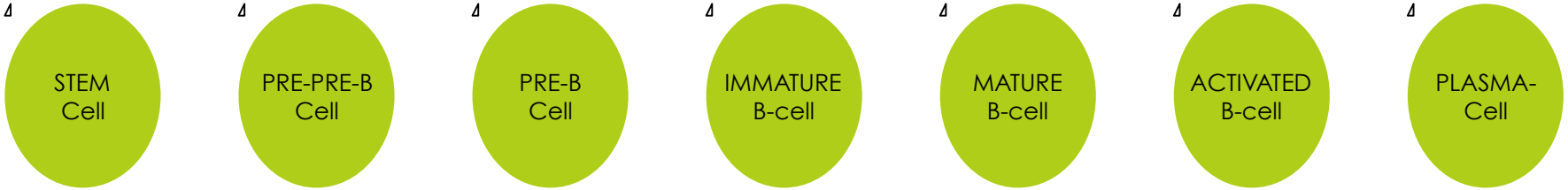
NON-HODGKIN LYMPHOMAS

B-cell

T-cell

Distinct for frequency, clinical presentation, morphology and phenotype, prognosis and therapy

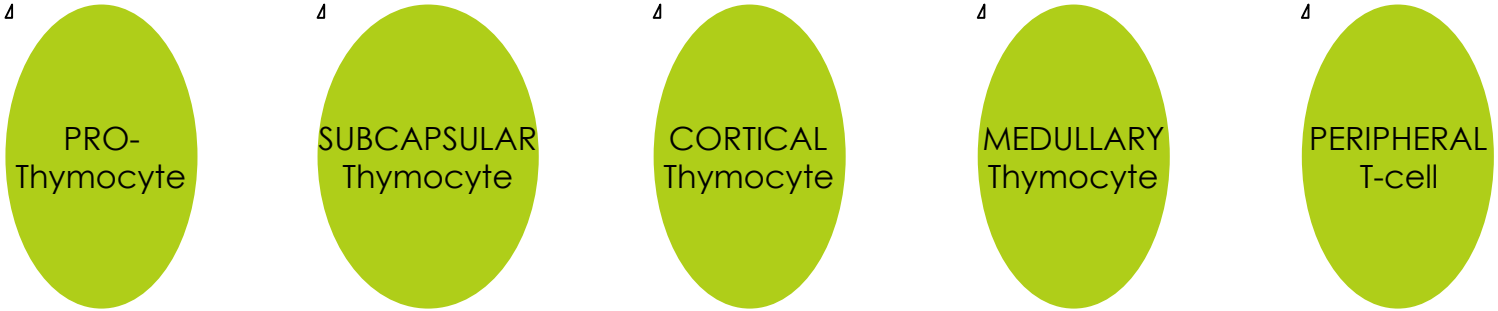
B-cell ontogenesis



antigen independent

Antigen dependent

T-cell ontogenesis



NON-HODGKIN LYMPHOMAS

Predisposing diseases

Sjogren syndrome
Hashimoto's thyroiditis
EBV infection
HHV8 infection
HCV hepatitis
HP-related chronic gastritis
Congenital immune-deficiencies

- Chediak-higashi
- Wiscott-Aldrich
- Atassia-teleangectasia
- IgA deficiancy
- Severe combined immune-deficiency

Organ transplantation
Immune-suppressive tretaments
AIDS
Heavy chain disease
Celiac disease
Hodgkin disease (post-treatments)

B-cell NHL

B-cell precursors

- *Lymphoblastic lymphoma*
- *Acute lymphoblastic leukemia*

Mature B-cells

- *Lymphocytic lymphoma / chronic lymphoid leukemia*
- *Pro-lymphocytic leukemia*
- *Follicular*
- *Mantle cell*
- *Marginal cell*
  - *Nodal*
  - *Extra-nodal (MALT)*
  - *Splenic*
- *Lympho-plasmacytic*
- *Large cells*
  - *Mediastinal*
  - *Intra-vascular*
  - *Body cavity fluids*
- *Burkitt*
- *Hairy cell leukemia*
- *Myeloma*

Lymphomatoid granulomatosis

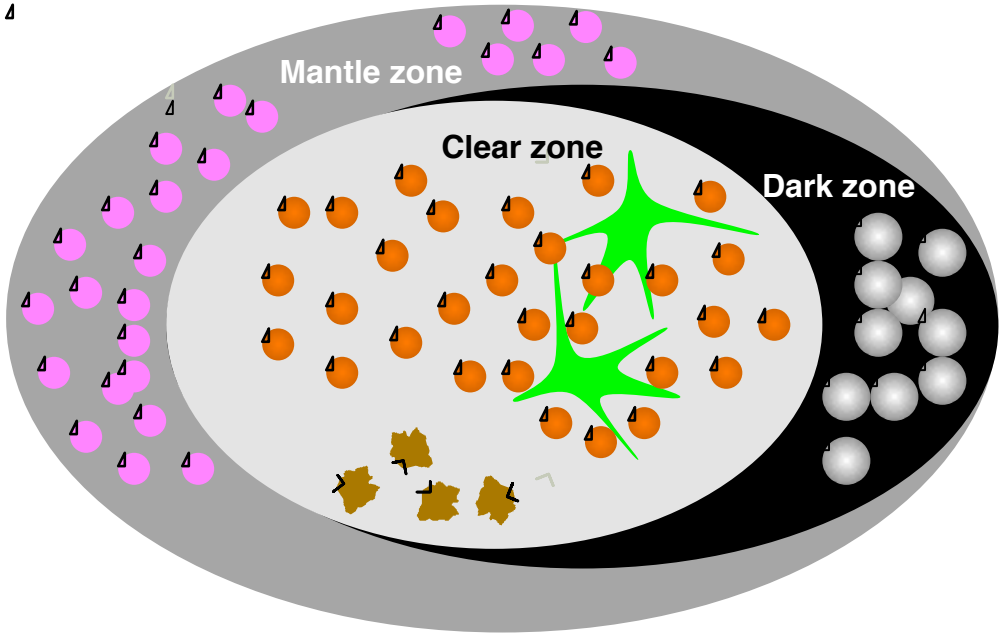
Post-transpantation lymphoproliferative disorders

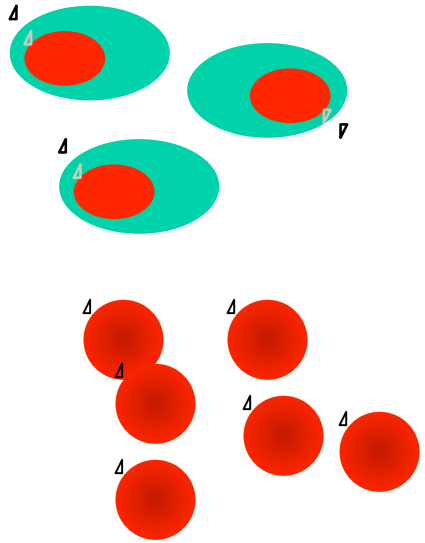
B-cell NHL: frequency by subtype

Diffuse large B-cells	30-31 %
Follicular	22%
Marginal cells	7%
Lymphocytico/ CLL	6.7%
Mantle cells	6%

Pre-GC B cell
Mantle cell NHL

Post-GC cell B
Multiple myeloma
Lymphoplasmacytic/Waldenstroem





GC B-cell
Follicular NHL
Diffuse Large B-cell-like NHL
NLP-Hodgkin L
Burkitt's Lymphoma
Classical Hodgkin L

Hairy Cell Leukemia
Chronic lymphocytic leukemia
Pro-lymphocytic leukemia
Large activated B-cell NHL
Marginal zone NHL

T-cell NHL

Precursor T-cell

- T-lymphoblastic
- T-lymphoblastic leukemia
- NK-cell lymphoma / leukemia

Mature/perypheral T/NK-cell

- Pro-lymphocytic leukemia
- Large granular T-cell leukemia
- NK leukemia
- Adult T-cell lymphoma/leukemia
  - NK/T nasal type
  - Enteropathy-associated
  - Hepato-splenic (gamma/delta)
  - Subcutaneous panniculitis
  - Mycosis fungoides & Sezary syndrome (skin)
  - Large anaplastic T-cell (cutaneous / systemic)
  - Large anaplastic T-cell Alk+
  - Perypheral T-cells
  - Angio-immunoblastic

T-cell NHL: frequency by subtype

Mature T-cells	7,6%
Anaplastic large cells	2,4 %
Lymphoblastic	1,7 %
Others	7-8%

NON-HODGKIN LYMPHOMA

STAGING (Ann Arbor)

I. Single lymph node basin
II. Two or more basins, same side of the diaphragm
III. Two or more basins, both sides of the diaphragm (+/- spleen (III s)
IV. Extra-lymphatic spread

For any stage
A – lack of symptoms
B – night sweats
fever
weight loss
weakness

B-cell NHL

B-cell precursors

- ***Lymphoblastic lymphoma***
- ***Acute lymphoblastic leukemia***

Mature B-cells

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Lymphomatoid granulomatosis

Post-transpantation lymphoproliferative disorders

B-CELL NHL

B-cell precursors

- ***Lymphoblastic lymphoma***
- *Acute lymphoblastic leukemia (blood & bone marrow)*

Frequency: 1%
Age: infancy (rare in adults)
M/F: 2-10/1
Stage III/IV at presentation
Superficial and deep nodes
Extra-nodal sites: CNS, gonads, skin, G.I. tract, salivary glands, bones

60% progress into B-ALL

B-CELL LYMPHOBLASTIC NHL

Pathogenesis

Recurrent chromosomal alterations

t(12;21)(p13;q22) translocation TEL-AML1 (fusion transcript)

- **25% of cases**
- **The most frequent in children**
- **Unknown mechanism**
- **Translocation may preceed NHL by 5-10 ys.**
- **Better prognosis (up to 90% cured)**

Iperploidia (>46 chromosomes)

- **Good prognosis**

t(1;19)(q23;13) translocation E2A-PBX (fusion transcript)

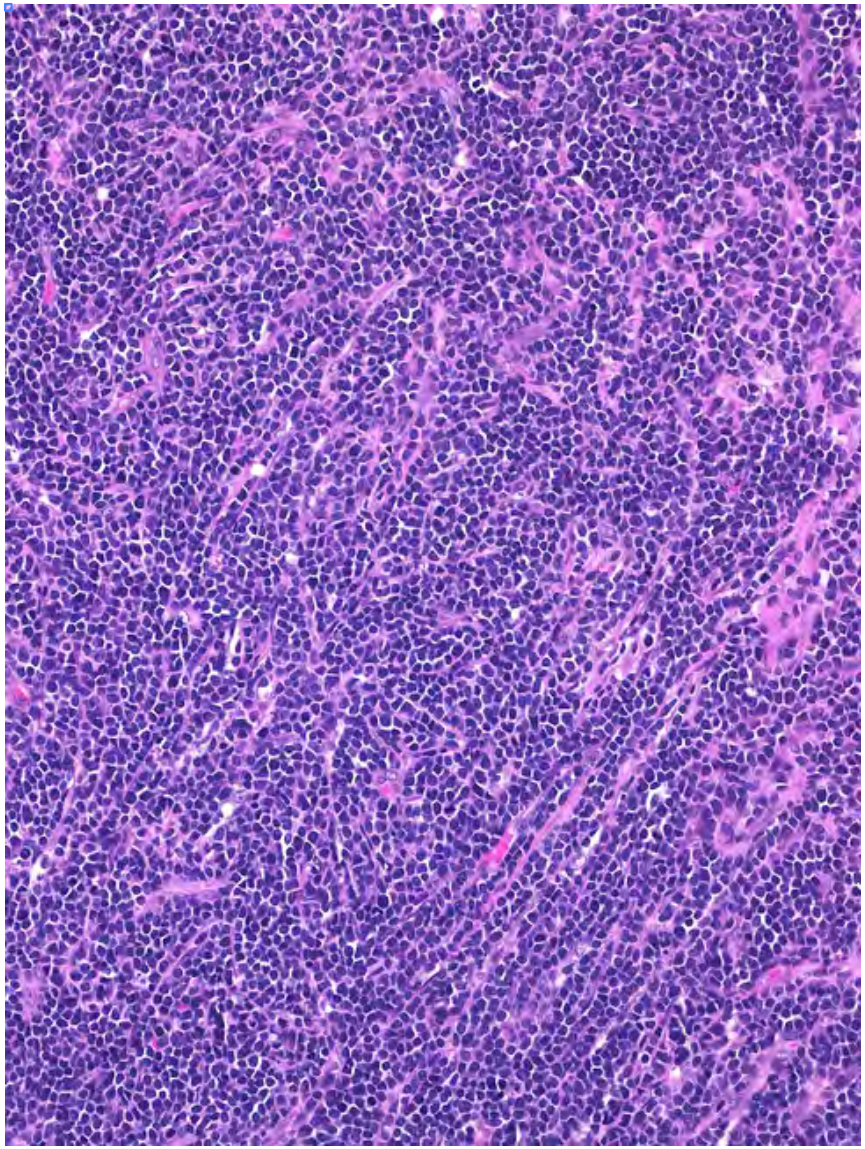
- **6% of cases**

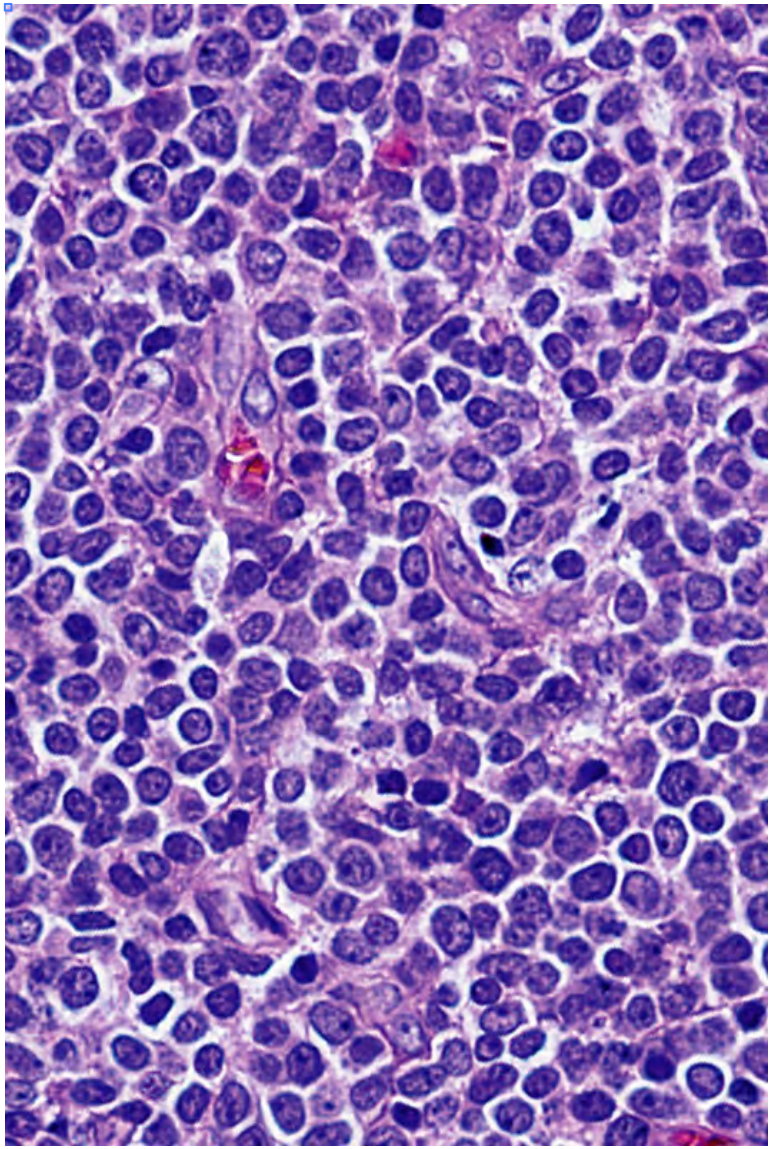
B-CELL LYMPHOBLASTIC NHL

Morphology

- Intermediate size cells
- Scarce cytoplasm
- Indented nuclear membrane
- Finely dispersed chromatin
- No nucleoli
- Mitotically active
- IHC: B-cell antigens (CD19, CD79a, CD22)
  TdT (Terminal Deoxynucleotidyl Transferasi)

B-CELL LYMPHOBLASTIC NHL





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Lymphomatoid granulomatosis

Post-transpantation lymphoproliferative disorders

B-CELL LYMPHOCYTIC NHL / CLL

Frequency: 6-7%

- **Isolated or diffuse lymphadenomegaly**
- **Leukemic pattern (70-80%) associated with:**
    a. **Bone marrow involvement**
    b. **Nodal localizations**
    c. **Hepato-splenomegaly**
    d. **Extra-nodal localizations**

Symptoms: anemia, weight loss, night sweat
Absolute lymphocytosis (> 4000/mm3) in peripheral blood

B-CELL LYMPHOCYTIC NHL / CLL

Normal or slightly enlarged nodes
Architectural effacement (homogeneous pattern)

Neoplastic cells

- **Small size**
- **Rounded nuclei**
- **"Salt & pepper" chromatin**
- **Scarce cytoplasm**
- **Rare mitoses**

Proliferating (pseudo-follicular) centres
Prolymphocytes, centrocetes, immunoblasts
IHC: CD19, CD5, CD23 +
CD20,CD79a +/-

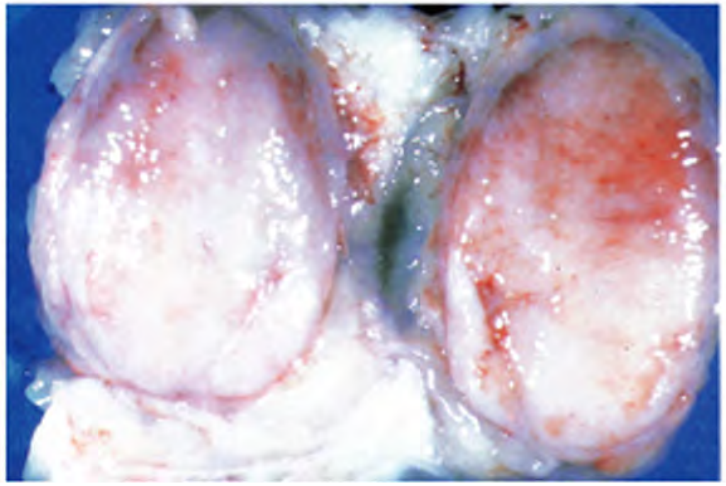
B-CELL LYMPHOCYTIC NHL / CLL

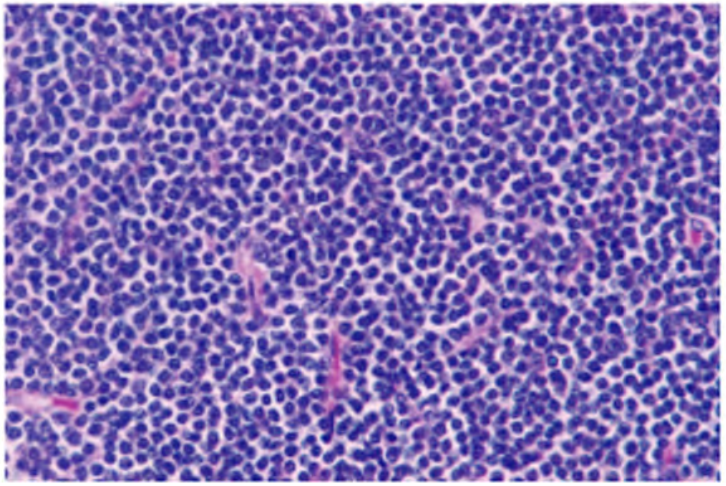
Clinical variants:

Indolent, less aggressive, better prognosis
Rapidly evolving aggressive form:

- **DLBCL (Richter syndrome)**
- **Pro-lymphocytic leukemia**
- **Hodgkin L.**

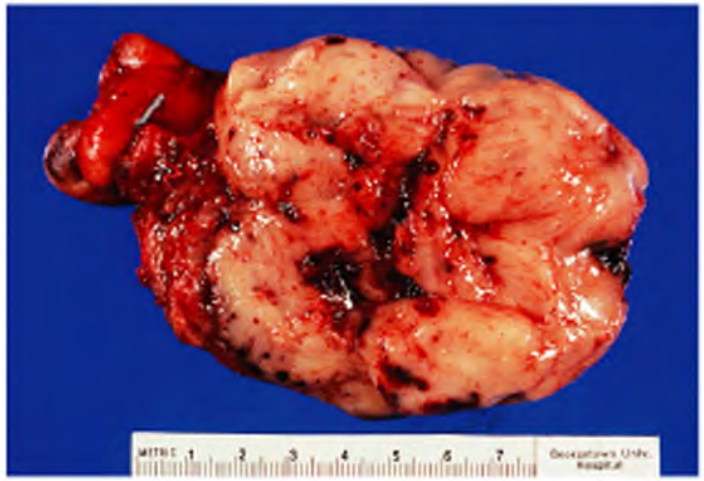
A

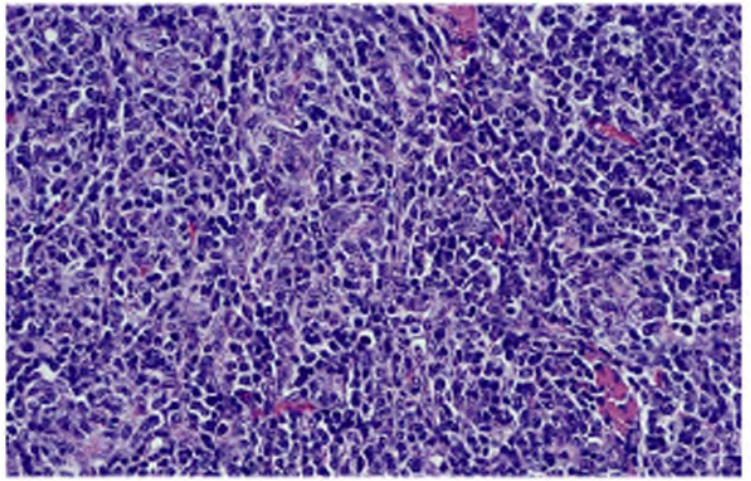




B

A





B

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- *Myeloma*

Lymphomatoid granulomatosis

Post-transpantation lymphoproliferative disorders

FOLLICULAR NHL

Frequency: 40 % of LnH
22% of B-cell NHL

Age: 55
Stage III/IV at presentation
Site: all lymph nodes
Indolent course (>10 ys.) with recurrences
25-40% progress into DLBCL
Morphology:
- **Nodular (pseudo-follicular) pattern / diffuse**
- **Centrocytes, centroblasts**
- **Follicular dendritic cells**
- **Reactive T-cells**

FOLLICULAR NHL

Prognosis

Grading: (based on number of centroblasts)

- **I: 0-5 centroblasts/HPF**
- **II: 6-15 centroblasts/HPF**
- **III: > 15 centroblasts/HPF**
  - **a) centrocytes still present**
  - **b) centroblasts only**

Proliferating cell ratio (Ki67)

Host reaction: > T-lymphocytes & macrophages

IHC:

- **B-cell lineage: CD 19, CD20, CD22, CD79a**
- **Germinal centre differentiation: CD10, bcl6**
  bcl2 (80-85%) = t(14;18)

FOLLICULAR NHL

Pathogenesis

t(14;18)(q32;q21) translocation: 80-85%

bcl2 protein overexpression

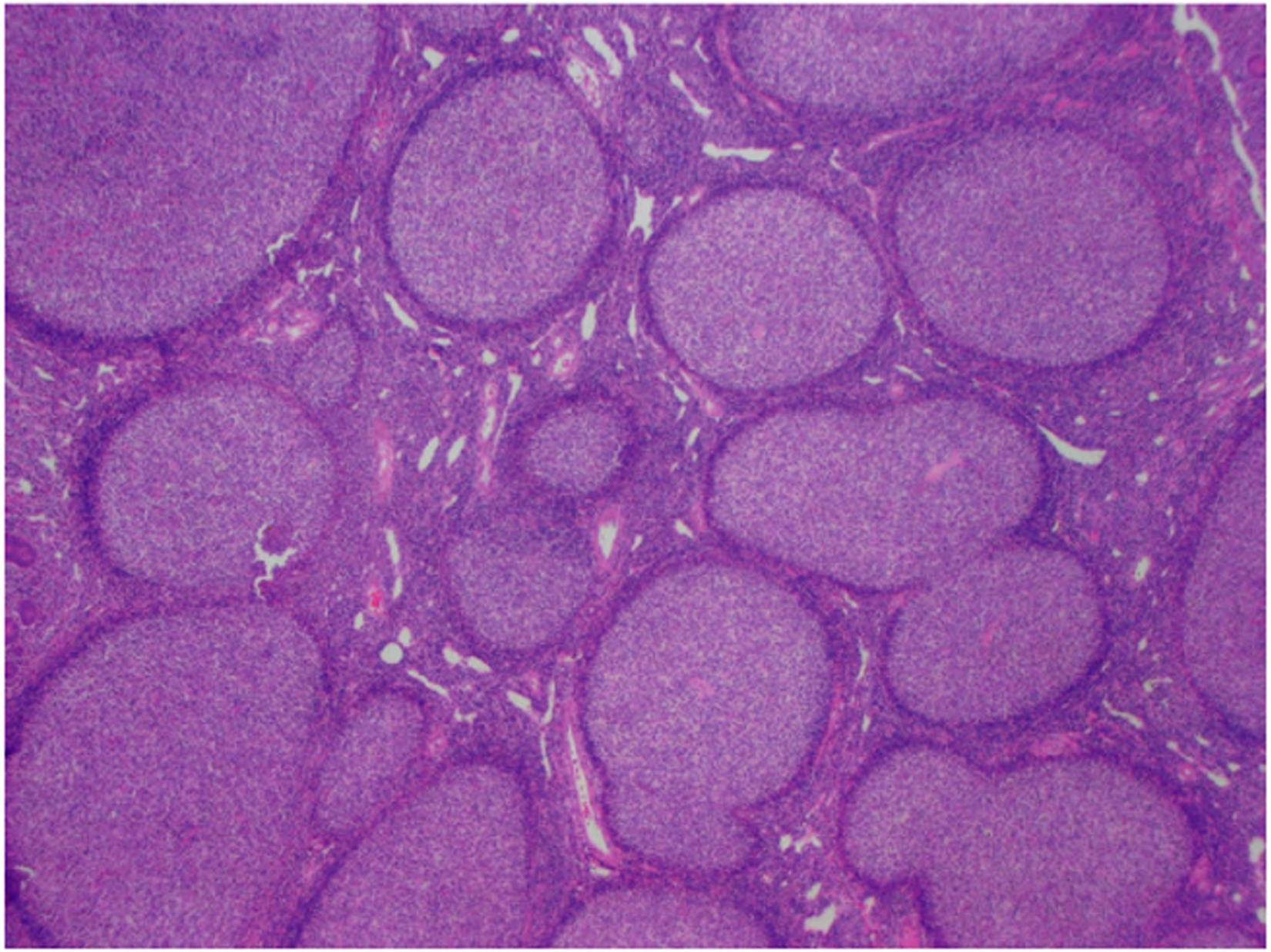
↓

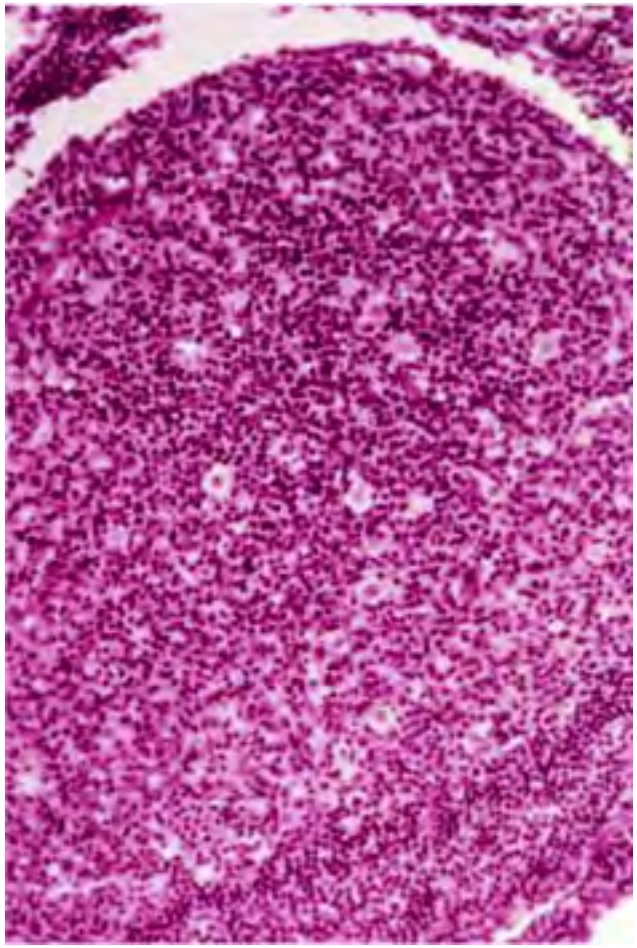
Apoptosis inhibition

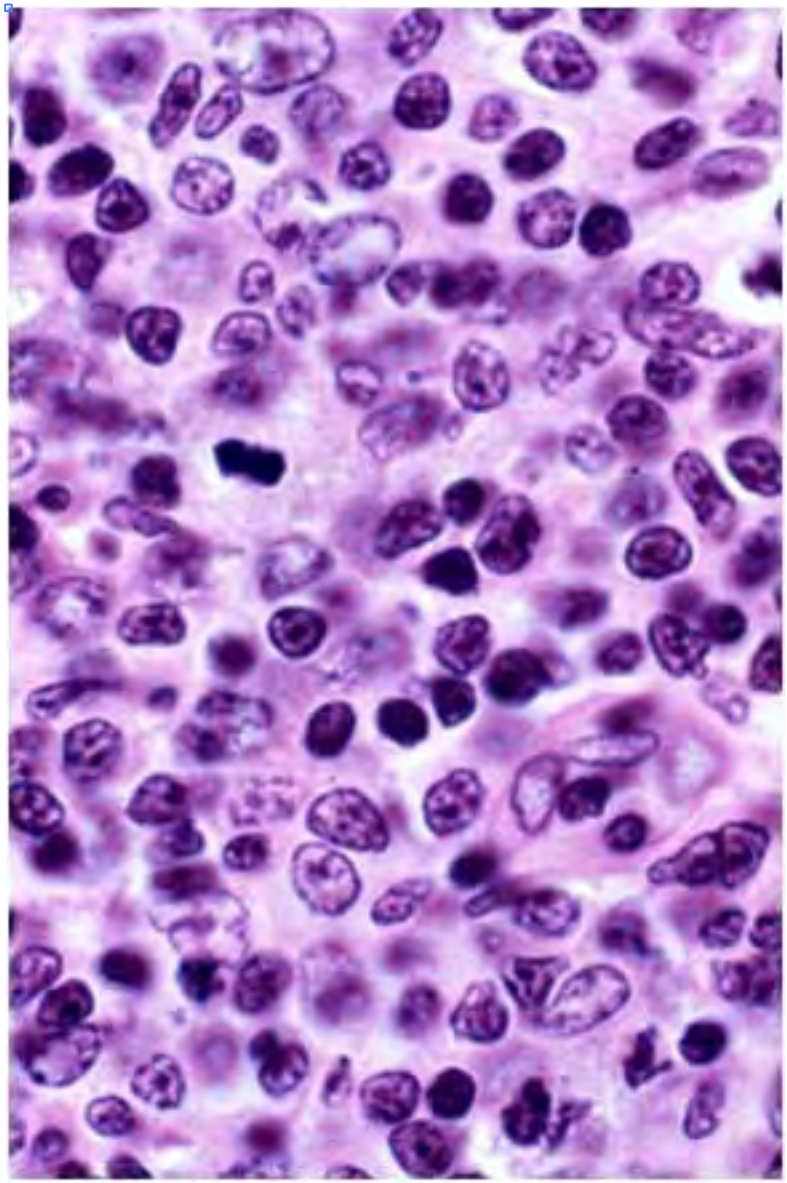
↓

Increased proliferation rates

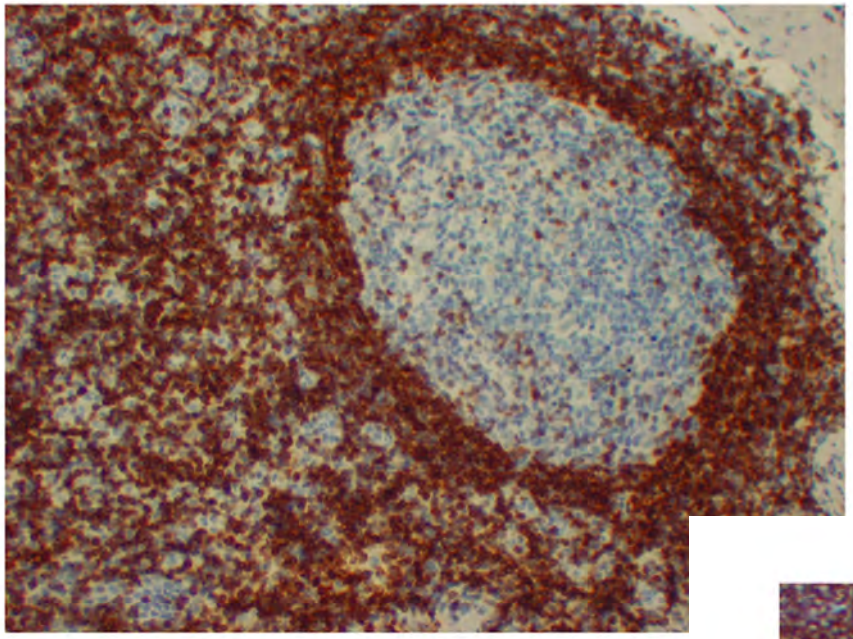
t(3;?) bcl6 translocation (10%)
Bcl6 promoter transactivation







Bcl 2



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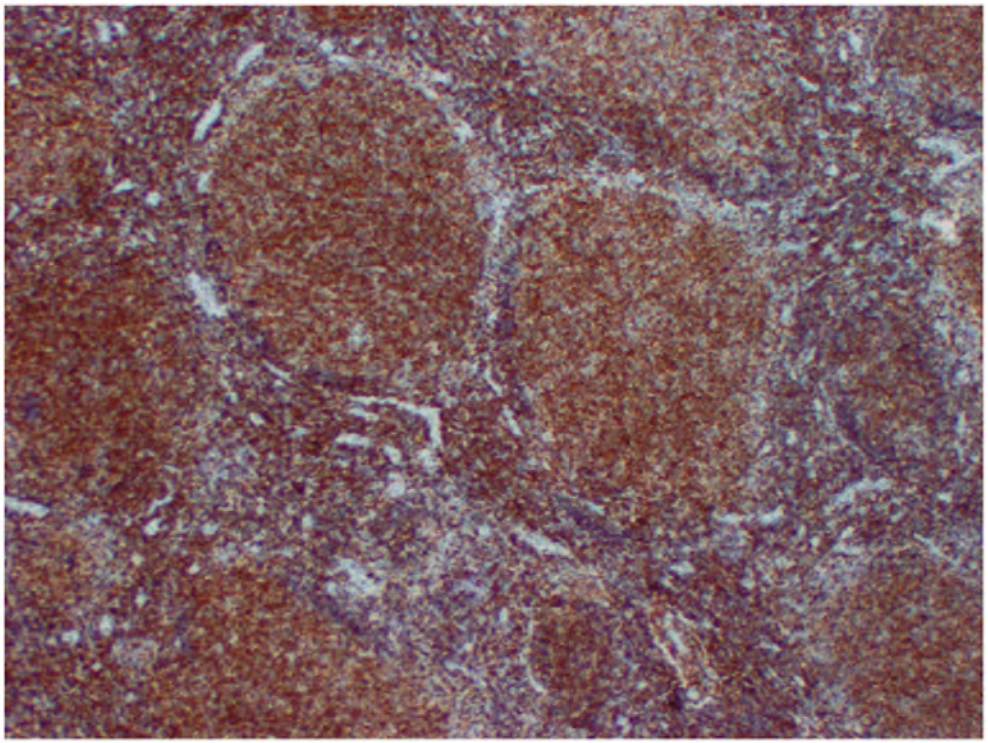
Normal Follicle

Follicular NHL



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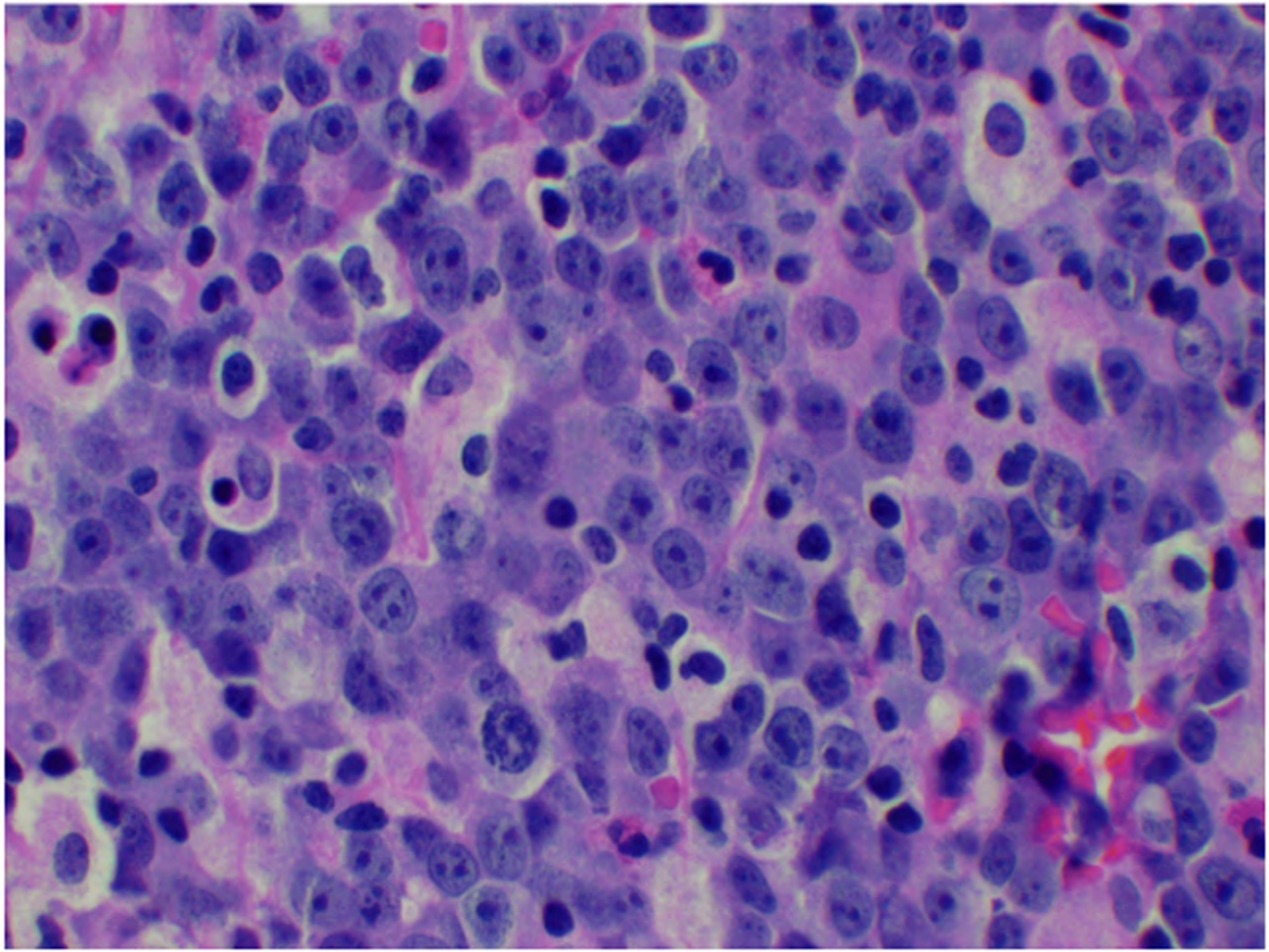
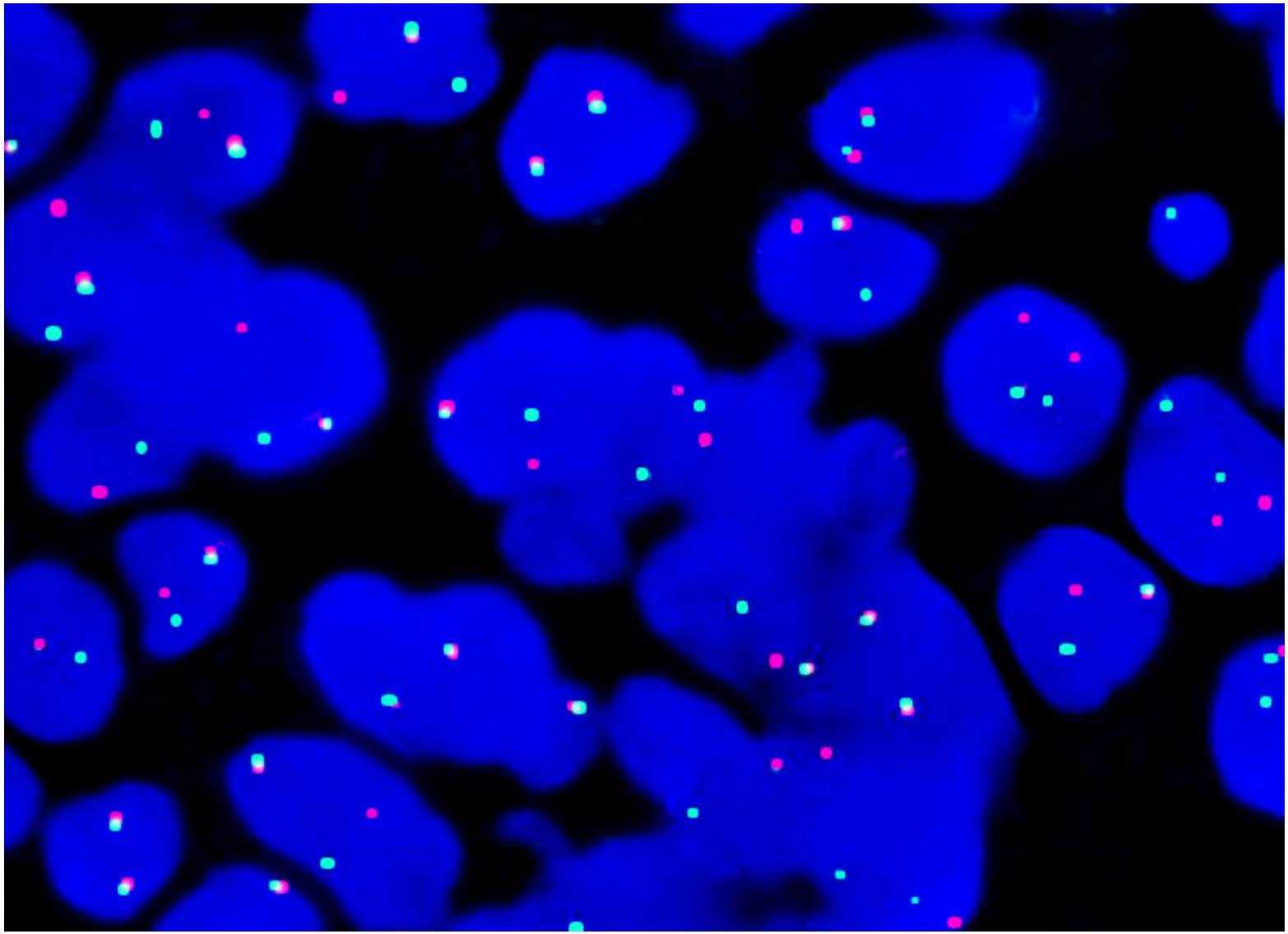


Follicular NHL: FISH – t(14;18) Bcl2, break-apart



B-cell NHL

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- *Burkitt*
- *Hairy cell leukemia*
- *Myeloma*

Lymphomatoid granulomatosis

Post-transpantation lymphoproliferative disorders

MANTLE CELL NHL

Frequency: 5-10% of all LnH
Age: 60 ys.

- **Diffuse disease at presentation**
- **Hepato-splenic involvement**
- **Leukemic pattern**
- **Bone marrow involvement**

Aggressive clinical course: median survival 3-4 ys.

MANTLE CELL NHL

Pathogenesis

t(11;14)(q13;q32) translocation involving the cyclin-D1 gene (11q13)

Juxtaposed to IgH gene (14q32)

↓

> Cyclin-D1 transcription

↓

Cyclin-D1 protein accumulation

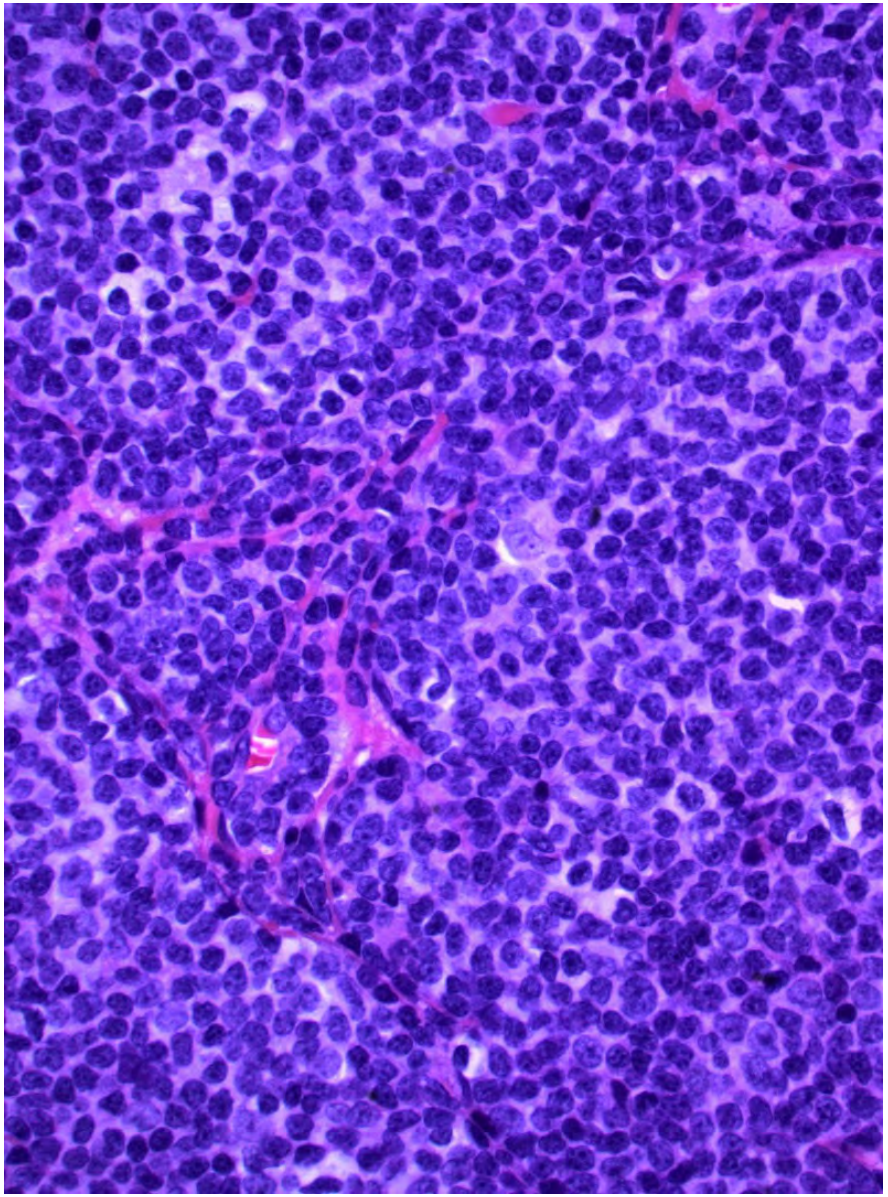
↓

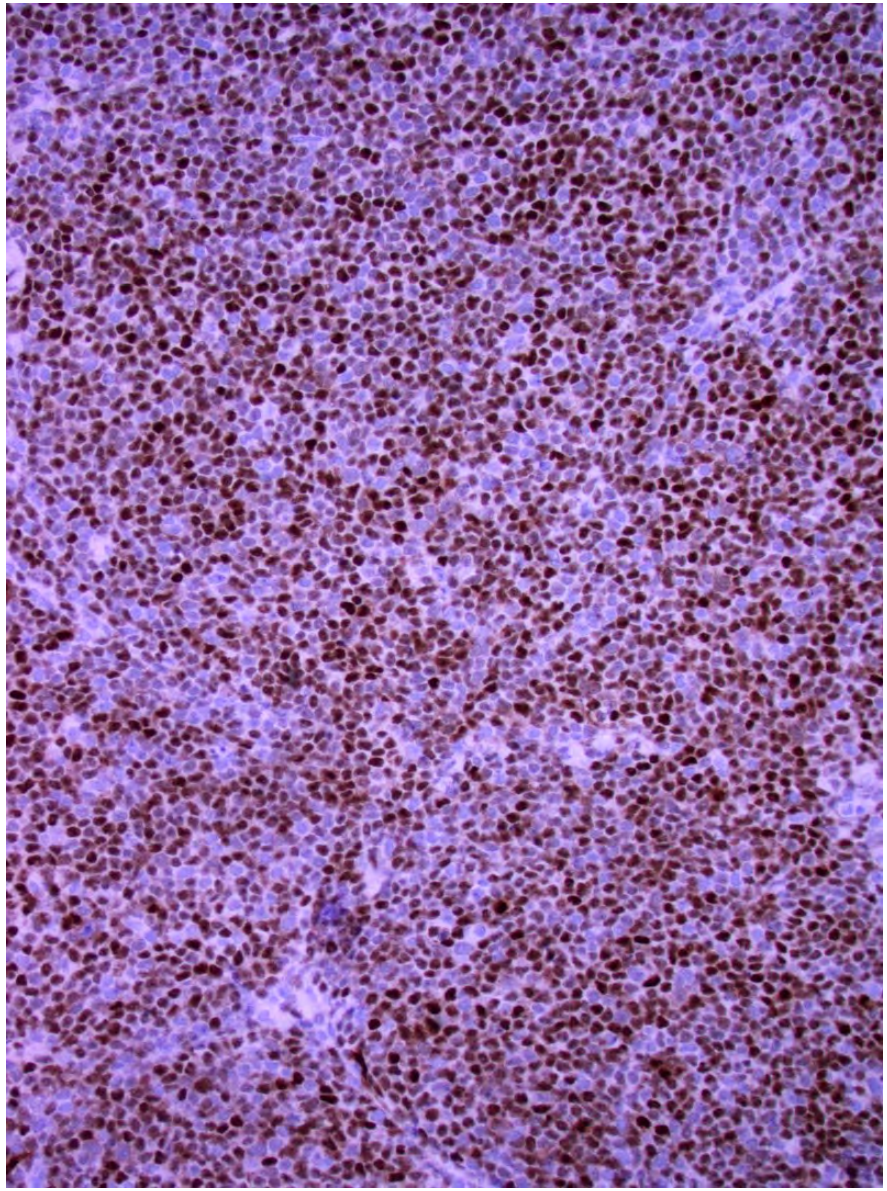
Reduced apoptotic rates

MANTLE CELL NHL

Morphology

Small-medium sized cells
Indented nuclei, scarce cytoplasm
Nodular/diffuse pattern
Blastoid variant (20%), aggressive course
IHC: B-cell Ag: CD19, CD20, CD22, CD79a
Mantle cell Ag: CD5, Ciclina D1





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Lymphomatoid granulomatosis

Post-transpantation lymphoproliferative disorders

MARGINAL ZONE NHL

Frequency: 7% of all NHL

Sites: nodal

splenic

extranodal = MALT NHL

- **G.I. tract (stomach, small bowel)**
- **Salivary glands (Sjogren)**
- **respiratory tract (lungs, larynx)**
- **Thyroid (Hashimoto)**
- **Ocular adnexa (congjunctiva, lacrimal glands)**

MARGINAL ZONE NHL

Symptoms depend on localization

Nodal marginal zone NHL:

- Advanced stage at presentation
- More aggressive coruse
- 10-20% progress into large cell NHL

Splenic marginal zone LNH:

- Splenomegaly
- Bone marrow involvement
- Leukemia

MALT NHL: localized with slowly progressive course

MARGINAL ZONE NHL

Pathogenesis

Prolonged antigenic stimulation

Infections	Helicobacter pylorii (stomach) Campylobacter jejuni (small bowel) HCV (lymph nodes)
Autoimmune diseases	Hashimoto's Thyroiditis Sjogren's syndrome

In gastric MALT NHL → HP eradication leads to NHL regression in 50-55%

MARGINAL ZONE NHL

Translocations in 20-40% MALT NHL

t(11,18)(q21;q21), t(14;18) (q32;q21), t(1;14) (p22;q32), t(1;2) (p22 ;p12)

>Transcription of BCL10 (cromosoma 1) or MALT1 (cromosoma 18)

Gastric MALT-NHL with translocations do not regress following HP-eradication

- *Antigen-dependent proliferation*
- *Antigen-independent progression*

MARGINAL ZONE NHL

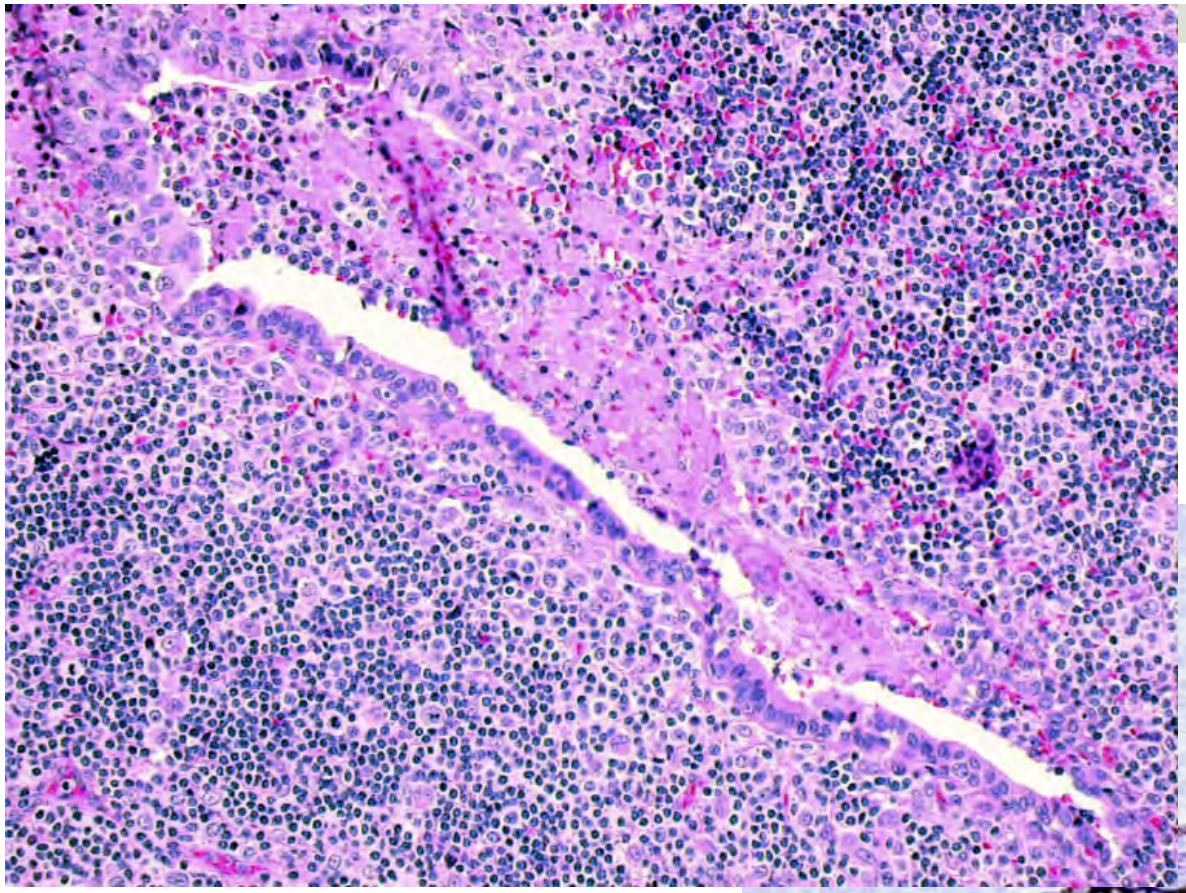
Morphology

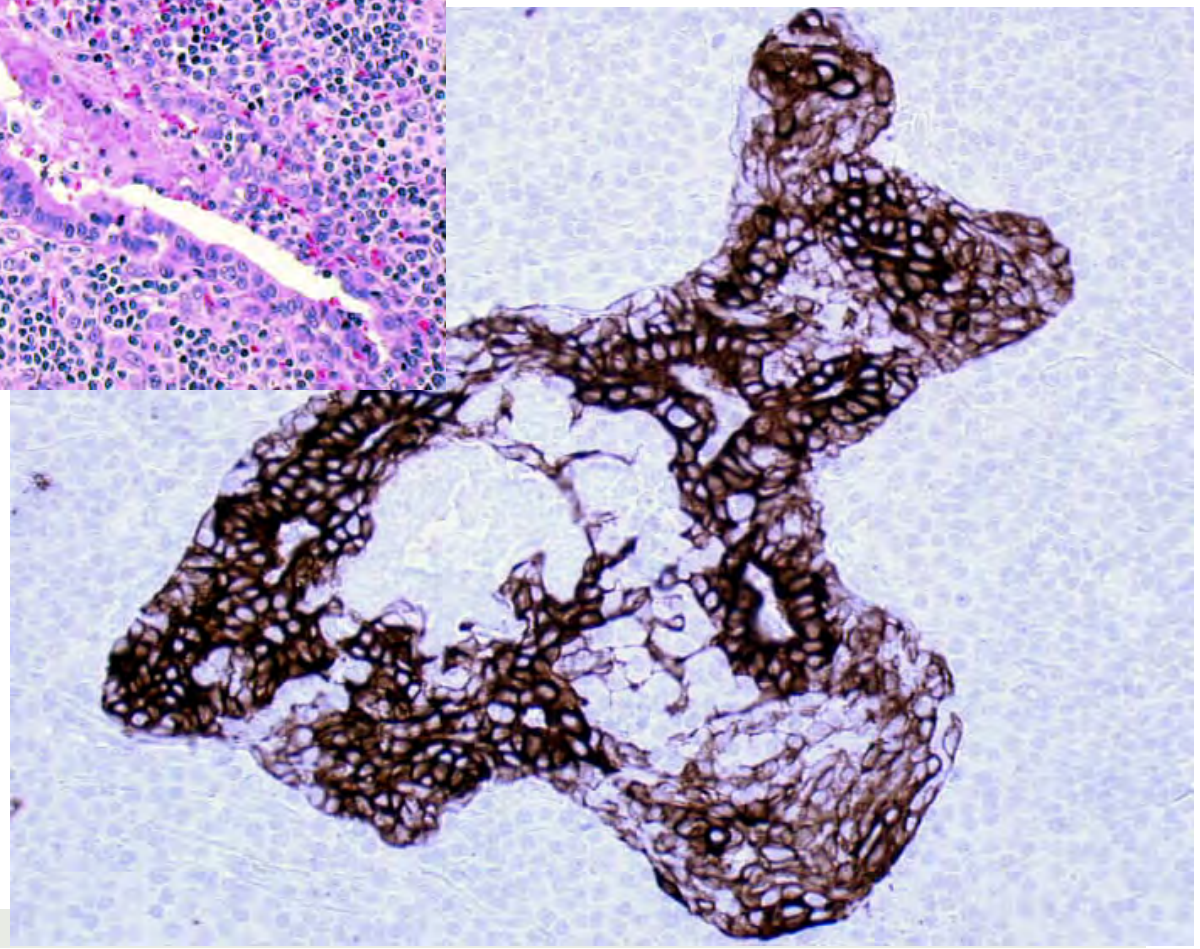
Lympho-epithelial lesions: destructive colonization of epithelial structures (glands)

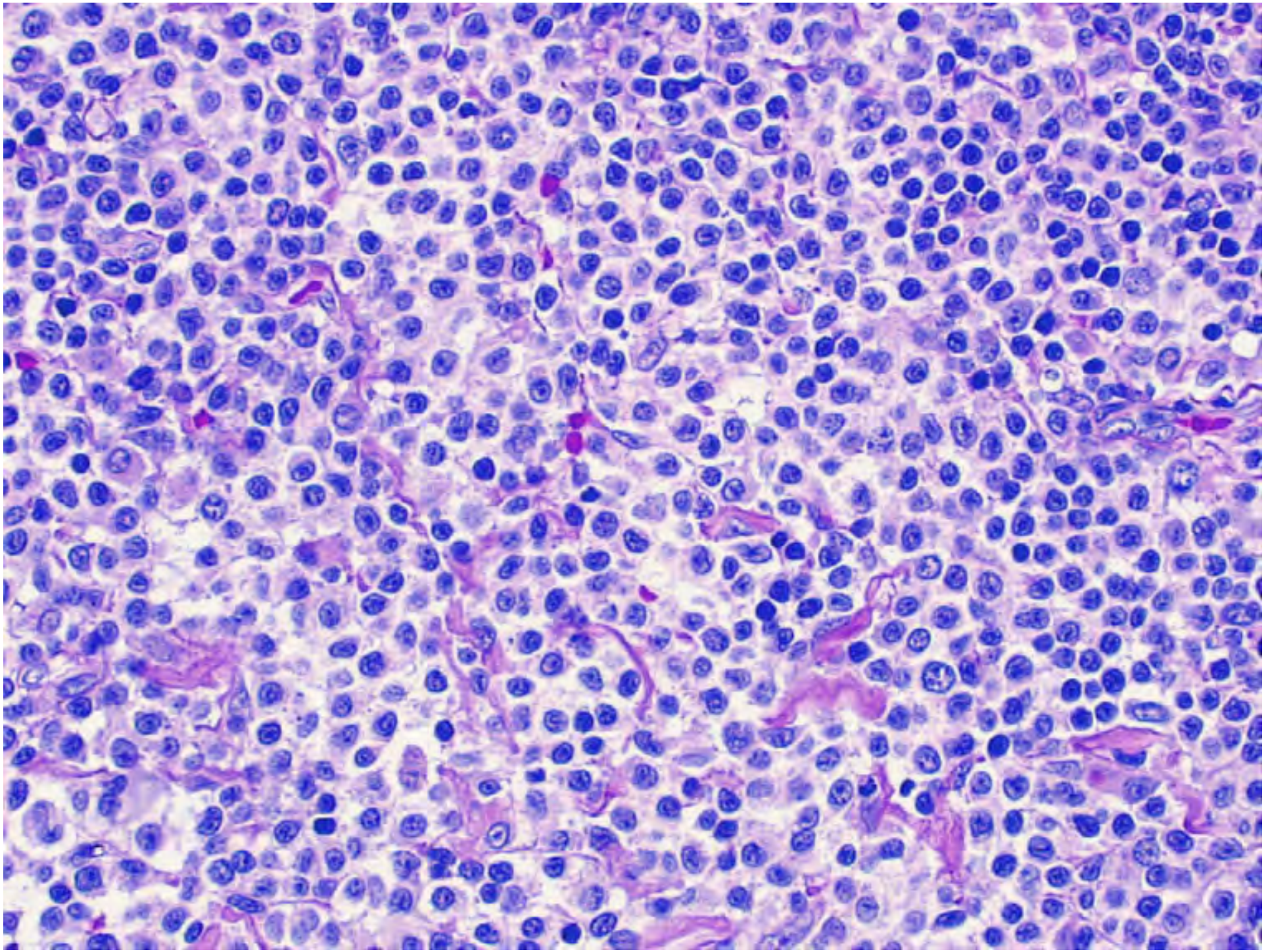
Reactive germinal centres: promoted by chronic inflammation

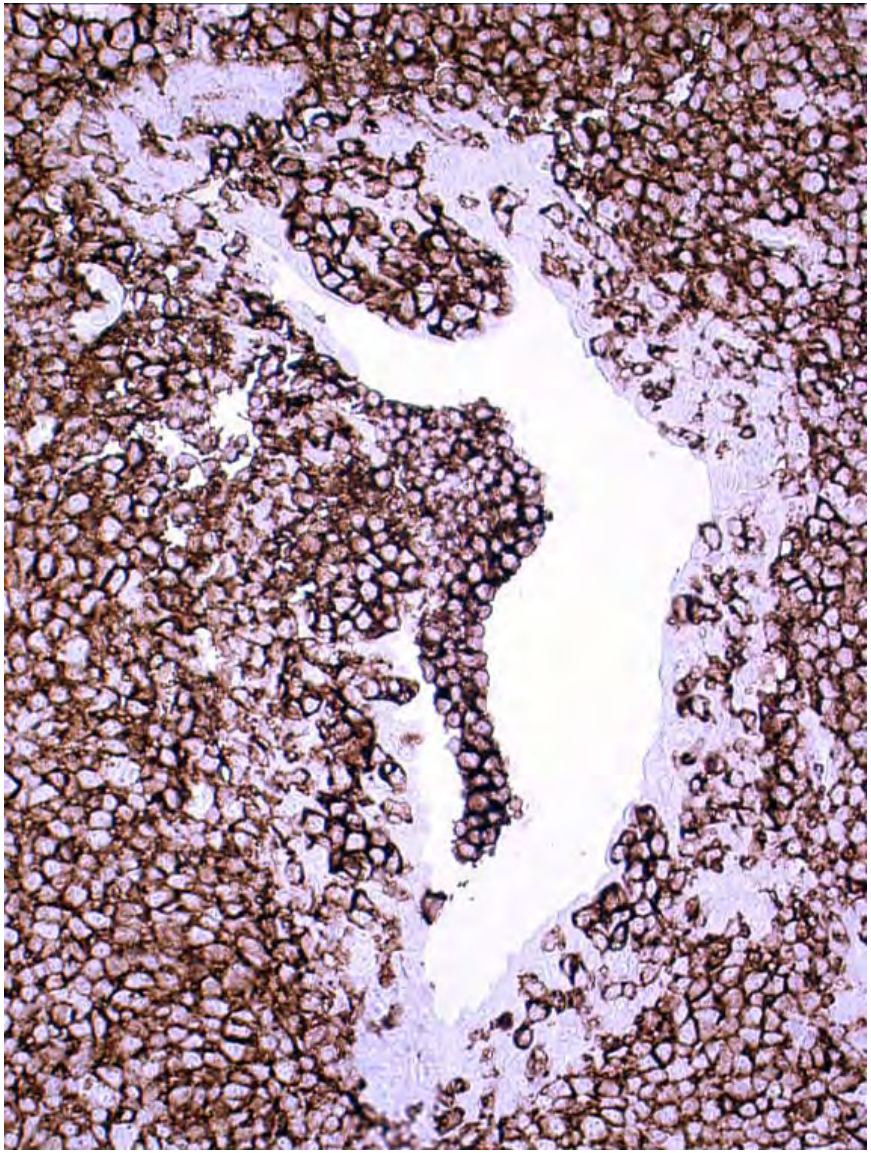
Centrocyte-like or monocytoid lymphoid cells (indented nuclei)

IHC: B-cell lineage: CD20, CD79a
CD10- (dd follicular LNH)
CD 5- (dd mantle cell LNH)

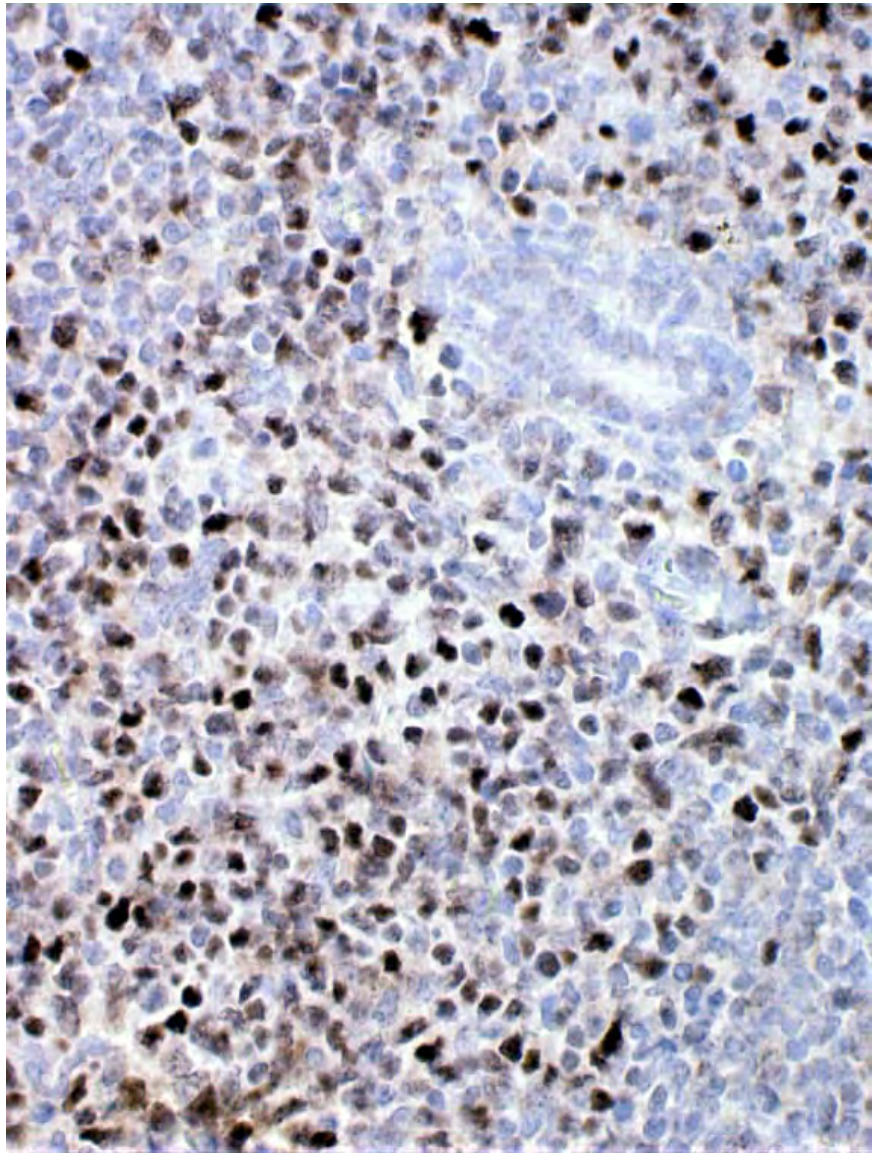






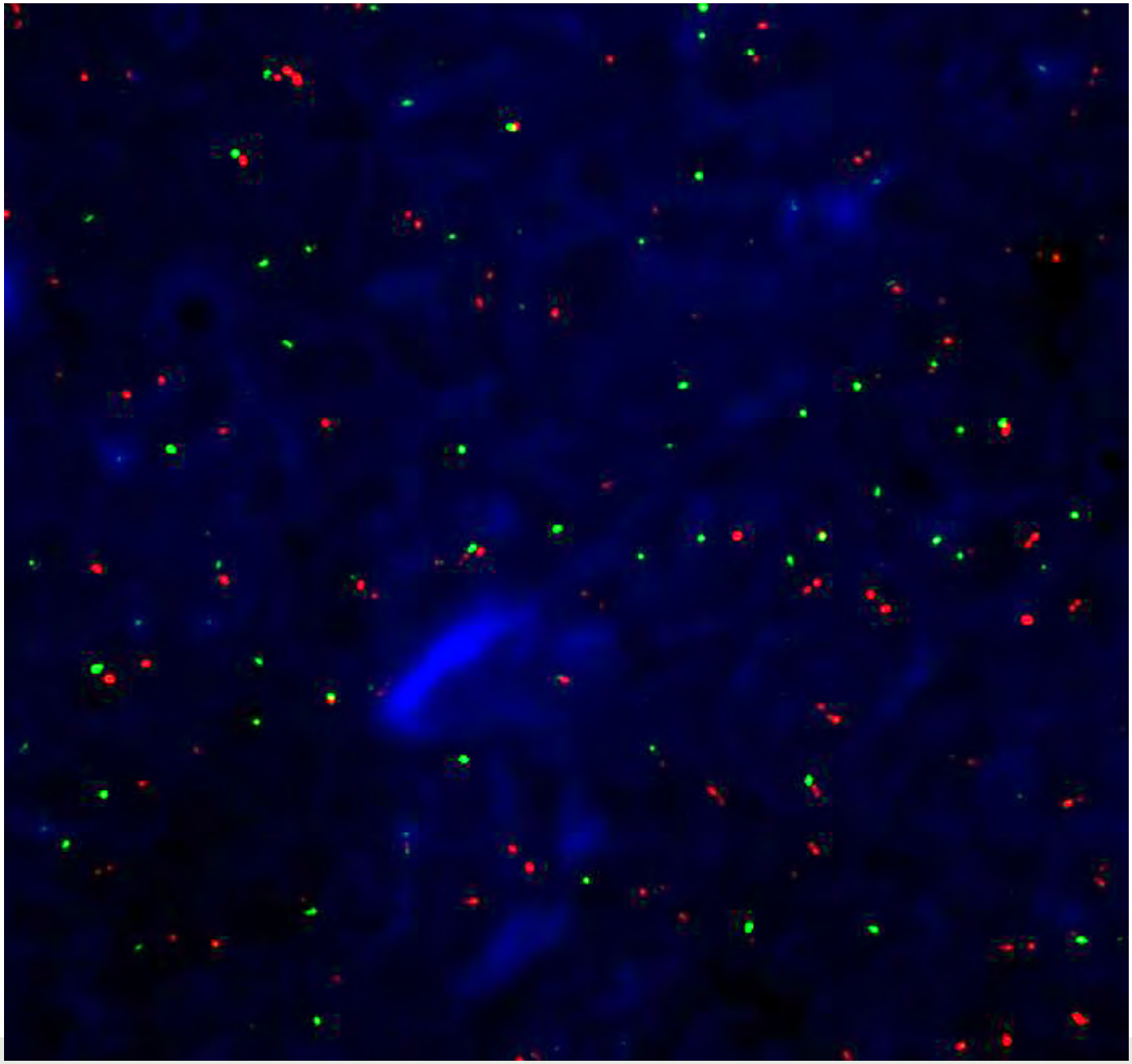


CD20



Bcl6

MALT NHL: FISH – MALT1, Break-apart



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Lymphomatoid granulomatosis

Post-transpantation lymphoproliferative disorders

LYMPHO-PLASMACYTIC NHL

Unfrequent
Localizations: Lymph nodes, spleen, bone marrow
Symptoms: dispnoea, weakness, anemia
thrombocytopenia (haemorrhages)
bacterial infections (neutropenia)
weight loss and fever

> IgM in peripheral blood

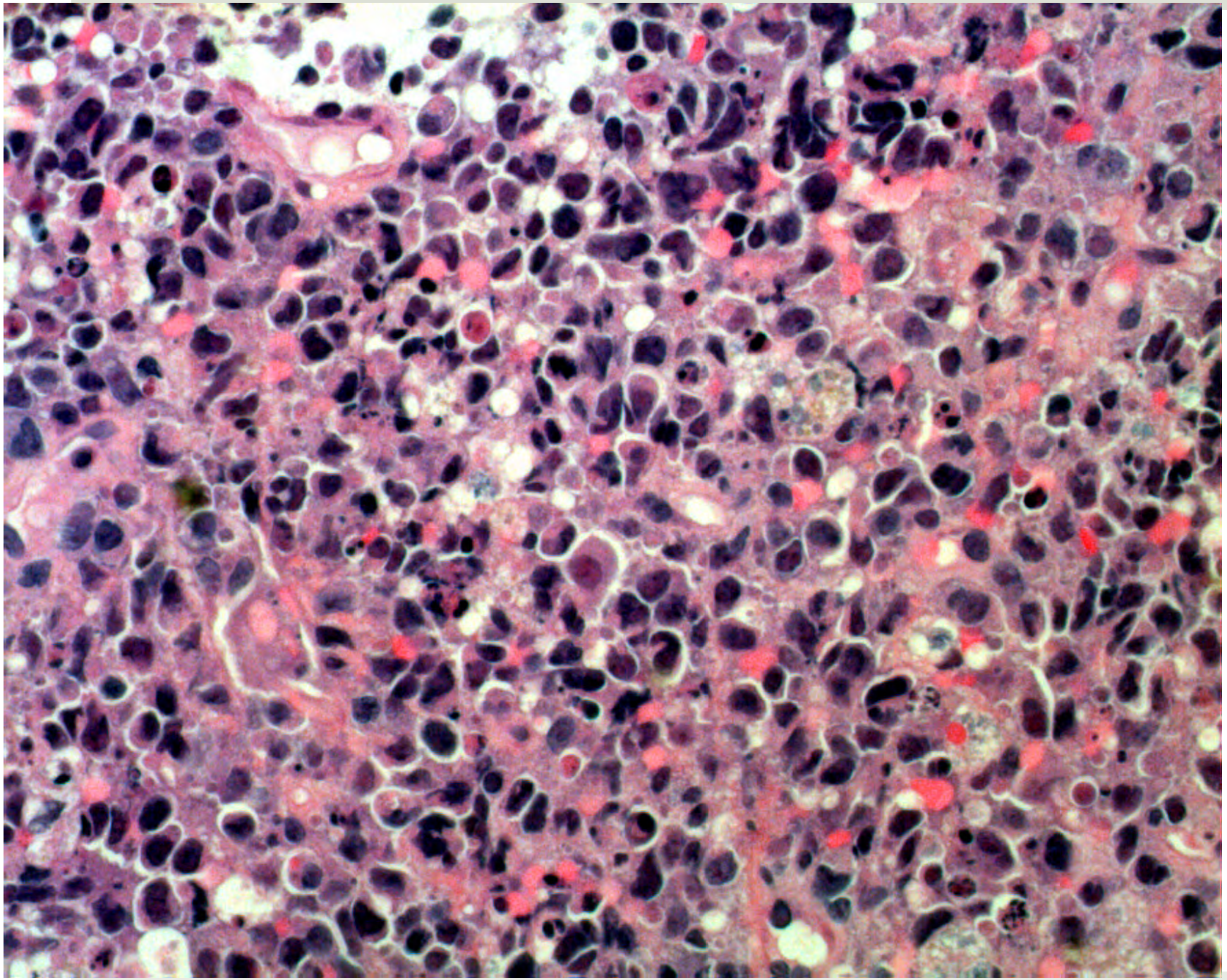
Lympho-plasmacytoid NHL + IgM > 3g/dl =
Waldenstrom Macroglobulinemia

LYMPHO-PLASMACYTIC NHL

Morphology

Diffuse pattern
Small, mature B-lymphocytes
Plasmacytoid differentiation

IHC: **B-cell lineage CD19, CD20, CD79a**
Cytoplasmic Ig citoplasmatiche (K o λ)
CD5, CD23, CD10-



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Lymphomatoid granulomatosis

Post-transpantation lymphoproliferative disorders

LARGE B-CELL NHL (DLBCL)

Frequency: 40% of all NHL
Age: adults and elderly
Stage III/IV at presentation
Symptoms: weakness, weight loss, rapidly enlarging mass

Localizations:	**Lymph nodes**
	Parenchymal organs
	Bone marrow
Prognosis:	**Age**
	Number of involved sites
	Performance status
	seric LDH
	80% complete remission after Ct
	50% survival at 10 ys.

LARGE B-CELL NHL (DLBCL)

Pathogenesis

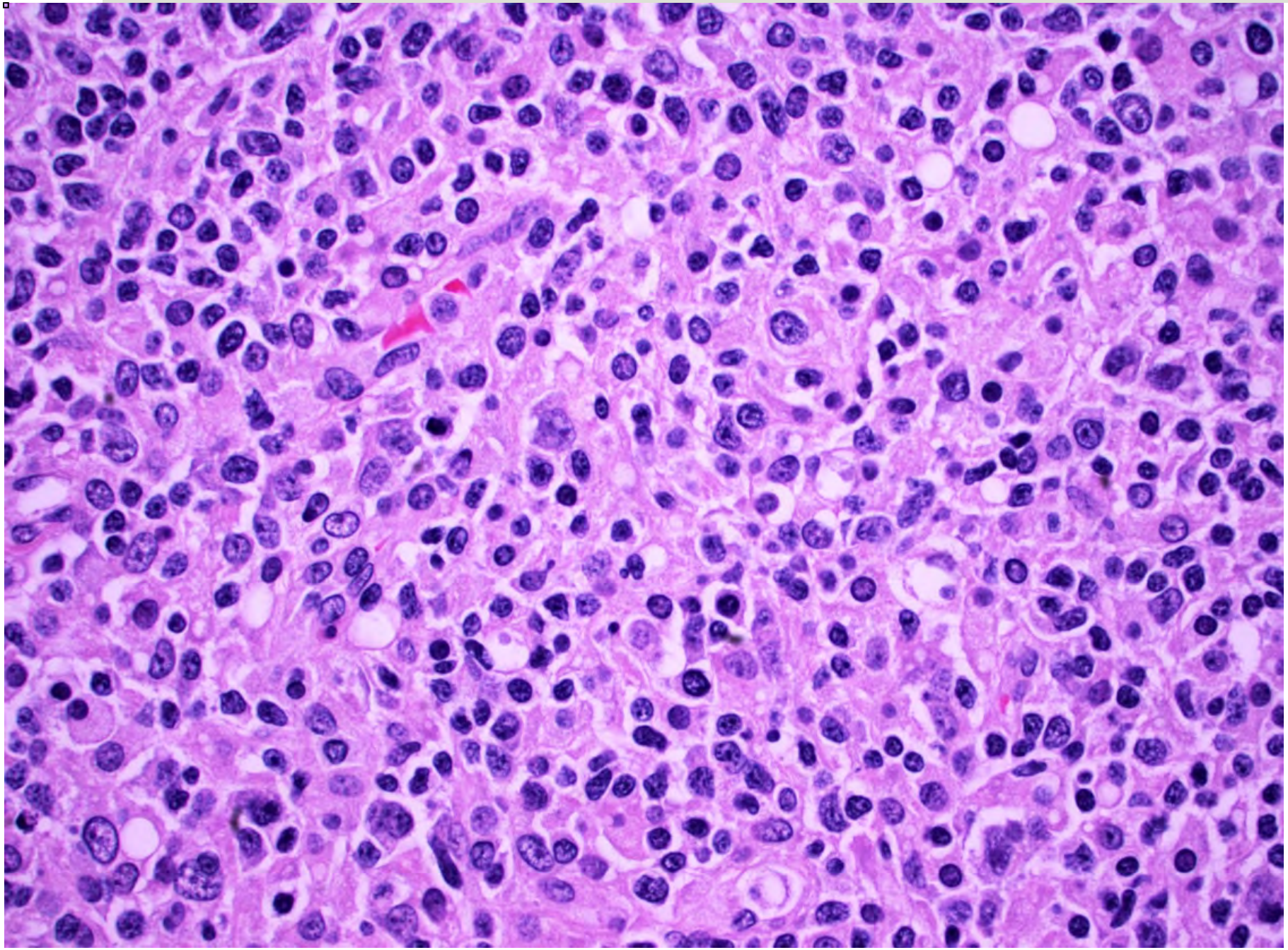
No specific translocation, several genetic abnormalities possible

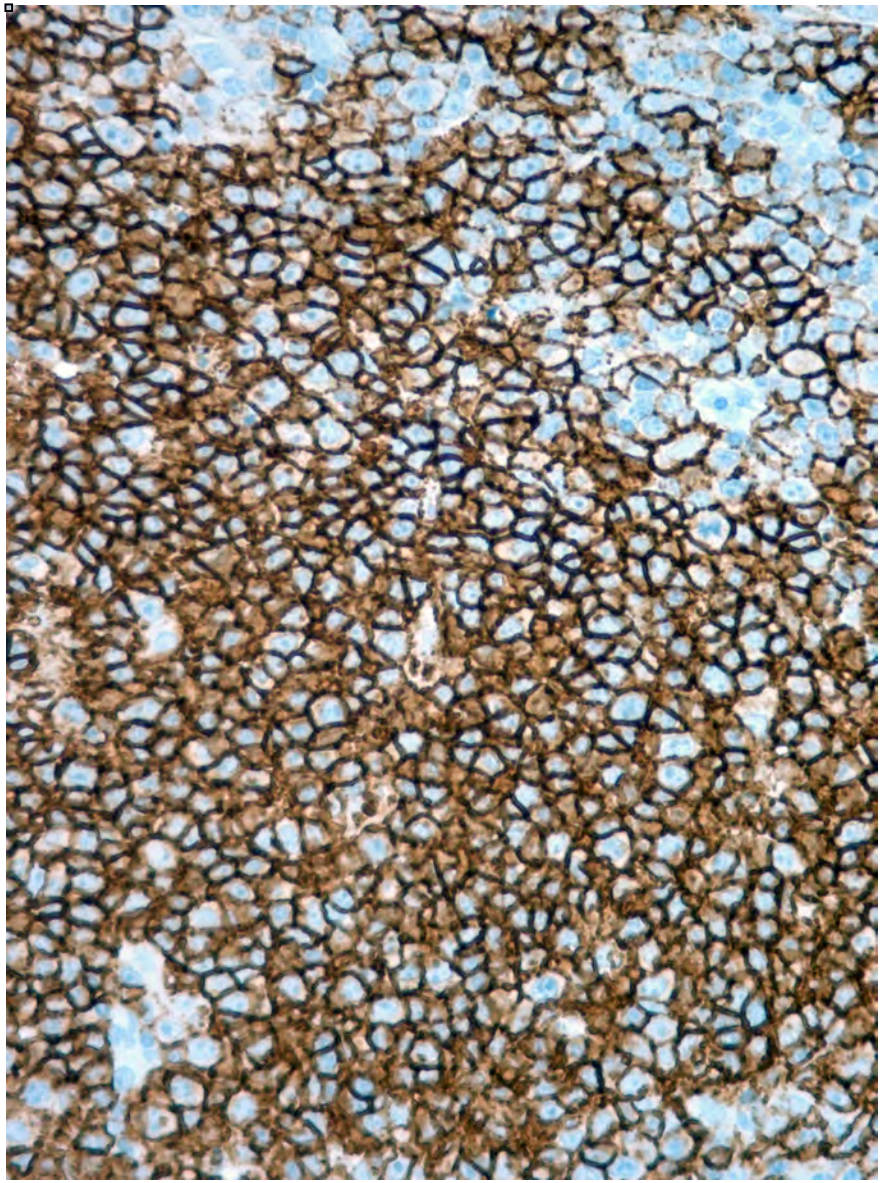
BCL6 translocation (35-40%) with > transcription in germinal centre cells
BCL6 → differentiation arrest of memory B-lymphocytes B memoria and plasmacells with proliferative advantage
BCL6 → reduced expression of p53
p53 → reduced apoptosis
Expansion of mutated cell clones

LARGE B-CELL NHL (DLBCL)

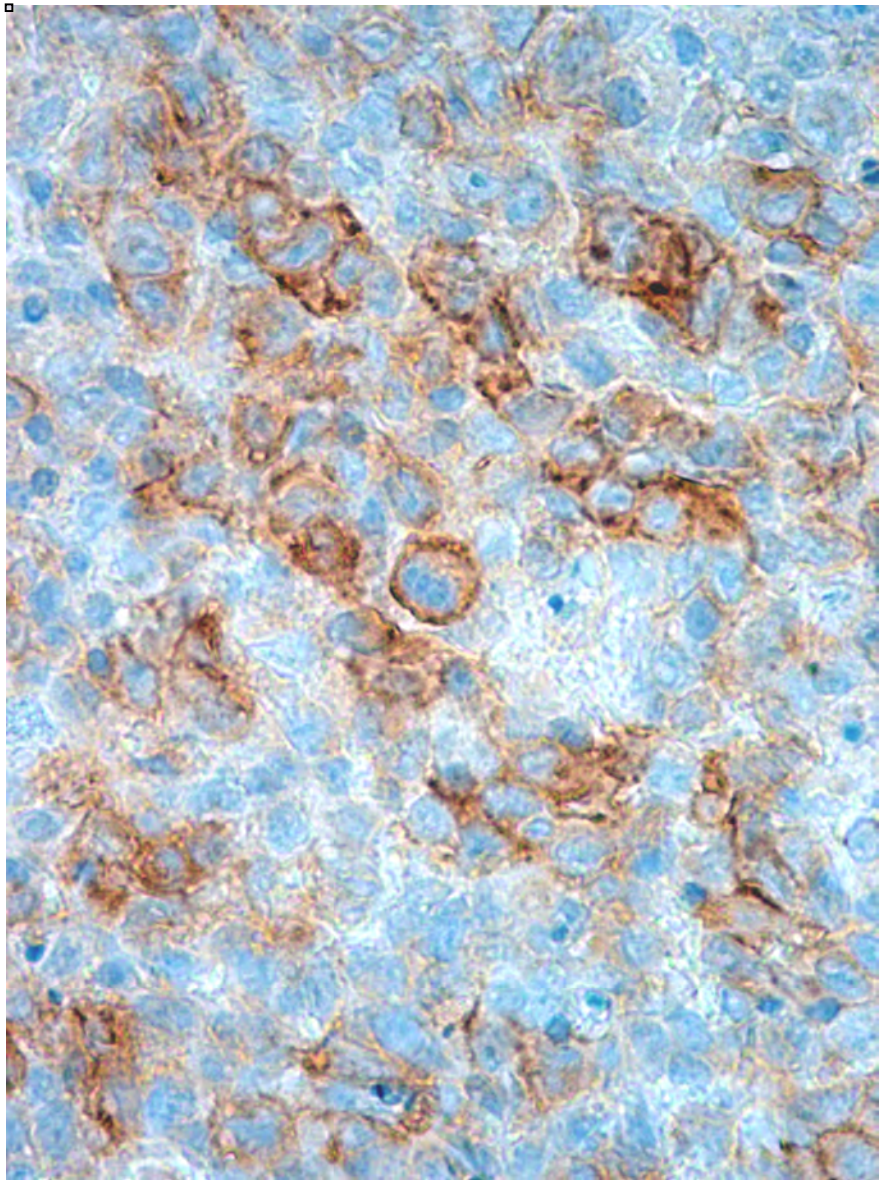
Morphology

Extensive architectural effacement
Large centroblast or immunoblast-like cells
Wide necrotic areas
Increased cell proliferation (Ki67 >>>)
IHC: CD19, CD20, CD22, CD79a
CD30+/-
Morphologic and phenotypic similarities with Lymphocyte Depletion-Hodgkin lymphoma





CD20



CD30

B-cell NHL

B-cell precursors

- *Lymphoblastic lymphoma*
- *Acute lymphoblastic leukemia*

Mature B-cells

- *Lymphocytic lymphoma / chronic lymphoid leukemia*
- *Pro-lymphocytic leukemia*
- *Follicular*
- *Mantle cell*
- *Marginal cell*
  - *Nodal*
  - *Extra-nodal (MALT)*
  - *Splenic*
- *Lympho-plasmacytic*
- *Large cells*
  - *Mediastinal*
  - *Intra-vascular*
  - *Body cavity fluids*
- ***Burkitt***
- *Hairy cell leukemia*
- *Myeloma*

Lymphomatoid granulomatosis

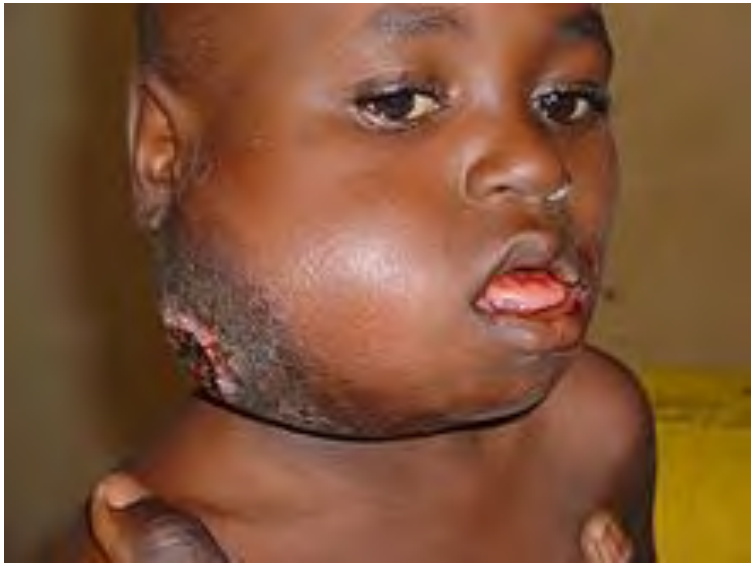
Post-transpantation lymphoproliferative disorders

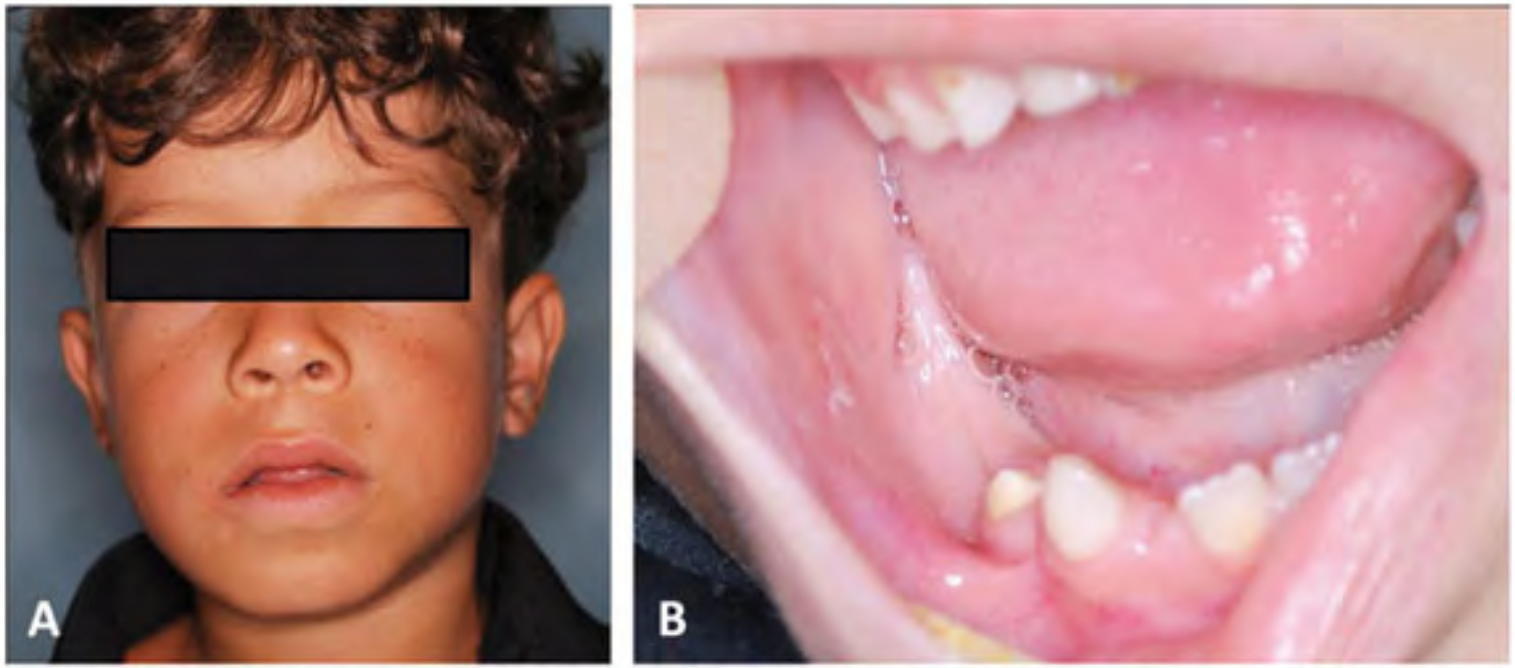
BURKITT LYMPHOMA

Firstly described by Burkitt in 1958 as a maxillary neoplasm, then identified as a lymphoma.
Nel 1961 identificato come linfoma

Endemic form	**Africa (sub-saharian)** **Infancy** **Malaria-associated** ***Jawbones***
Sporadic form	**Western countries** **Infancy & adulthood** **Lymph nodes & ileum** **Less frequently: kidneys, adrenals, testis, ovary, bone marrow**
HIV-associated	**HIV+ patients with frank AIDS**

Rapidly growing mass with extensive destruction
Excellent response to CT




A
B

BURKITT LYMPHOMA

Pathogenesis

EBV infection

95% endemic Burkitt
30-40% HIV-Burkitt
20% sporadic cases

Endemic malaria leads to immune depression and facilitates viral infection

EBV immortalizes B-lymphocytes in vitro, thus favouring their proliferation

BURKITT LYMPHOMA

B-cell immortalization in EBV-negative cases results from c-myc amplification/overexpression

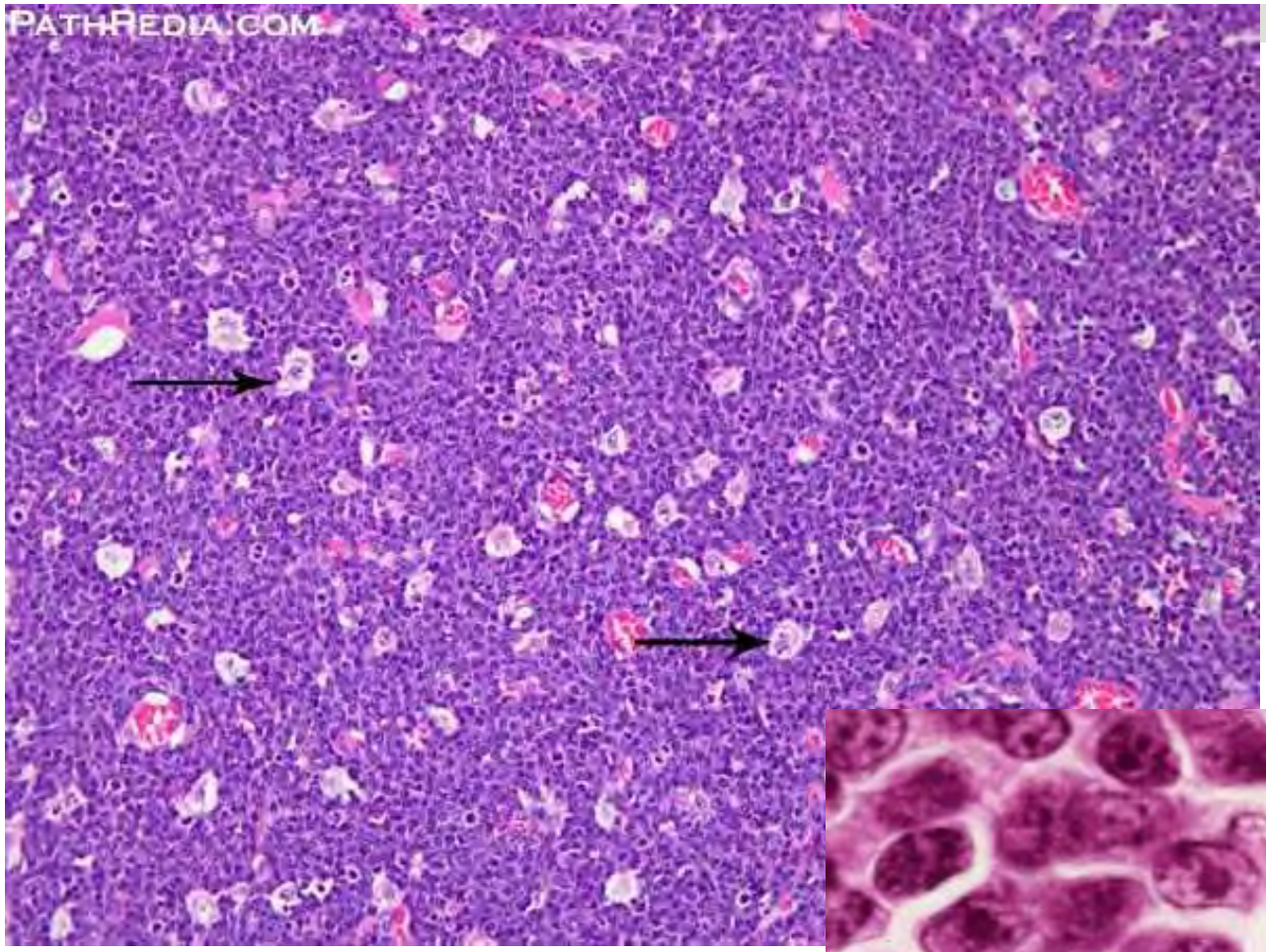
c-myc regulates:	**cell maturation** **oxygen metabolism** **protein synthesis** **apoptosis** **cell cycle progression**

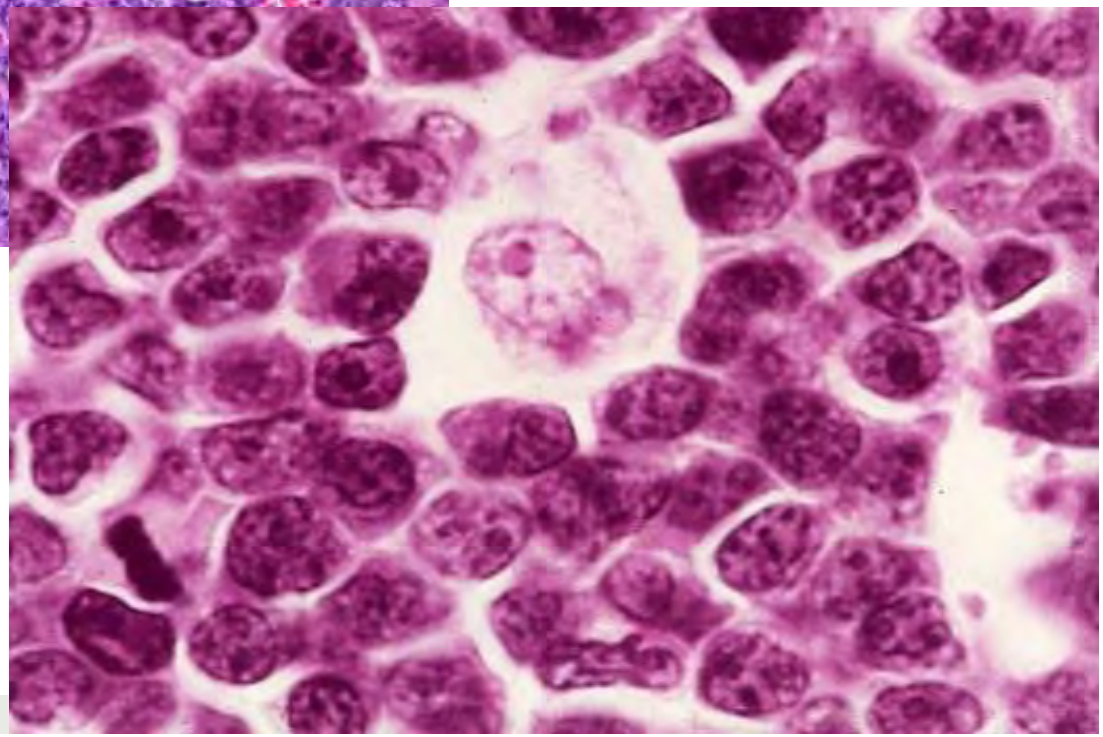
BURKITT LYMPHOMA

Morphology

"starry sky pattern"

Intermediate cell size
Scarce basophilic cytoplasm
Rounded nuclei
Multiple nucleoli
High mitotic rate → Ki67>90%
Macrophages with wide clear cytoplasm
Tingible (apoptotic) bodies


PathRedia.com



B-cell NHL

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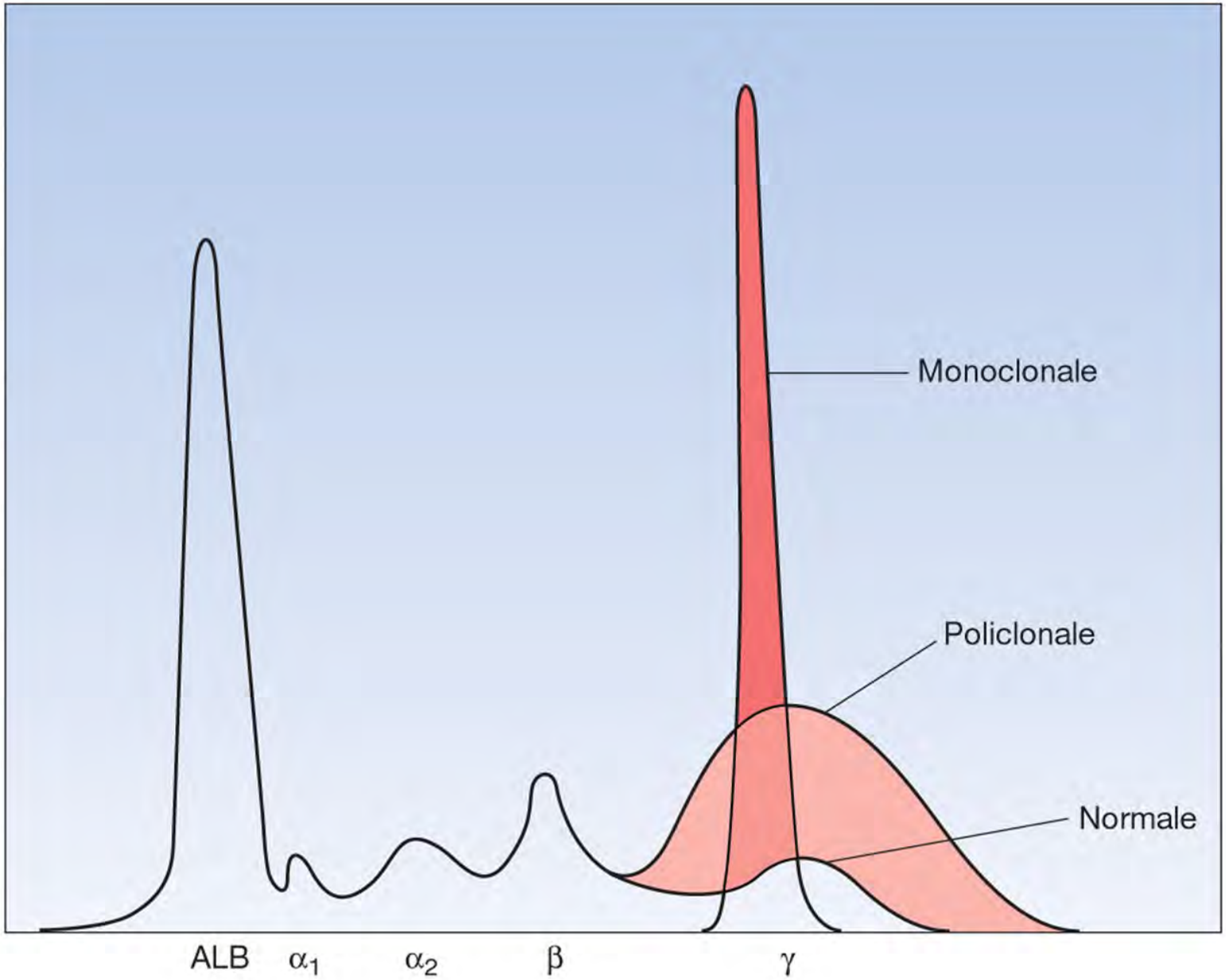
- *Large cells*
  - *Mediastinal*
  - *Intra-vascular*
  - *Body cavity fluids*
- *Burkitt*
- *Hairy cell leukemia*
- ***Myeloma***

Lymphomatoid granulomatosis

Post-transpantation lymphoproliferative disorders

MULTIPLE MYELOMA / PLASMACYTOMA

- **Middle-aged to older adults**
- **2° haematological malignancy**
- **20% deaths for leukemia/lymphoma**
- **Unknown risk factors**
- **Monoclonal immunoglobulin production**
  - **Complete Ig**
  - **IgG: 60%, IgA: 20-25%, IgM, IgD, IgE: rare**
  - **Light chains (K / λ) = Bence-Jones** protein



Rubin, Patologia

MULTIPLE MYELOMA / PLASMACYTOMA

Distinct and progressive clinical pictures

- **Monoclonal Gammopathy of Uncertain Significance (MGUS)**
  - **>50 (1%) 70 (3%) ys.**
  - **No symptoms**
  - **Monoclonal Ig <30 g/l**
  - **Marrow plasma cells < 10%**
  - **1% yearly risk of progression in MM**
- **Smoldering (occult) myeloma**
  - **No symptoms**
  - **Monoclonal Ig >30 g/l**
  - **Marrow plasma cells 10-30%**
- **Multiple myeloma / plasma cell leukemia**

MULTIPLE MYELOMA / PLASMACYTOMA

Morphology:

- **Architerctural effacement**
- **Solid, cohesive nests of plasma cells**
- **Metastasis-like colonization**
- **Wide pleomorphic cells with basophilic cytoplasm**
- **Horse-shoe nuclei, evident nucleoli**

IHC: **CD30+ (membranous, Golgi, cytoplasmic)**

CD38, CD138

ALK-

MULTIPLE MYELOMA / PLASMACYTOMA

Symptoms:
- **Anemia**
- **Osteolythic lesion**
- **Pathologic fractures/osteoporosis**
- **Hypercalcemia**
- **Infections**
- **Chronic renal failure (glomerular Ig accumulation)**

Evolution:
- **Extramedullary extension**
- **Soft tissue involvement**
- **Plasma cells leukemia**
- **Systemic amyloidosis (Ig light chains)**

MULTIPLE MYELOMA / PLASMACYTOMA

Pathogenesis

Post-germinal centre plasmablast

|

Hypersomatic mutation

|

Heavy chain maturation and Ig production

|

Bone marrow migration → maturation

MULTIPLE MYELOMA / PLASMACYTOMA

Molecular mechanisms

30% Hyperdiploid caryotype with rare translocations
70% Hyperdiploid caryotype with translocations

|

Cyclins overexpression

|

Hyperproliferative response to marrow cyclins
Apoptosis (and CT) resistance
Cyclin-mediated bone resorption (osteolysis)

|

Accumulation of genetic damage

|

Disease progression

MULTIPLE MYELOMA / PLASMACYTOMA

Bone marrow involvement

- **Increased plasma cells <10, 10-30, >30%**
- **Growth pattern**
  - **interstitial**
  - **nodular**
  - **diffuse**
- **Haematopoietic suppression**

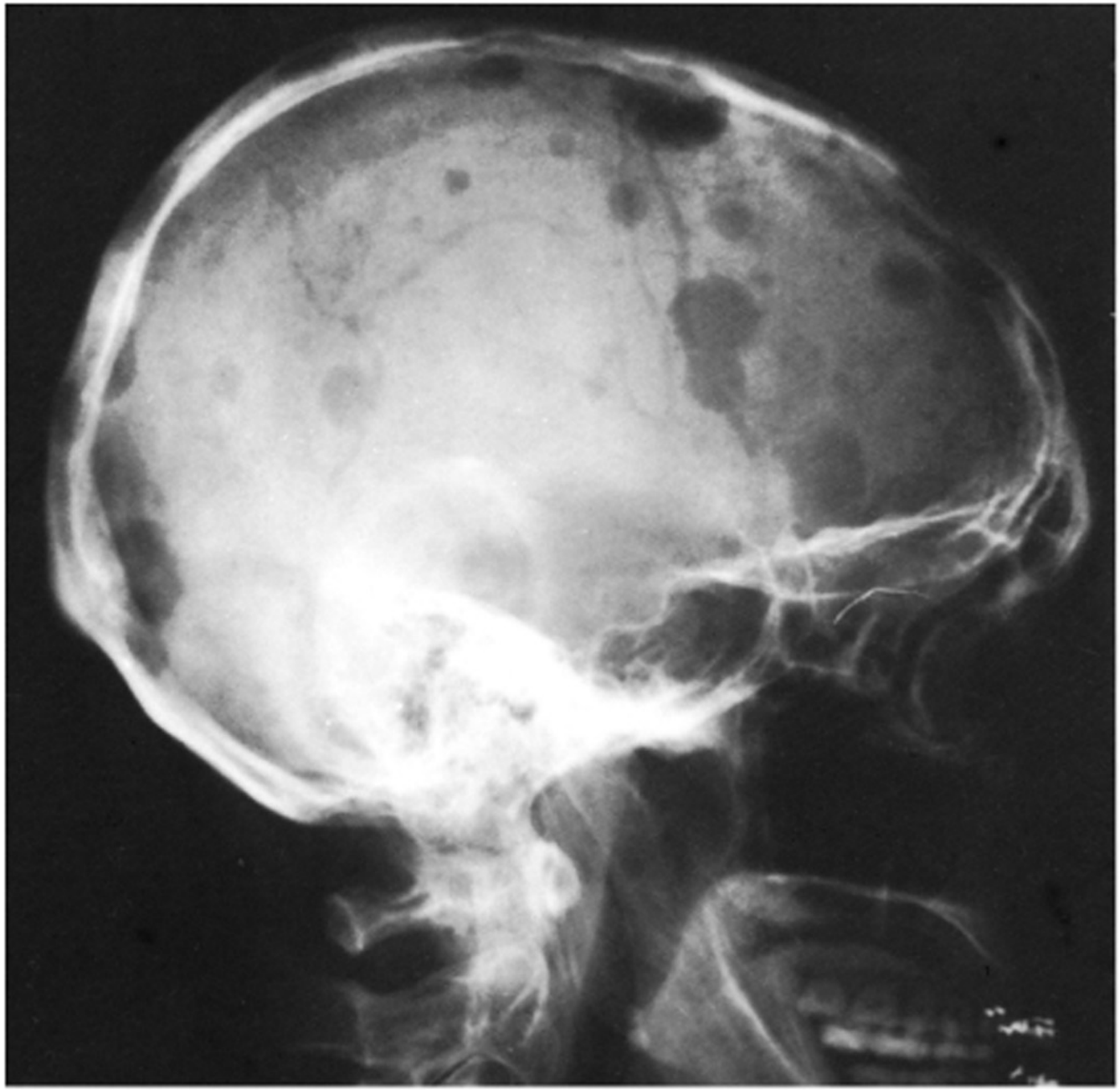
Clinical variants

Solitary bone plasmacytoma

Extra-osseous plasmacytoma

Osteosclerotic myeloma in **POEMS** syndrome

Polyneuropathy, Organomegaly, Endocrinopathies, Monoclonal Gammapathy, Skin abnormalities



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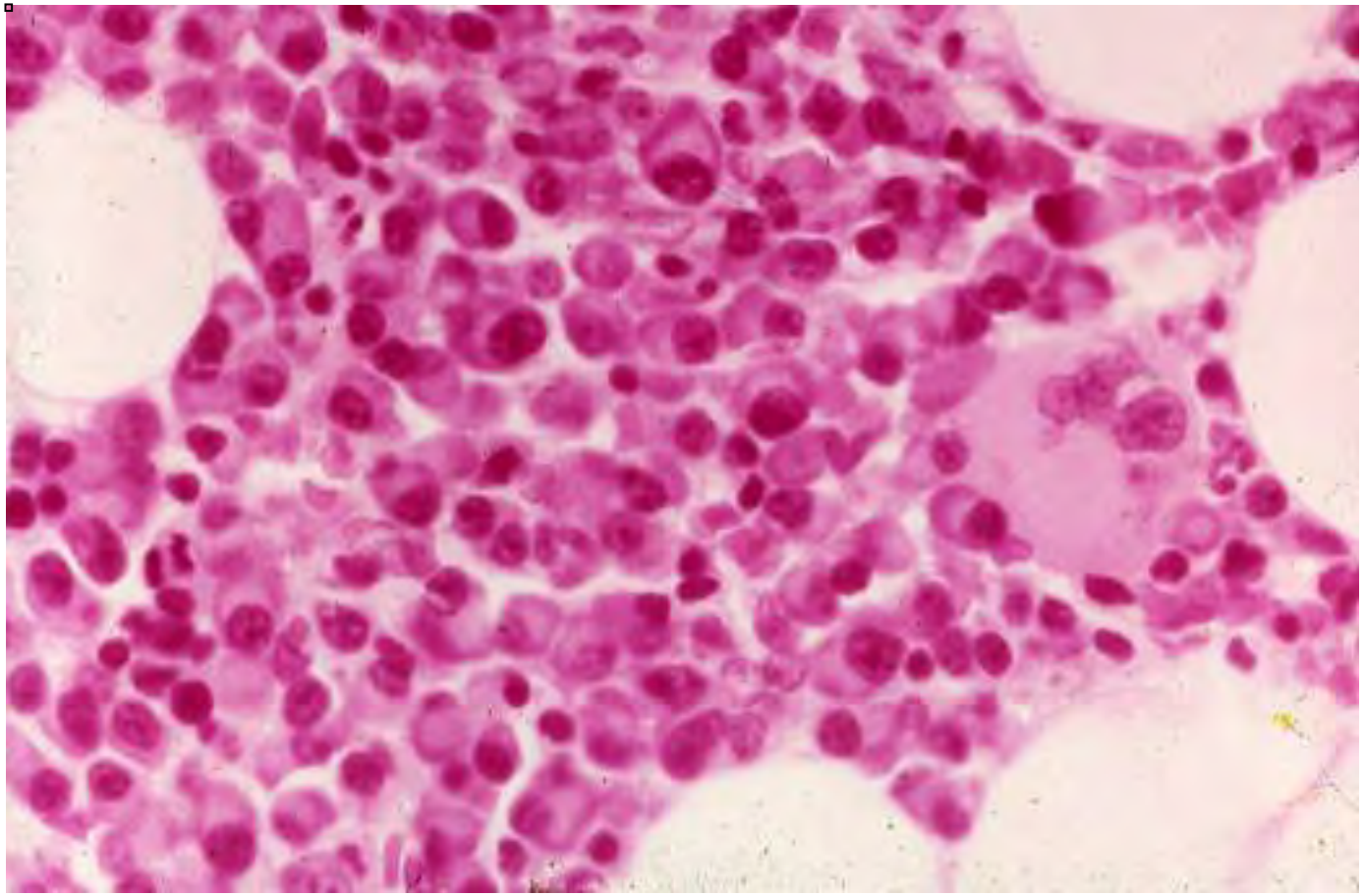

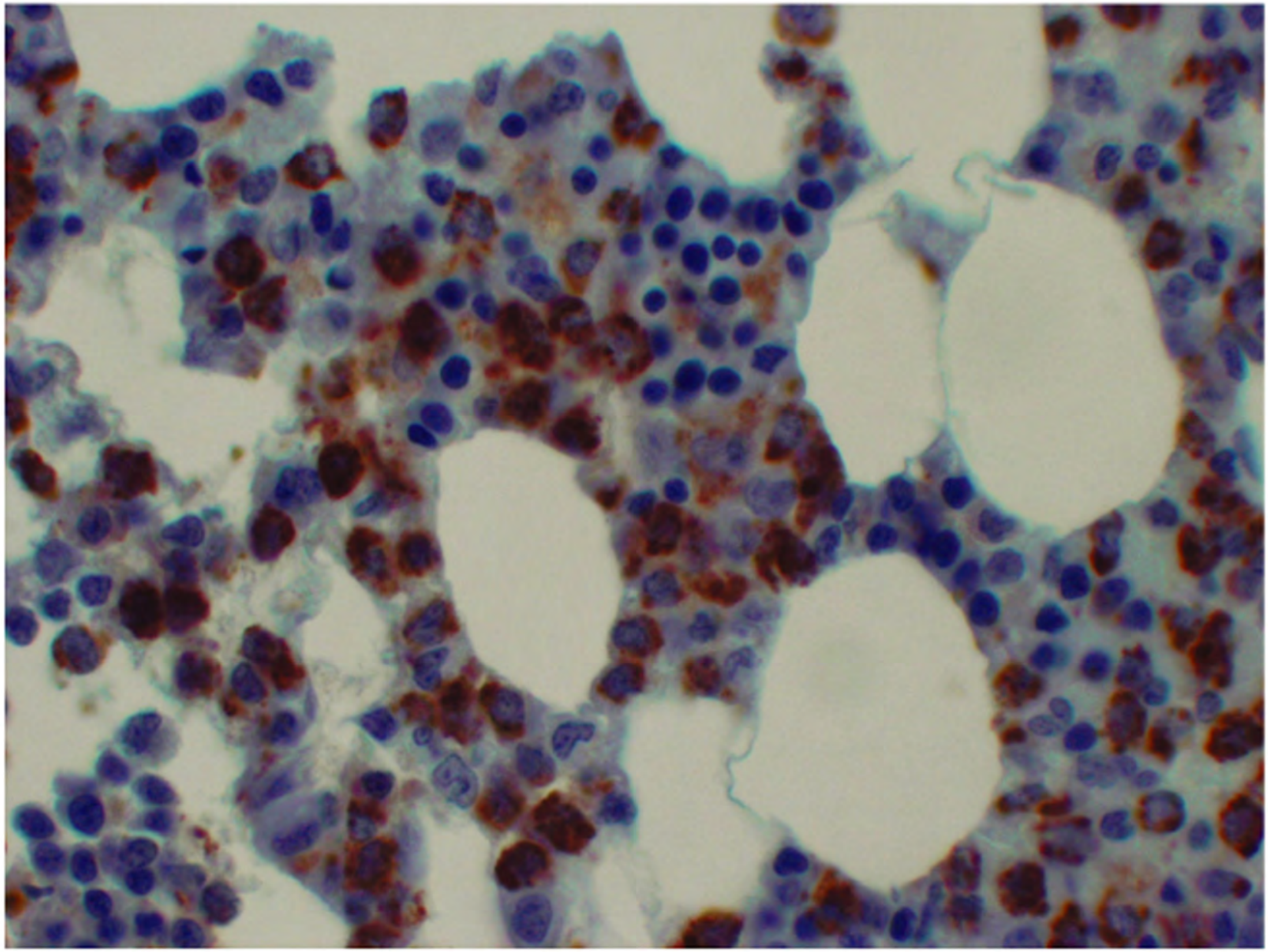

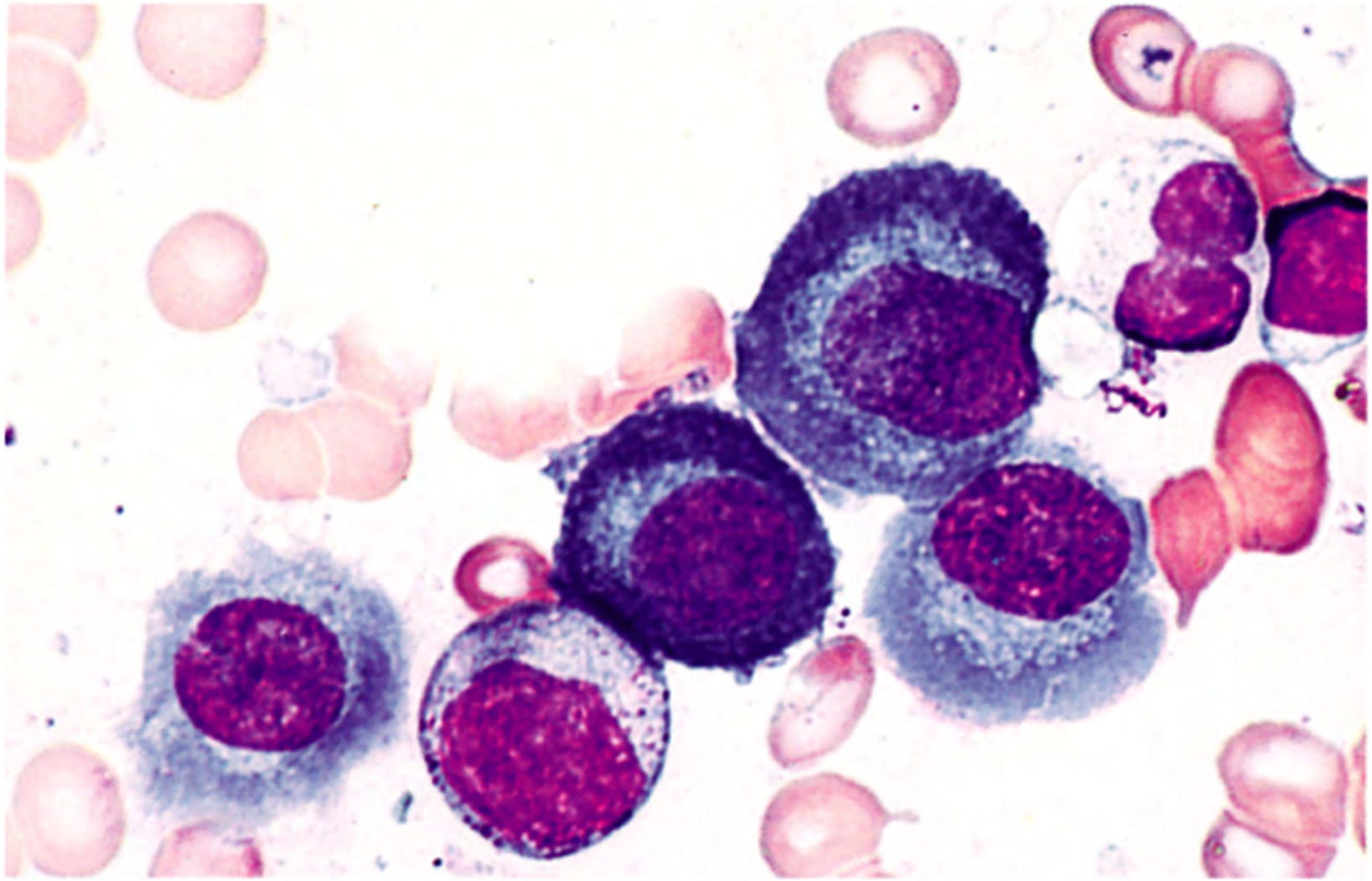

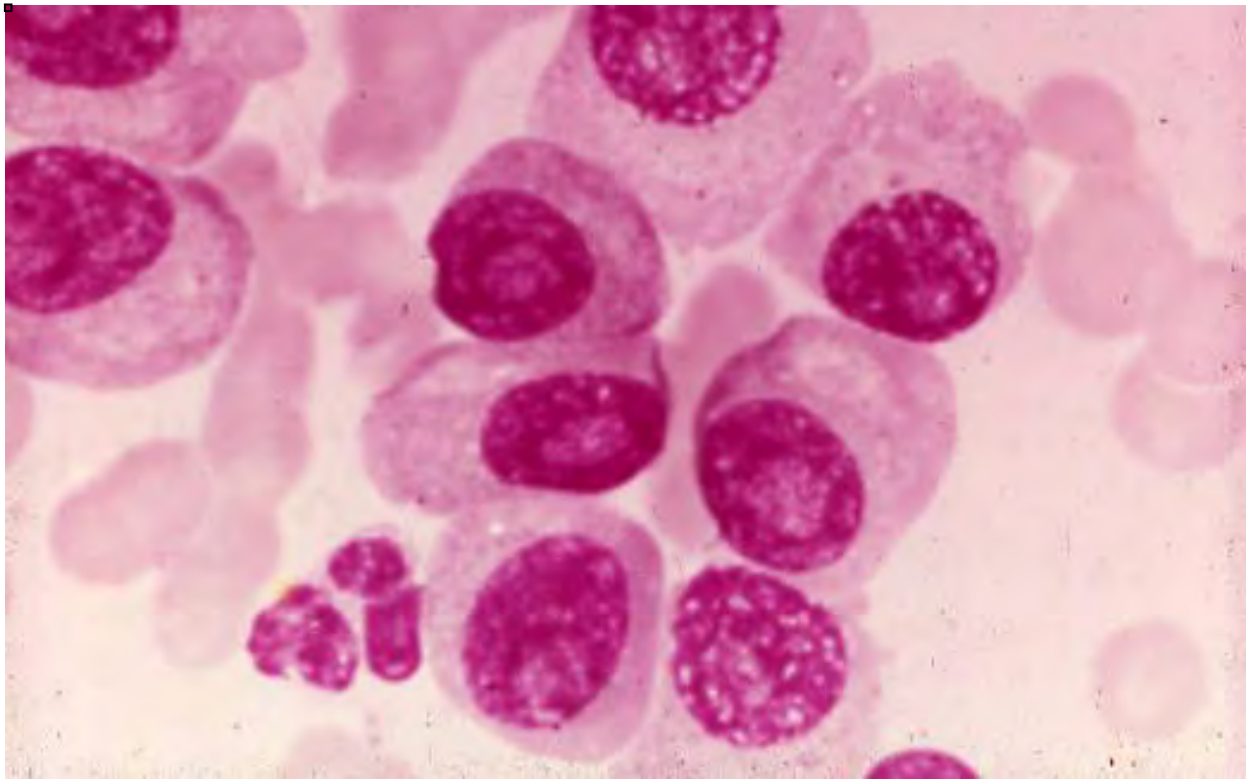

T-cell NHL

Precursor T-cell

- T-lymphoblastic
- T-lymphoblastic leukemia
- NK-cell lymphoma / leukemia

Mature/perypheral T/NK-cell

- Pro-lymphocytic leukemia
- Large granular T-cell leukemia
- NK leukemia
- **Adult T-cell lymphoma/leukemia**
  - NK/T nasal type
  - Enteropathy-associated
  - Hepato-splenic (gamma/delta)
  - Subcutaneous panniculitis
  - Mycosis fungoides & Sezary syndrome (skin)
  - Large anaplastic T-cell (cutaneous / systemic)
  - Large anaplastic T-cell Alk+
  - Perypheral T-cells
  - Angio-immunoblastic

ADULT T-CELL NHL

Age: adults only (20-80 ys.)

Endemic in South-West Japan, Carribean, Central Africa

Human T-Lymphotropic Virus 1 (HTLV-1)

Long latency period

Largely disseminated, systemic disease

Lymph nodes, spleen, lungs, liver, G.I. tract, CNS

Highly pleomorphic, anaplastic lymphoid cells of variable size

IHC → CD3,CD5,CD4+ CD8-

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NK/T-CELL NHL, NASAL-TYPE

Age: adults
Extra-nodal lymphoma
Asia, Mexico
EBV-related
Nasal/paranasal cavities, rhinopharynx, palate
Formerly: Lethal midline granuloma
Extensively destructive growth with vascular obliteration and mucosal damage

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ENTEROPATHY-ASSOCIATED T-CELL NHL

Northern Europe

80-90 % associated with *celiac disease*

10-20% sporadic

Mucosal ulceration with intra-epithelial lymphocytes

Large cell transformation

Atrophic villi and hyperplastic criptae

Monomorphic T-cells of intermediate size

IHC: CD3+ CD4- (CD30+ pleomorphic cells in celiac d.)

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SUBCUTANEOUS PANNICULITIS

Rare (<1% NHL)

Age: Young adults (20% < 20 ys.)

F>M

Cytotoxic T-cells

20% associated with autoimmune disease (Systemic Lupus)

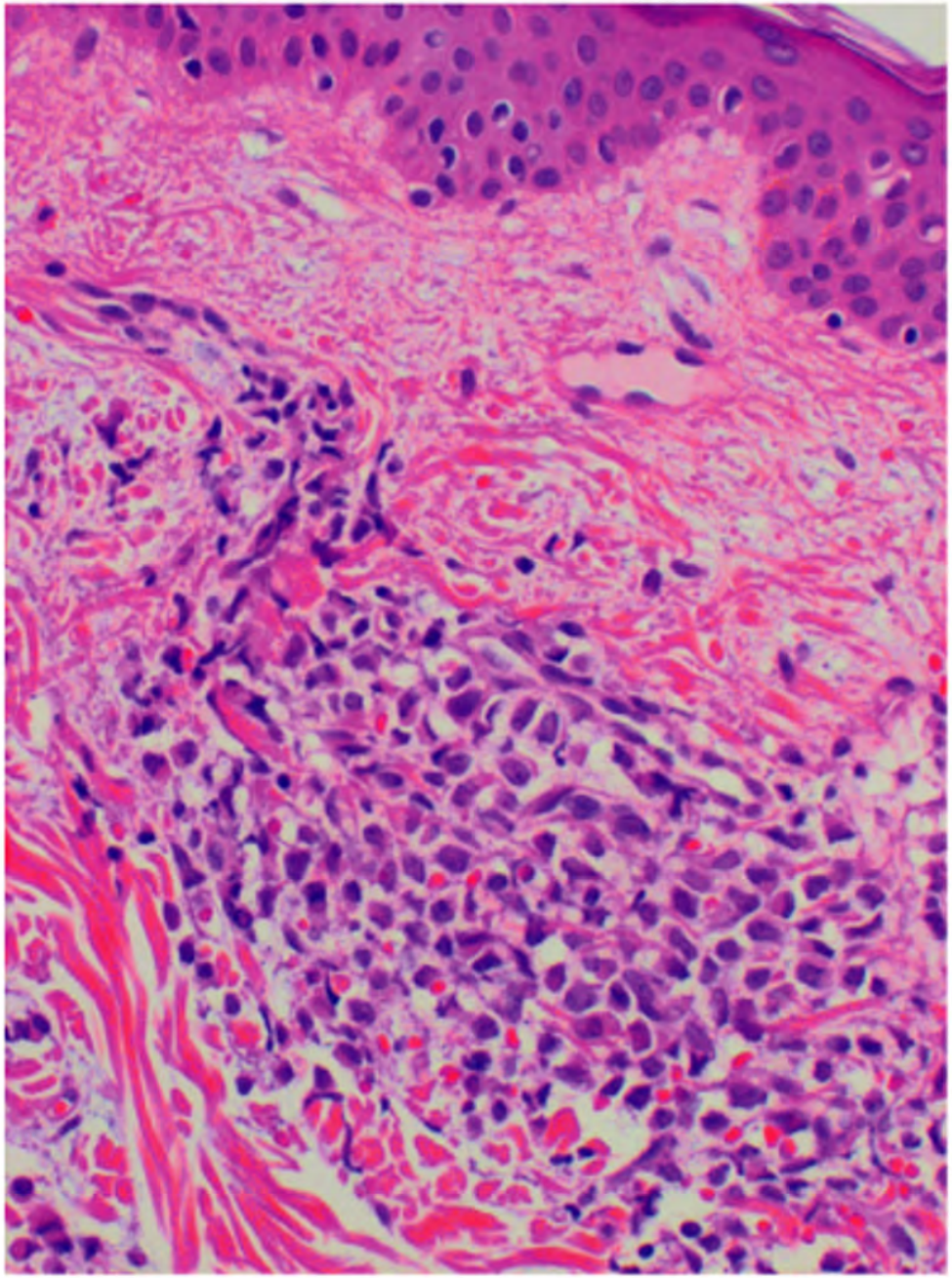
Multiple subcutaneous nodules (limbs and trunk)

No lymphoadenomegaly

Small lymphoid cells in the subcutaneous, surrounding individual adipocytes

Foamy lipid-laden macrophages

IHC: CD8 +, granzyme B+



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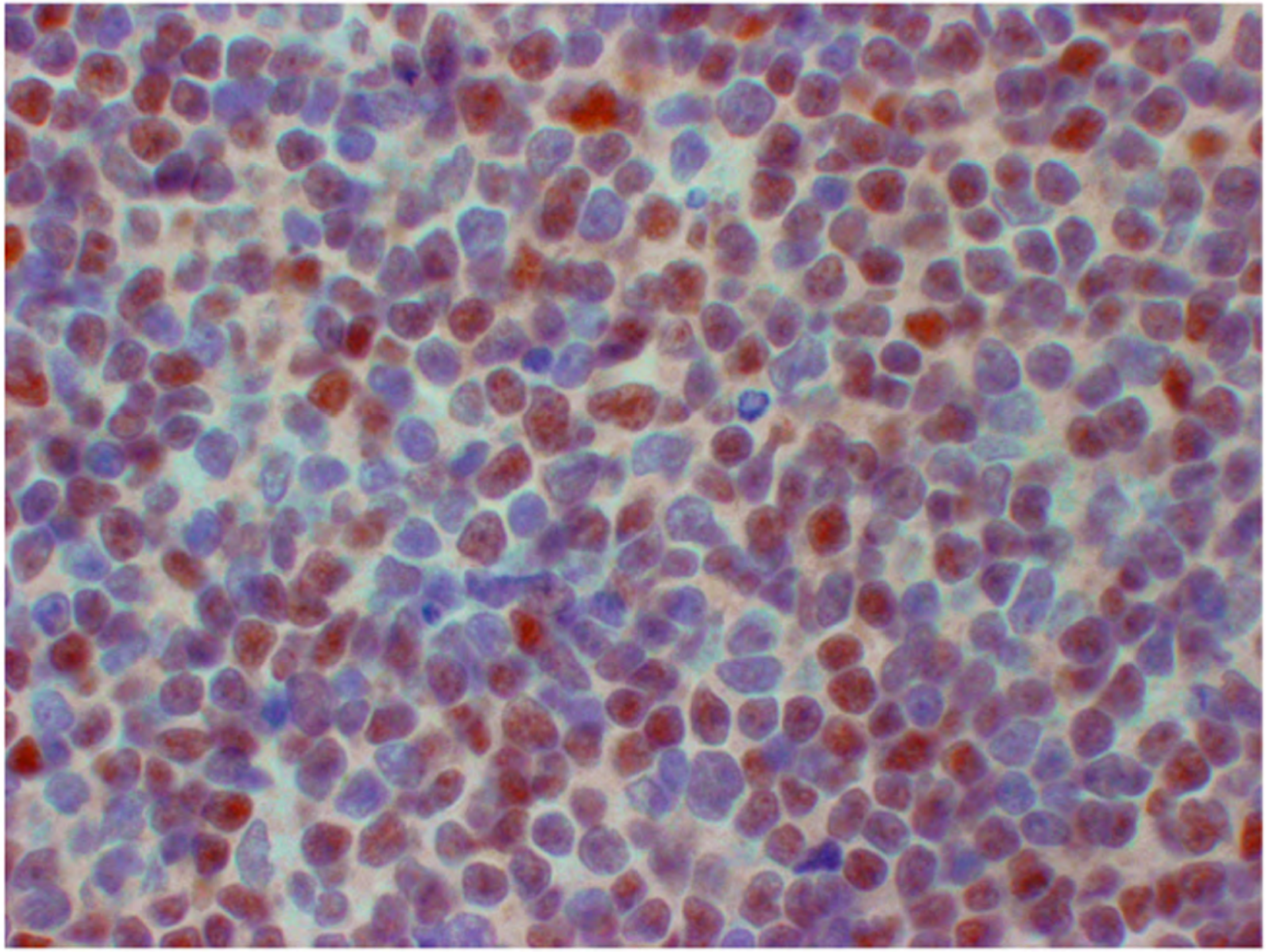

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  - Perypheral T-cells
  - Angio-immunoblastic

MYCOSIS FUNGOIDES

Epidermotropic T-cell lymphoma

The most frequent cutaneous lymphoma

Age: adults

M>F

Prolonged clinical course with progression from erythematous plaques to ulcerated lesions

Late nodal and visceral involvement

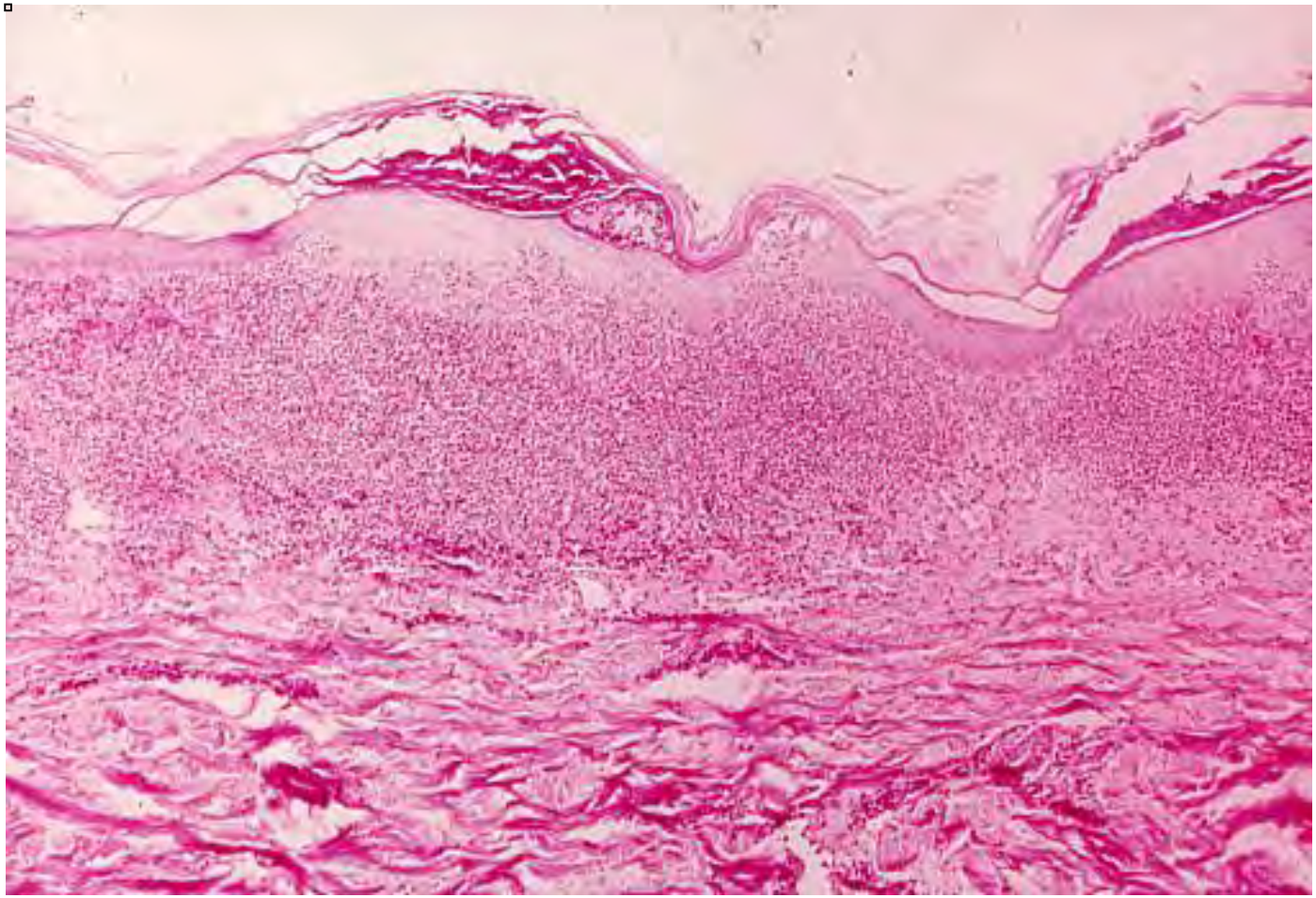
MYCOSIS FUNGOIDES

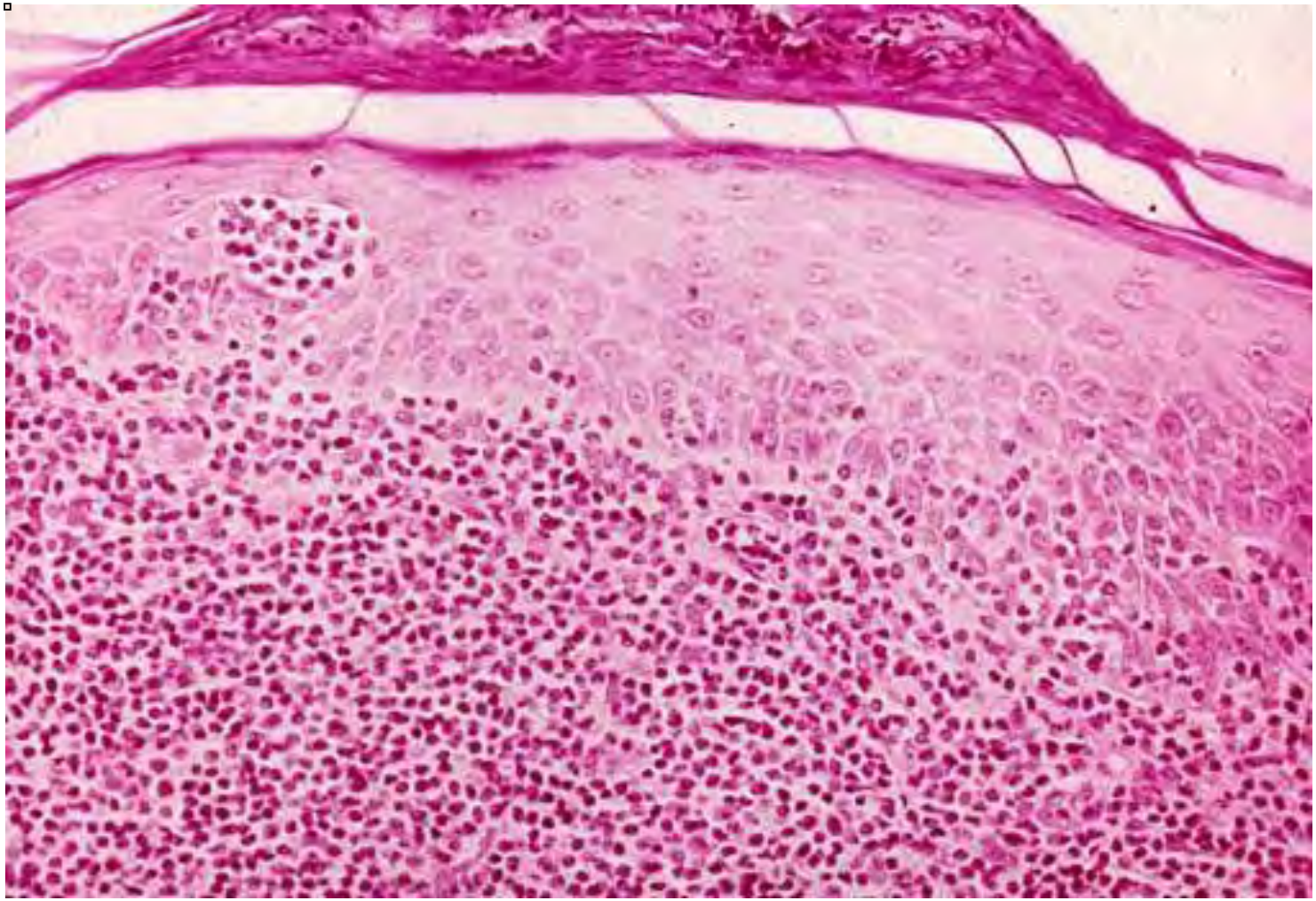
Morphology:

- Band-like infiltration
- Lymphocytes and macrophages
- Evident epidermotropism
- Small-medium sized atypical lymphoid cells
- Cerebriform, indented nuclei
- Intra-epidermal micro-abscesses (Pautrier)
- IHC: CD3, CD5, CD4+, CD8-

In advanced stages:

- Wide dermal involvement
- Blastic large cells (CD30+)
- Reduced epidermotropism





SEZARY SYNDROME

Rare, corresponds to the **leukemic stage** of Mycosis Fungoides
Symptoms: erythroderma, generalized lymphadenopathy, Sezary cells in skin, lymph nodes and blood
Morphology:

- Medium-large cells
- Cerebriform and indented nuclei
- CD2, CD3, CD5+

Prognosis:

- 10-20% OS at 5ys.
- Opportunistic infections

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  - Subcutaneous panniculitis
  - Mycosis fungoides & Sezary syndrome (skin)
  - **Large anaplastic T-cell (cutaneous / systemic)**
  - Large anaplastic T-cell Alk+
  - Perypheral T-cells
  - Angio-immunoblastic

CUTANEOUS ANAPLASTIC T-CELL NHL

Rare (<1% NHL)

Age: Adults (40-50 ys.)

Symptoms: multifocal skin papules or nodules, spontaneous regression possible

Large T-cells with pleomorphic nuclei, CD3, CD30+

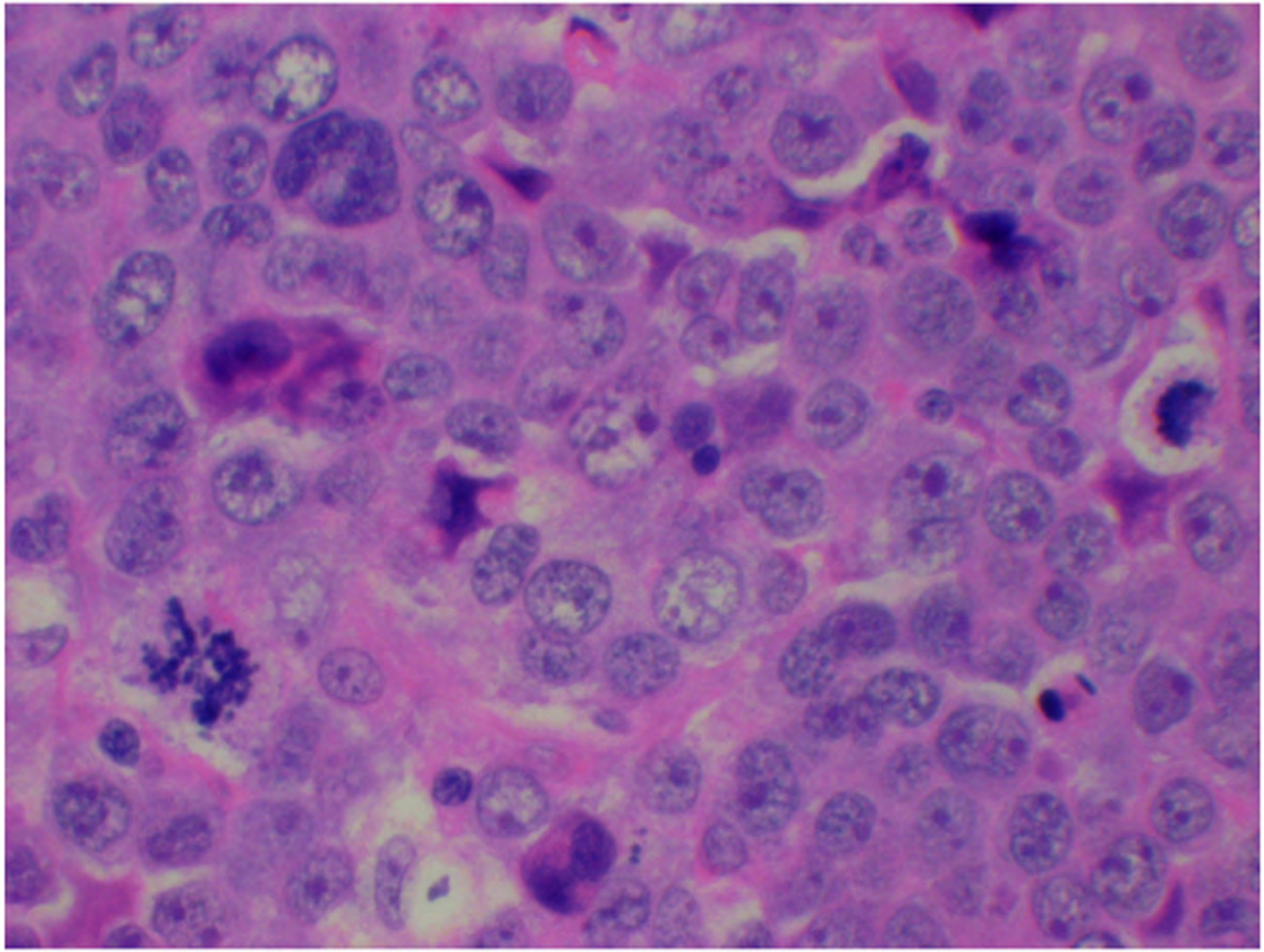
No epidermotropism

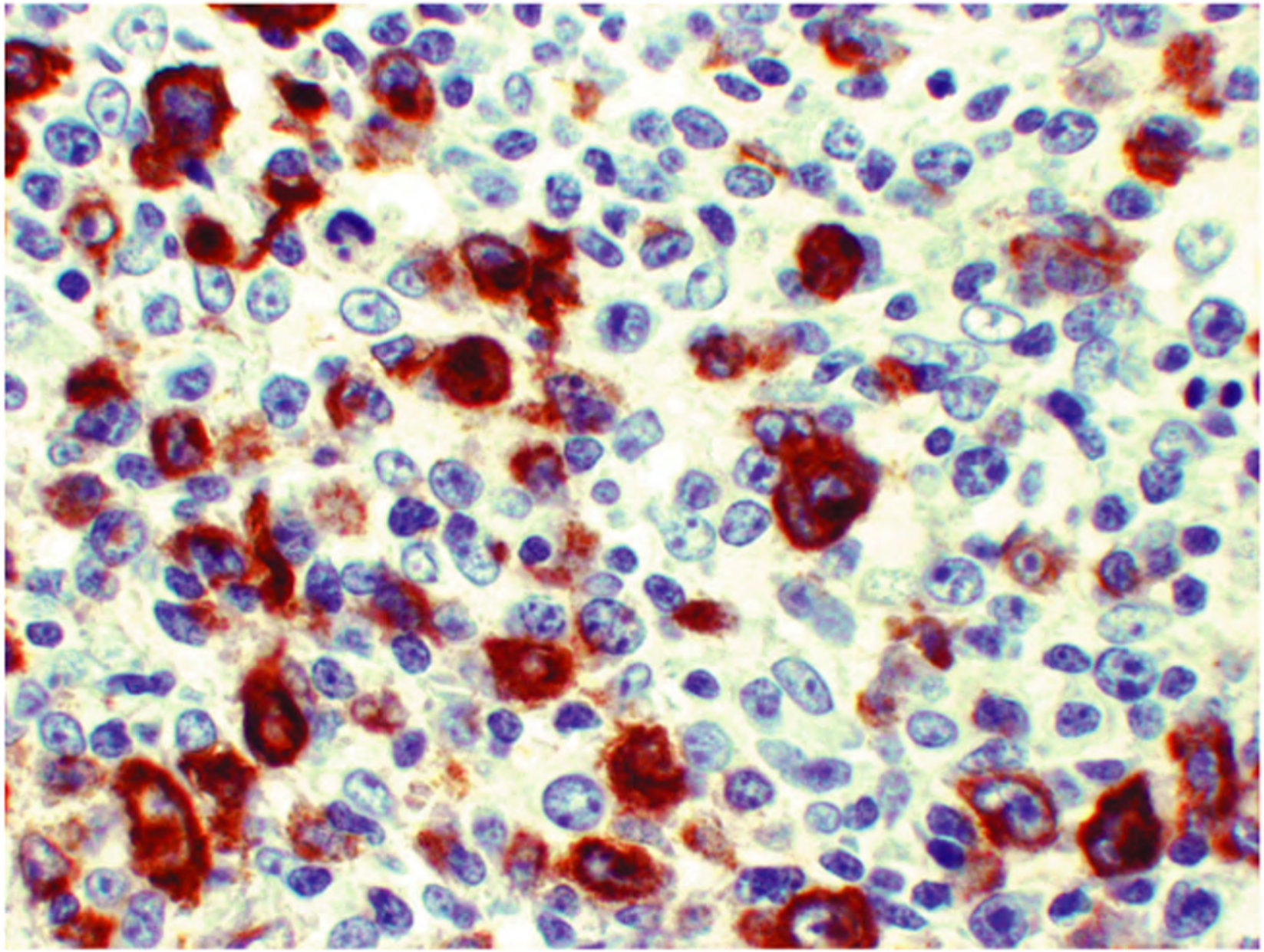
LYMPHOMATOID PAPULOSIS

Multiple subcutaneous nodules (limbs and trunk)

Spontaneous regression (3-12 weeks) frequent

May preceed ALCT-NHL by decades





ALK+ ANAPLASTIC T-CELL NHL

Rare (<1% NHL)

Age: Infancy and young adults (<30 ys.)

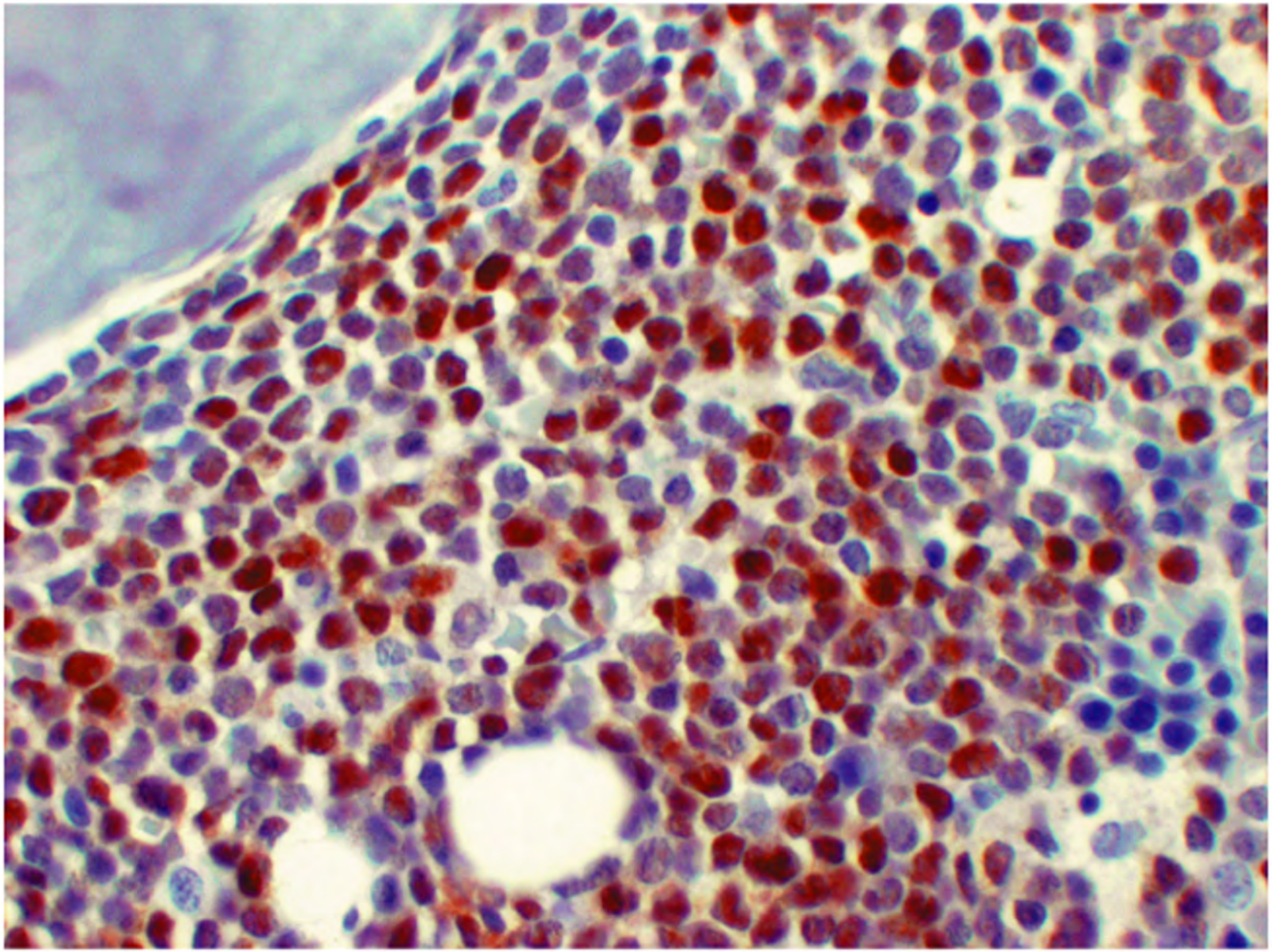
Symptoms: lymphomegaly, extra-nodal involvement (skin, bone, soft tissues, lungs, liver)

Intra-sinusoidal growth (metastasis-like)

Small and large T-cells with pleomorphic nuclei, CD3, CD30, ALK+

Specific ALK translocation

ALK- variant in older patients (40-65 ys.), more advanced stage at presentation, poorer prognosis than ALK+



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  - Large anaplastic T-cell (cutaneous / systemic)
  - Large anaplastic T-cell Alk+
  - **Perypheral T-cells**
  - Angio-immunoblastic

PERIPHERAL T-CELL NHL

Rare (<5% NHL)

Age: Adults (40-50 ys.)

Symptoms: lymphadenopathy, extra-nodal involvement (skin, G.I. tract)

Small, monomorphic T-cells with rounded nuclei, CD3+

Poor response to treatments, reduced survival in comparison with B-cell lymphocytic NHL / CLL

T-cell NHL

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  - Mycosis fungoides & Sezary syndrome (skin)
  - Large anaplastic T-cell (cutaneous / systemic)
  - Large anaplastic T-cell Alk+
  - Perypheral T-cells
  - **Angio-immunoblastic**

ANGIO-IMMUNOBLASTIC NHL

Rare (<2% NHL)

Age: Adults (50-60 ys.)

Symptoms: systemic lymphadenopathy, hepato-splenomegaly, extra-nodal involvement (cutaneous rash, pleuro-peritoneal effusion), hyper-gamma-globulinemia

Morphology:

Paracortical involvement

Large blastic cells CD2, CD3+

RS-like cells, **EBV+**

Aggressive clinical course (OS = 3 ys.) with progression in ALCL