

Update On Lipomatous Tumors: Old Standbys and New Concepts

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Benign Lipomatous Tumors (WHO, 2002)

- Lipoma
- Lipoblastoma
- Angiolipoma
- Myolipoma
- Chondroid lipoma
- Angiomyolipoma
- Myelolipoma
- Hibernoma
- Spindle cell / pleomorphic lipoma

Lipomatous Tumors of Intermediate Malignancy (WHO, 2002)

**Atypical lipomatous tumor
(Well-differentiated liposarcoma)**

Malignant Lipomatous Tumors (WHO, 2002)

- **Dedifferentiated liposarcoma**
- **Myxoid liposarcoma**
- **Round cell liposarcoma**
- **Pleomorphic liposarcoma**
- **Mixed-type liposarcoma**
- **Liposarcoma, NOS**

Liposarcoma

- Atypical lipomatous tumor
(well-differentiated liposarcoma)
 - lipoma-like
 - sclerosing
 - inflammatory
 - spindle cell
 - dedifferentiated
- Myxoid / round cell liposarcoma
- Pleomorphic liposarcoma

KHOS-290
1A₁
KWRHNTAL

Sob-28689

KHOS-290
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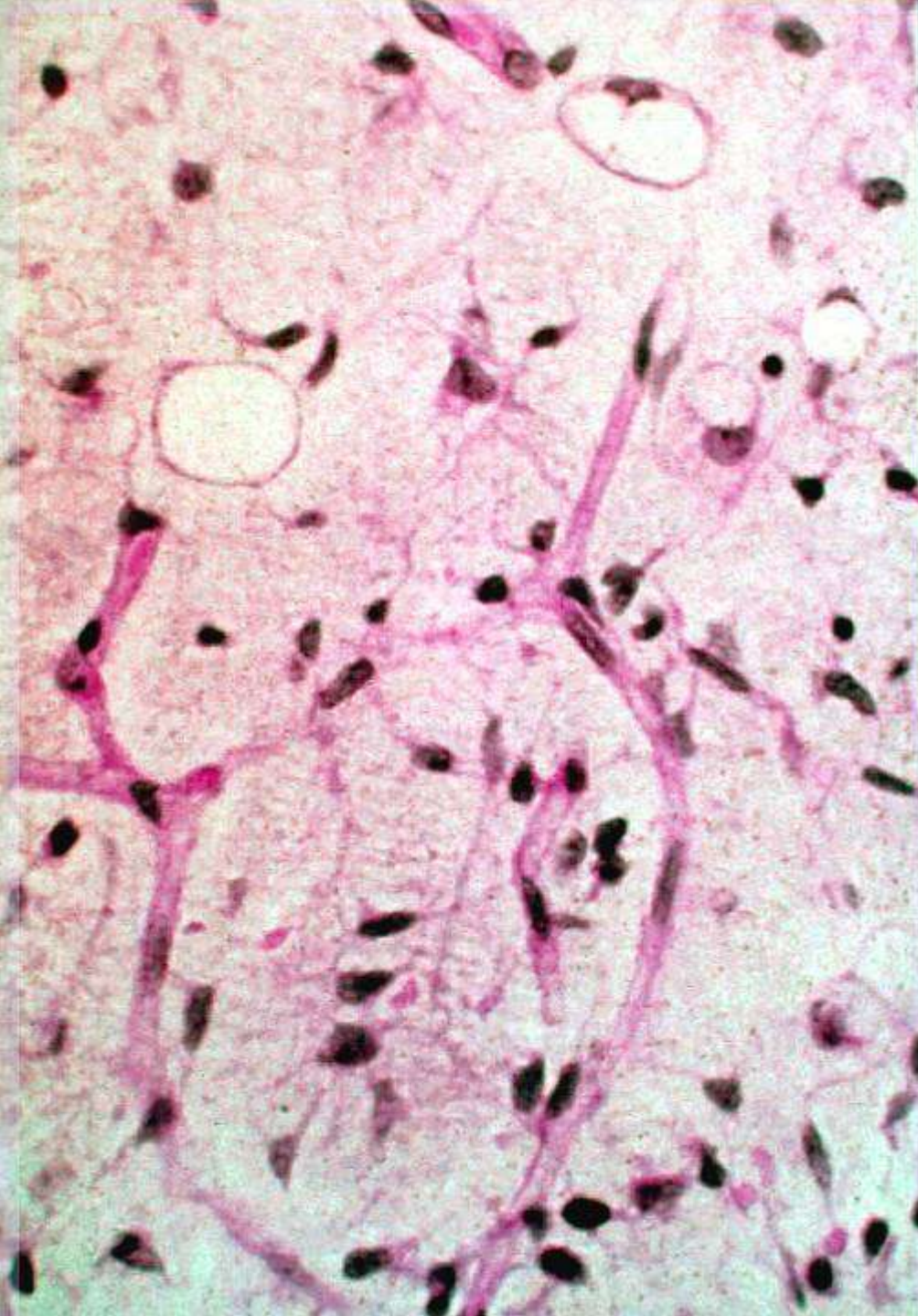
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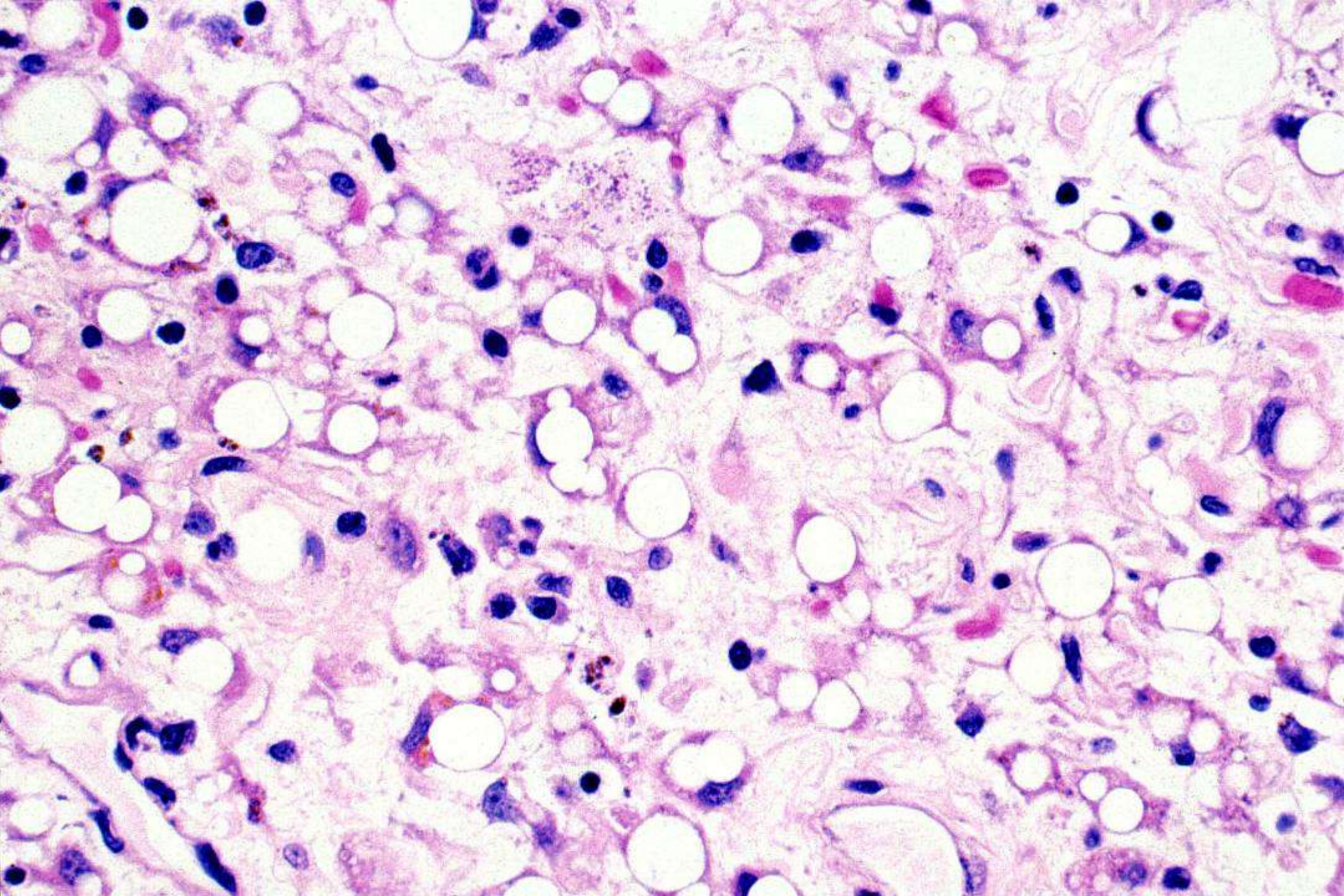


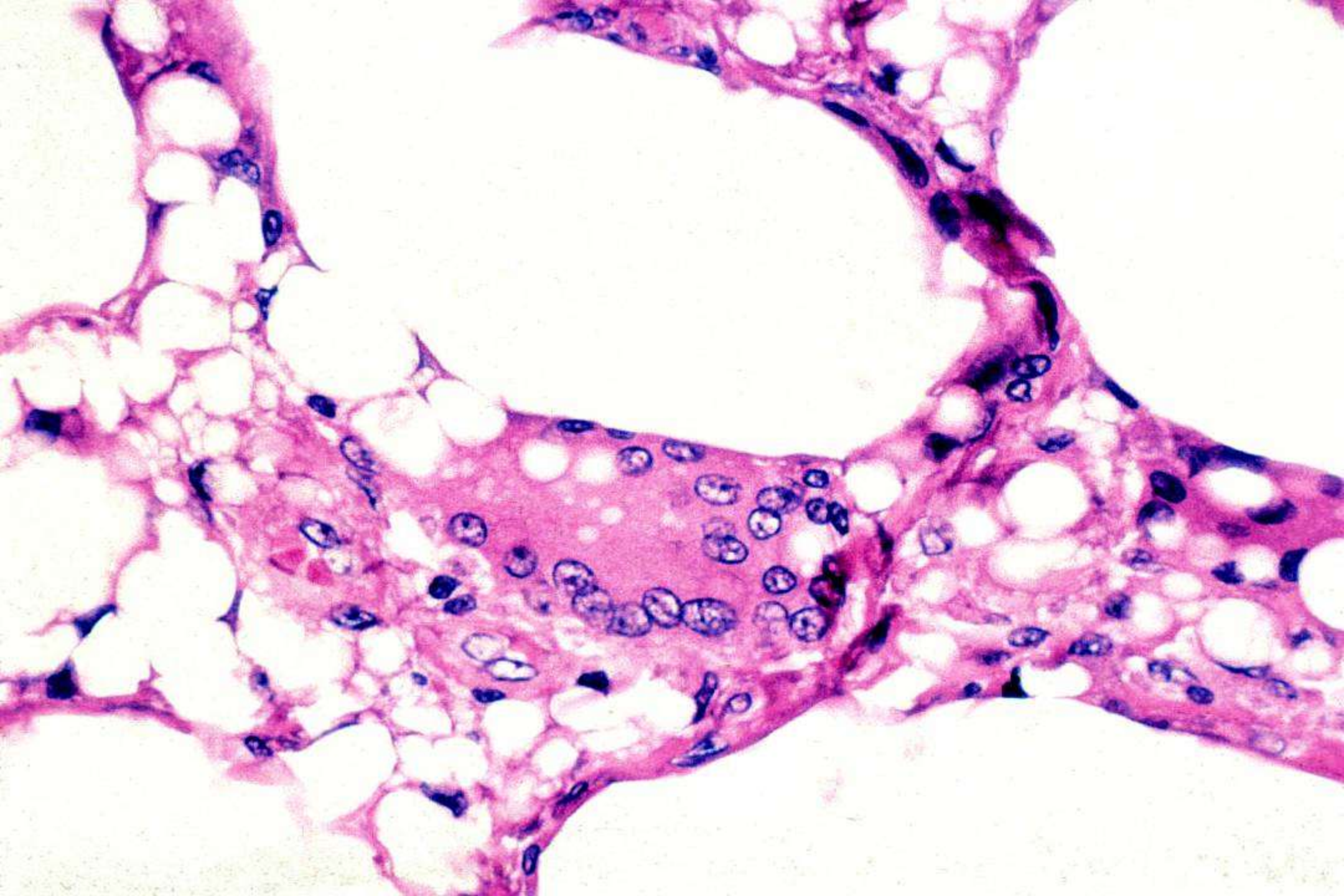
Lipoblast

- **Lipid-rich cytoplasm**
- **Hyperchromatic indented/scalloped nucleus**
- **Appropriate histologic background**

Pseudolipoblasts

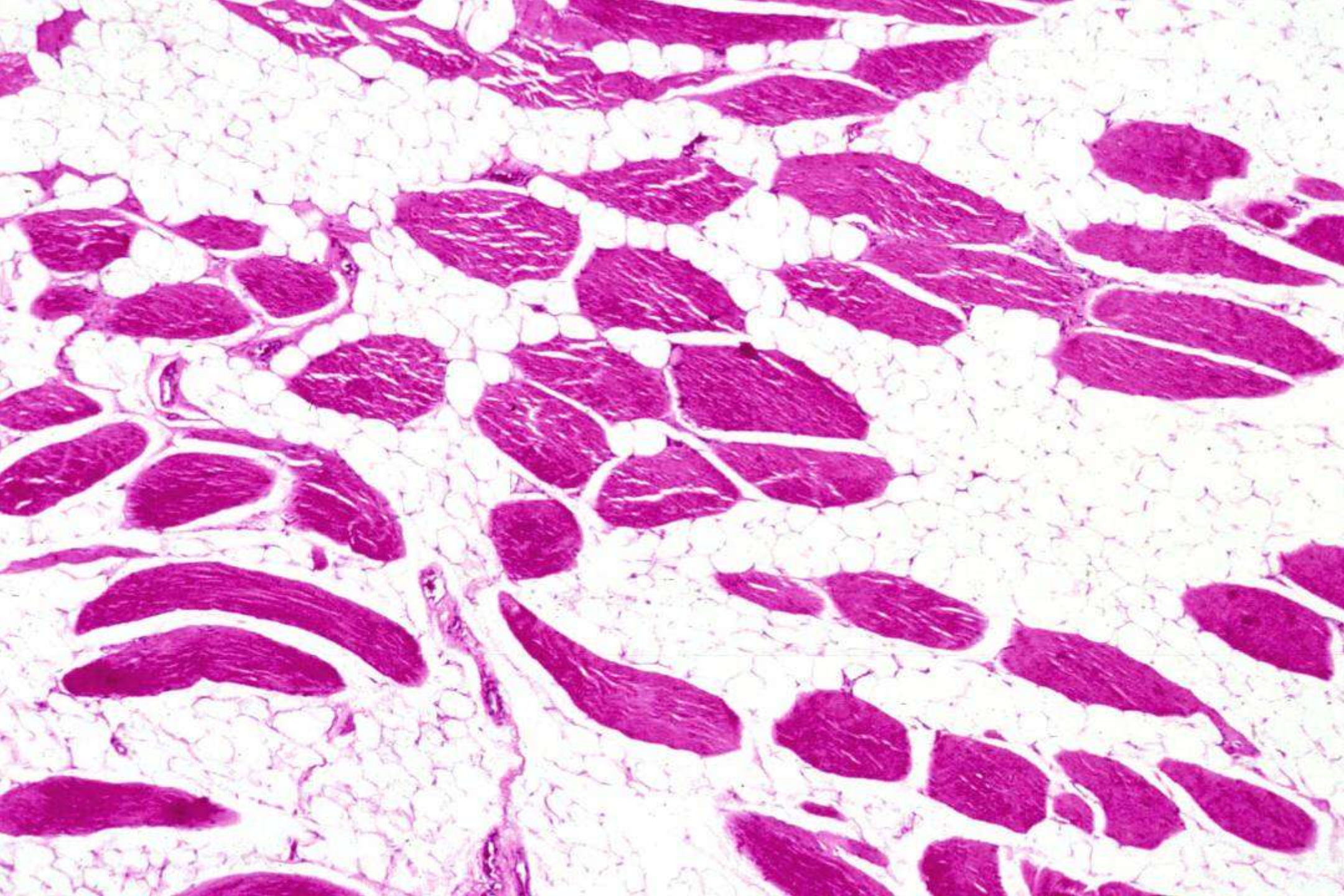
- Fat atrophy
- Hibernoma cells
- Silicone reaction
- Signet ring cells
- Fixation artifact
- Neoplastic fat infiltration

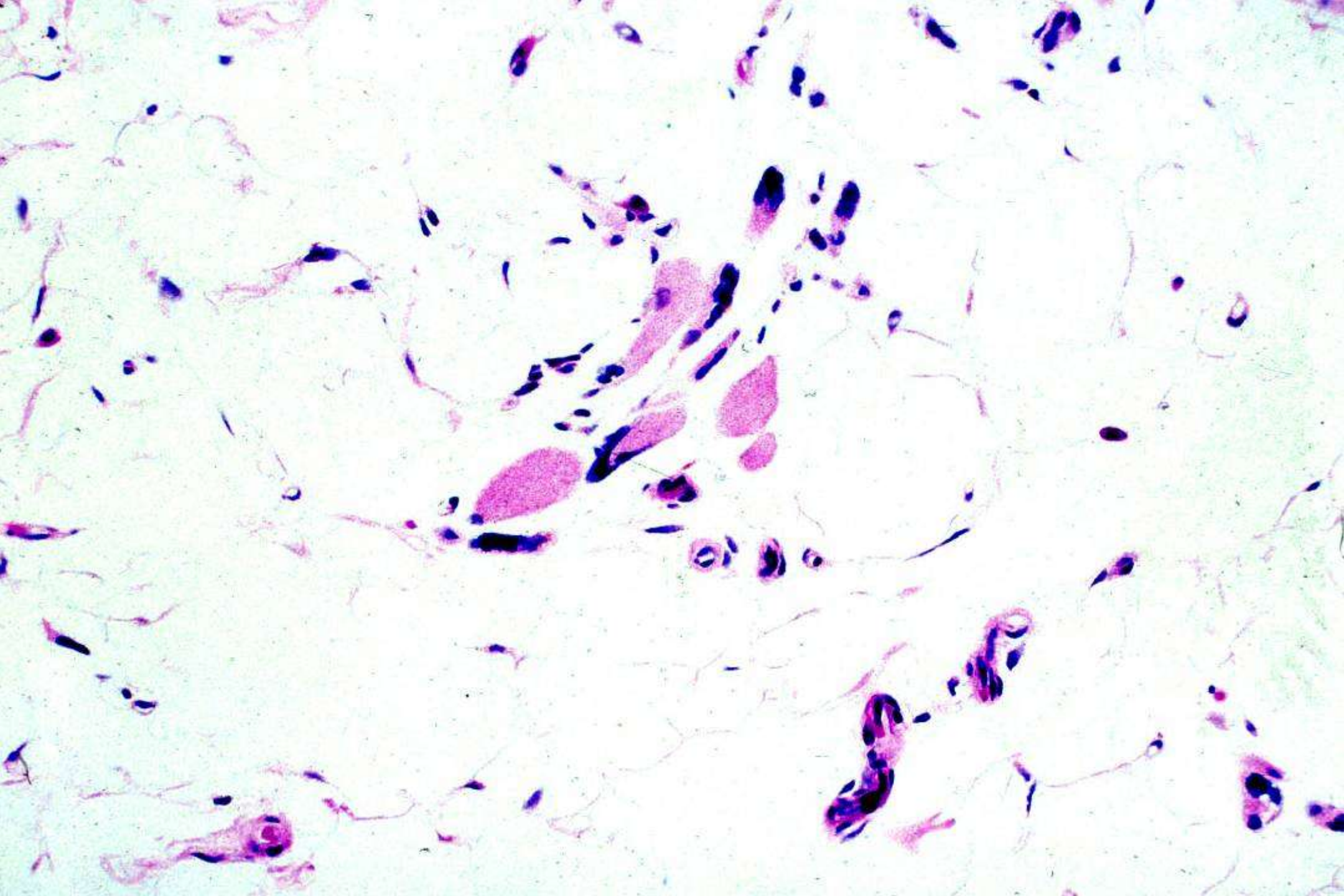


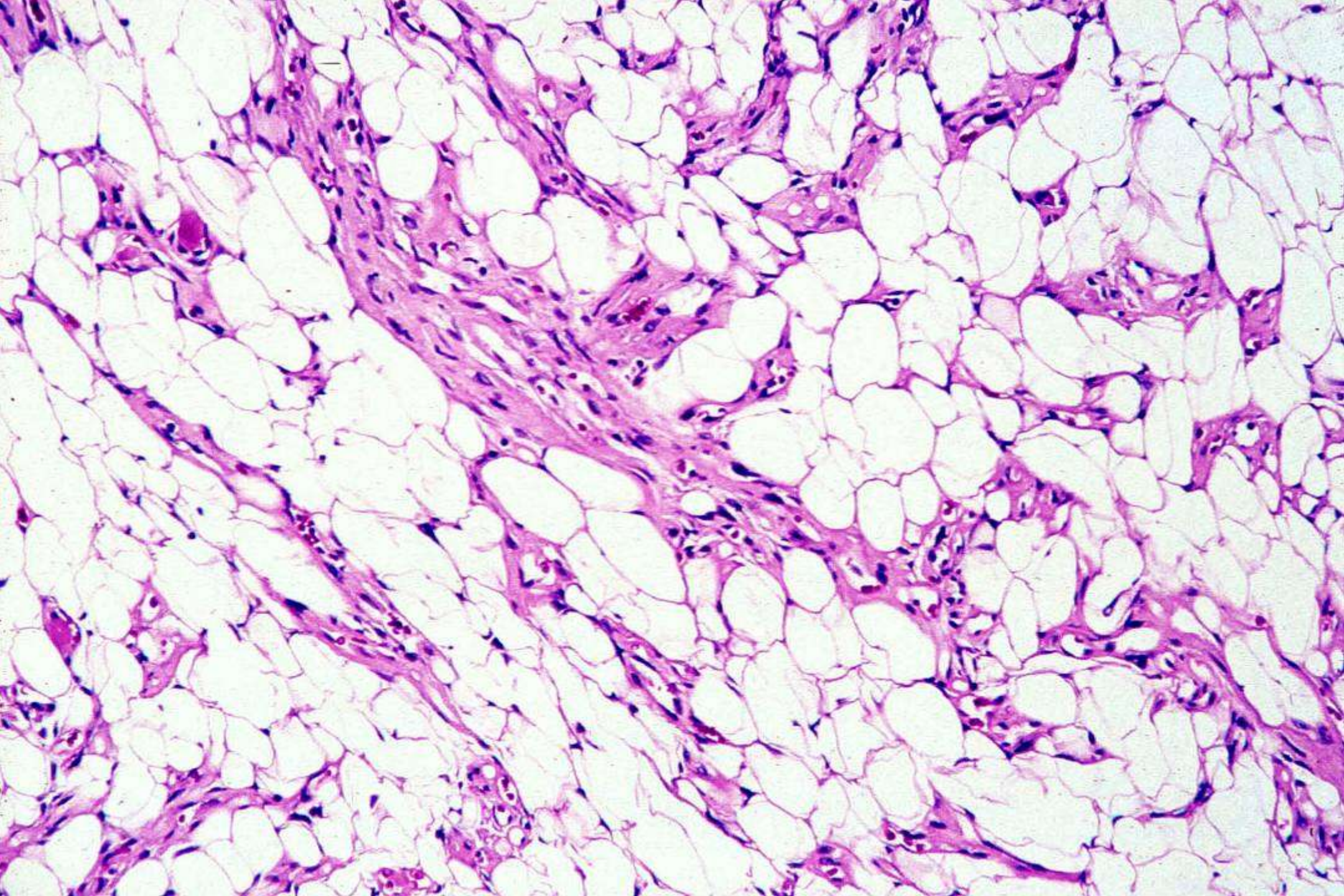


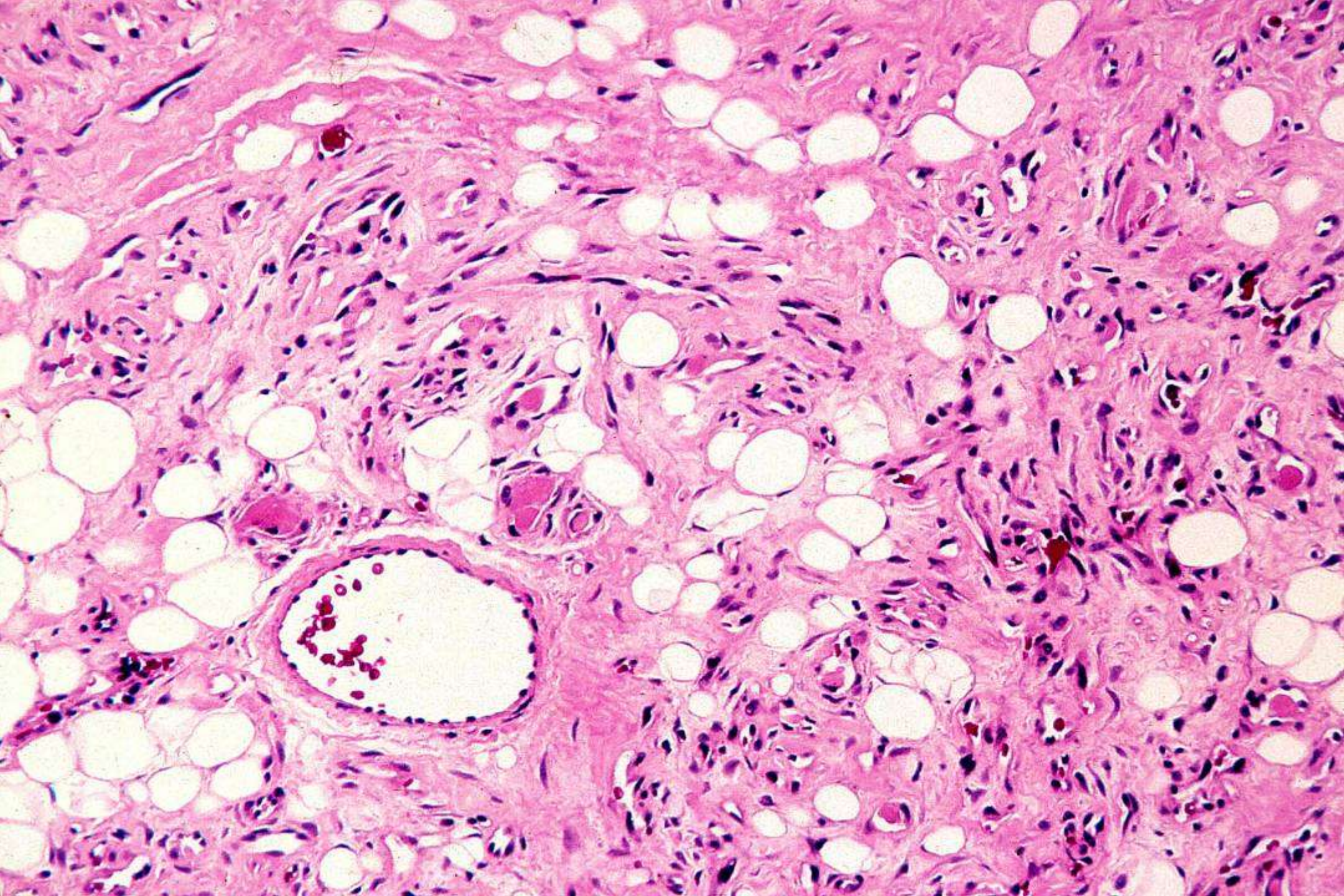
Problematic Lipomas

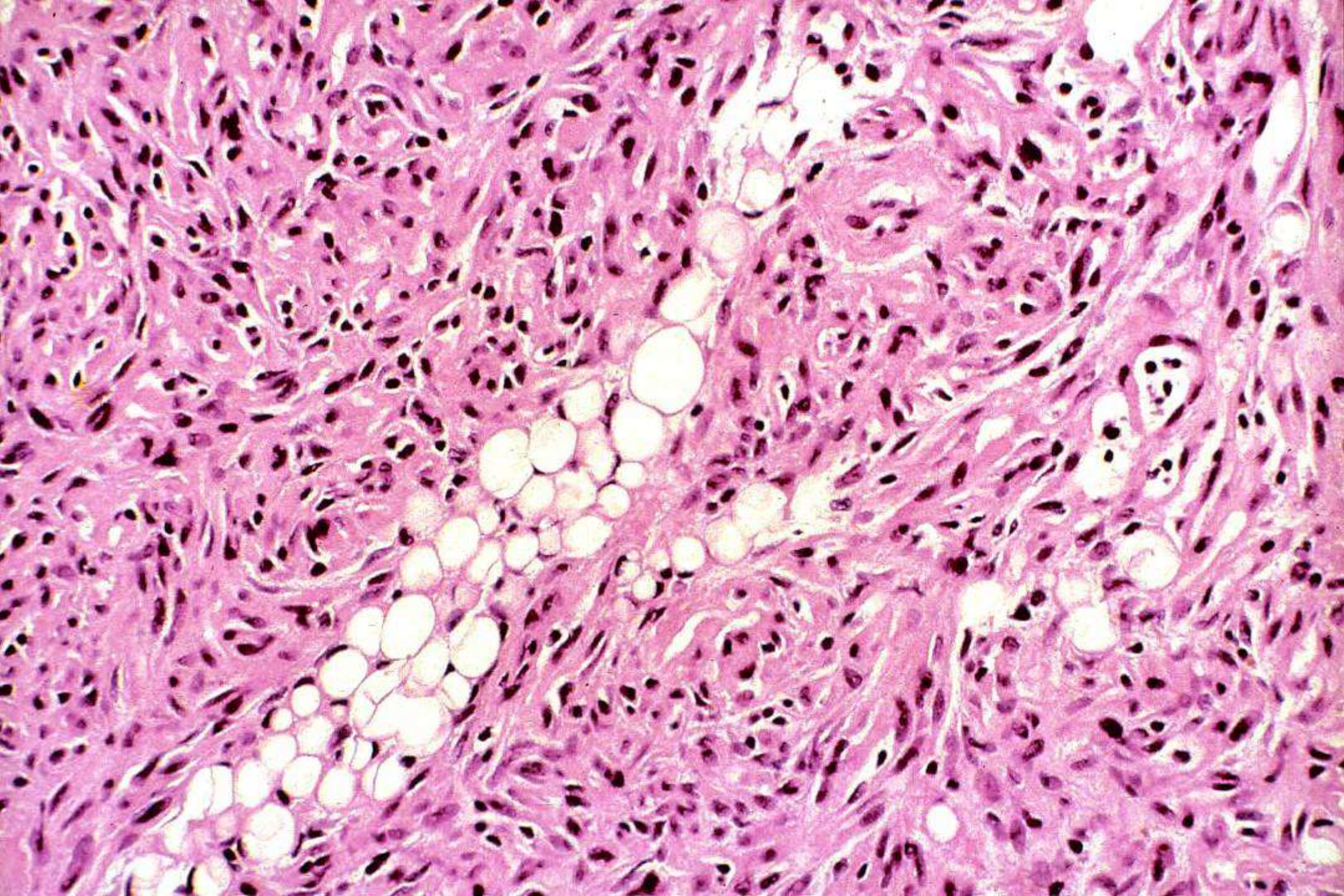
- Intramuscular lipoma
- Lipoma with hibernomatous change
- Lipoma with fat necrosis
- Cellular angiolipoma
- Spindle cell / pleomorphic lipoma
- Chondroid lipoma



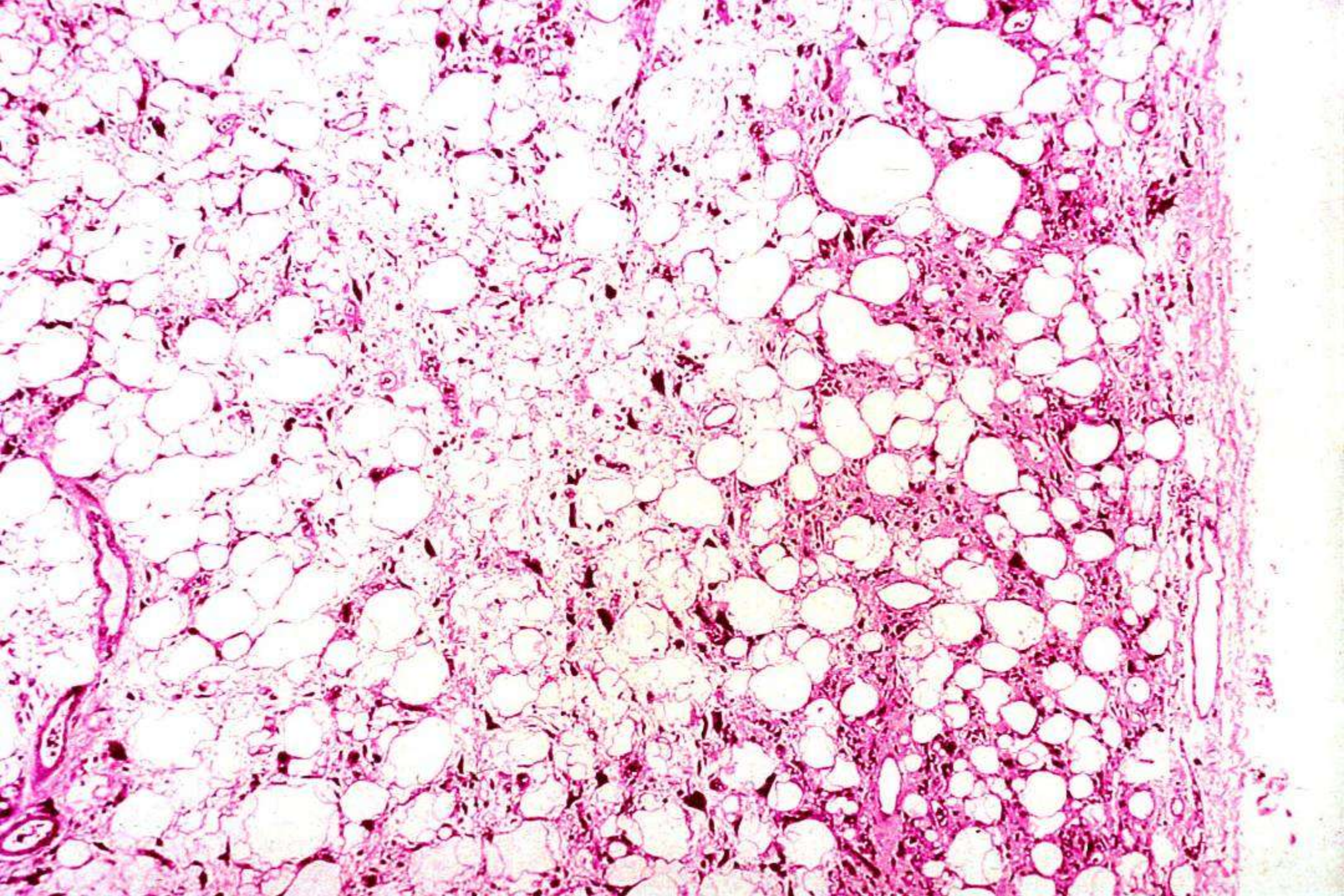


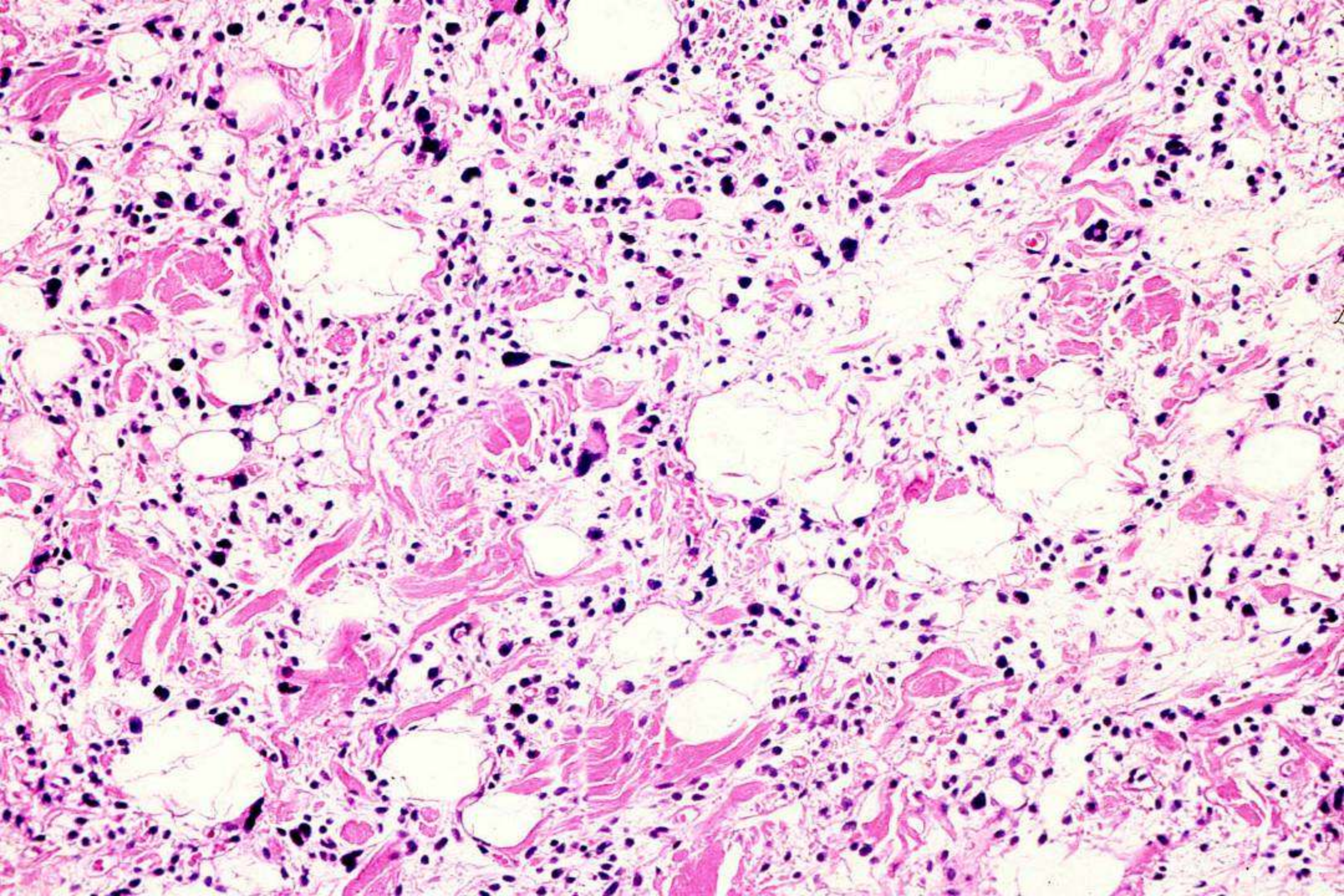


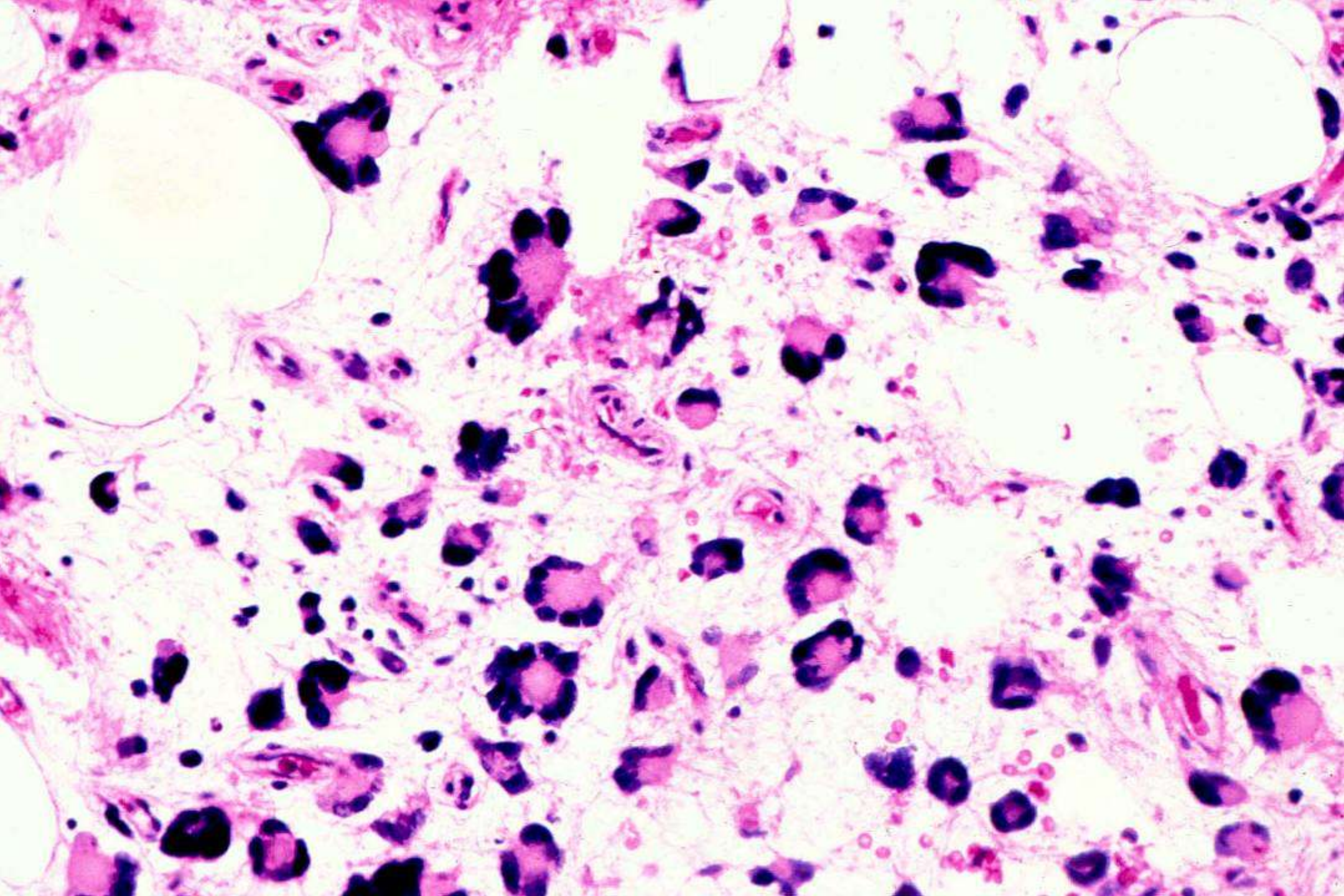


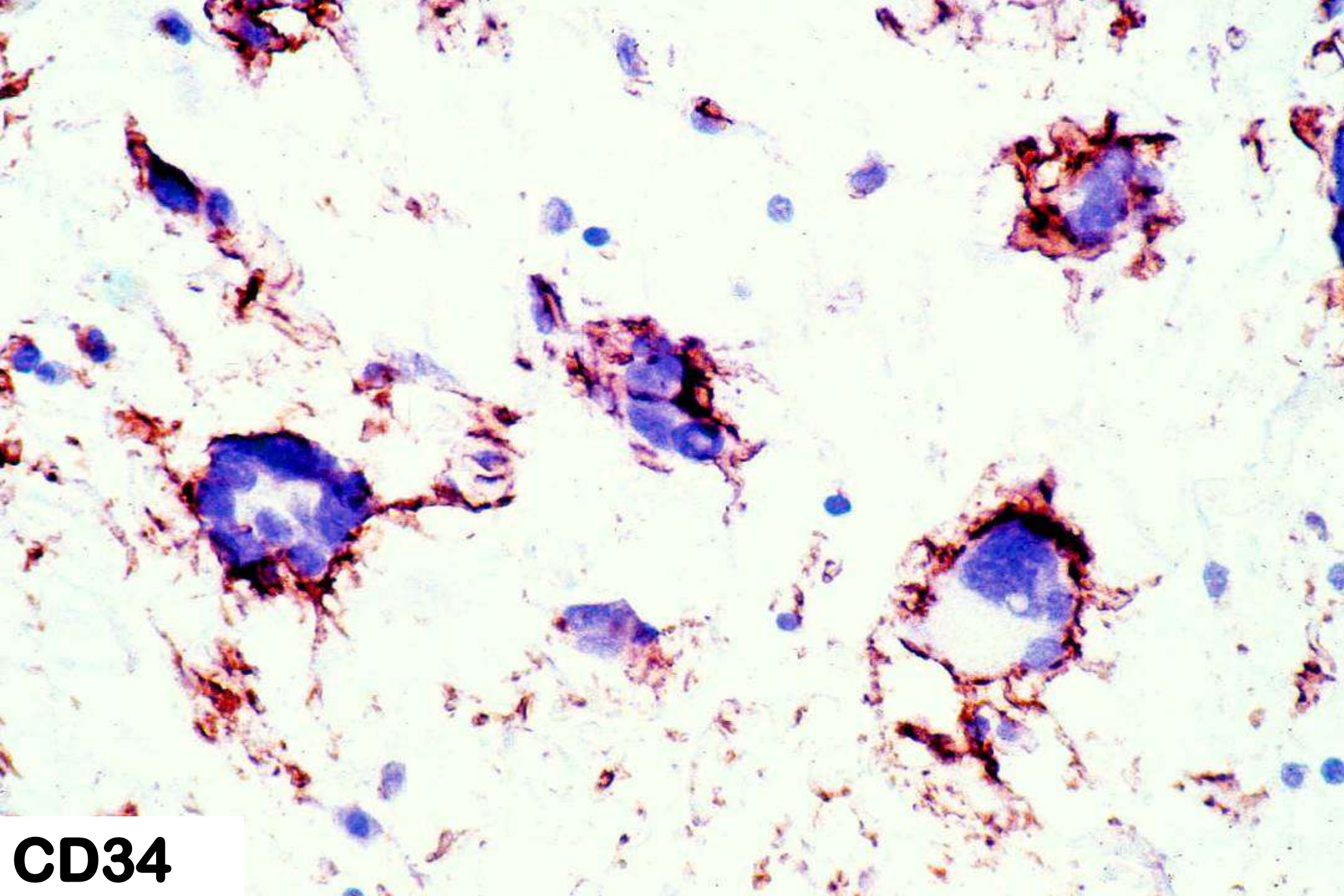




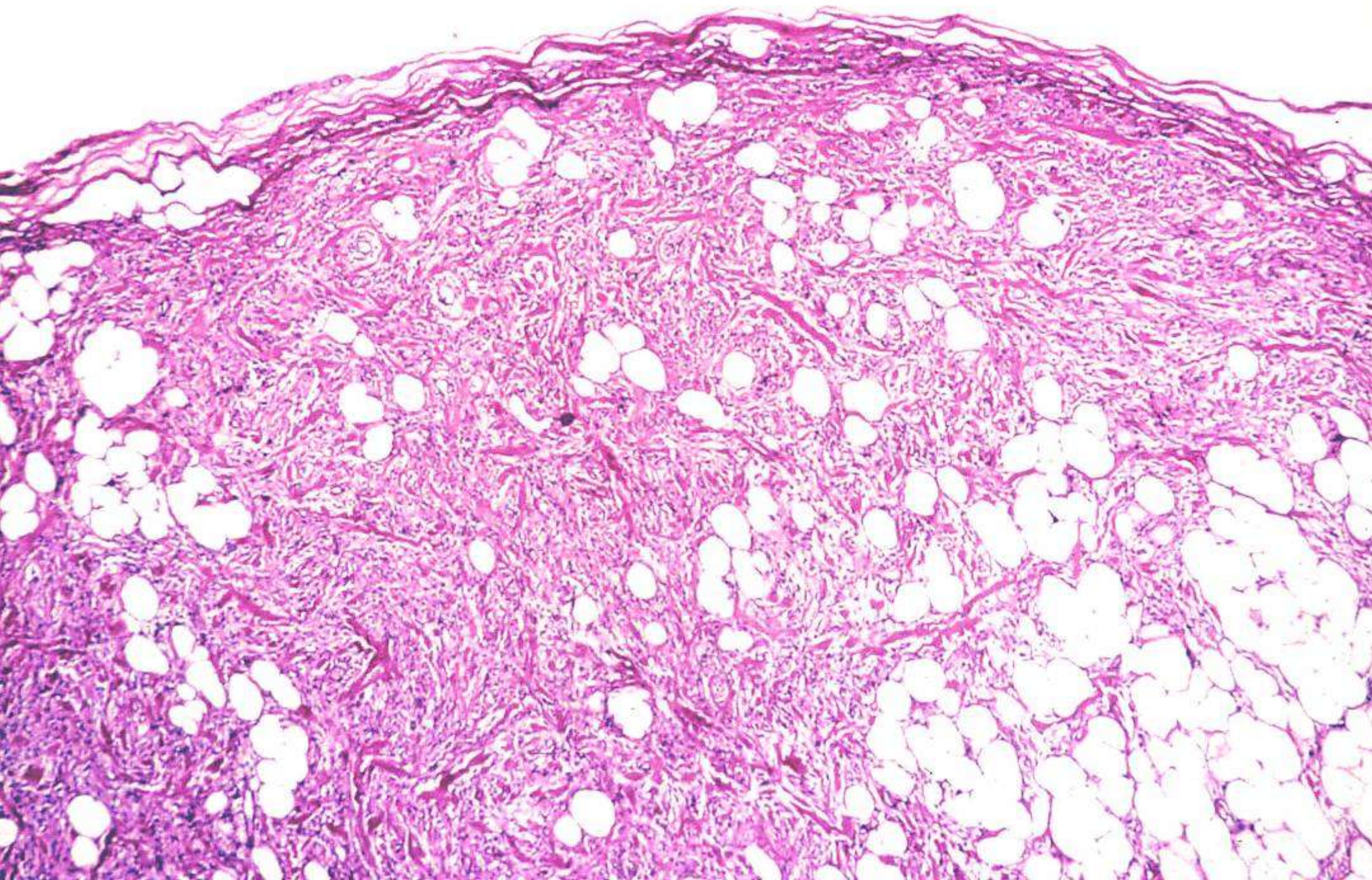


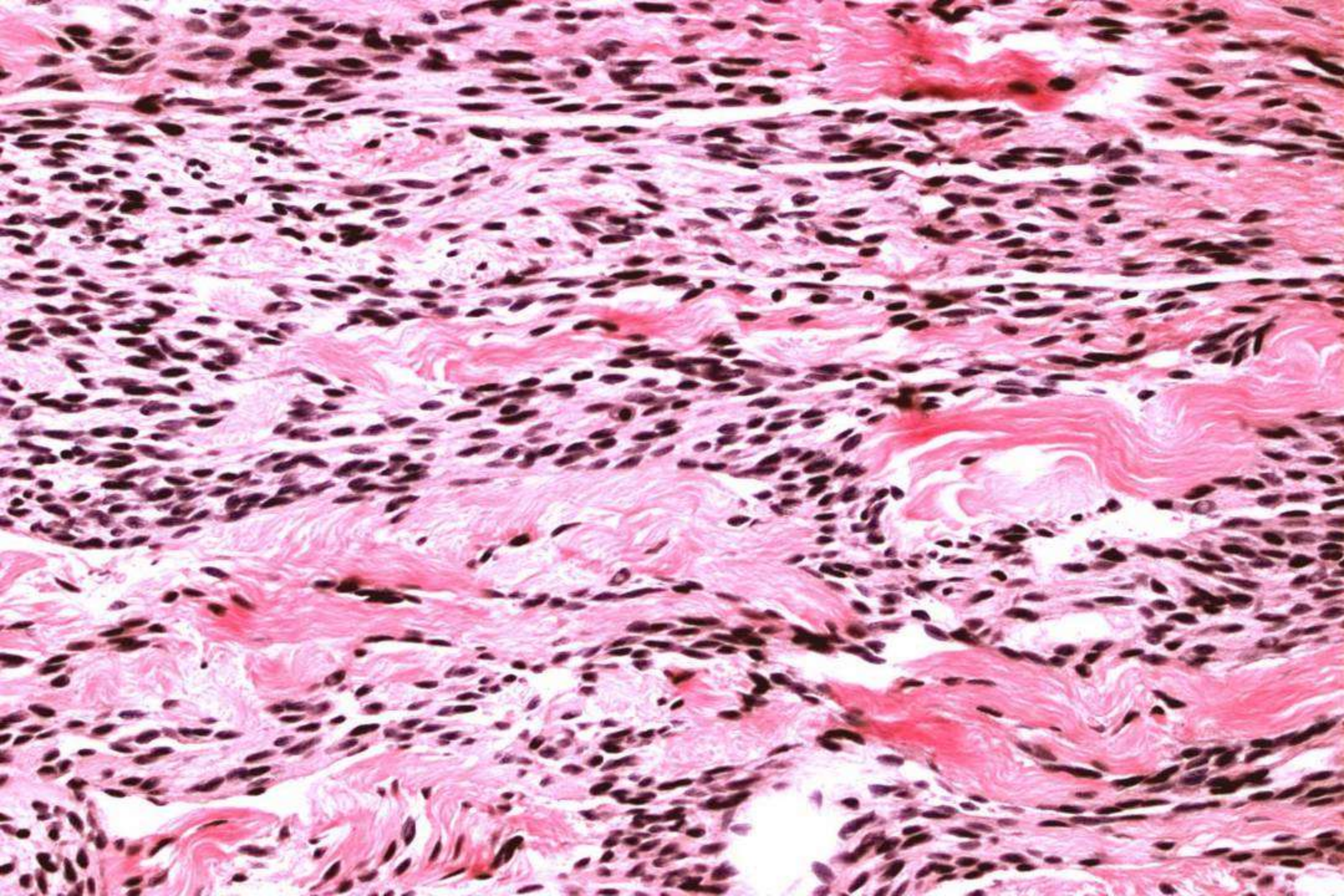


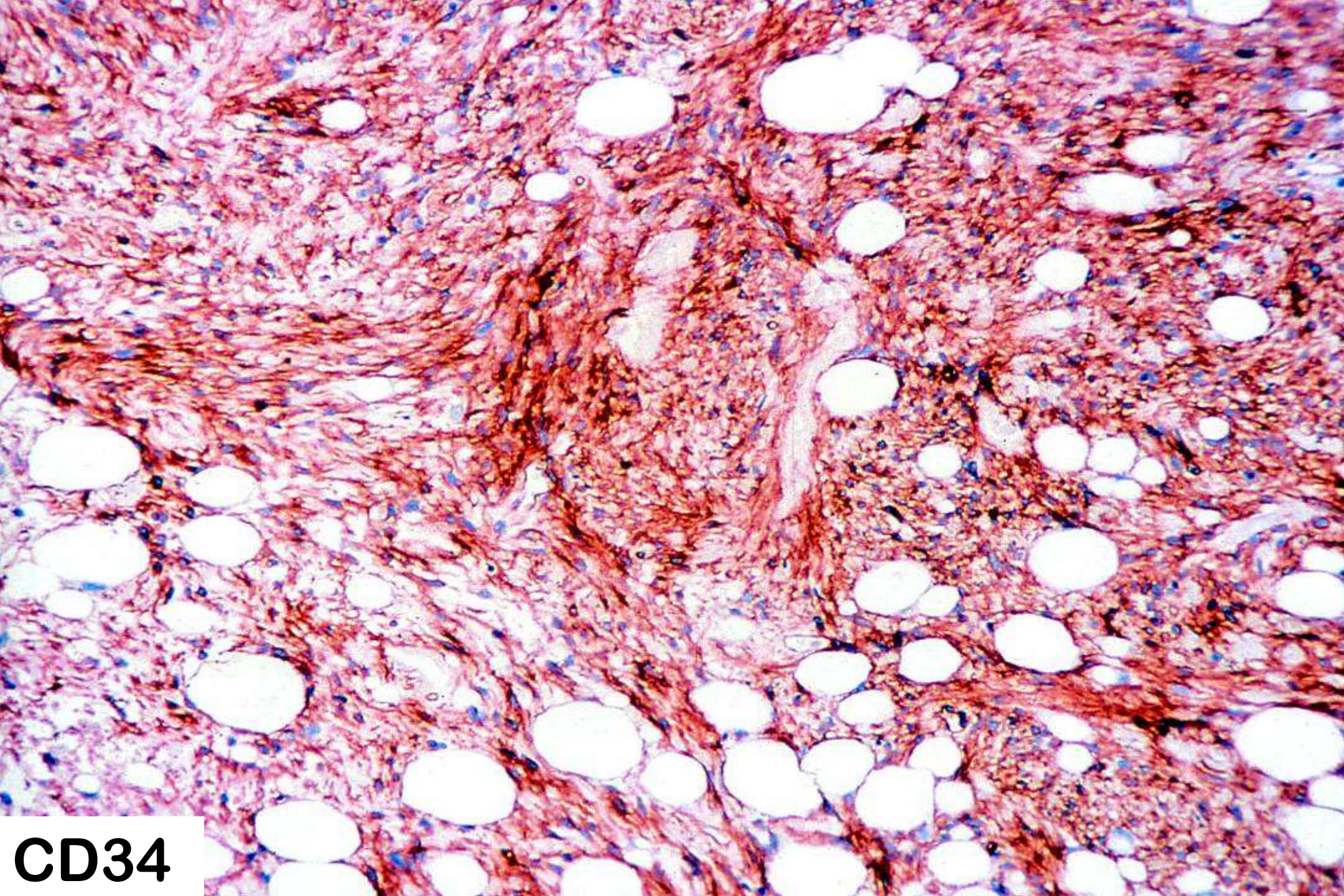




CD34







CD34

Spindle Cell / Pleomorphic Lipoma

- Well-circumscribed subcutaneous mass
- Shoulder, neck, back
- Striking male predominance
- No recurrence / metastasis
- CD34-positive
- Common cytogenetic abnormality (16q⁻, 13q⁻)

Pleomorphic Lipoma

Differential Diagnosis

- **Atypical lipomatous tumor**
- **Pleomorphic sarcoma**

ALT/WDL: A Historical Perspective

Evans (1979)

	<u>Recur</u>	<u>Dediff</u>	<u>Mets</u>	<u>Died</u>
Subcutis (9)	0	0	0	0
Deep soft tissue (13)	69%	0	0	0
Retroperitoneum (8)	62%	0	0	37%

Evans (1979)

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graph TD; A["Evans (1979)"] --> B["Subcutis"]; A --> C["Deep soft tissue"]; A --> D["Retroperitoneum"]; B --> E["Atypical lipoma"]; C --> F["Atypical intra-muscular lipoma"]; D --> G["WDL"];
```

Subcutis

Atypical lipoma

Deep soft tissue

Atypical intra-muscular lipoma

Retroperitoneum

WDL

ALT/WDL: A Historical Perspective

Weiss & Rao (1992)

	<u>Recur</u>	<u>Dediff</u>	<u>Mets</u>	<u>Died</u>
Deep soft tissue (46)	43%	6%	0%	0%
Retroperitoneum (23)	91%	17%	17%	33%

Weiss (1992)

Subcutis

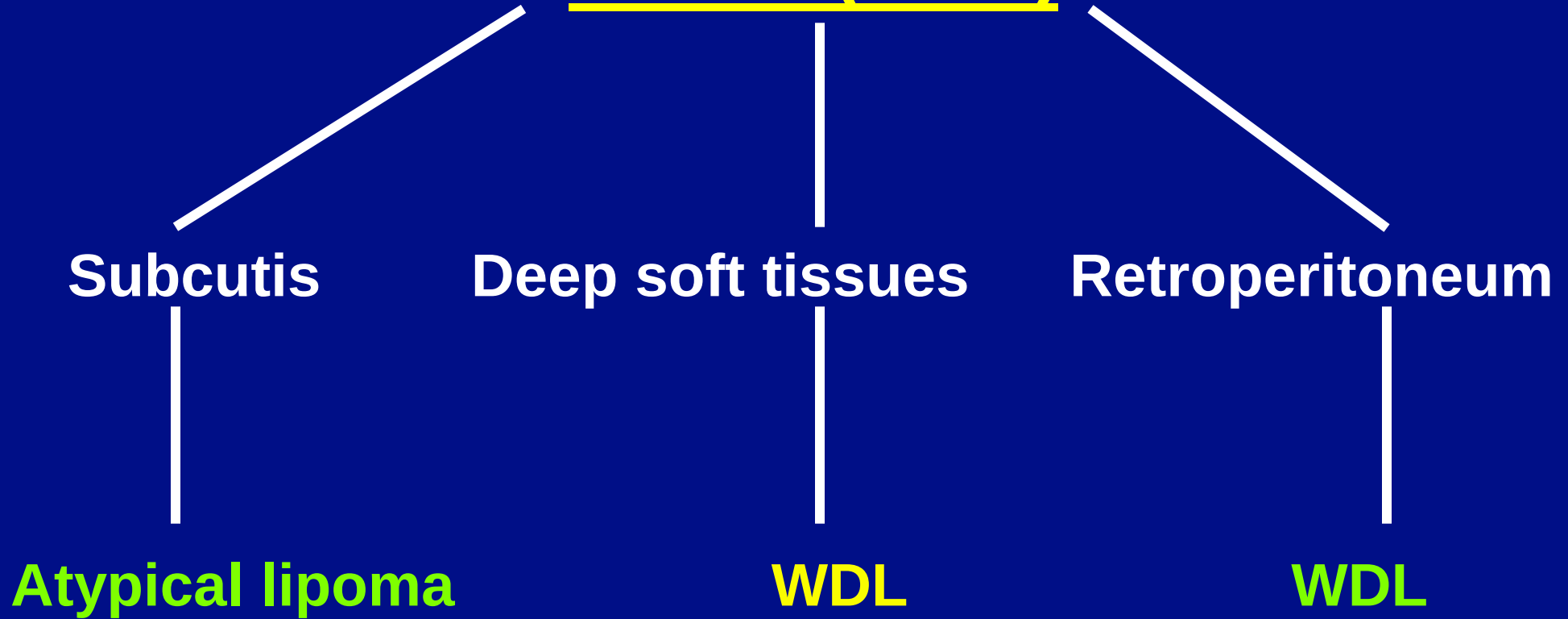
Deep soft tissues

Retroperitoneum

Atypical lipoma

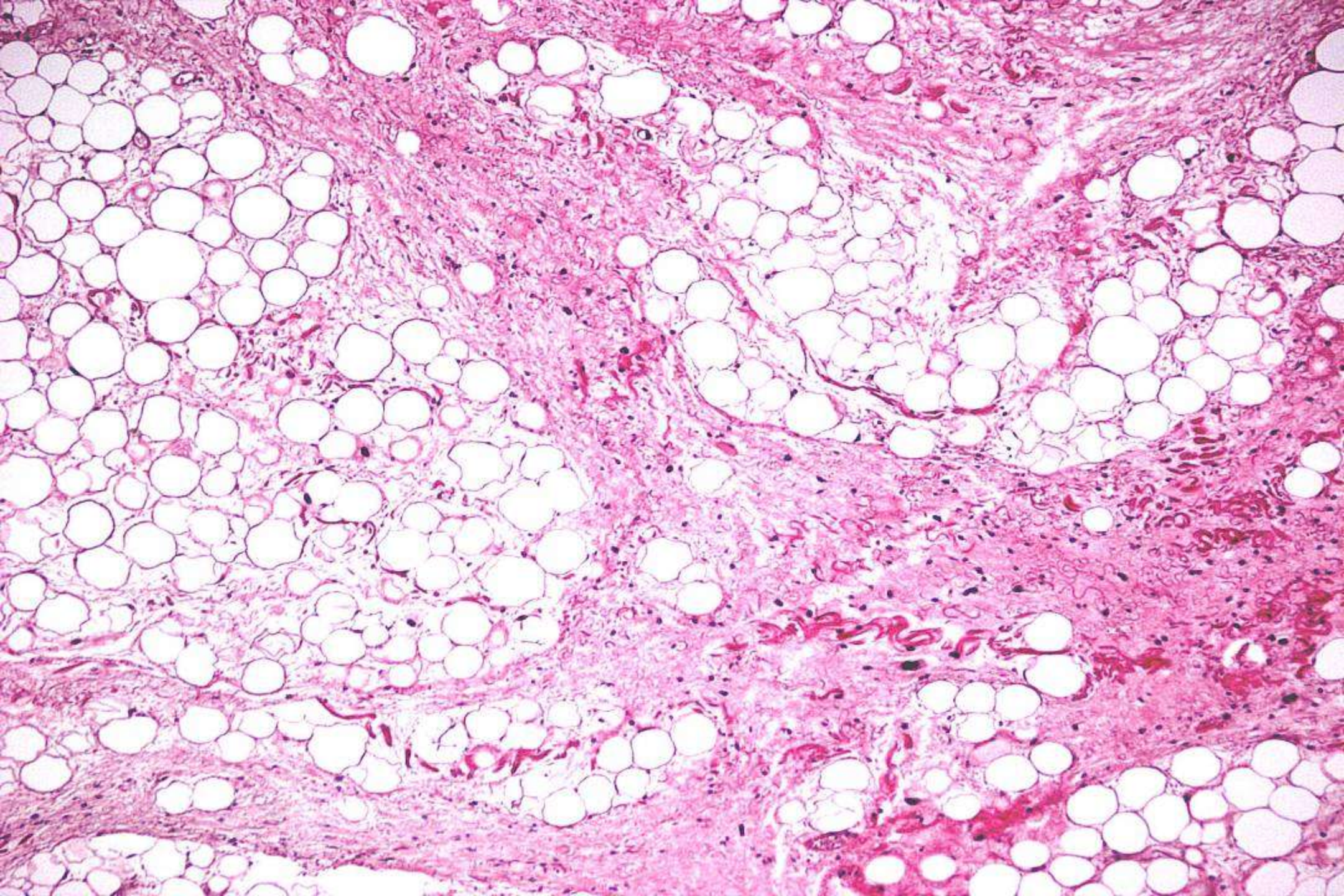
WDL

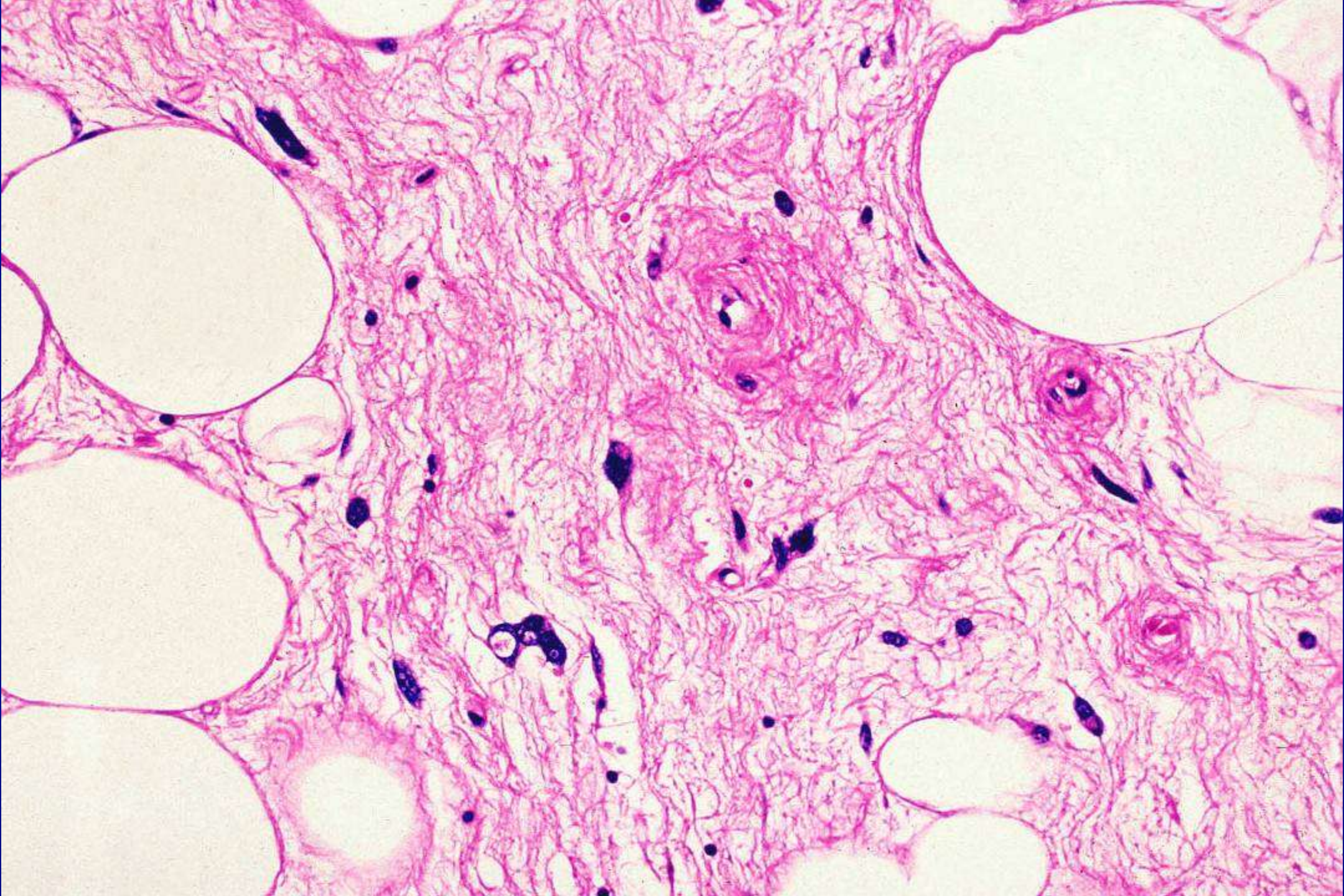
WDL

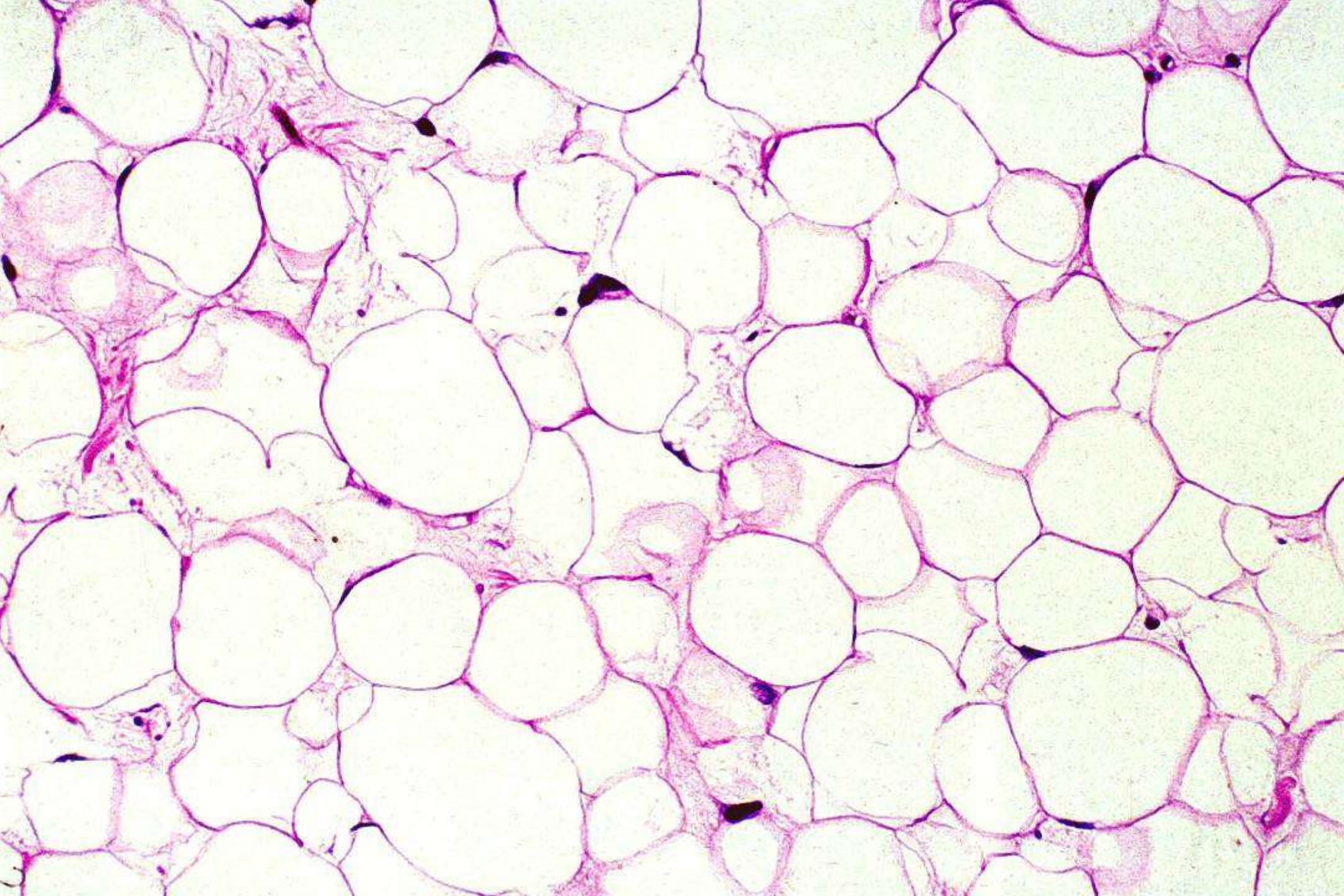


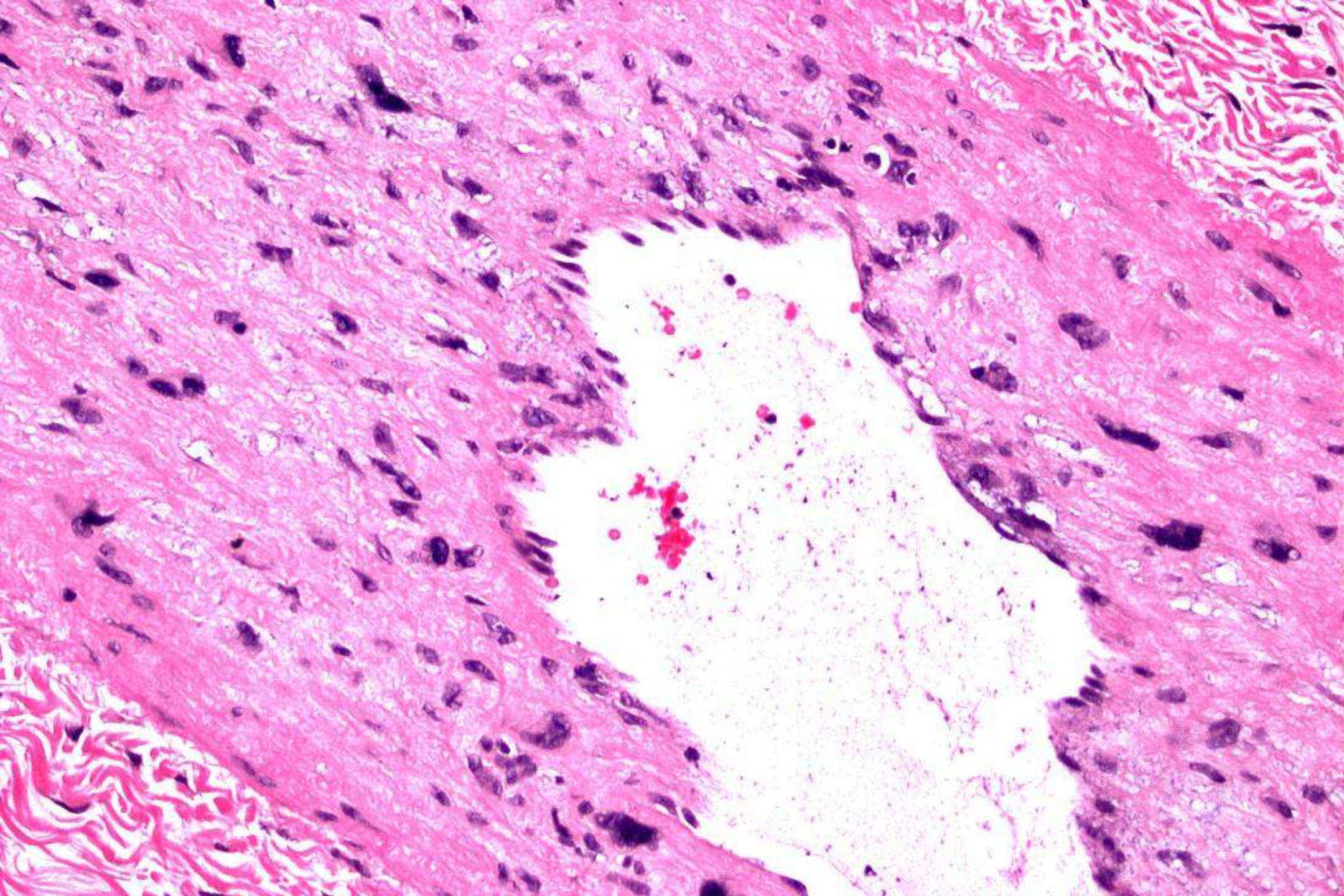
ALT/WDL: Lumper or Splitter?

- **Lumpers**
 - **Call all tumors** (regardless of site) **ALT**
 - **Call all tumors** (regardless of site) **WDL**
 - **Splitters**
 - **Superficial (subcutis)** **Atypical lipoma**
 - **Deep** (deep soft tissue/retro) **WDL**
- * Requires communication and understanding between pathologist and surgeon/oncologist!**





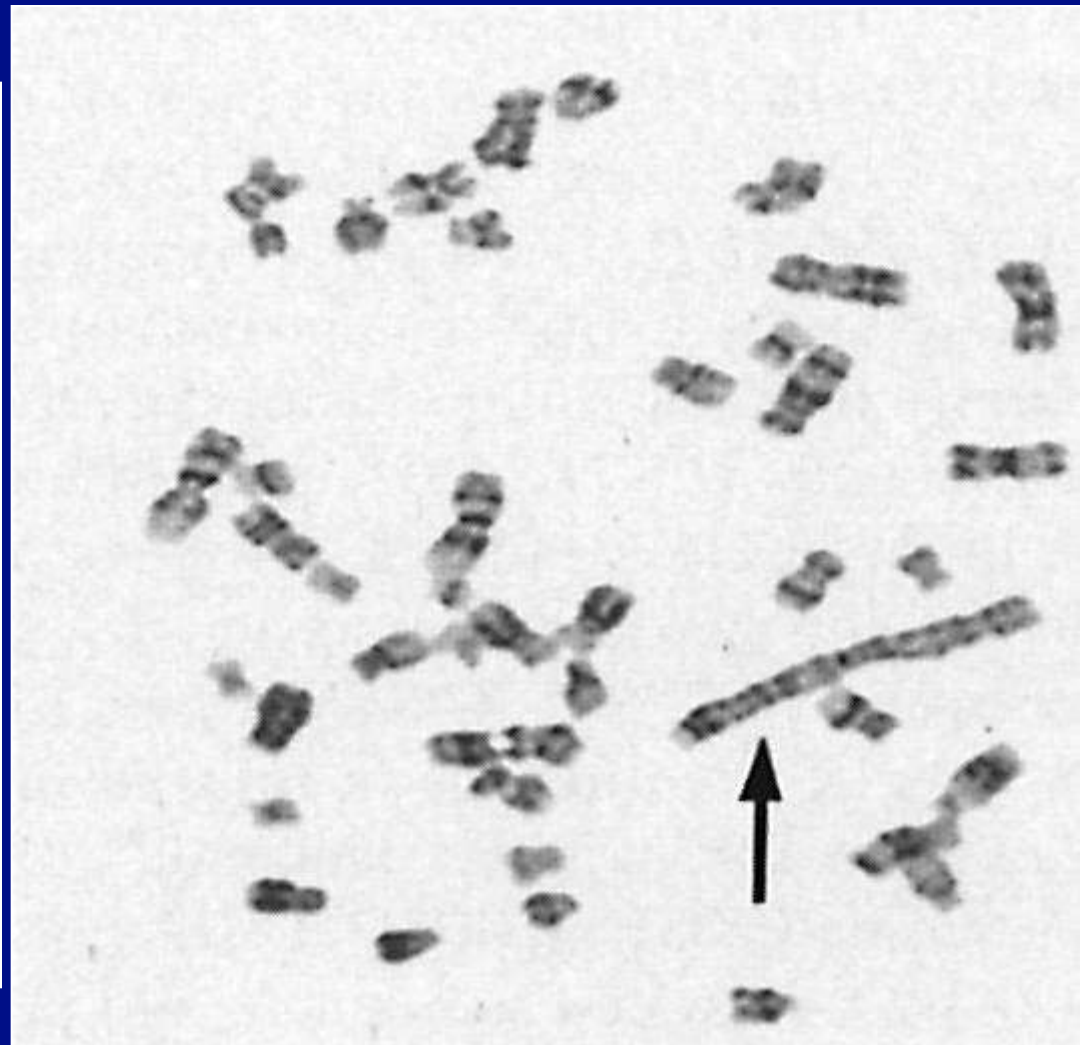
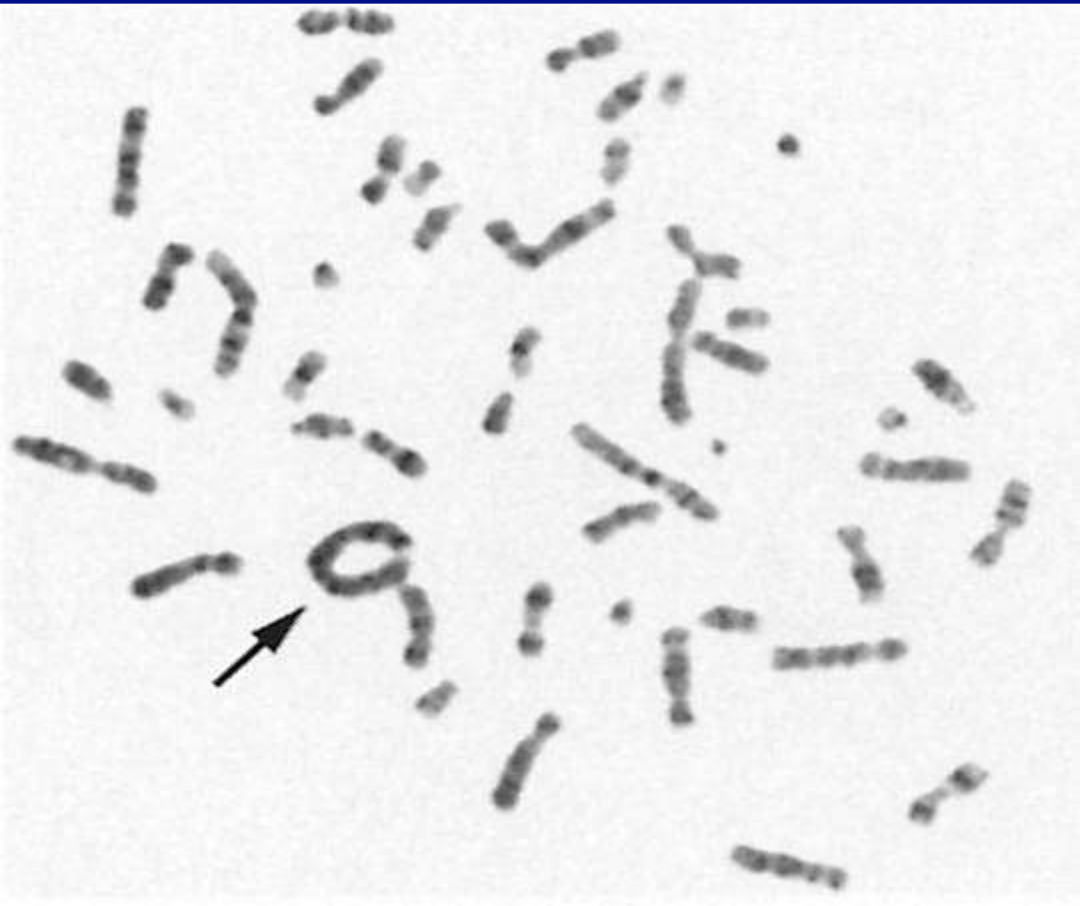


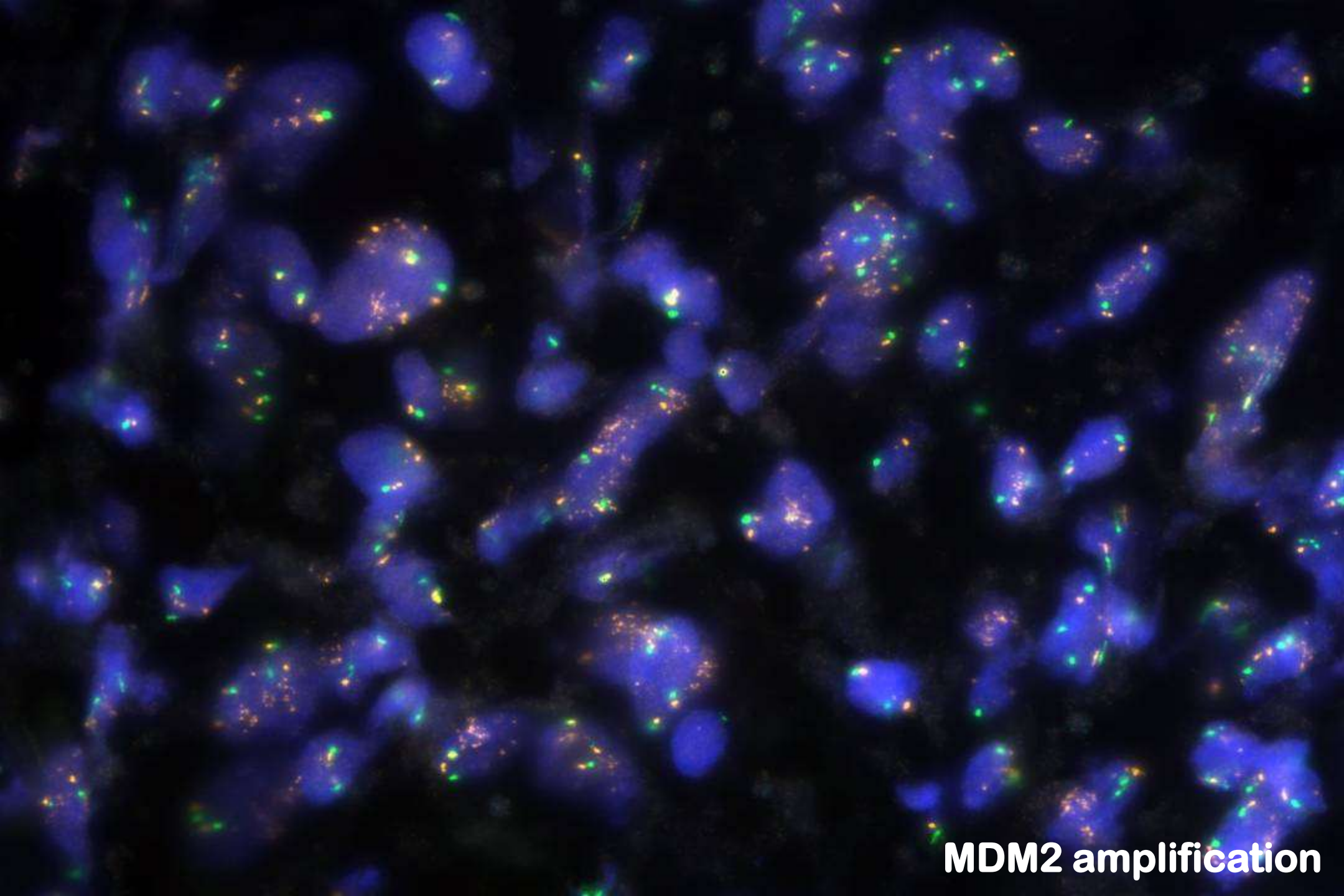


When To Suspect ALT/WDL

- Large and deep fatty tumor (when it comes in buckets!)
- Retroperitoneal fatty tumor (with rare exceptions)
- MRI heterogeneity (surgeon is suspicious)
- Fibrous bands
- Atypia (hyperchromasia) identified at low power

***Don't look for lipoblasts!!**

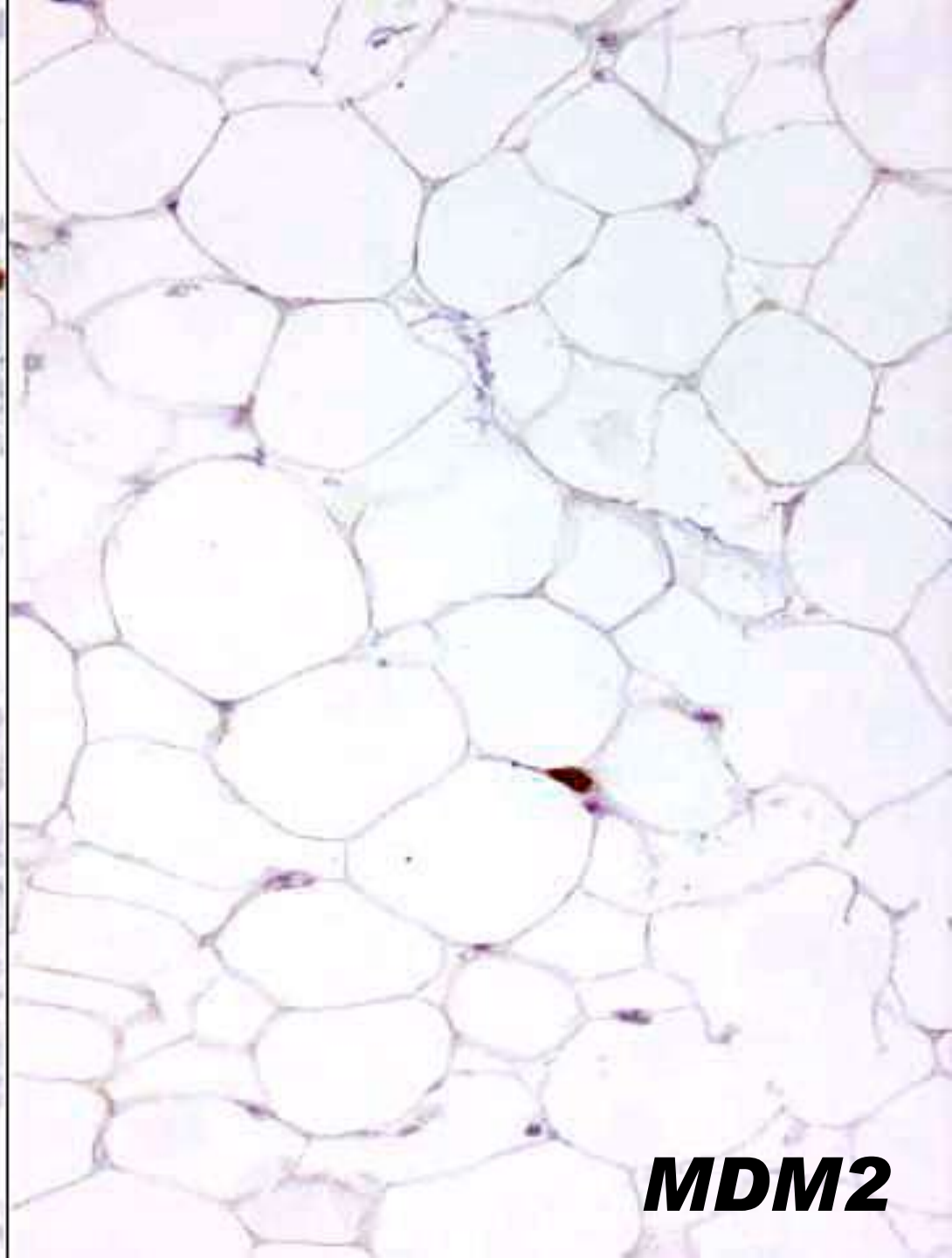
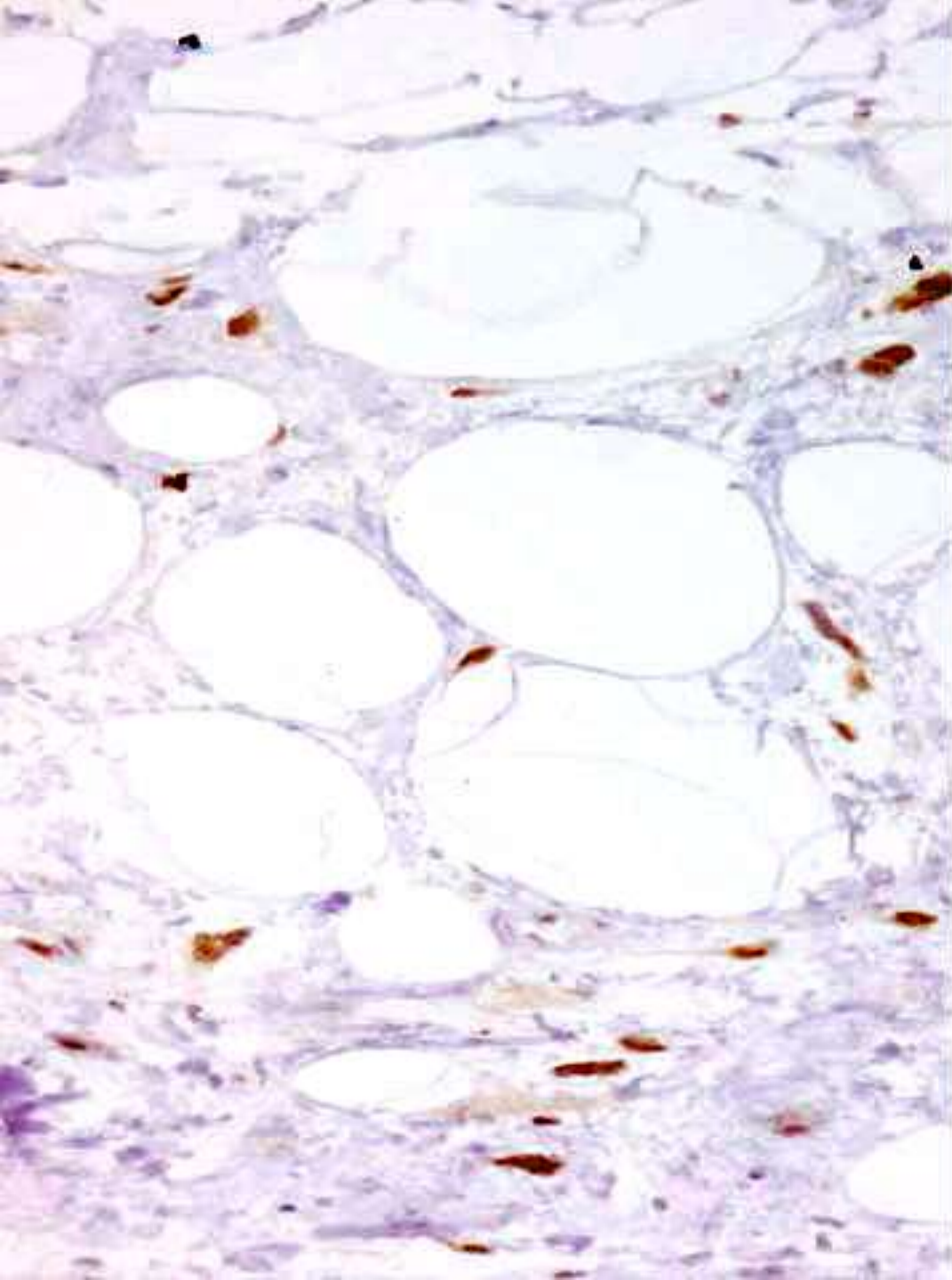




MDM2 amplification

MDM2 Amplification: Utility of FISH

	<u>MDM2 amplification</u>
Benign lipomatous tumors (n=30)	0/30
Lipoma	0/10
Angiolipoma	0/10
SCL/PL	0/9
Lipoblastoma	0/1
ALT/WDLS (n=13)	13/13
Dediff LS (n=14)	14/14



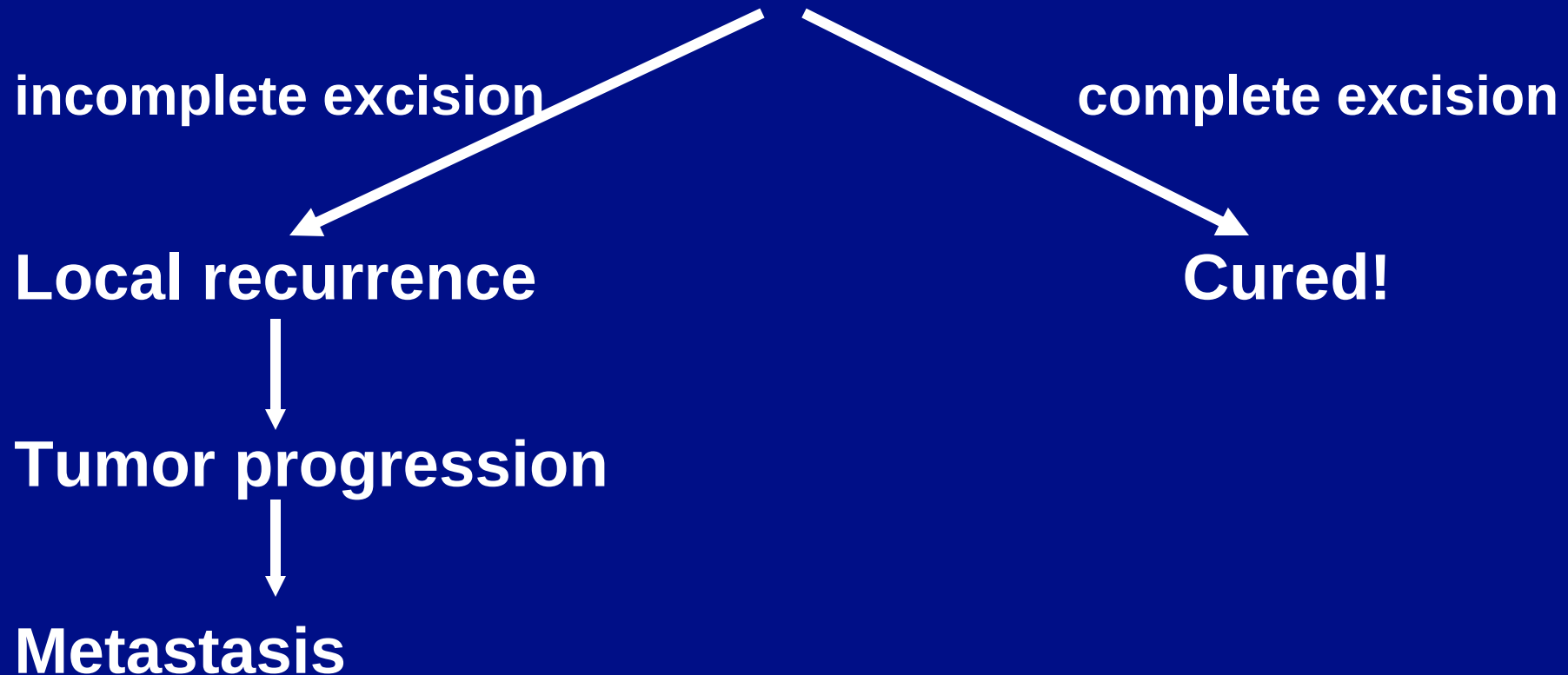
MDM2

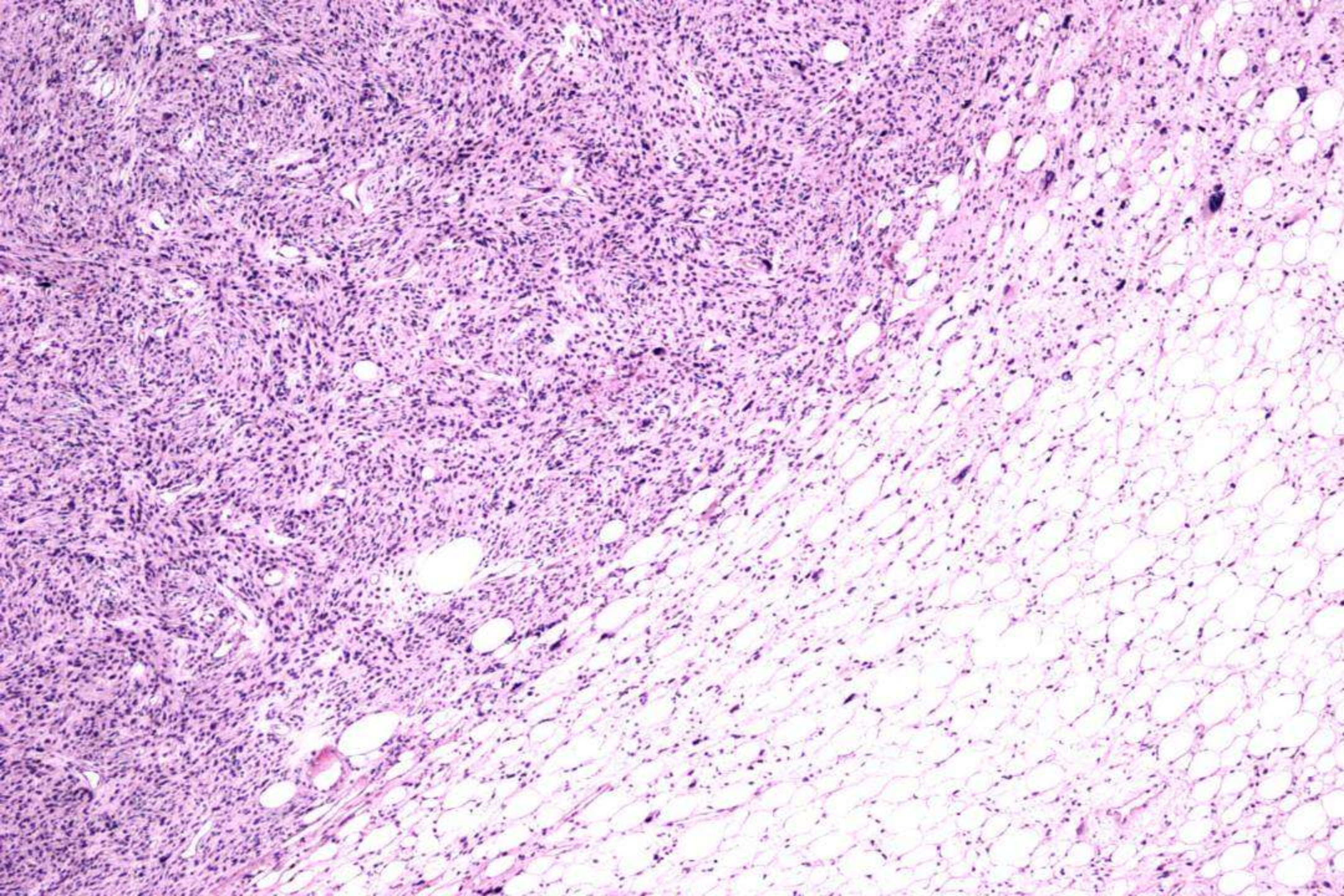
Pleomorphic Lipoma vs ALT

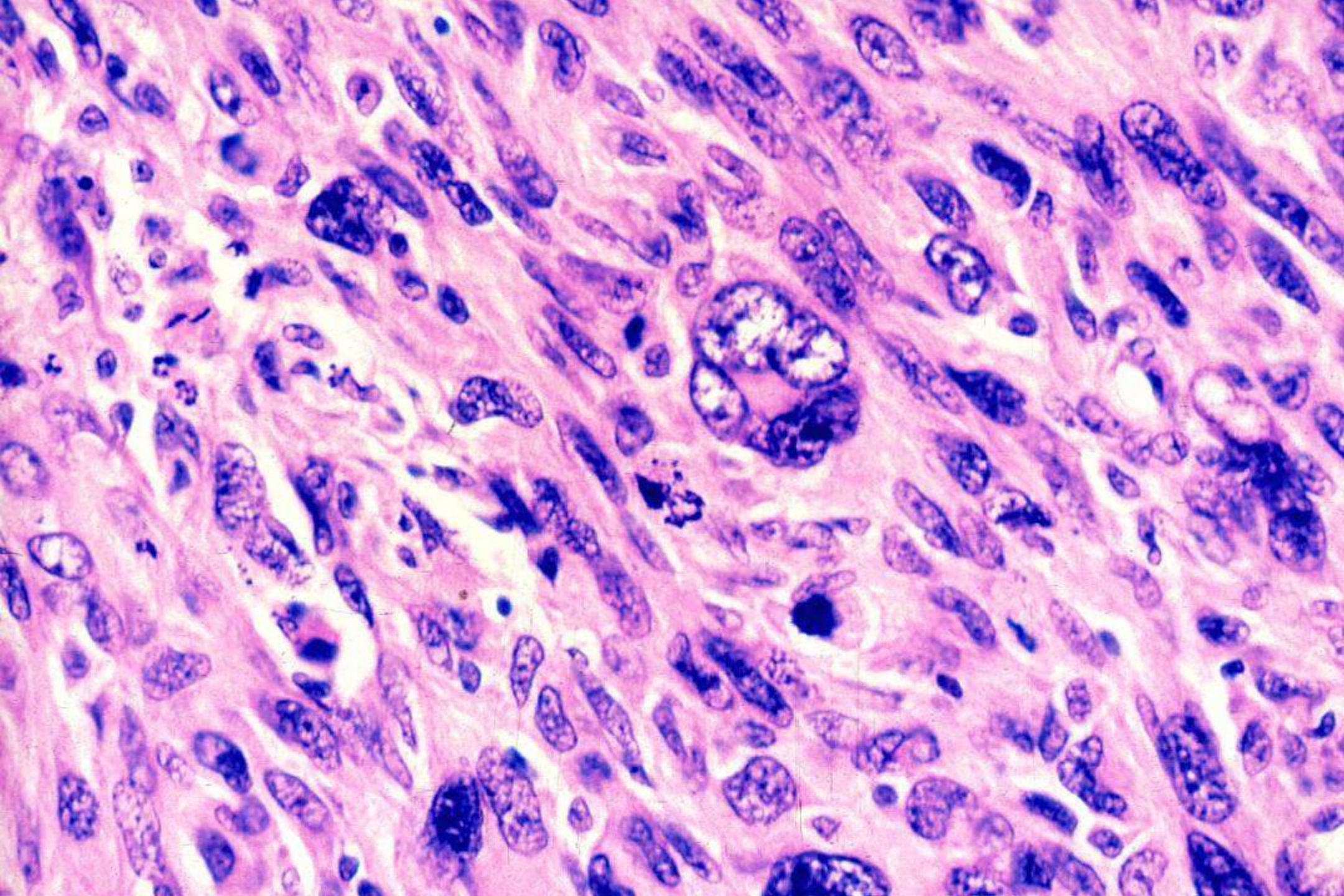
	<u>PL</u>	<u>ALT/WDL</u>
Atypical cells	Yes	Yes
Floret cells	characteristic	sometimes
Ropey collagen	Yes	No
CD34	Yes	Rare cells
MDM2 ampl	No	Yes
Dedifferentiation	No	Sometimes

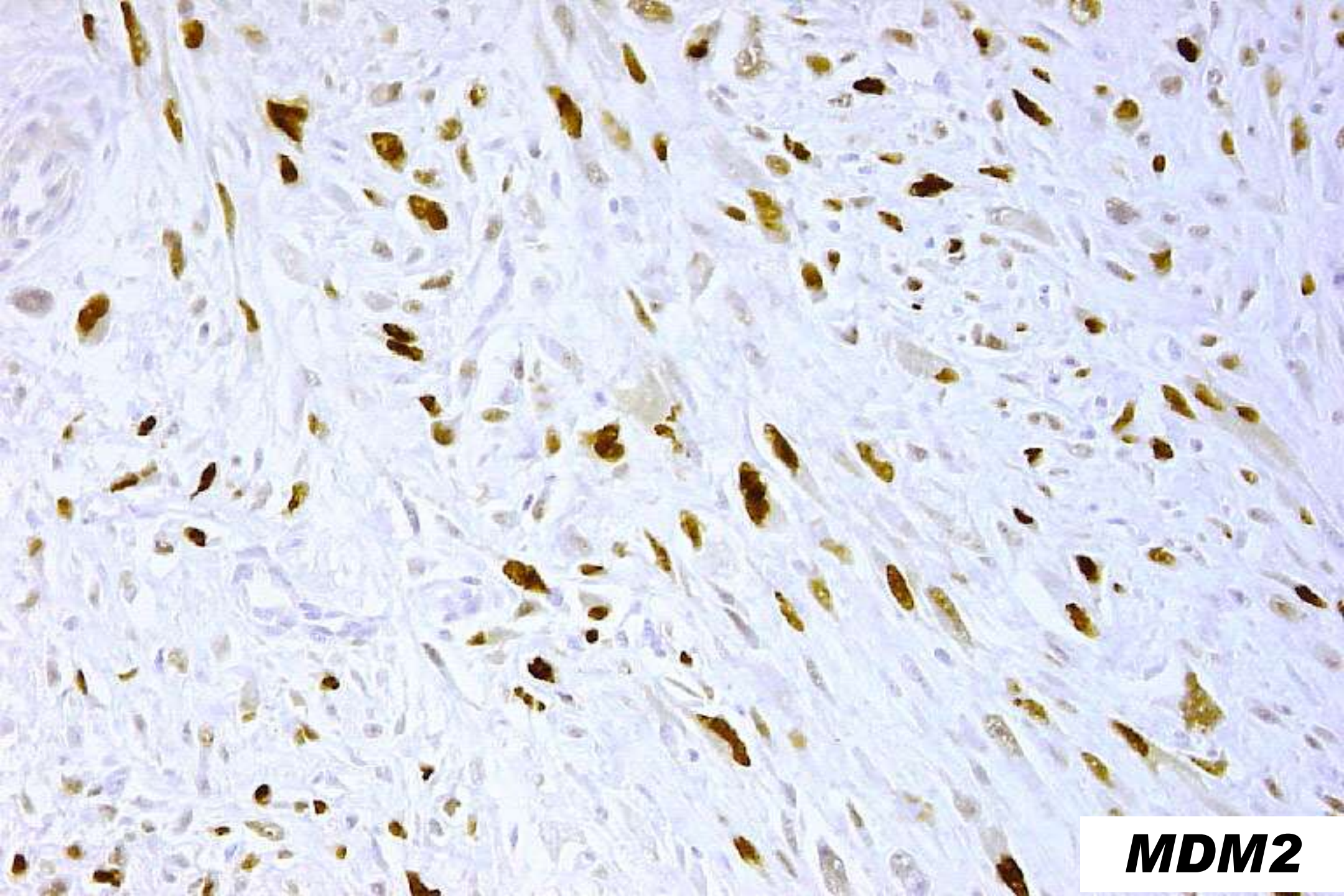
ALT / WDL

**Low-grade sarcoma
(no metastatic capability)**





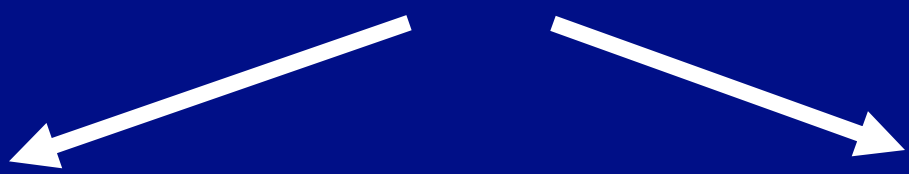




MDM2

Retroperitoneal “MFH”: Does It Exist?

25 Retroperitoneal “MFH”



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graph TD; A[25 Retroperitoneal "MFH"] --> B[17 reclassified as DDLS]; A --> C[8 classified as undifferentiated sarcoma]
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17 reclassified as DDLS

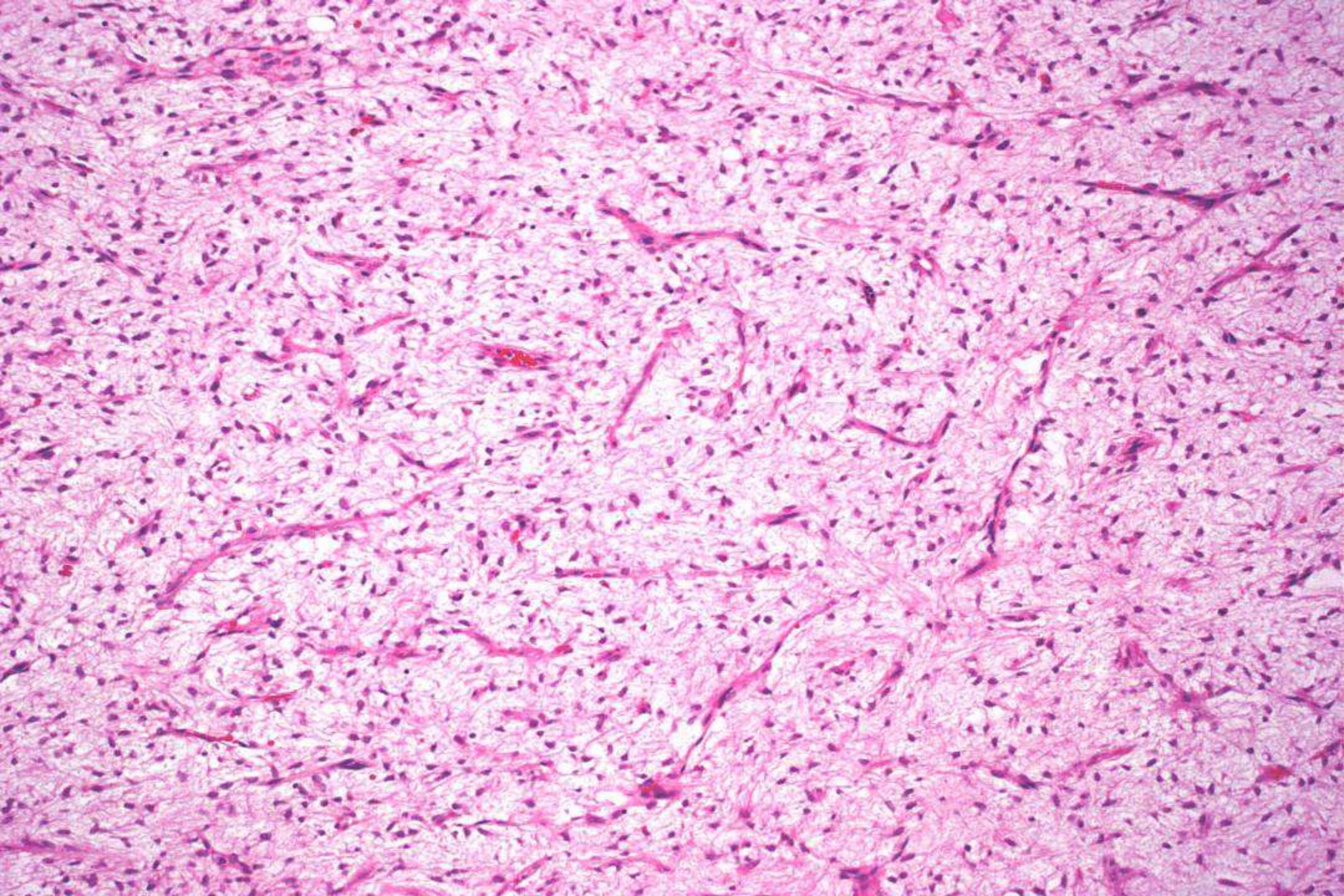
8 classified as undifferentiated sarcoma

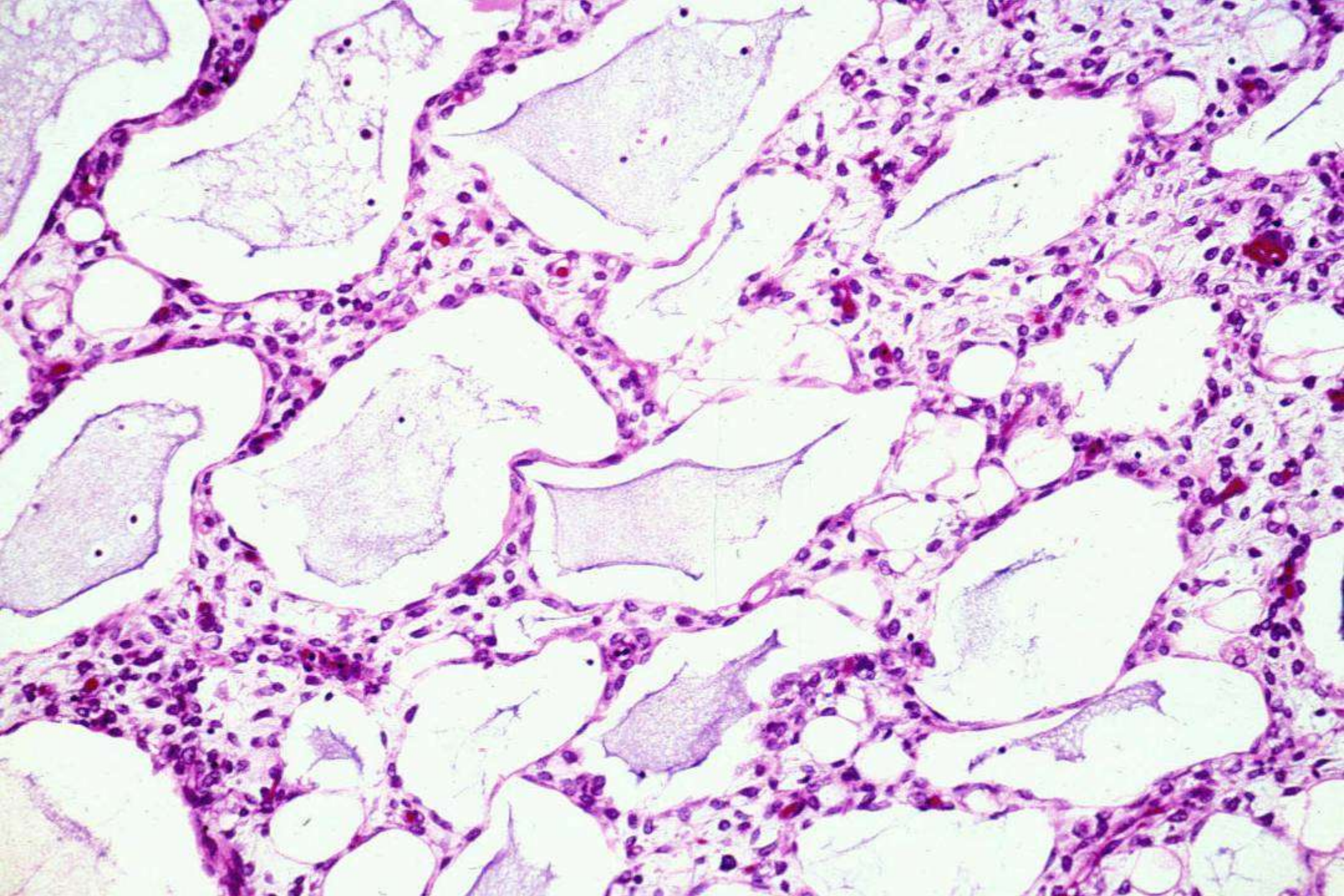
- Extensive sampling revealed foci of ALT/WDL
- MDM2/CDK4 immunoreactivity
- 12q13-15 amplification (CGH)

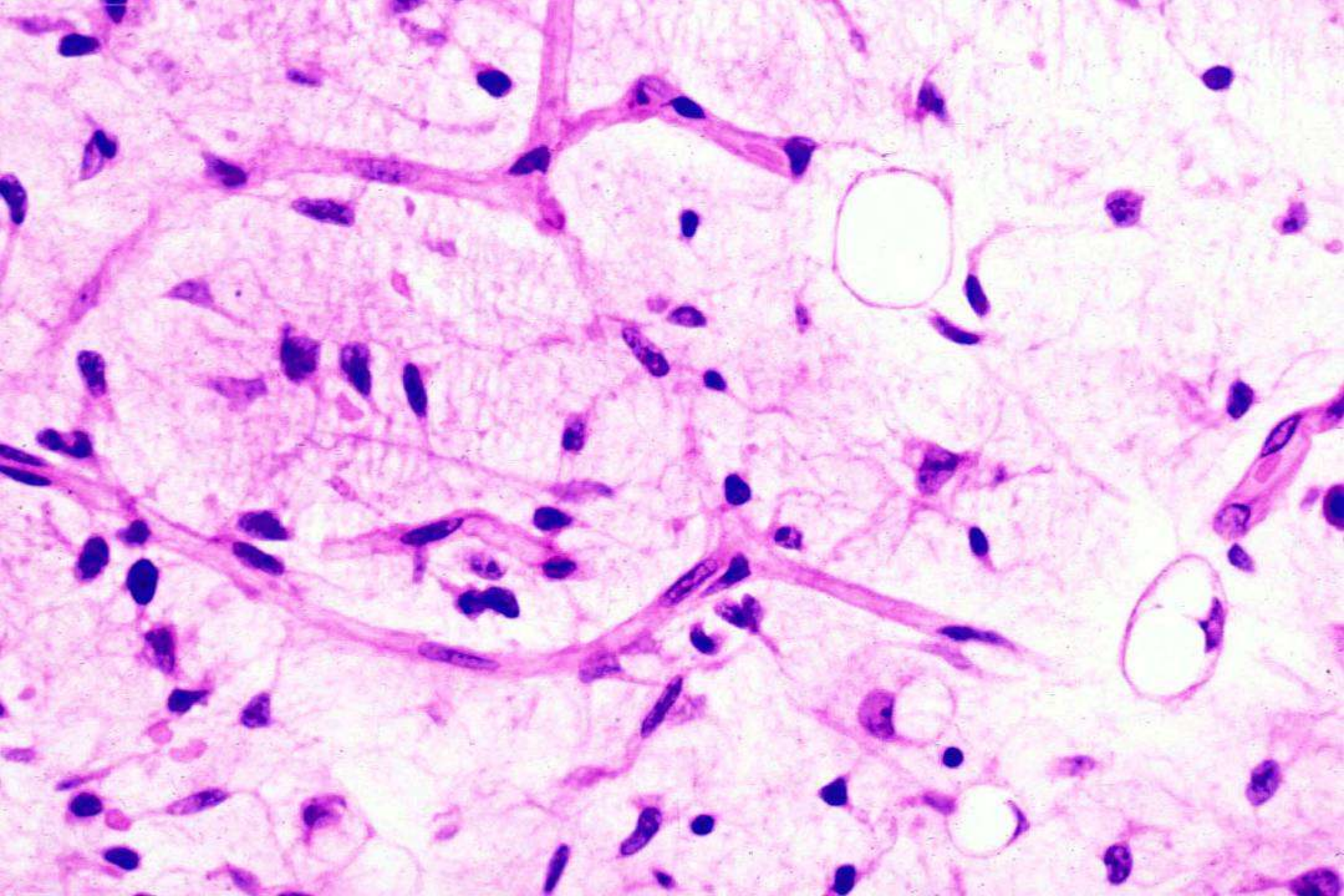
***most retroperitoneal “MFH” actually represent dedifferentiated areas of a DDLS**

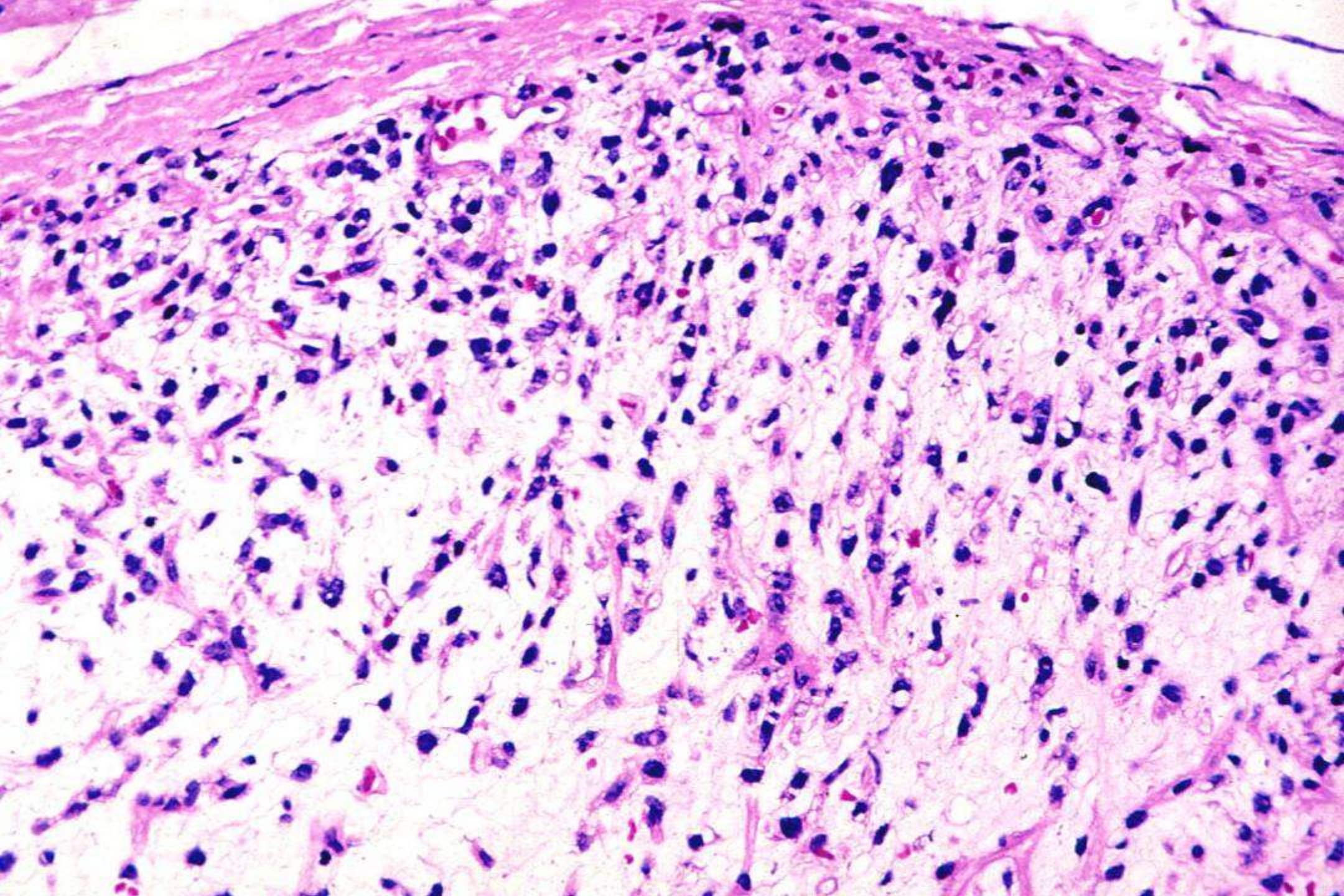
Myxoid / Round Cell Liposarcoma

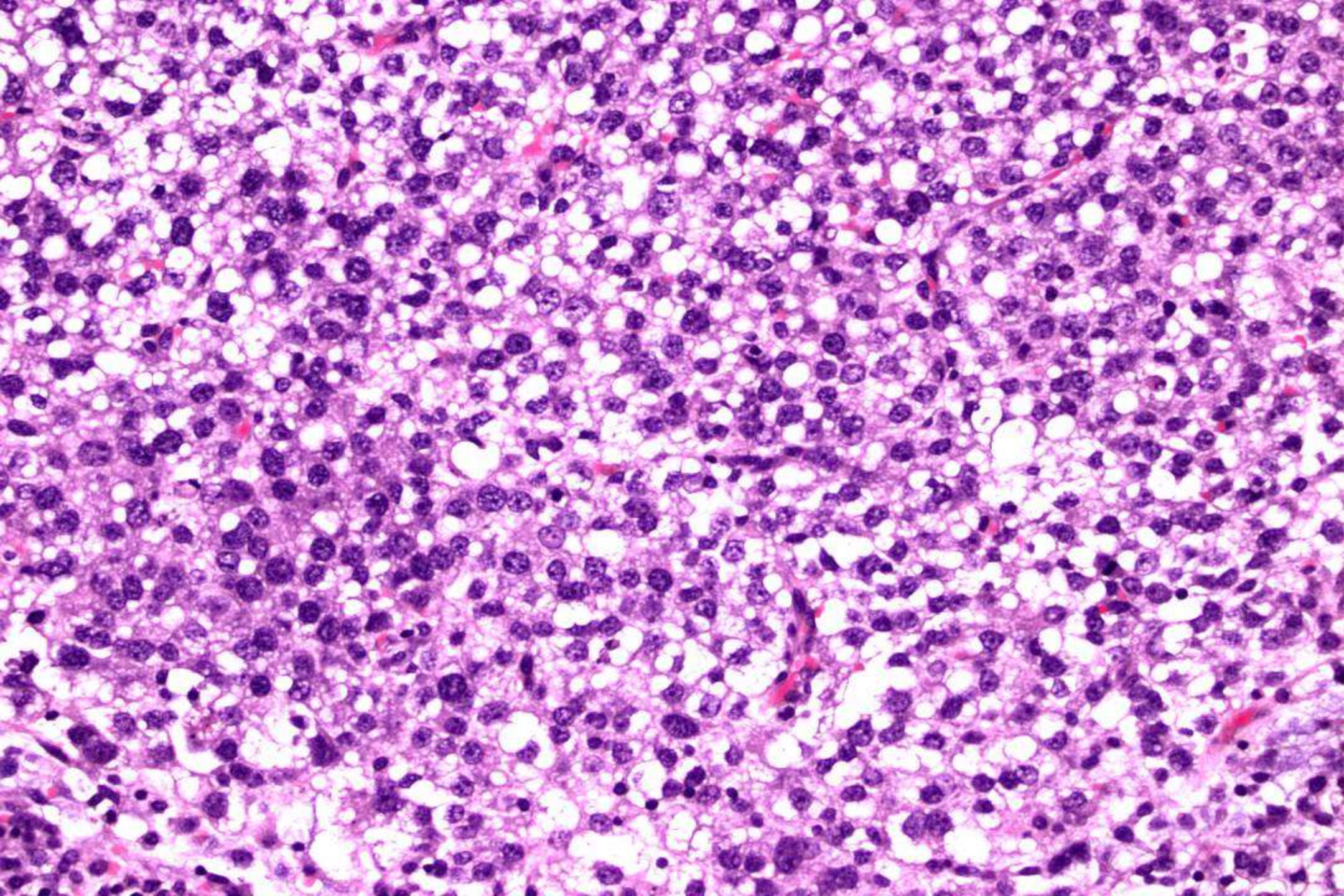
- **Second most common subtype of liposarcoma**
- **Peak Age: 5th decade**
(not in children < 10 years)
- **Extremities (thigh, popliteal fossa)**

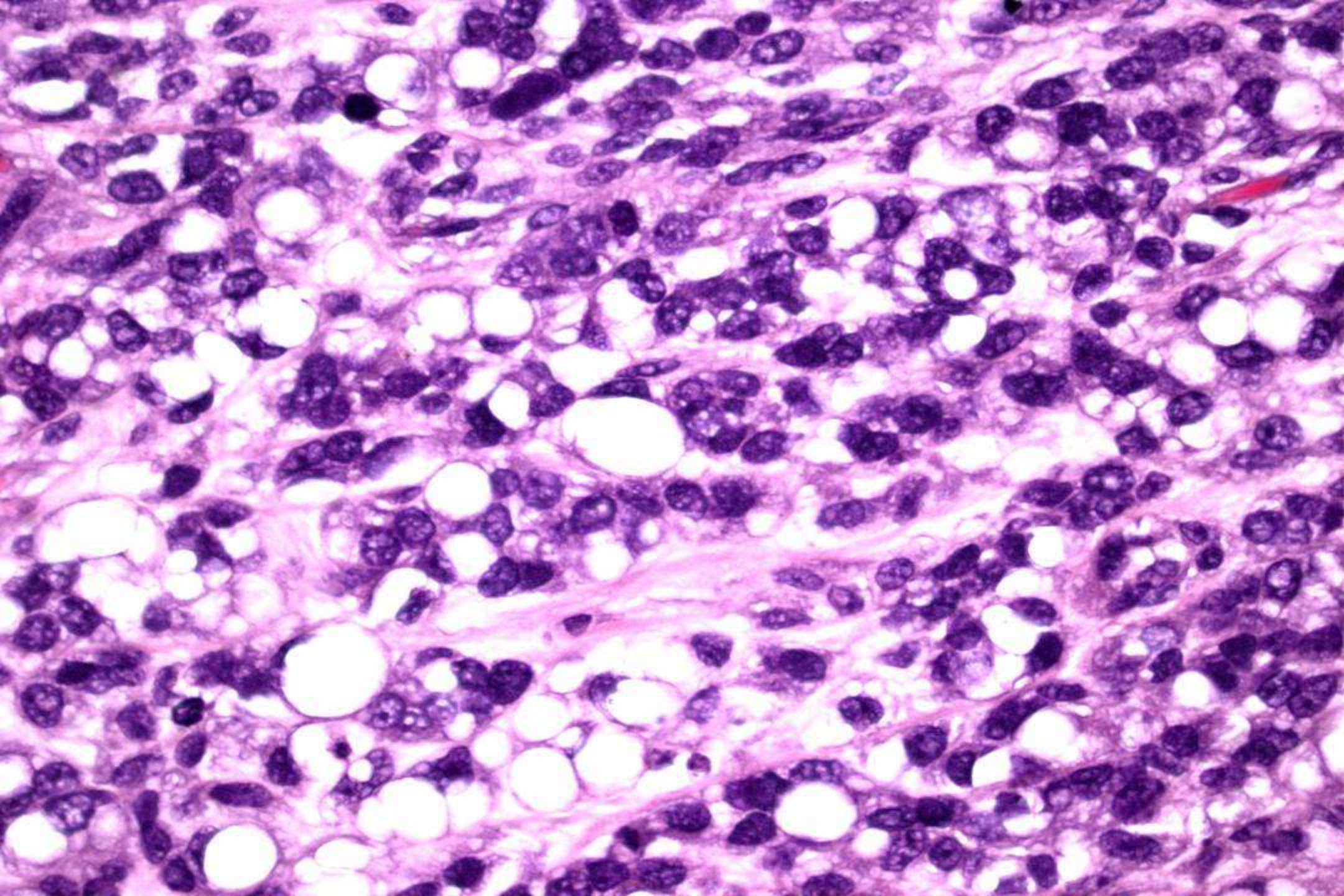


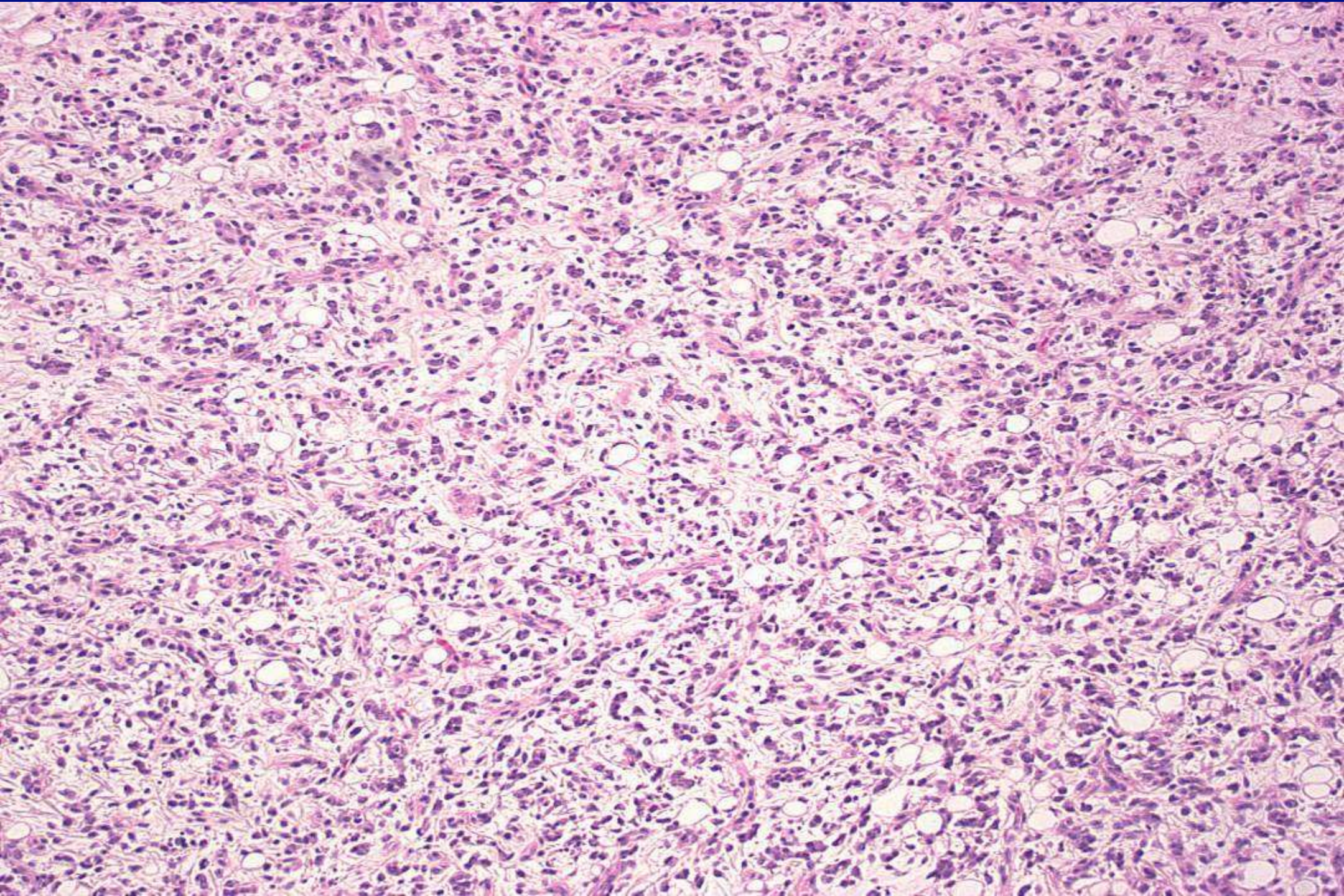












Criteria for Round Cell Liposarcoma

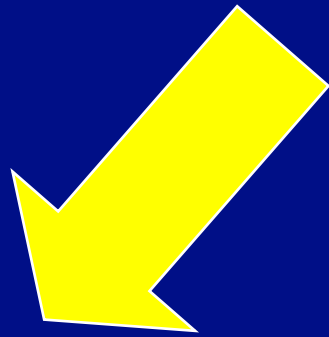
- Closely packed round cells with high-grade nuclei
- Little/no intervening myxoid stroma
- Obliteration of characteristic plexiform vascular pattern

Transitional / Hypercellular Zones

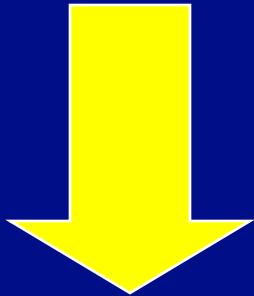
- More cellular than typical myxoid liposarcoma but not fulfilling criteria for round cell liposarcoma
 - No proven prognostic significance of transitional areas
 - Warrant increasing to Grade II/III?

Myxoid/Round Cell Liposarcoma

Cytogenetics



t(12;16)(q13;p11)



DDIT3 (CHOP)/FUS

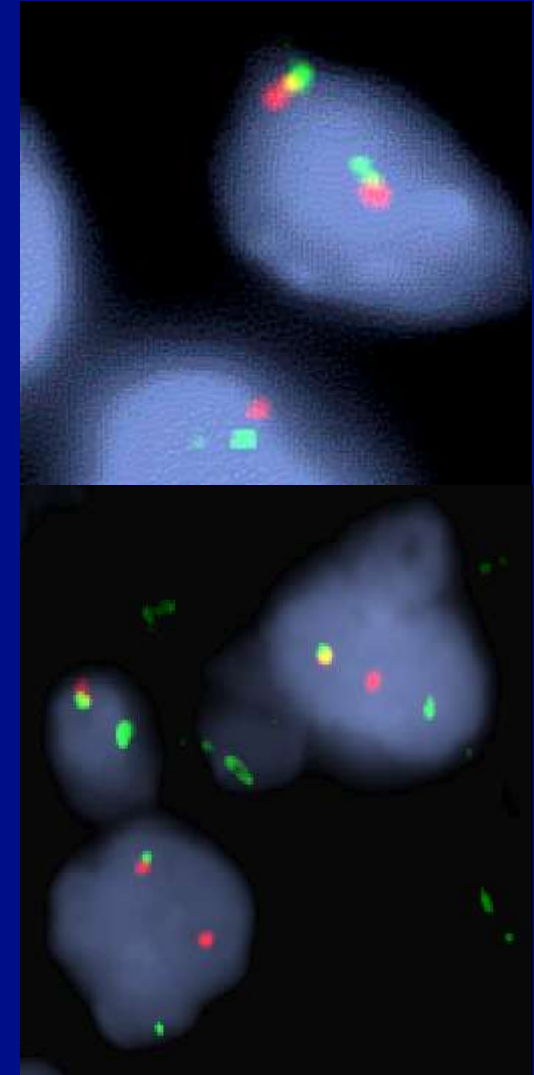
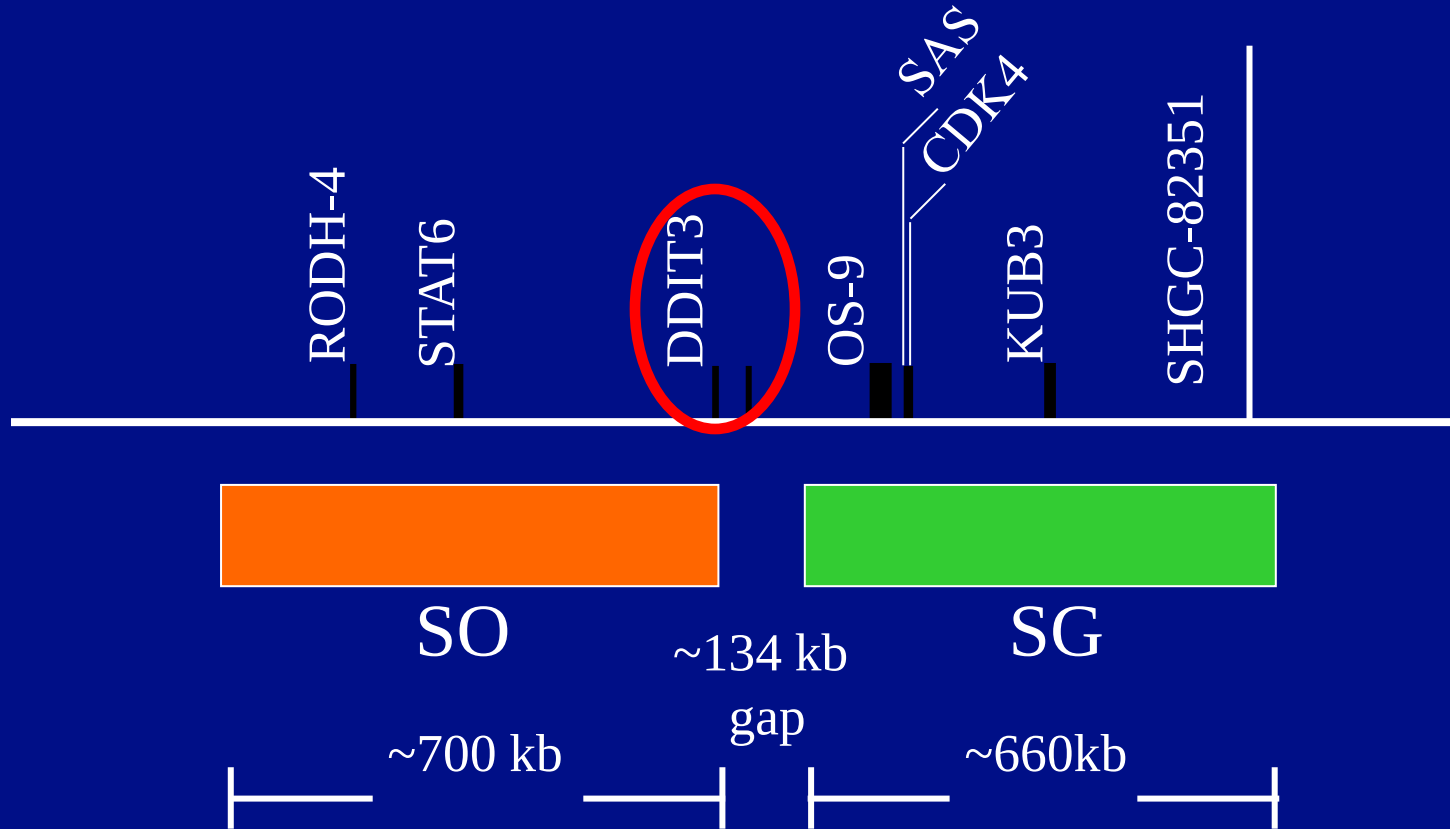


t(12;22)(q13;q12)



DDIT3 (CHOP)/EWSR1

DDIT3 (12q13) – Break-Apart Probe



Myxoid/Round Cell Liposarcoma

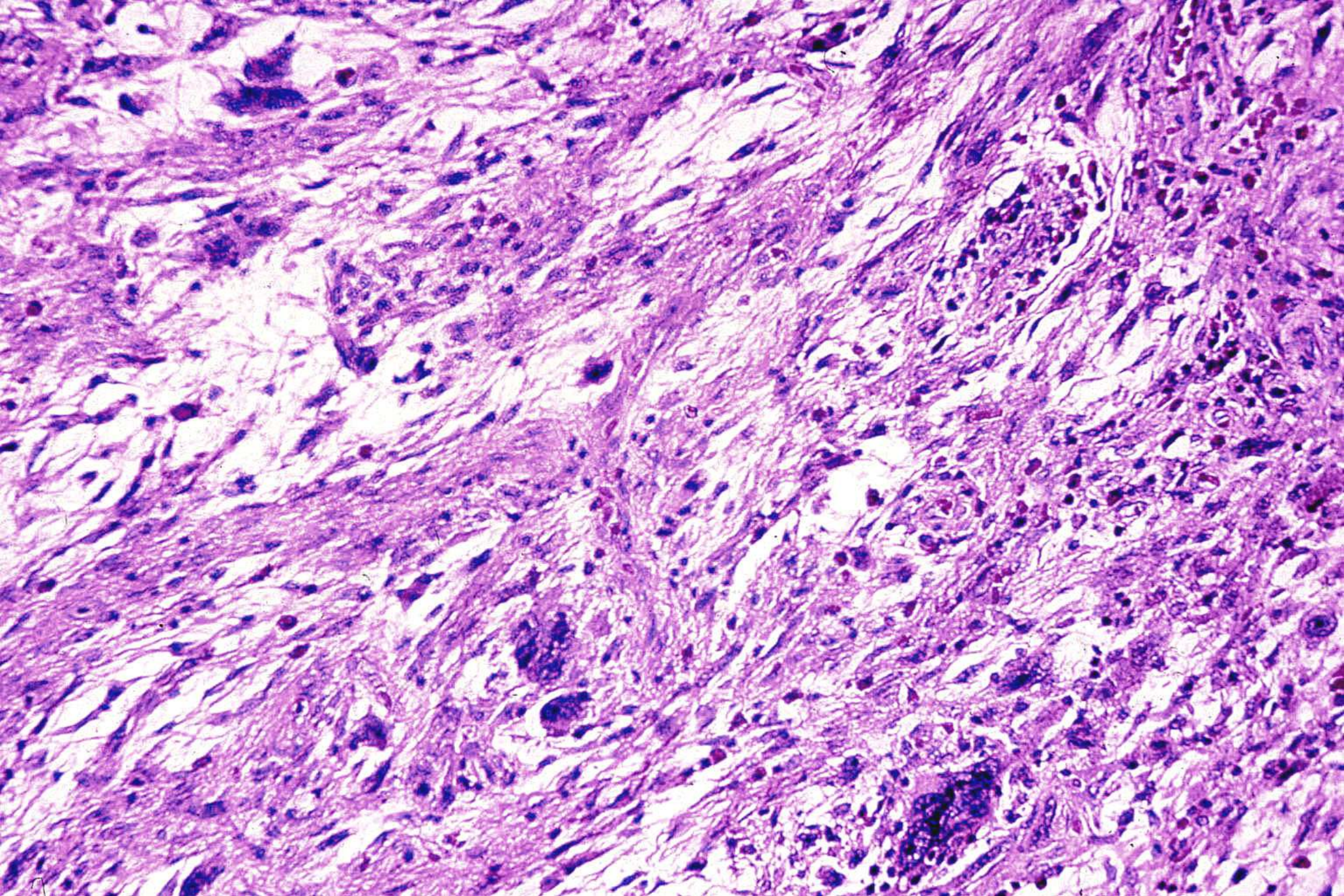
Pleomorphic Liposarcoma

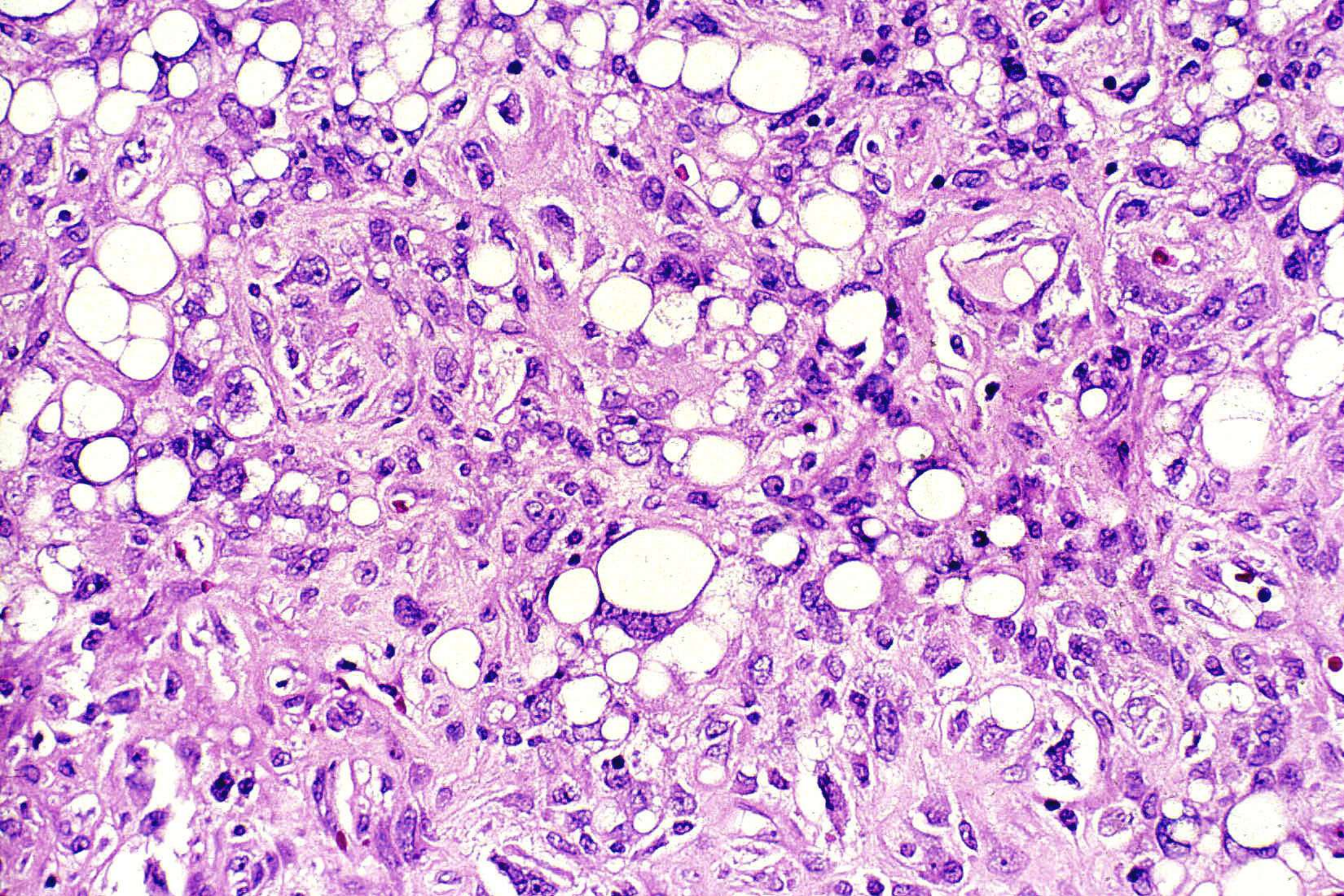
- Rarest subtype of liposarcoma
- Adults (6th-7th decade); M > F
- Most arise in deep soft tissues of extremities
 - Trunk
 - Retroperitoneum
 - Inguinal region
 - Head and neck

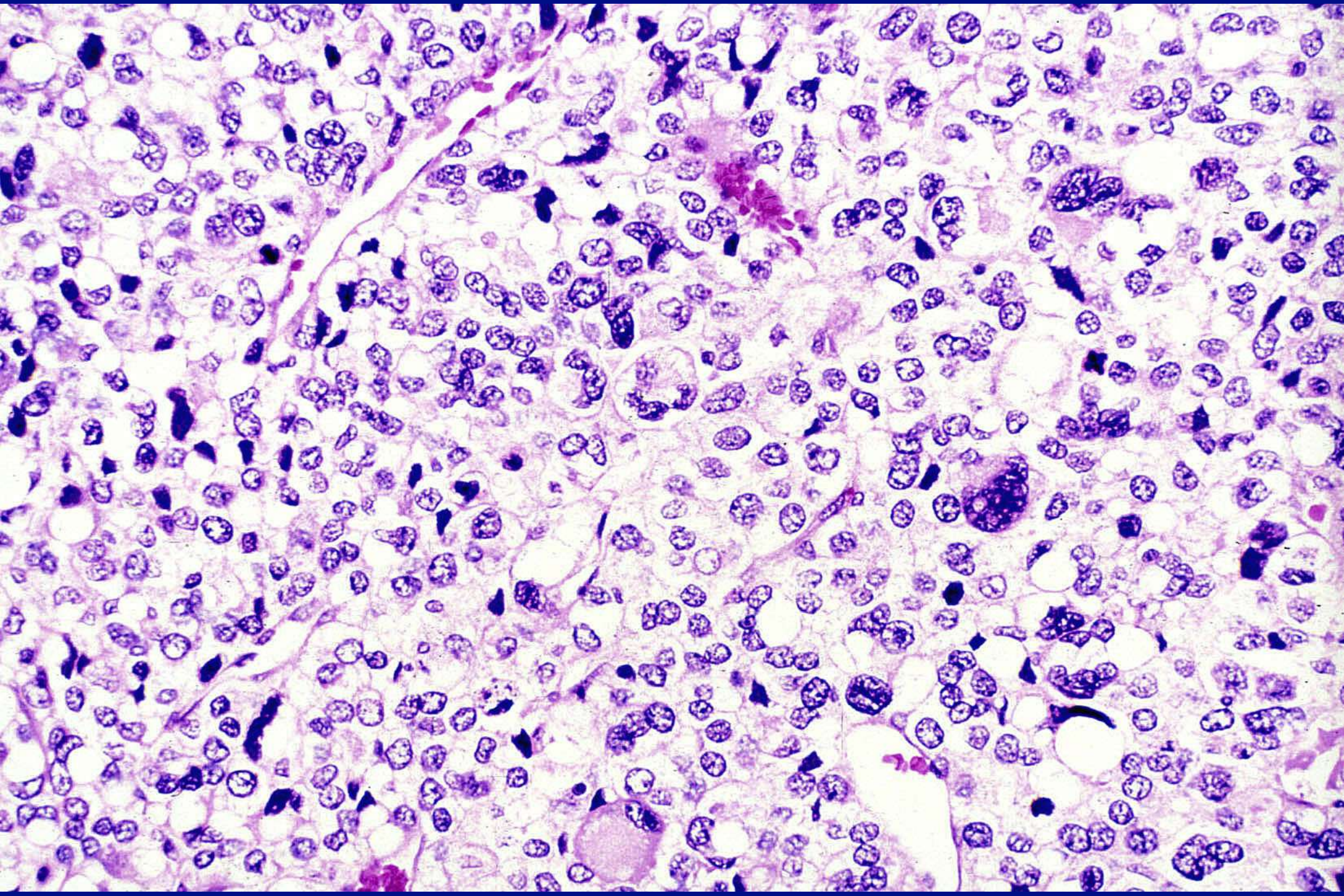
Pleomorphic Liposarcoma

Histologic Patterns

- **MFH-like with focal lipoblastic differentiation**
- **Sheets of bizarre lipoblasts**
- **Epithelioid variant**







Pleomorphic Liposarcoma

<u>Author</u>	<u>Recurrence</u>	<u>Metastasis</u>	<u>Death</u>	<u>F/U (median)</u>
Mentzel (24)	21%	29%	38%	24 mos
Downes (17)	29%	47%	53%	25 mos
Miettinen (10)	-	-	60%	6.5 mos

Pleomorphic Sarcomas - Cytogenetics

- 46 pleomorphic sarcomas (most originally diagnosed as MFH)
- Most displayed highly complex karyotypes
- No aberration specific for any subgroup
- Not useful in subclassifying pleomorphic sarcomas

Well-differentiated Lipomatous Tumors

Cytogenetics

Lipoma	12q, 6p, 13q
Hibernoma	11q
Lipoblastoma	8q
Spindle / pl lipoma	16q, 13q
ALT / WDL	ring chromosomes (12q)

Liposarcoma

Category

ALT/WDL

Dedifferentiated

Myxoid/round cell

Pleomorphic

Cytogenetics

Ring/giant marker
chromosomes (12q13-15)

Additional complex
aberrations

t(12;16)(q13;p11)

Complex aberrations