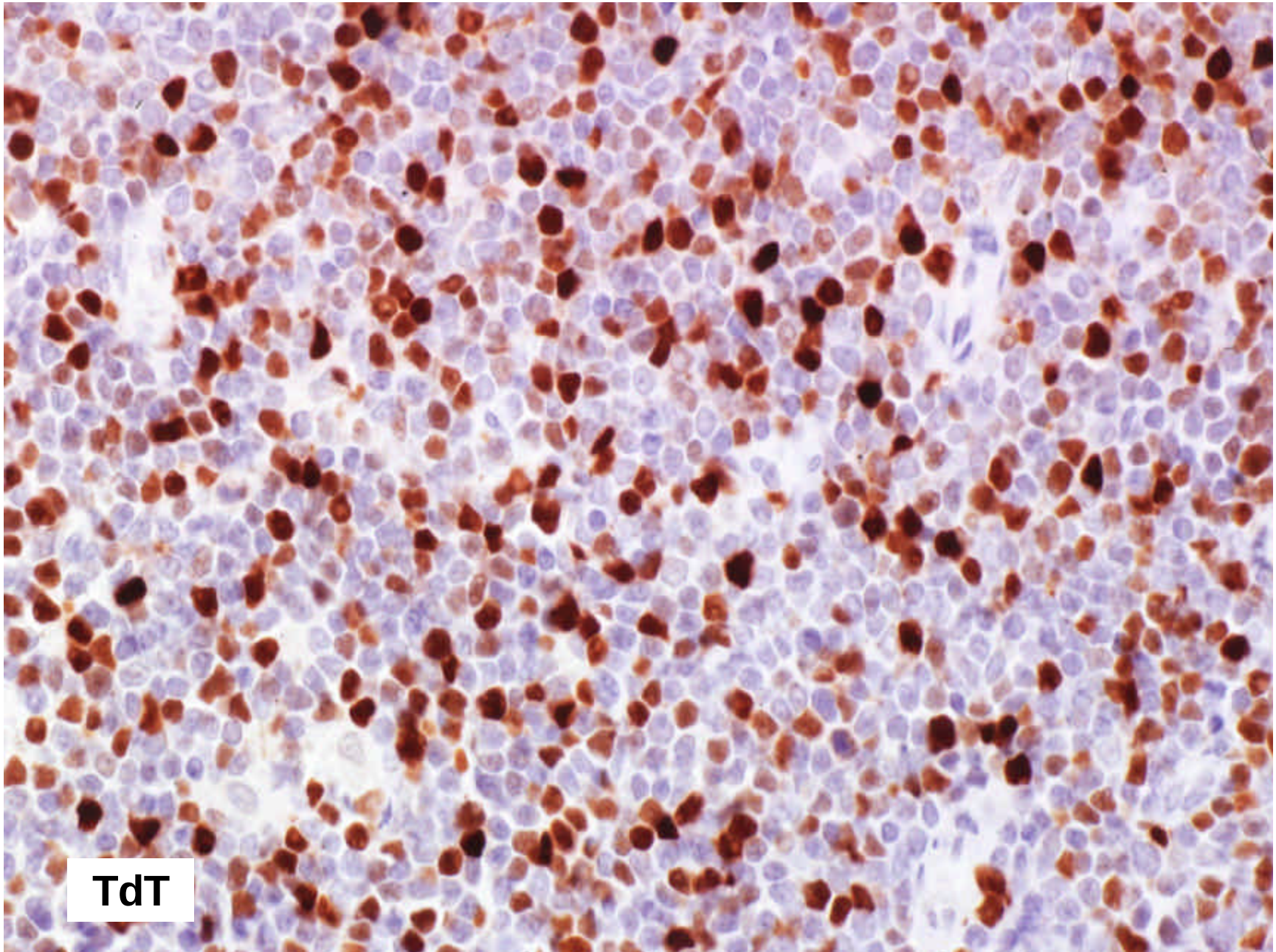
L. C. Periféricas

L T PATRONES DE INFILTRACION

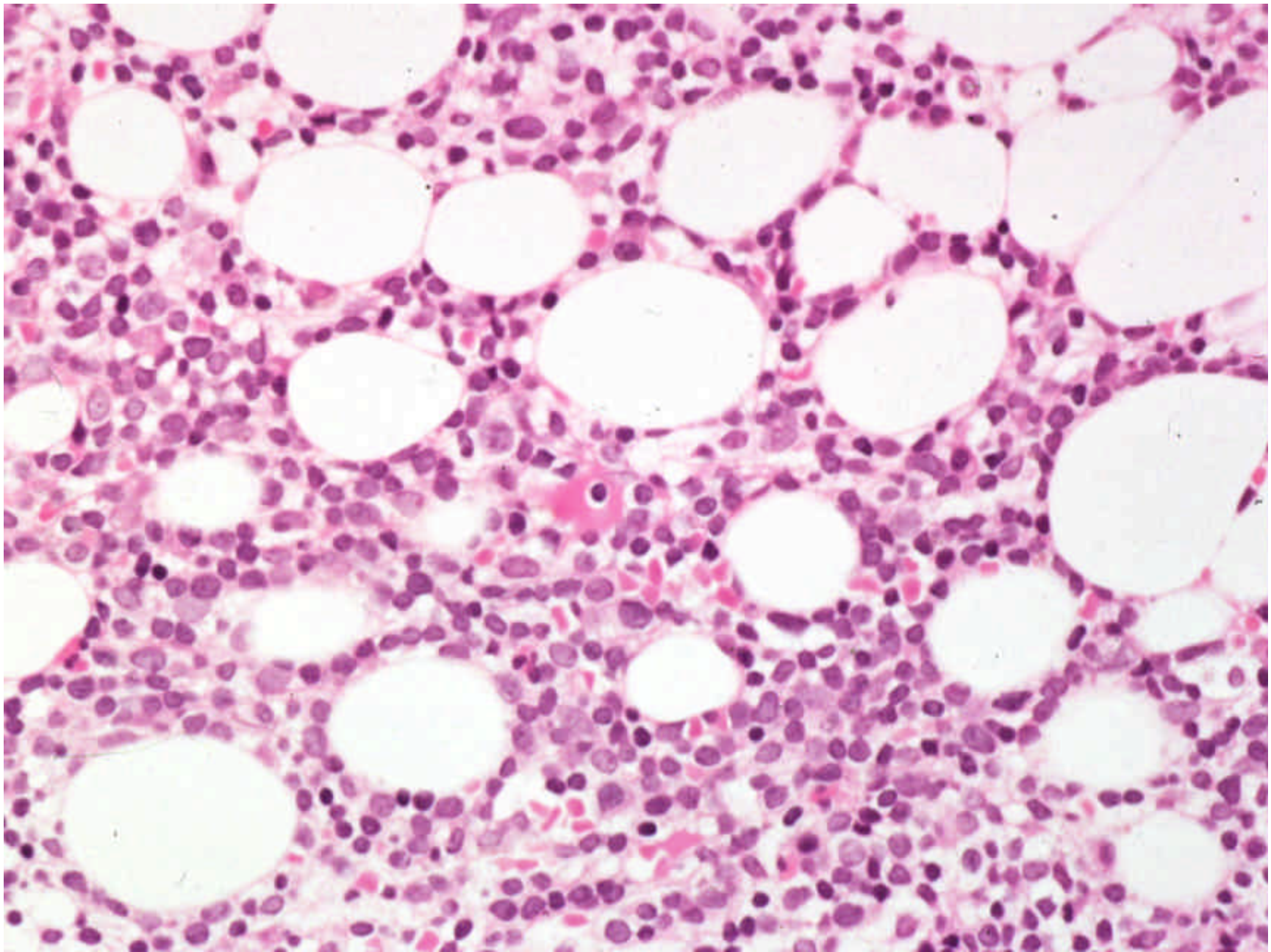
??? Hepatoesplénico	IS
T periférico no especificado	FA, D
Angioinmunoblástico	FA, D
Linfoblástico	INT, D
Micosis fungoides	FA, D
Anaplásico células grandes	FA, INT*, D

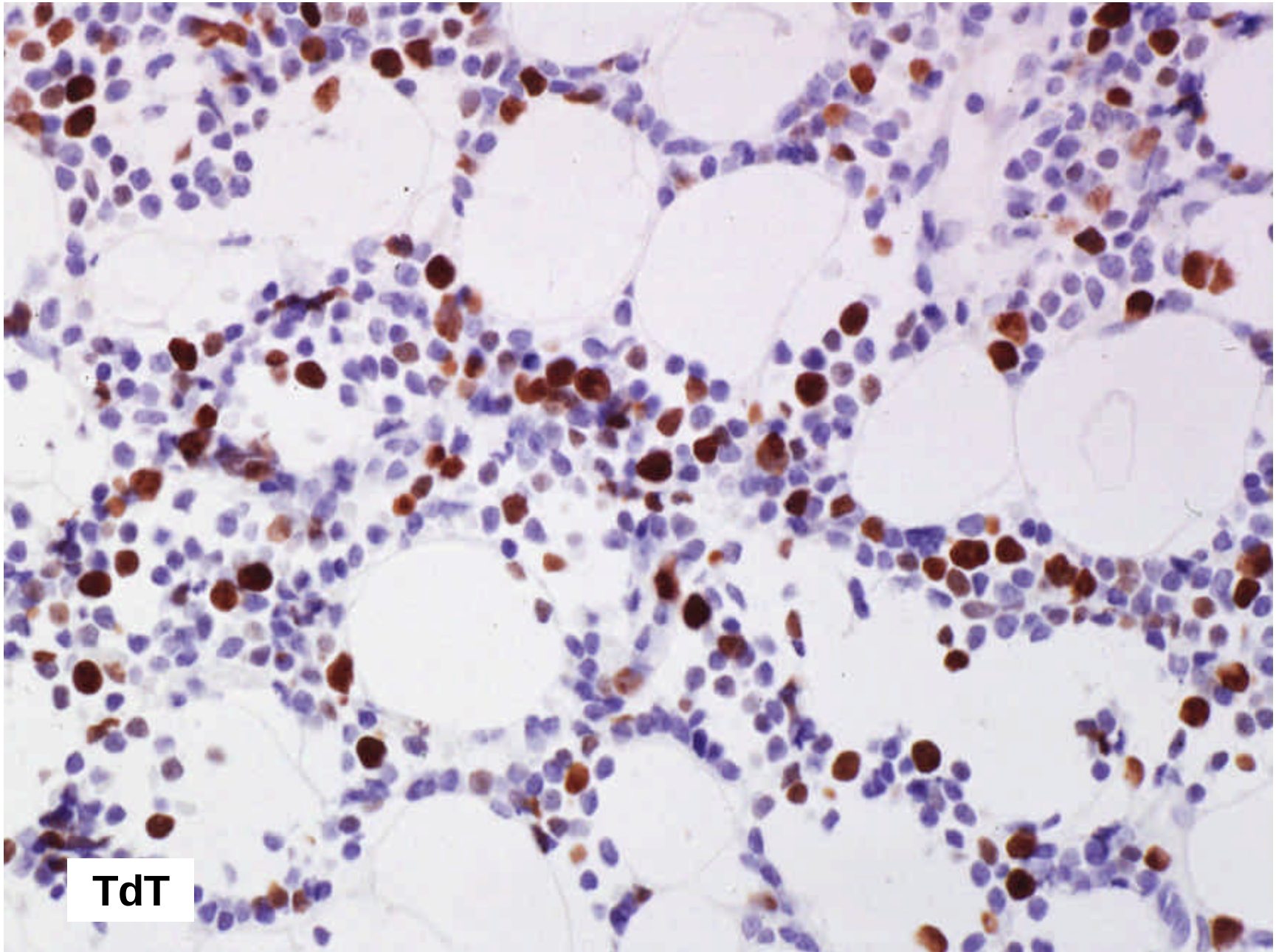






TdT





TdT

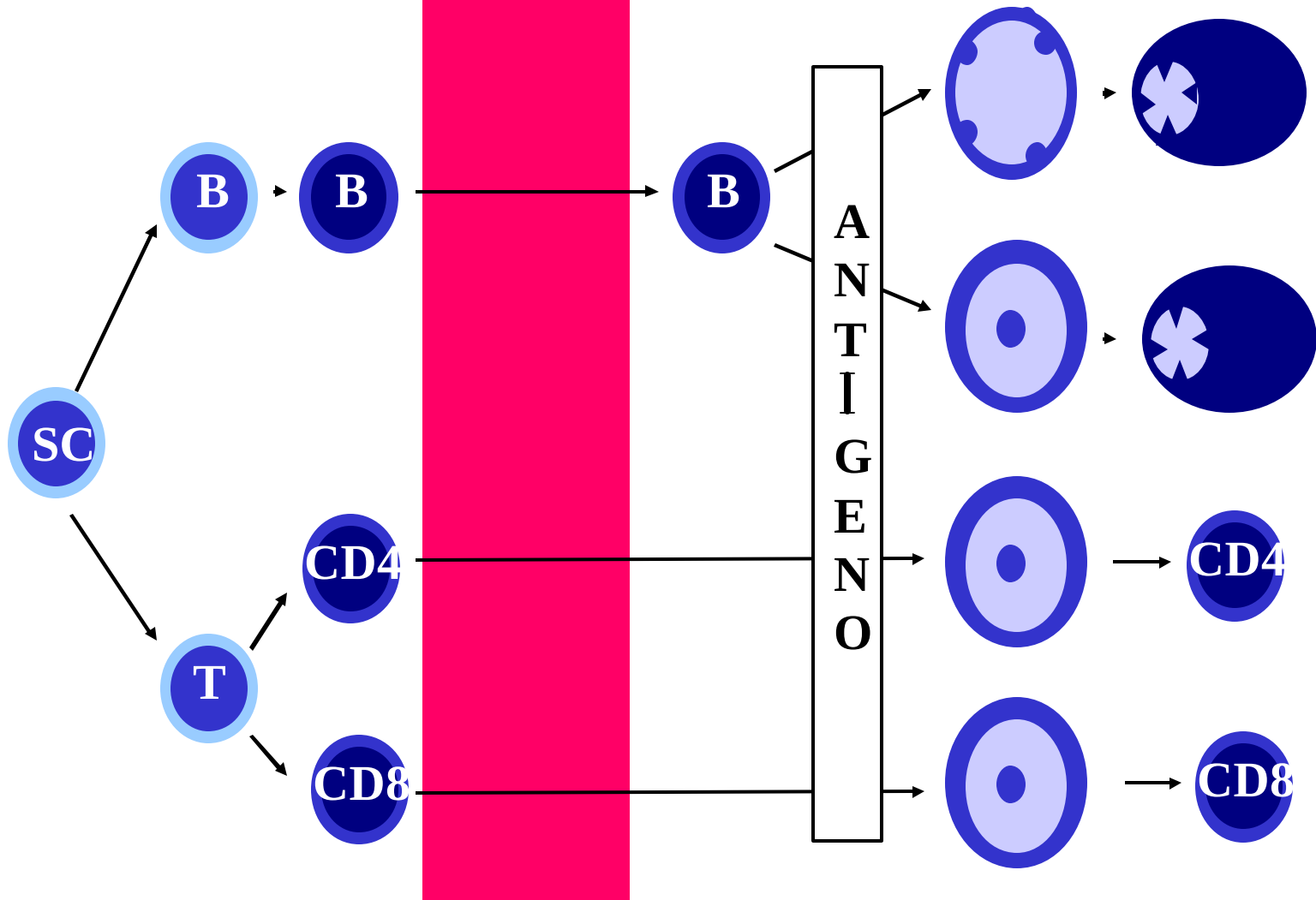
L T FRECUENCIA DE AFECTACIÓN

??? Hepatoesplénico	100%
T periférico no especificado	50-80%
Angioinmunoblástico	50-80%
Linfoblástico	50-60%
Micosis fungoides	25%
Anaplásico células grandes	20%

O. L. PRIMARIOS

SANGRE

O. L. SECUNDARIOS

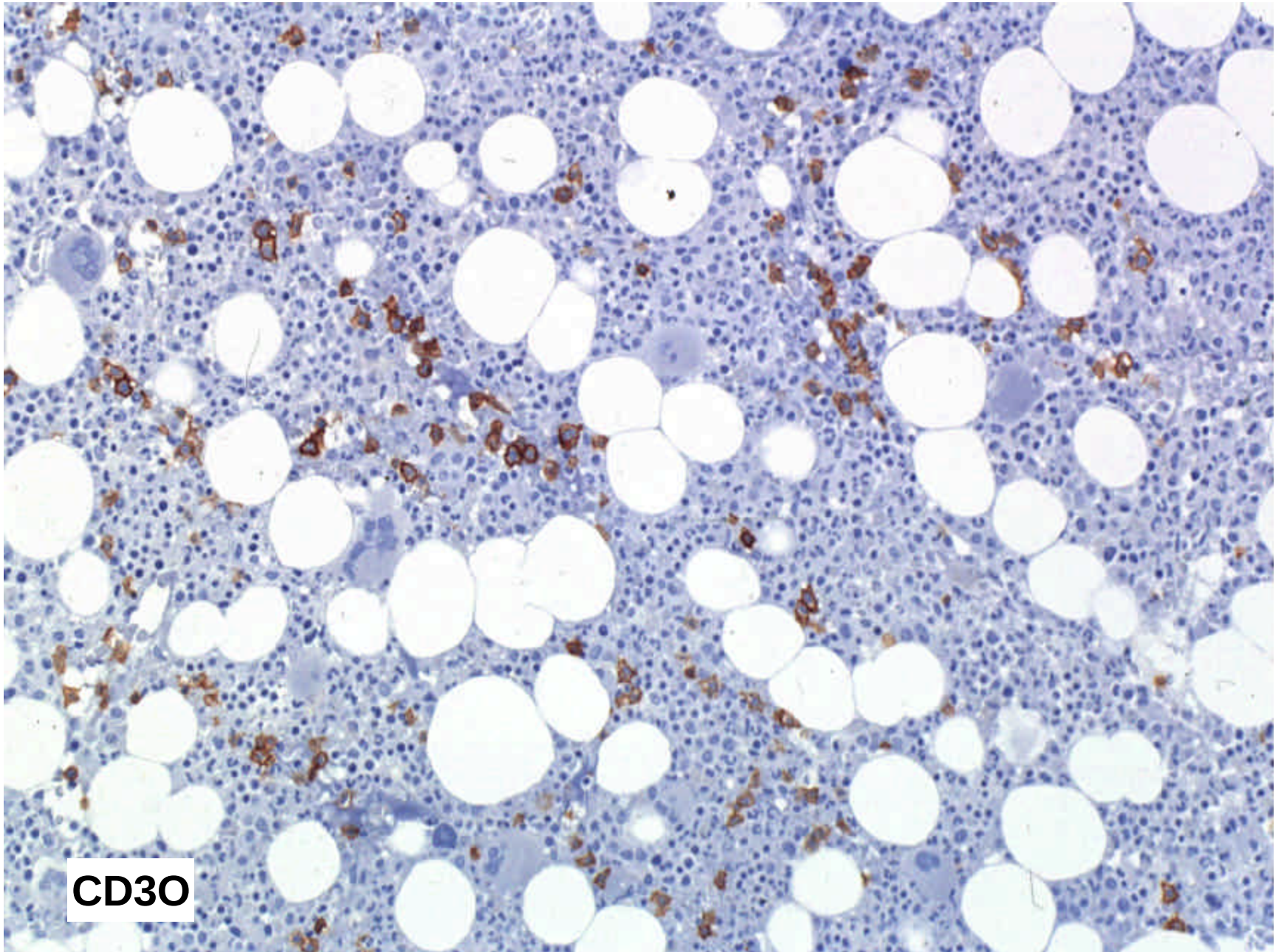


L. C. Precursoras

L. C. Periféricas

L T PATRONES DE INFILTRACION

??? Hepatoesplénico	IS
T periférico no especificado	FA, D
Angioinmunoblástico	FA, D
Linfoblástico	INT, D
Micosis fungoides	FA, D
Anaplásico células grandes	FA, INT*, D

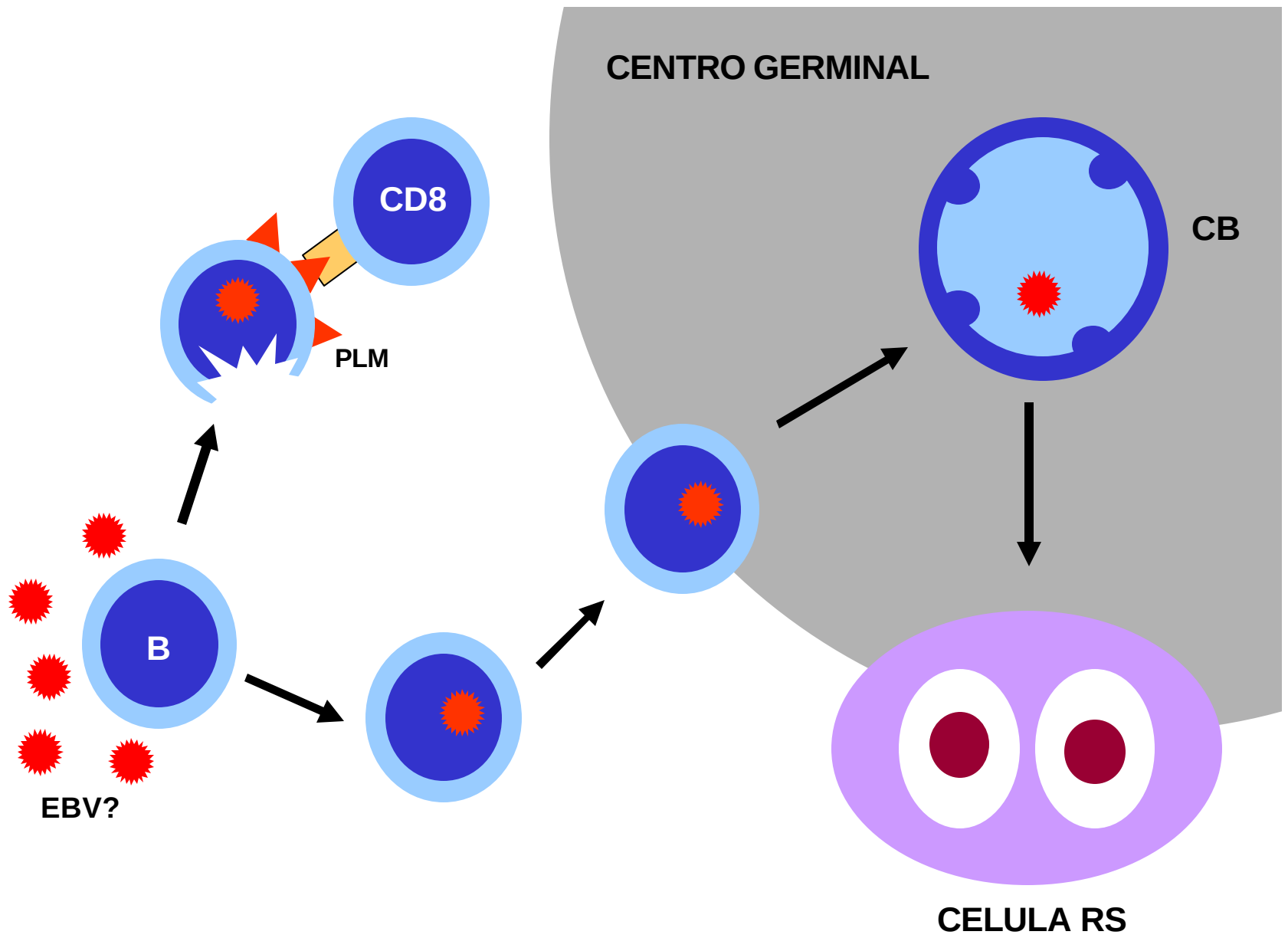


CD30

- **LINFOMAS B**

- **LINFOMAS T**

- **LINFOMA DE HODGKIN**



LINFOMA DE HODGKIN

•Frecuencia de infiltración 5-10%

•Patrones de infiltración

Focal al azar 30%

Difuso 70%

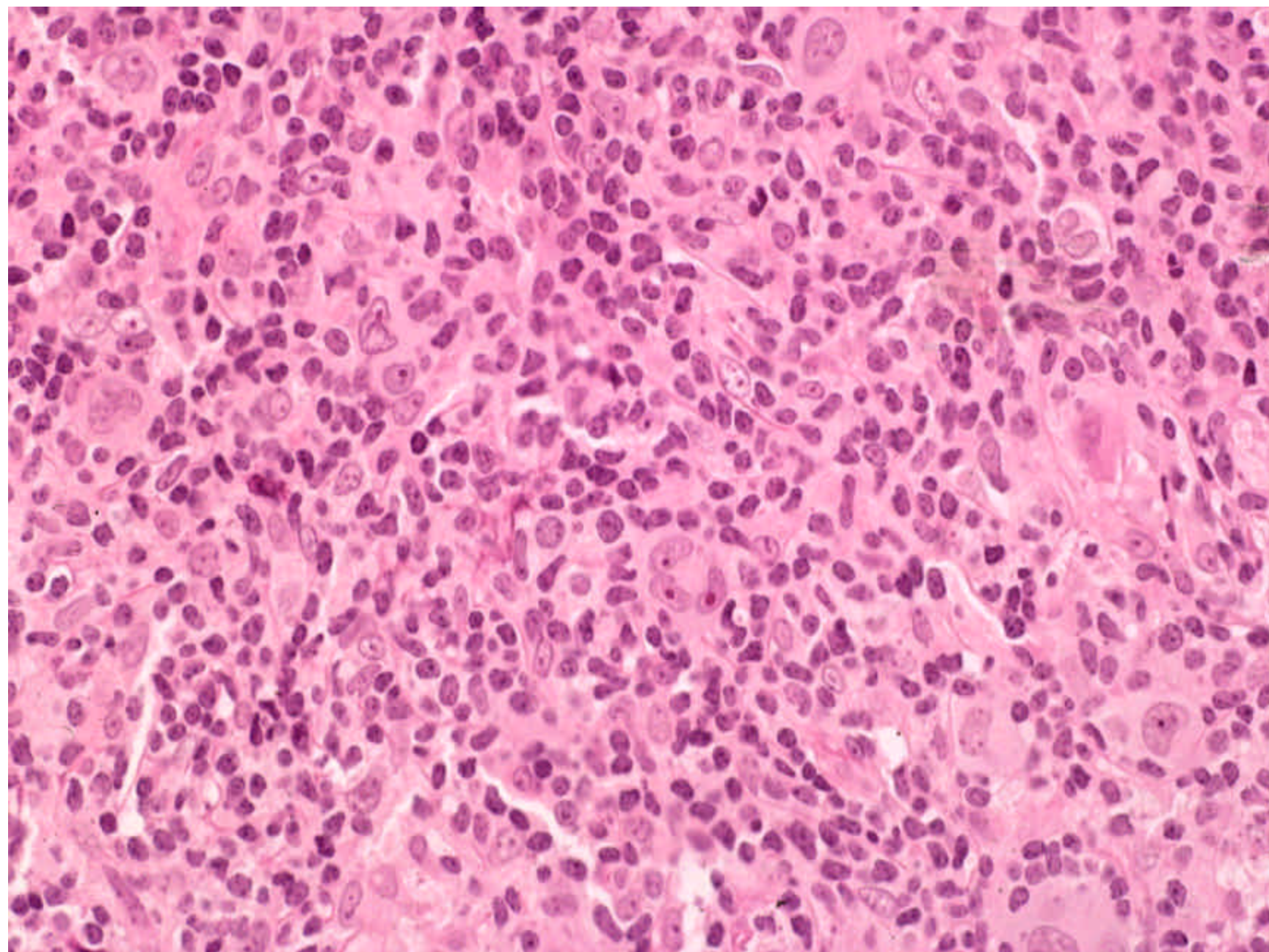
LINFOMA DE HODGKIN

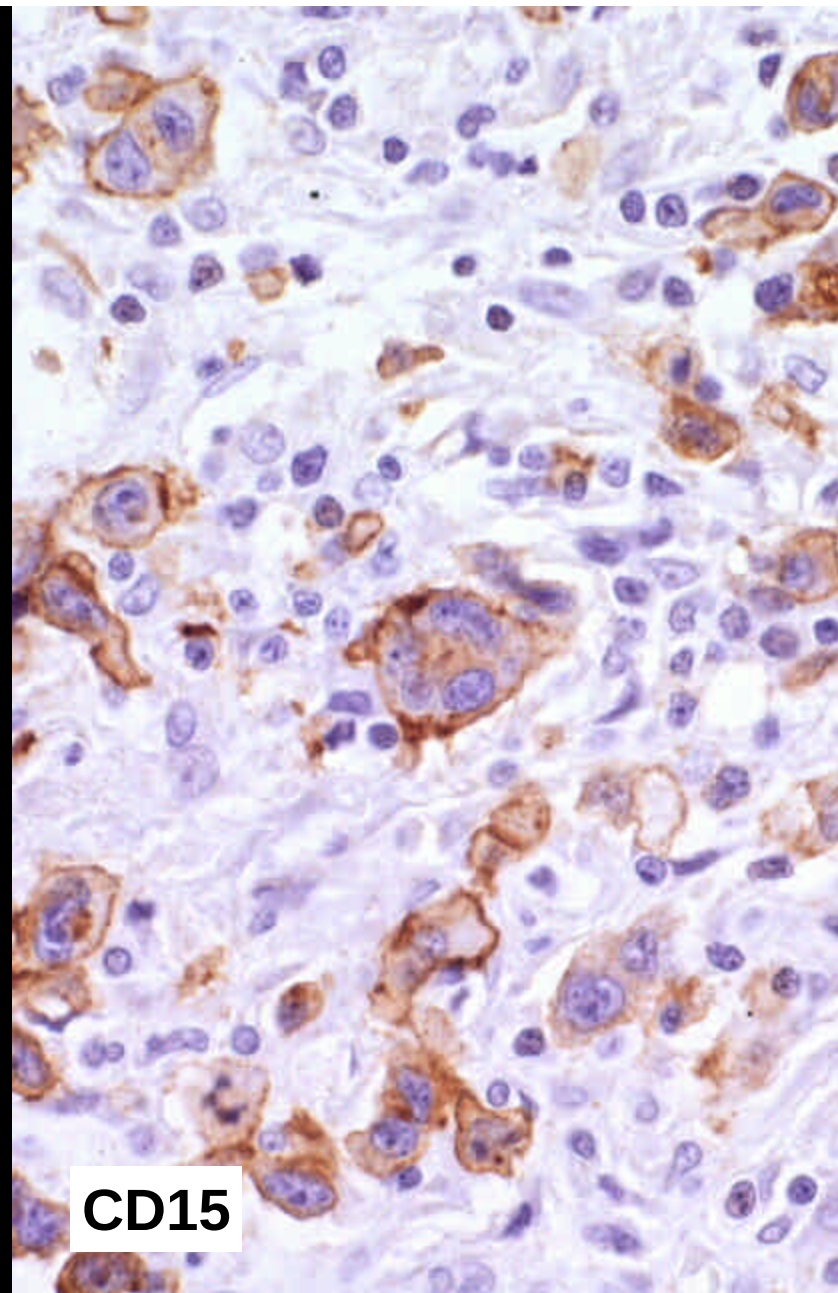
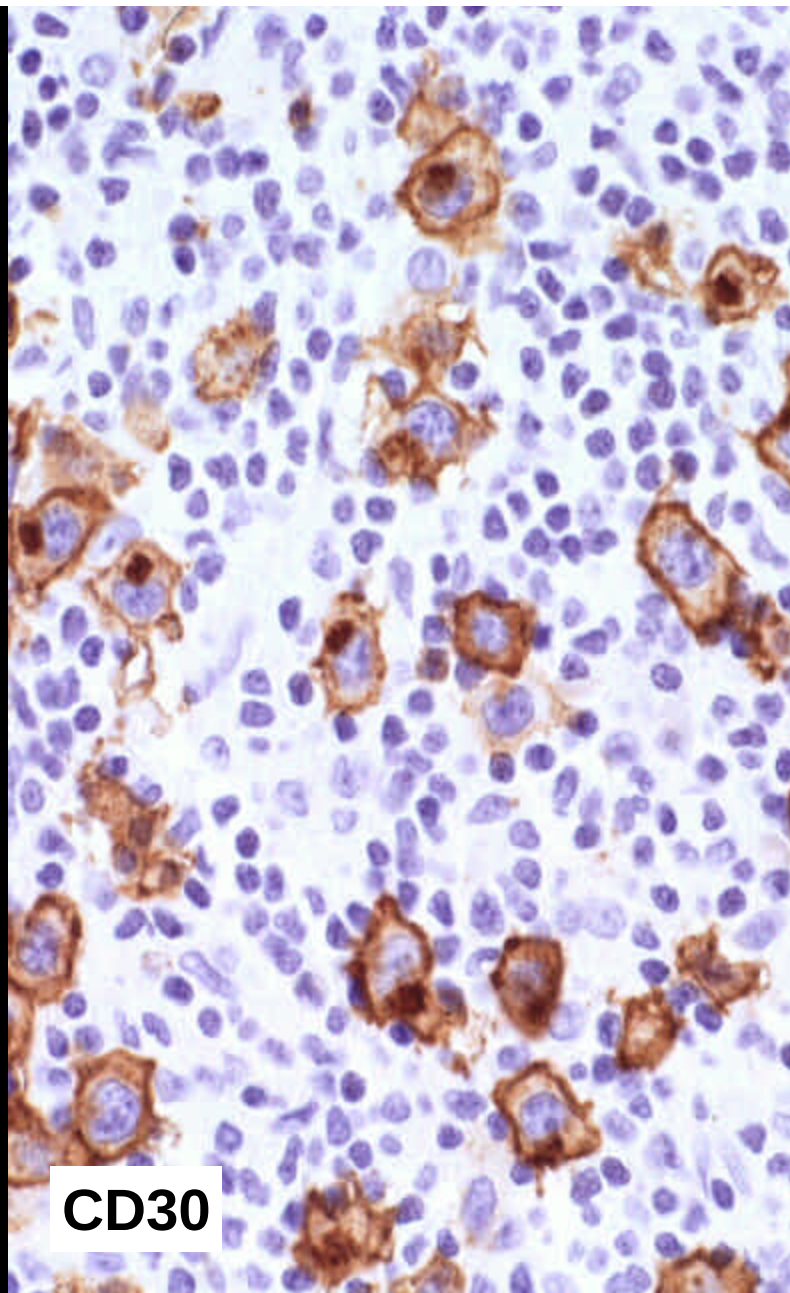
CRITERIOS DIAGNOSTICOS

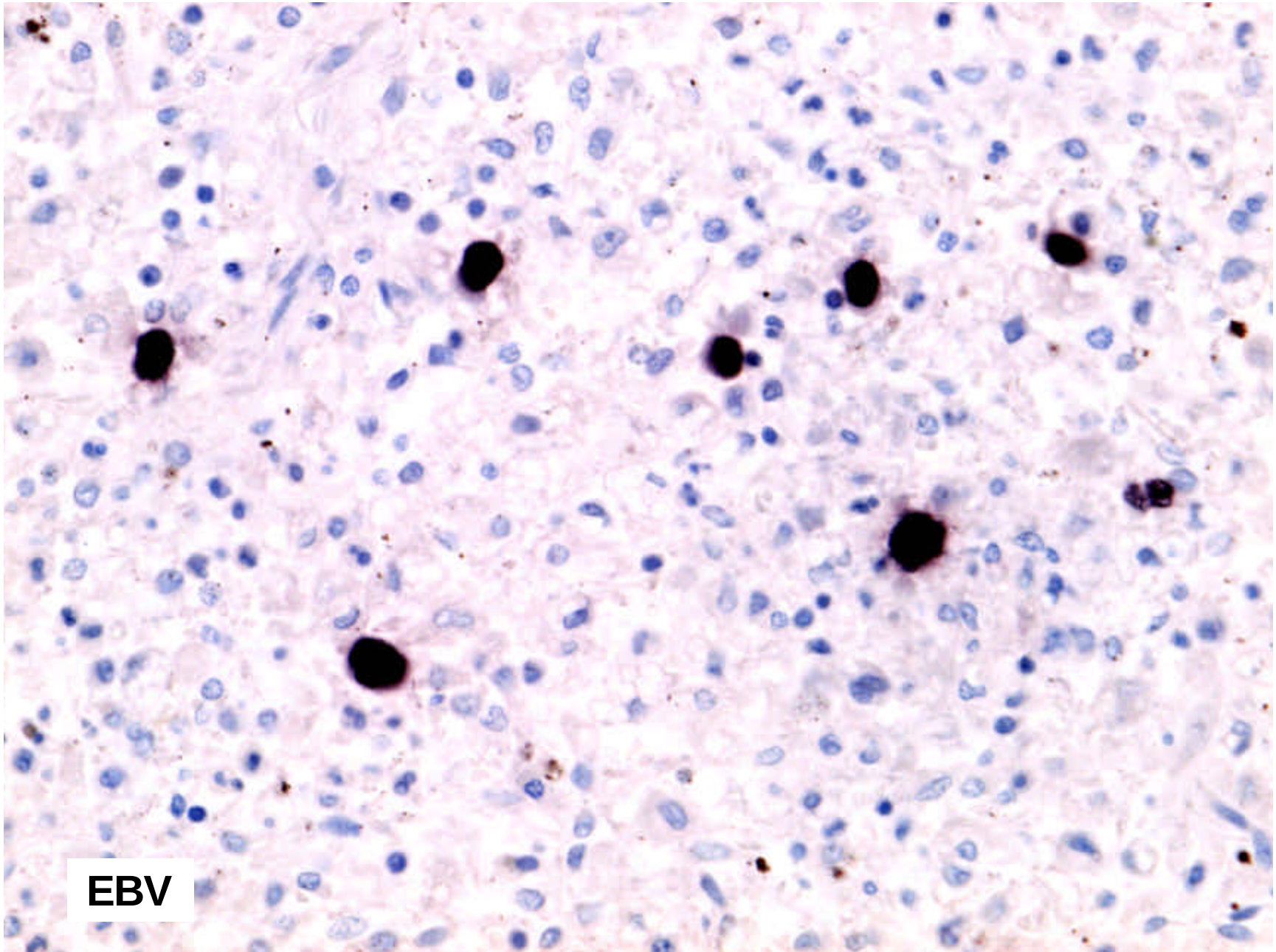
- **Células RS diagnósticas en un contexto característico**
- **Variantes mononucleares de la célula RS en un contexto característico, si el enfermo ya ha sido diagnosticado**

CRITERIOS DE SOSPECHA

- **Células atípicas en un contexto característico, si el enfermo ya ha sido diagnosticado**
- **Focos de fibrosis, si el enfermo ya ha sido diagnosticado**







EBV

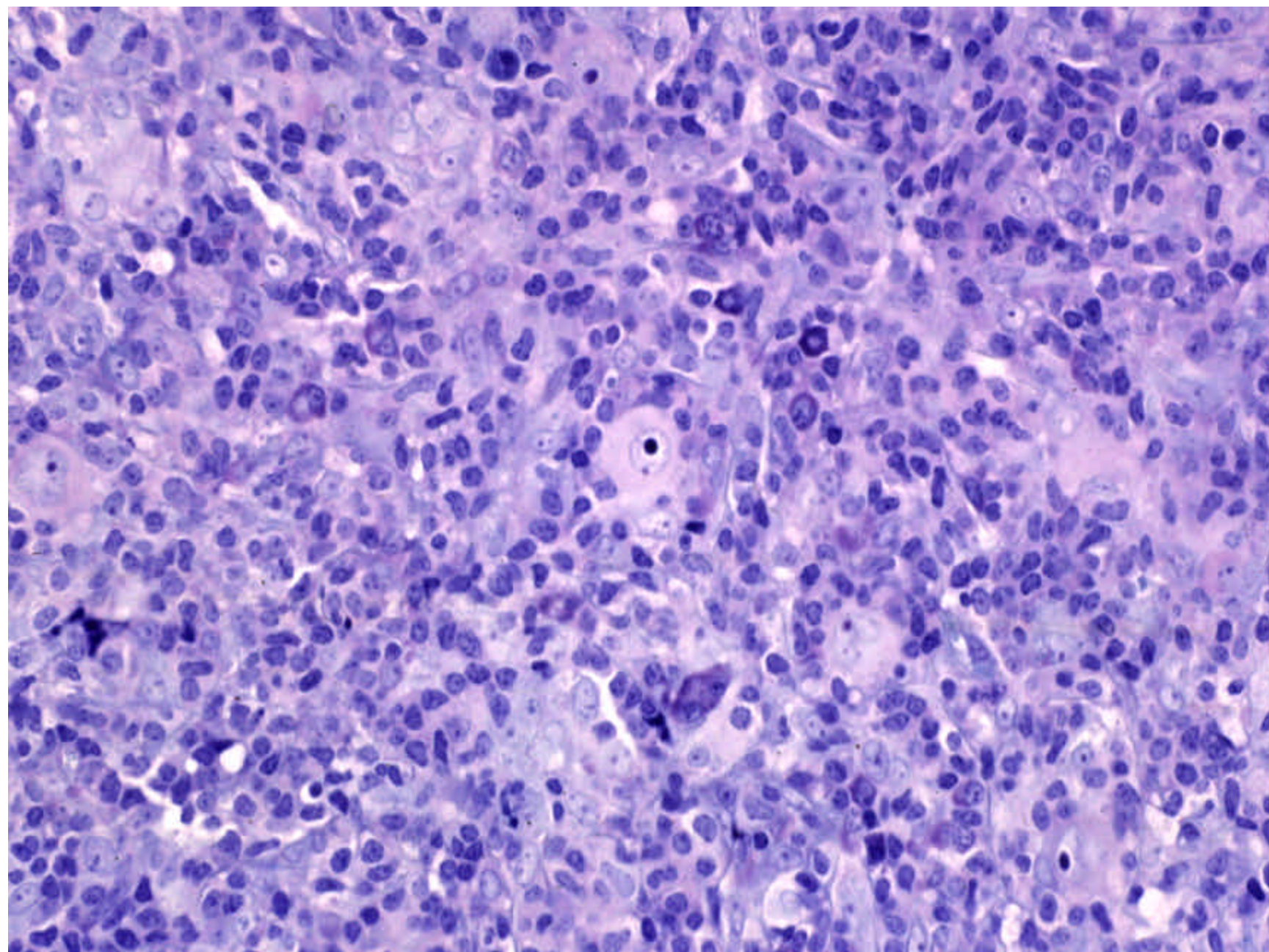
LINFOMA DE HODGKIN

CRITERIOS DIAGNOSTICOS

- Células RS diagnósticas en un contexto característico
- Variantes mononucleares de la célula RS en un contexto característico, si el enfermo ya ha sido diagnosticado

CRITERIOS DE SOSPECHA

- Células atípicas en un contexto característico, si el enfermo ya ha sido diagnosticado
- Focos de fibrosis, si el enfermo ya ha sido diagnosticado



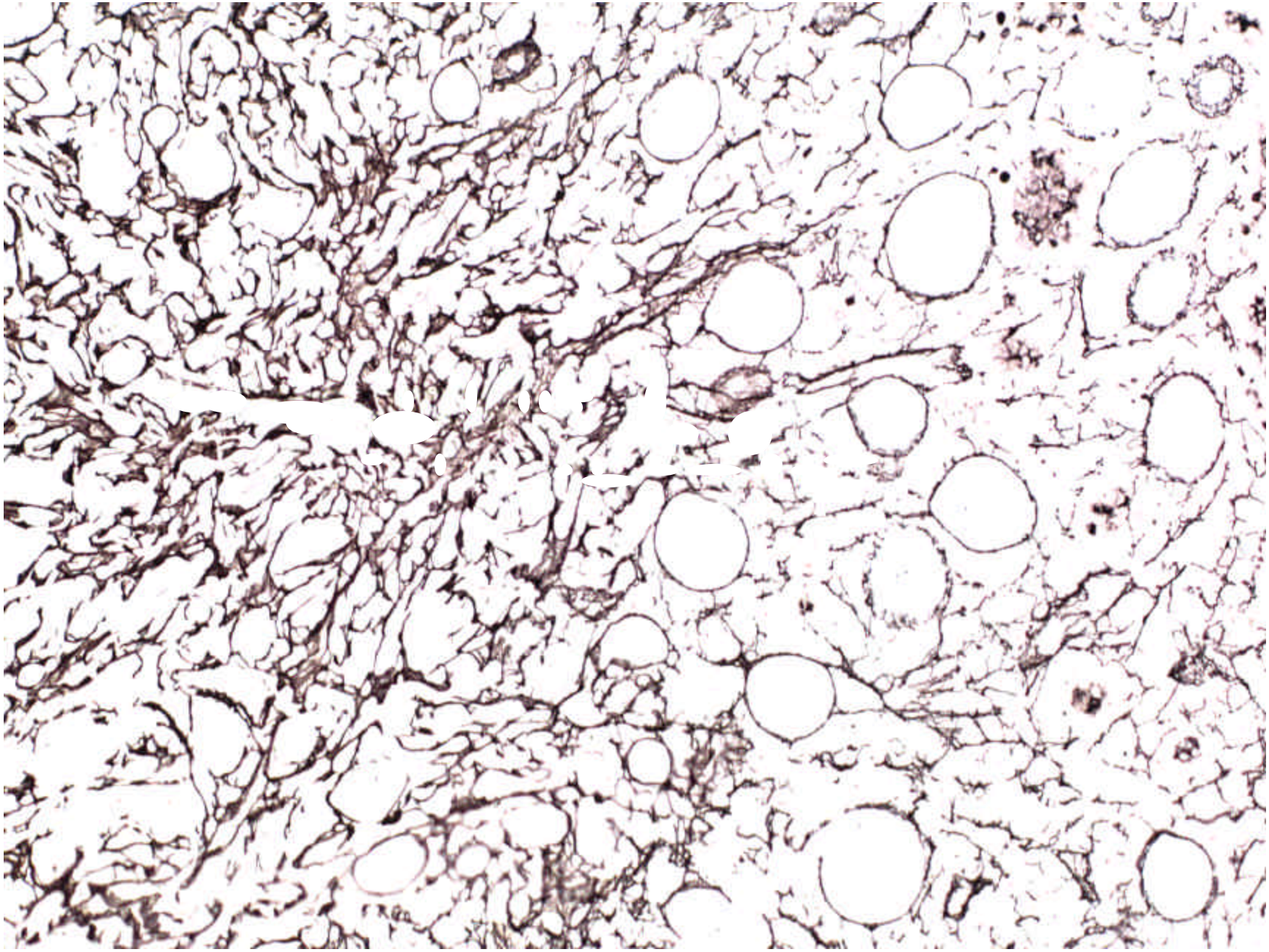
LINFOMA DE HODGKIN

CRITERIOS DIAGNOSTICOS

- **Células RS diagnósticas en un contexto característico**
- **Variantes mononucleares de la célula RS en un contexto característico, si el enfermo ya ha sido diagnosticado**

CRITERIOS DE SOSPECHA

- **Células atípicas en un contexto característico, si el enfermo ya ha sido diagnosticado**
- **Focos de fibrosis, si el enfermo ya ha sido diagnosticado**



DIAGNOSTICO DIFERENCIAL

- **Linfomas T periféricos**
- **Linfoma B rico en en células T**

LESIONES INESPECÍFICAS

- **Hiperplasia granulocítica**
- **Eosinofilia**
- **Hiperplasia megacariocítica**
- **Plasmocitosis**
- **Granulomas**

“TAKE HOME LESSONS”

INFILTRADOS LINFOIDES

- **Si son paratabeculares**
- **Si son difusos**

INFILTRADOS INTERSTICIALES

- Si son extensos**
- Si se asocian a aumento de la reticulina**
- Si son de predominio B (en adultos)**
- Si expresan: CD34, CD10, TDT, CD23, BCL6, Ciclina D1, p53, BCL10(Nuclear)**
- Si son CD79+ y coexpresan CD5 y/o CD43**

NODULOS LINFOIDES

- **Si son de gran tamaño (no en HIV+)**
- **Si son numerosos**
- **Si estan mal delimitados**
- **Si expresan: CD10 y BCL2; CD23, CD5 y CD43; BCL10 (nuclear); Ciclina D1**
- **Si son CD79+ y coexpresan CD5 y/o CD43**

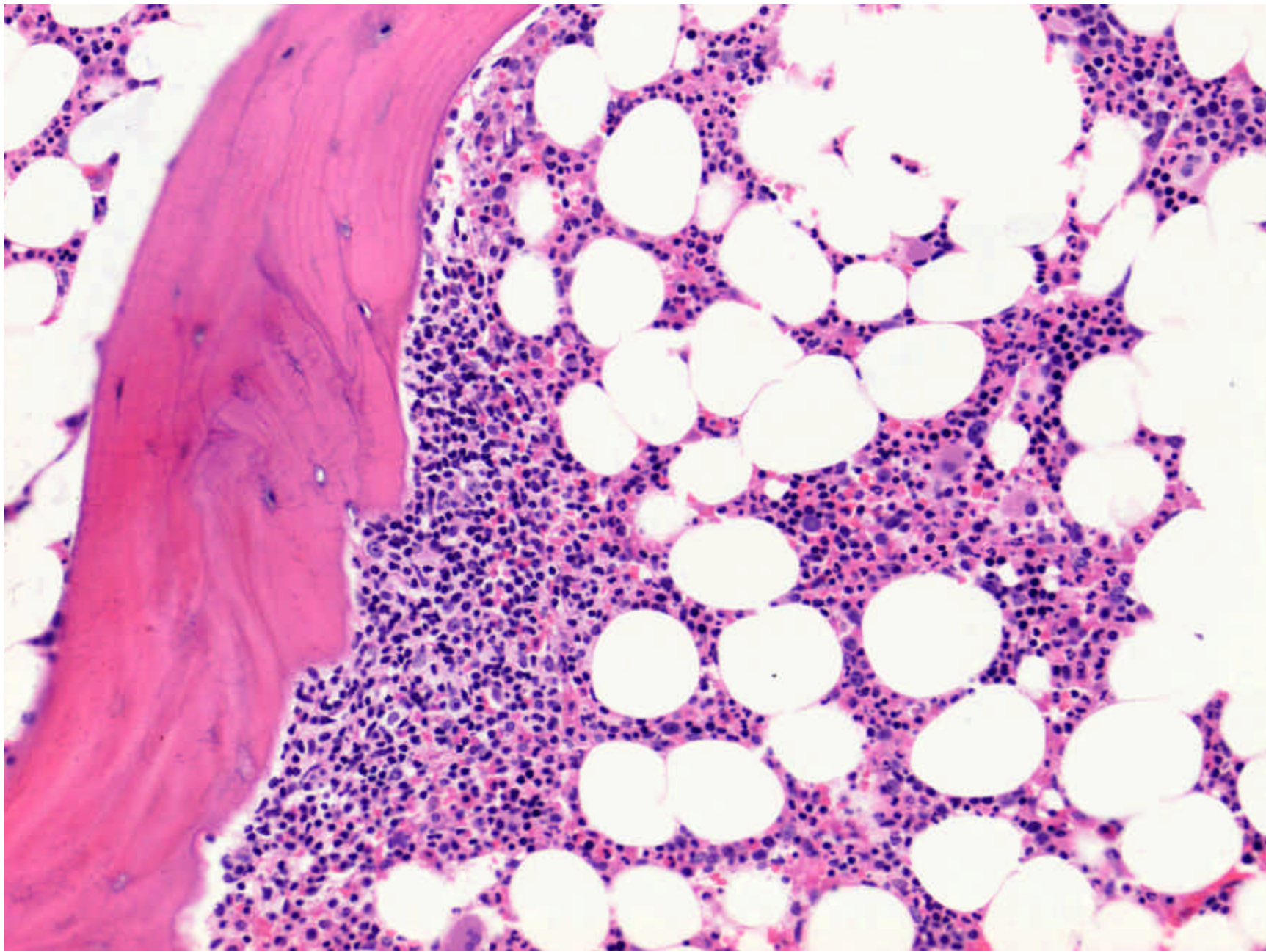
EVALUACION TRAS LA QUIMIOTERAPIA

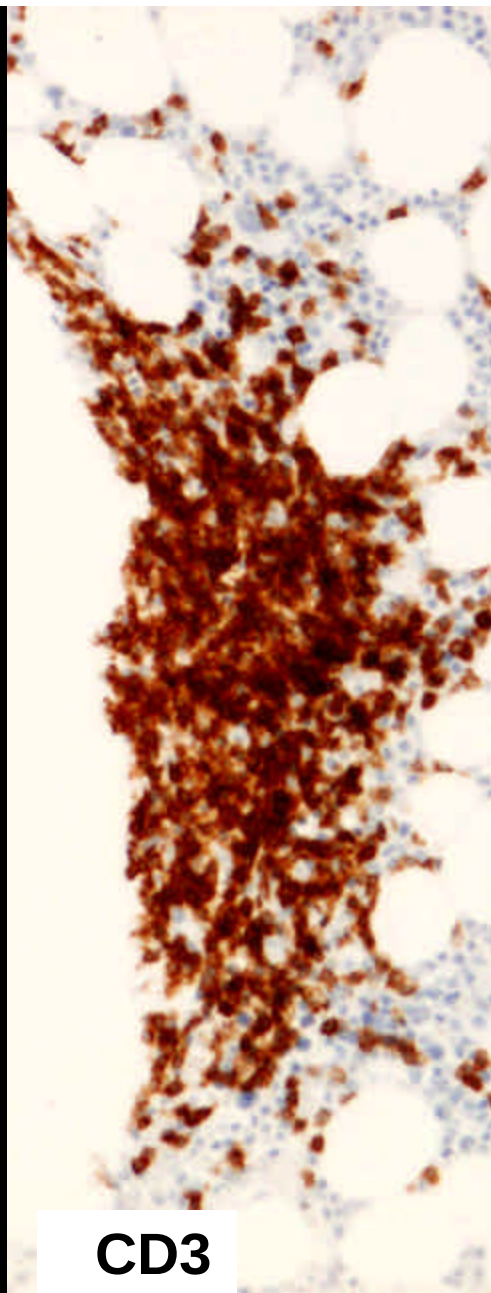
- **Ausencia de infiltrados**

- **Infiltrados residuales**

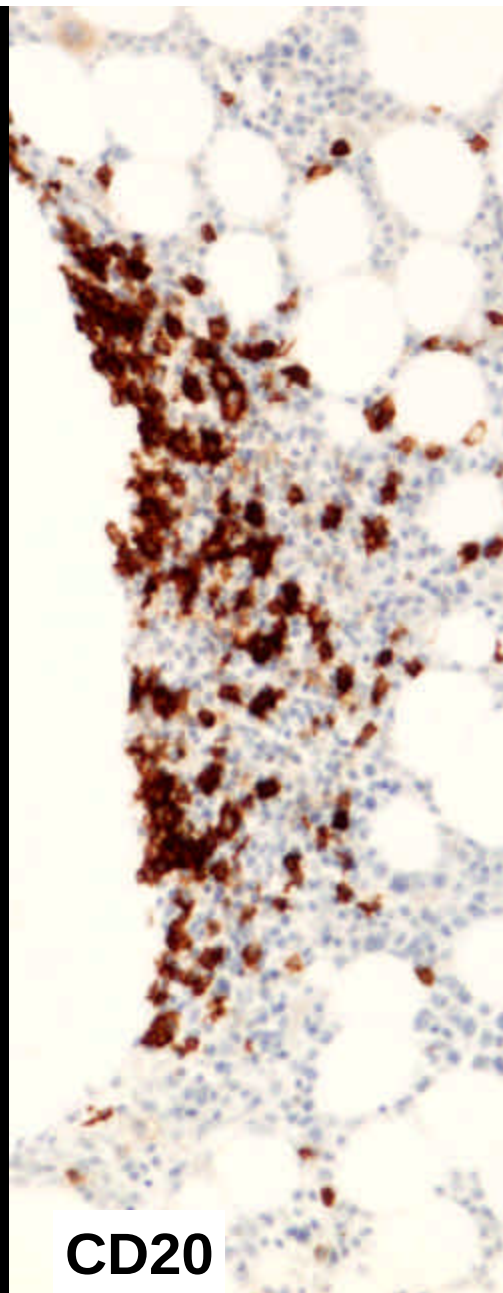
- **Claramente tumorales**
 - **Dudosos**

- **Inmunofenotipo diferente**
 - **Inmunofenotipo similar**

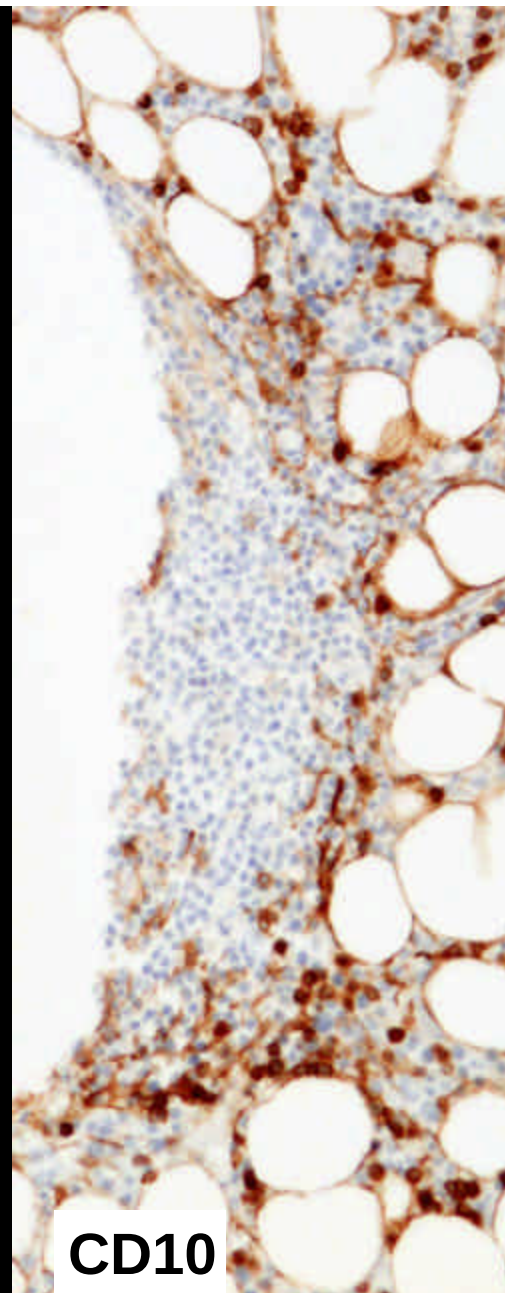




CD3



CD20



CD10

