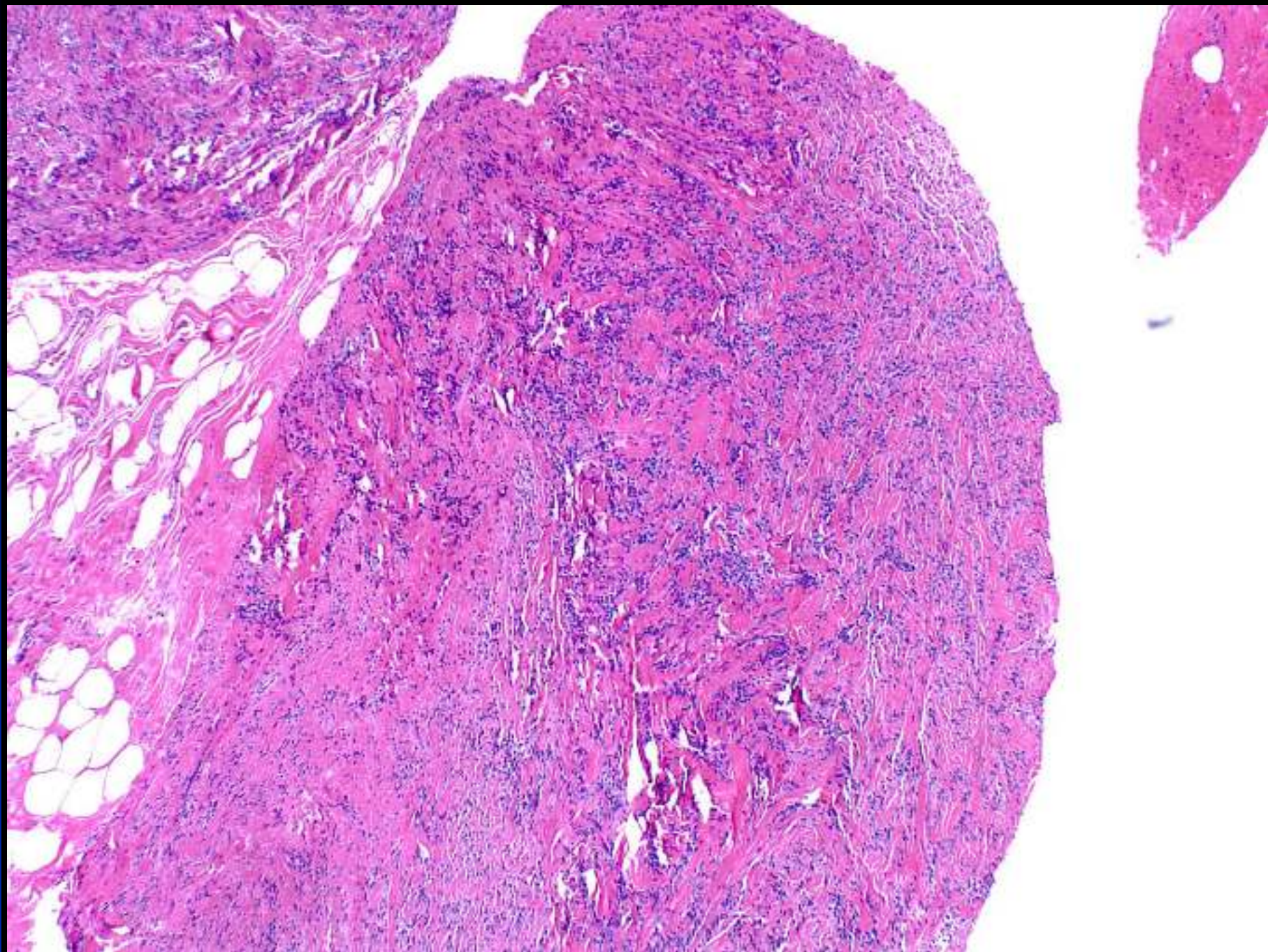
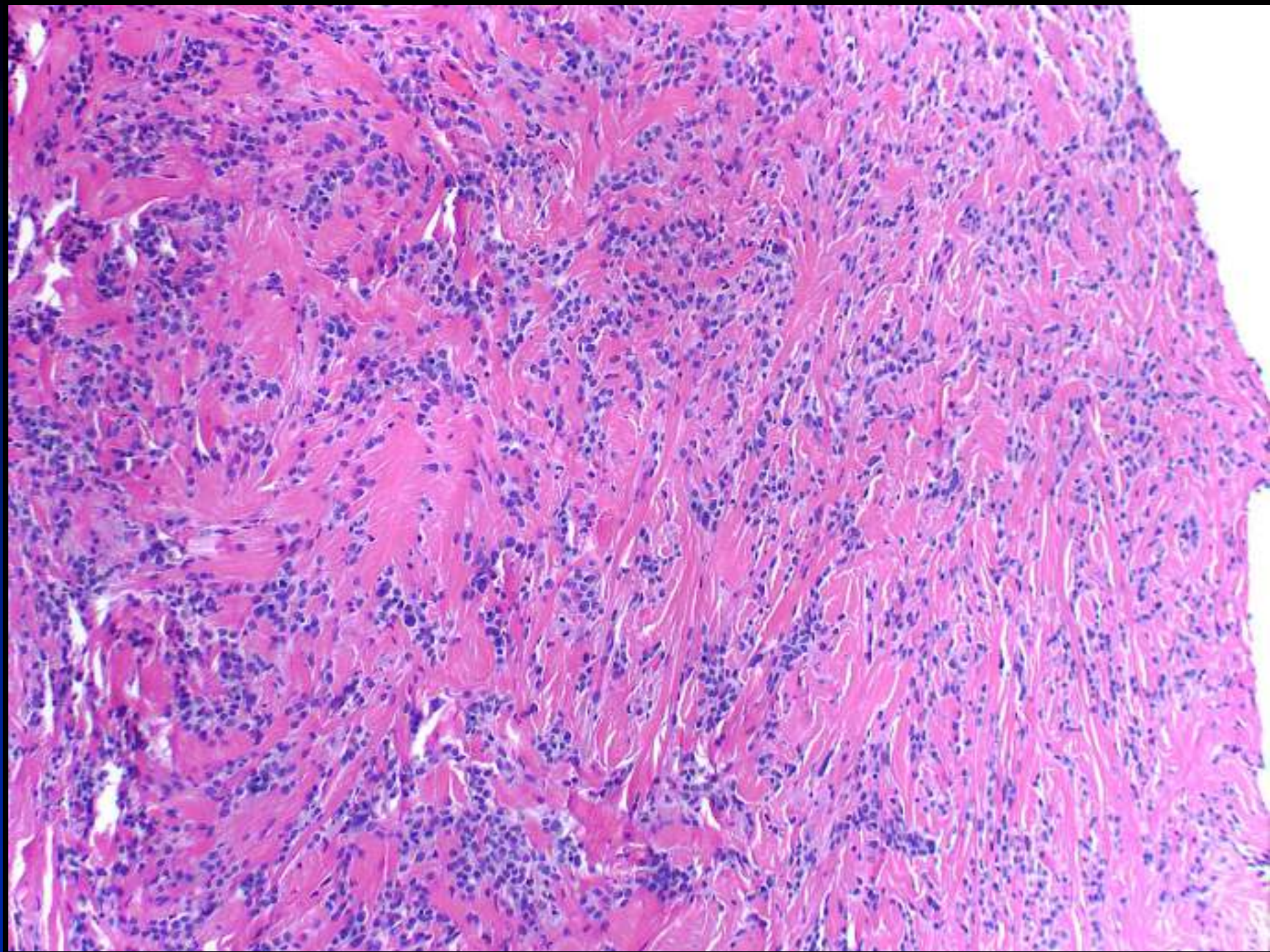


## Case 2

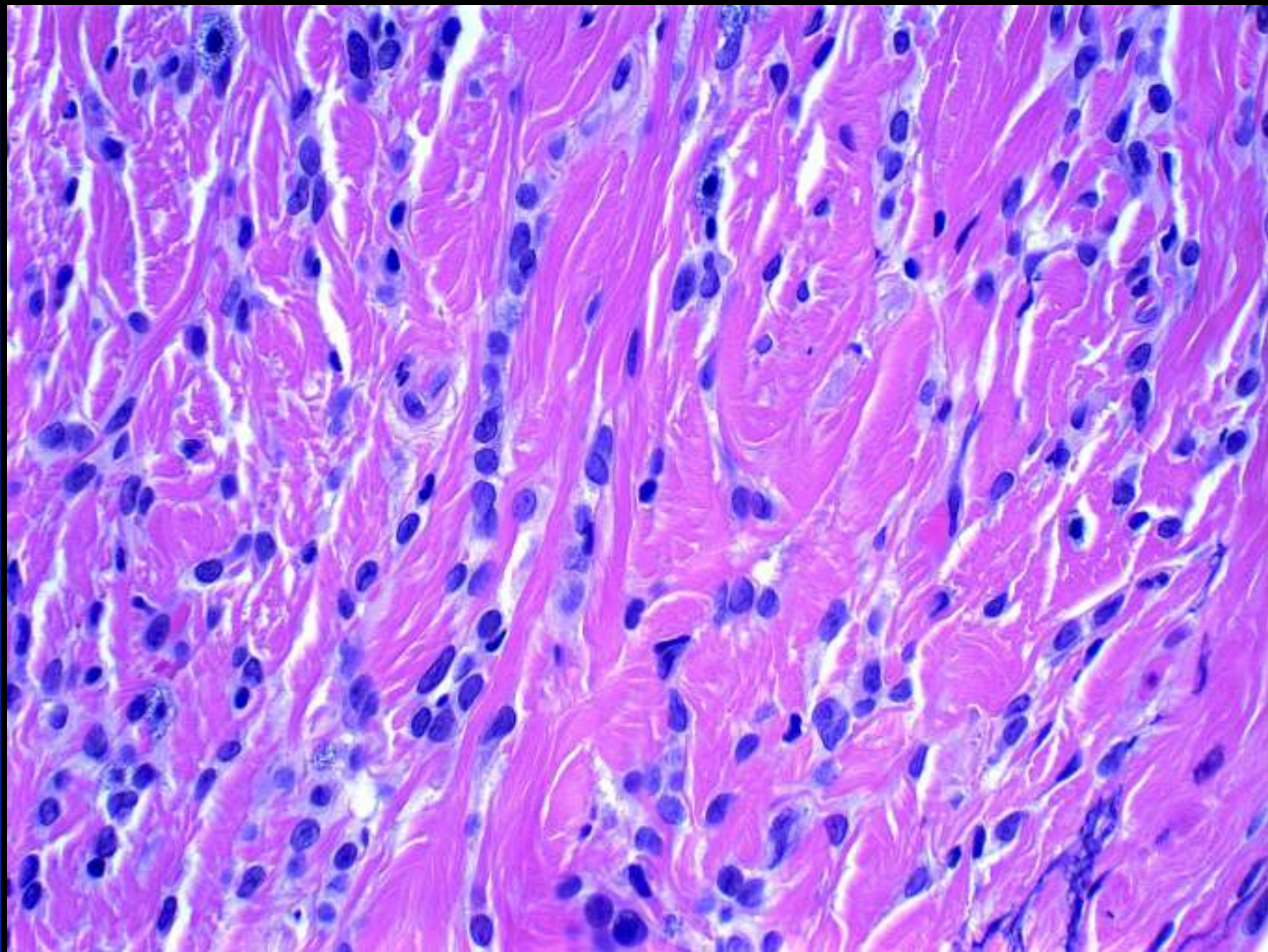
- **A 43 year old woman was found to have a relatively circumscribed mass on a screening mammogram.**
- **A core needle biopsy was performed.**









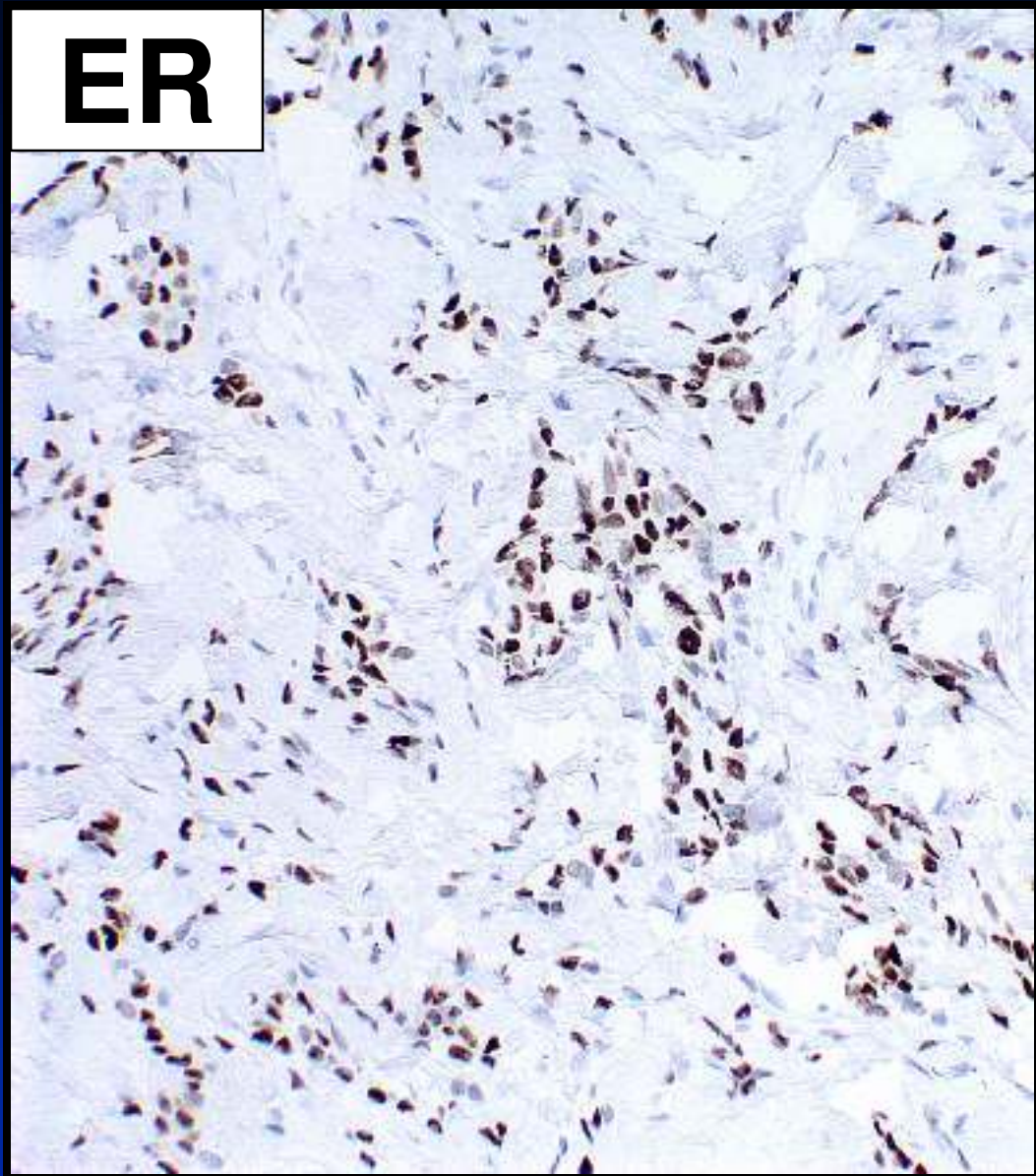


# Diagnosis

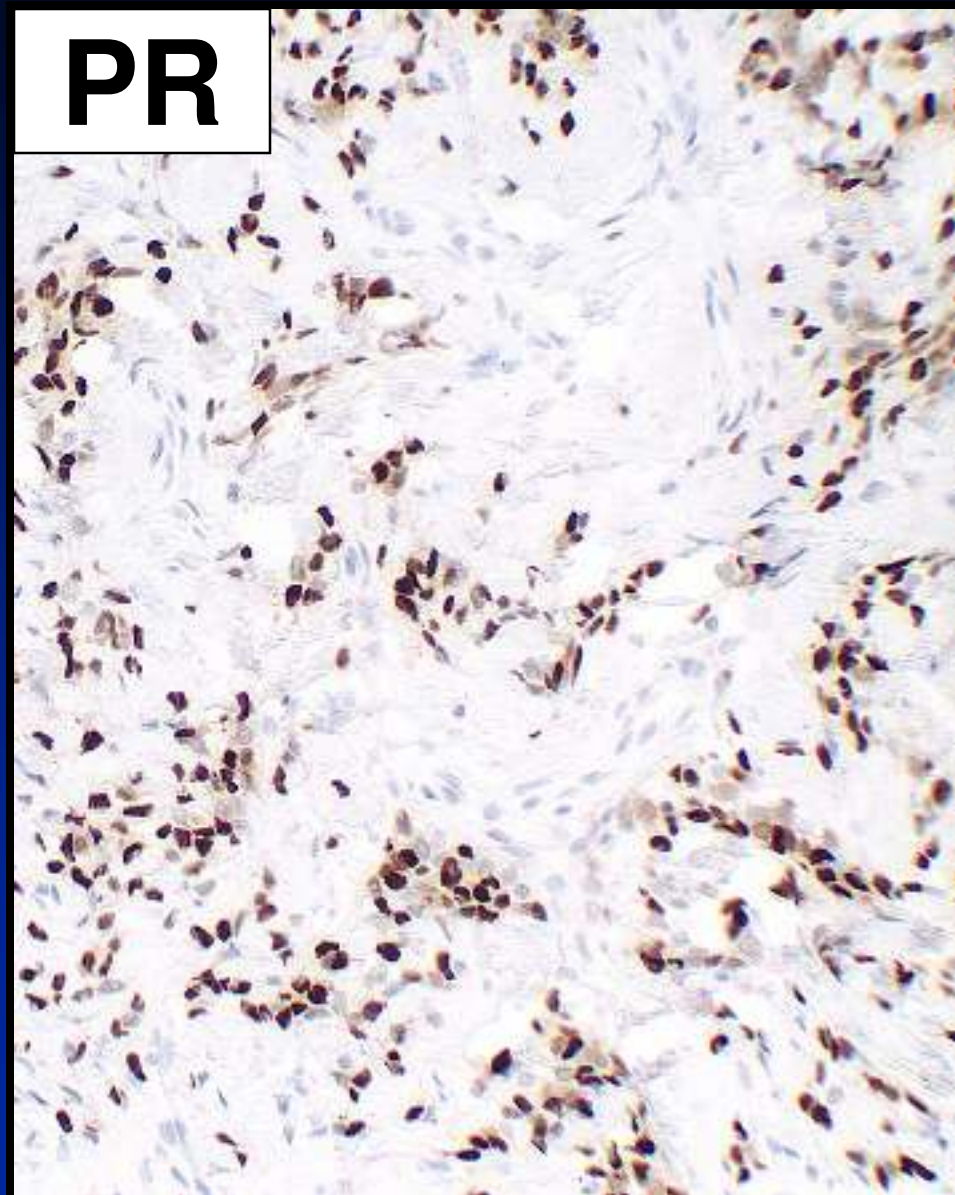
**Invasive lobular carcinoma**



**ER**



**PR**

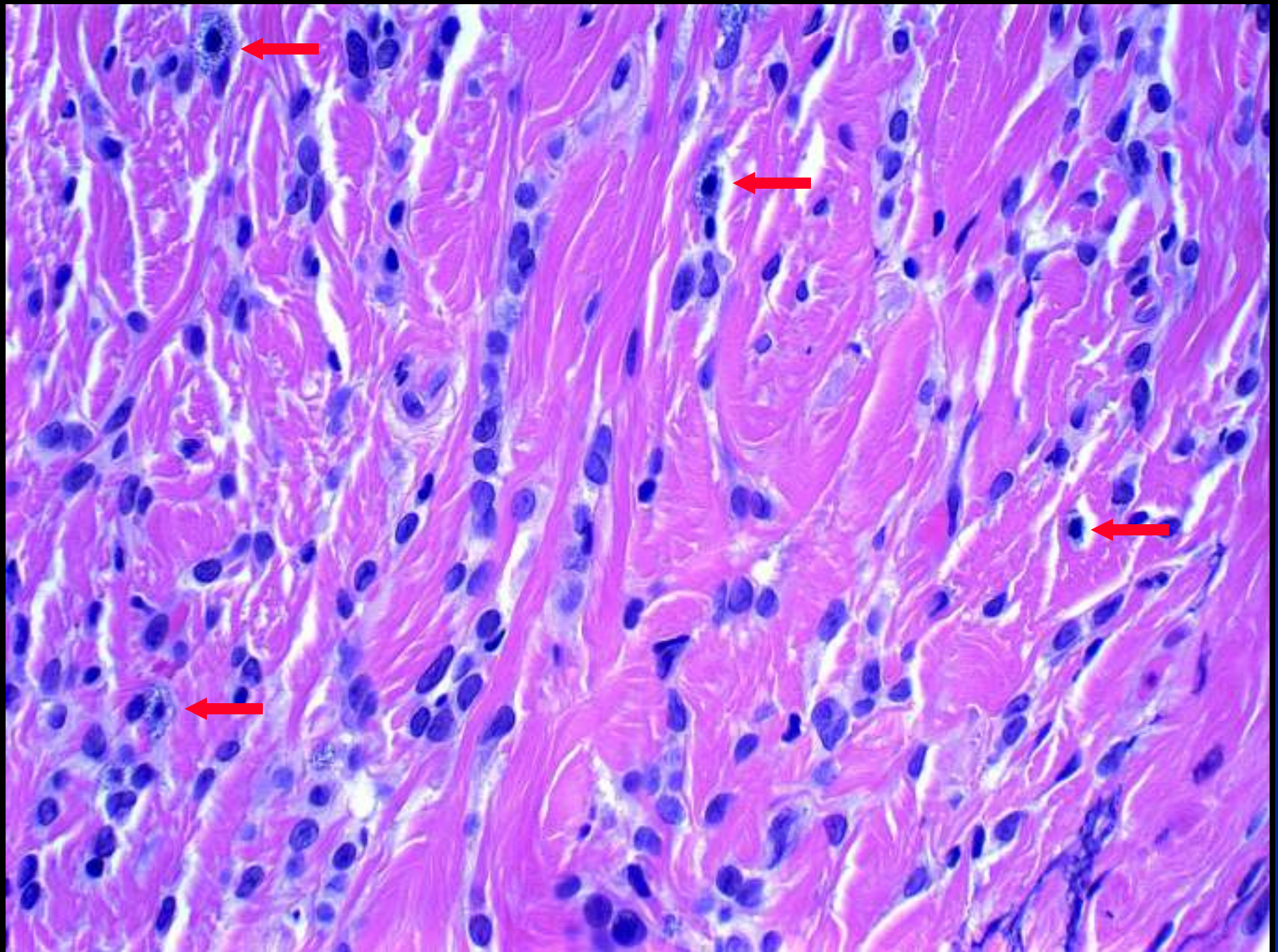


# Diagnosis

**Invasive lobular carcinoma,  
ER+, PR+, HER2-**

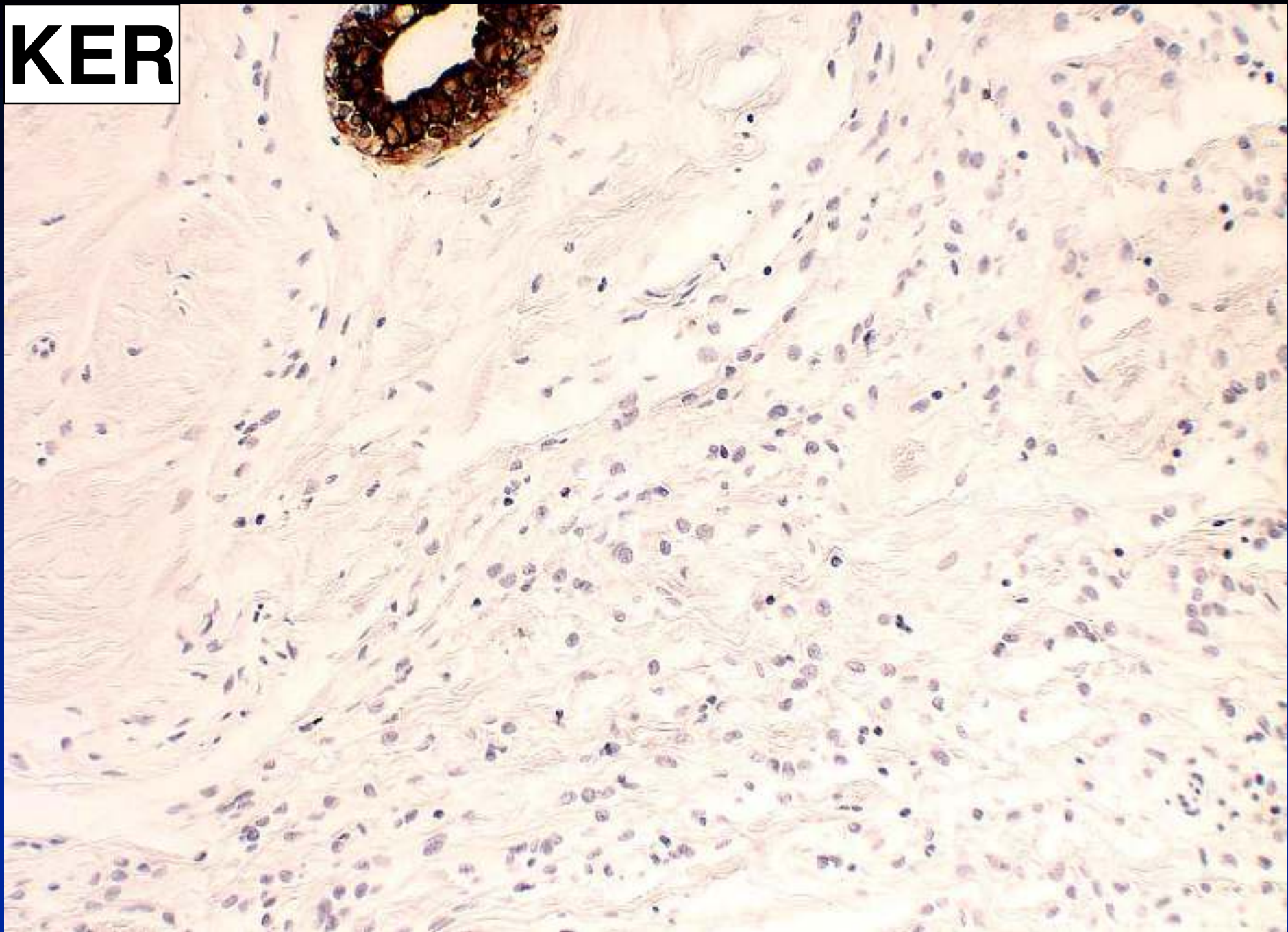
- **Mastectomy recommended**
- **Patient came to BIDMC BreastCare Center for second opinion**
- **Slides brought along for review**







**KER**





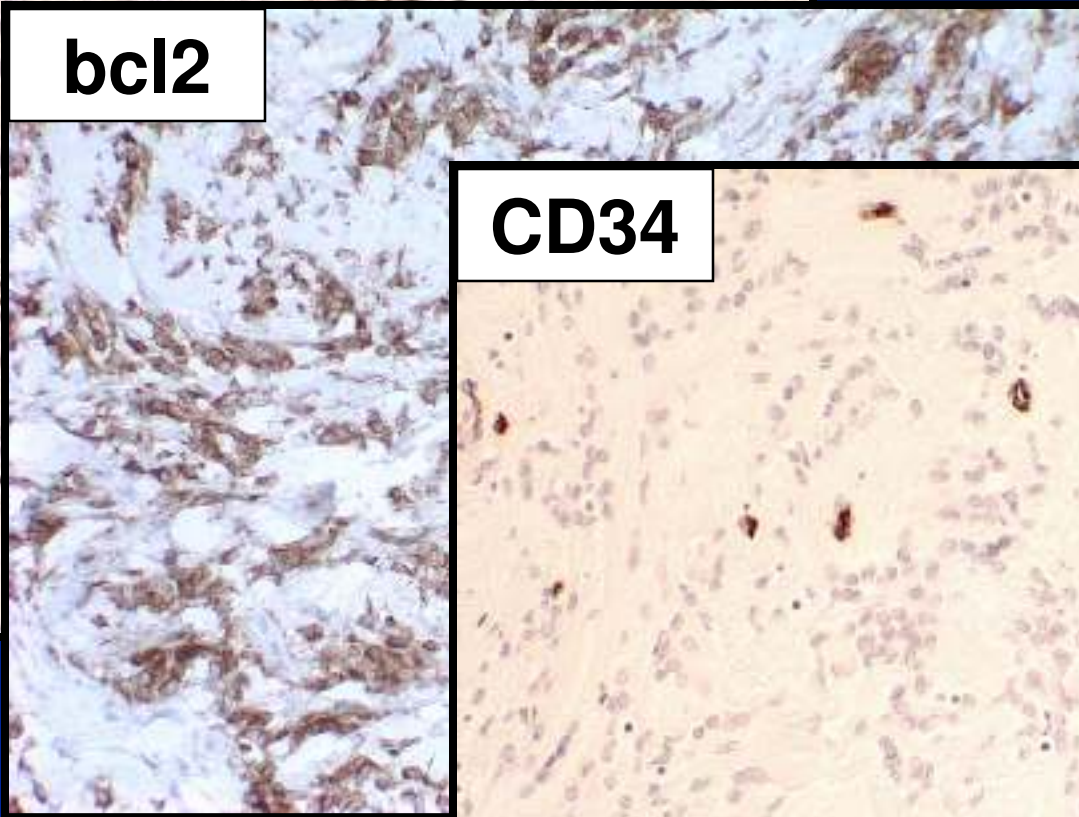
**Actin**



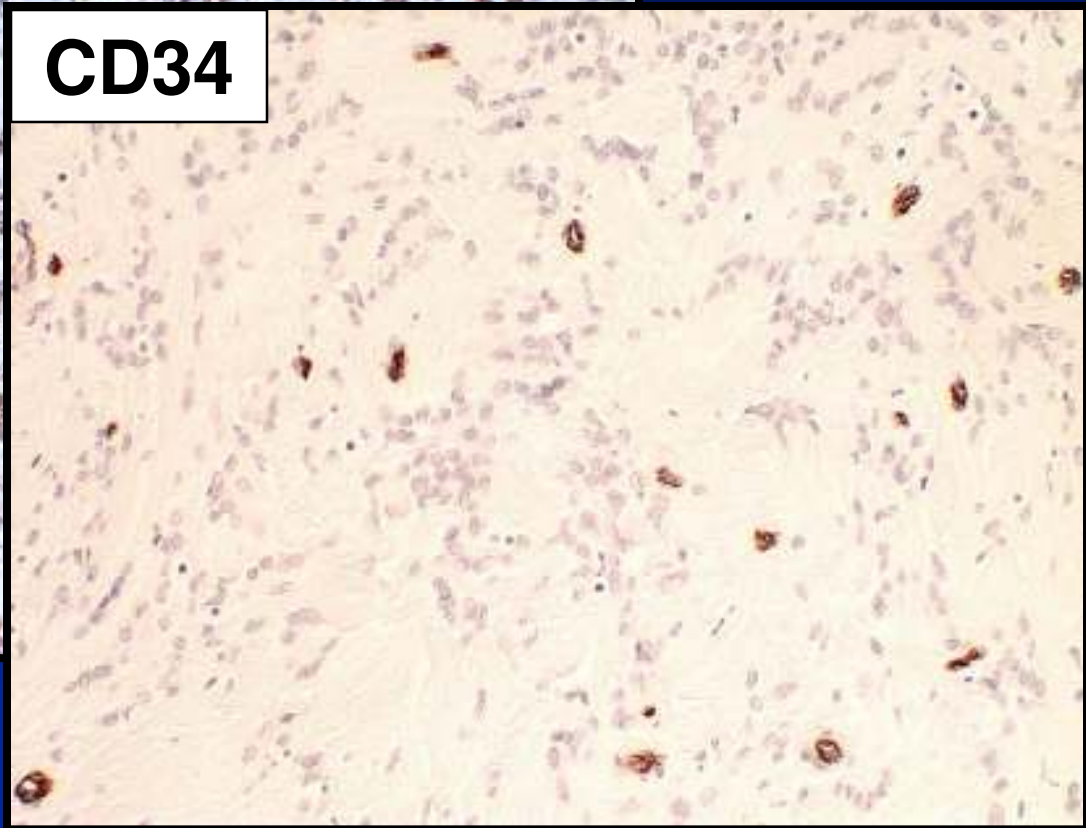
**Desmin**



**bcl2**



**CD34**



# Diagnosis

**Myofibroblastoma,  
epithelioid variant**



# Myofibroblastoma

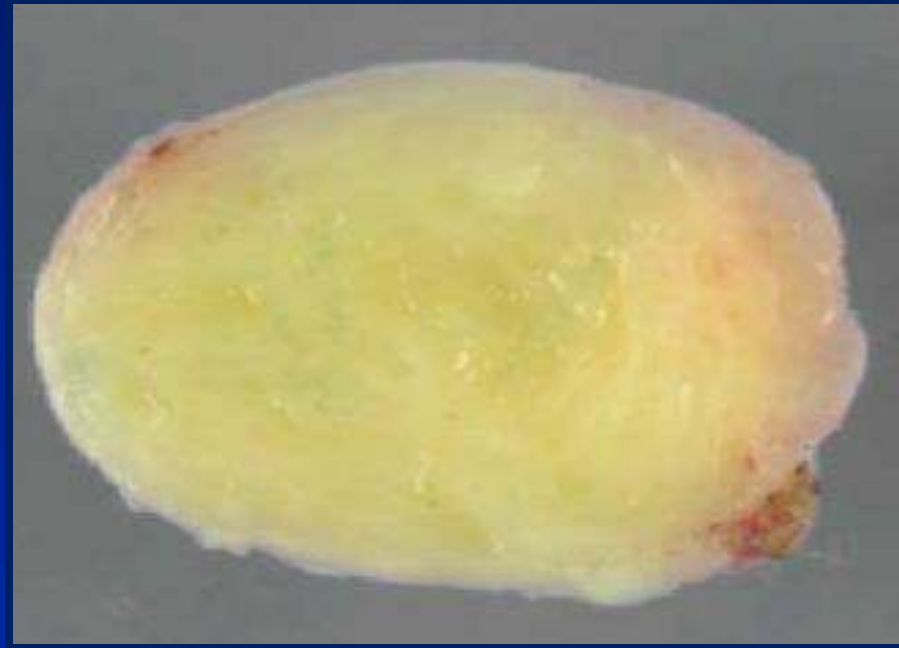
## Clinical Features

- Males = females
- Increasingly detected on mammogram
- Peak 50-75 years
- Mobile, slowly growing, painless
- Most < 4 cm; occasionally very large
- Mammary-type myofibroblastomas may occur outside breast (most commonly inguinal/groin region)
- ***Benign; no recurrence (even in setting of positive margins)***

# Myofibroblastoma

## Pathologic Features

- Well circumscribed, rubbery firm to gelatinous; yellow to white/gray/tan cut surface; variably fatty



*Howitt, 2016*

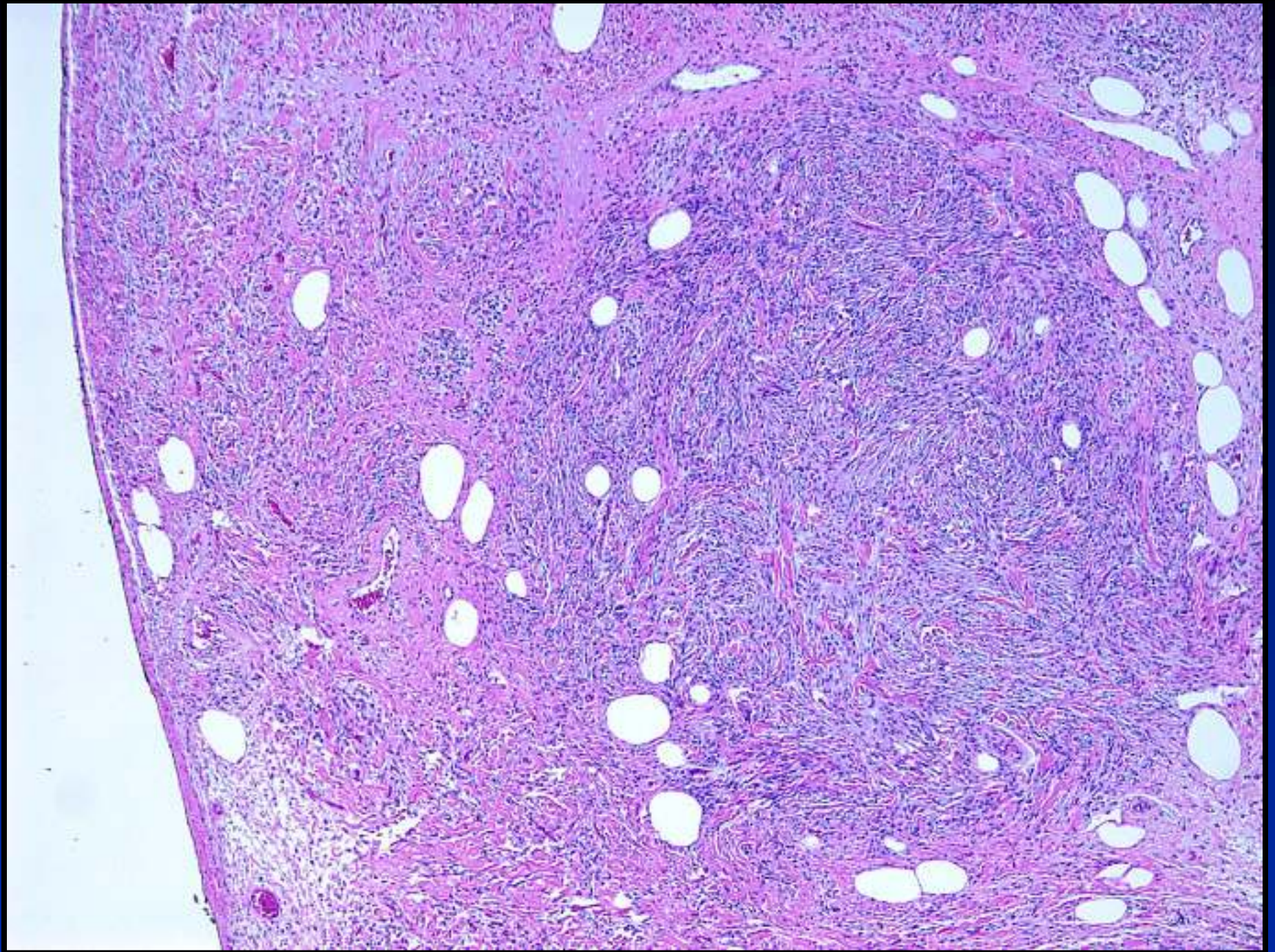


# Myofibroblastoma

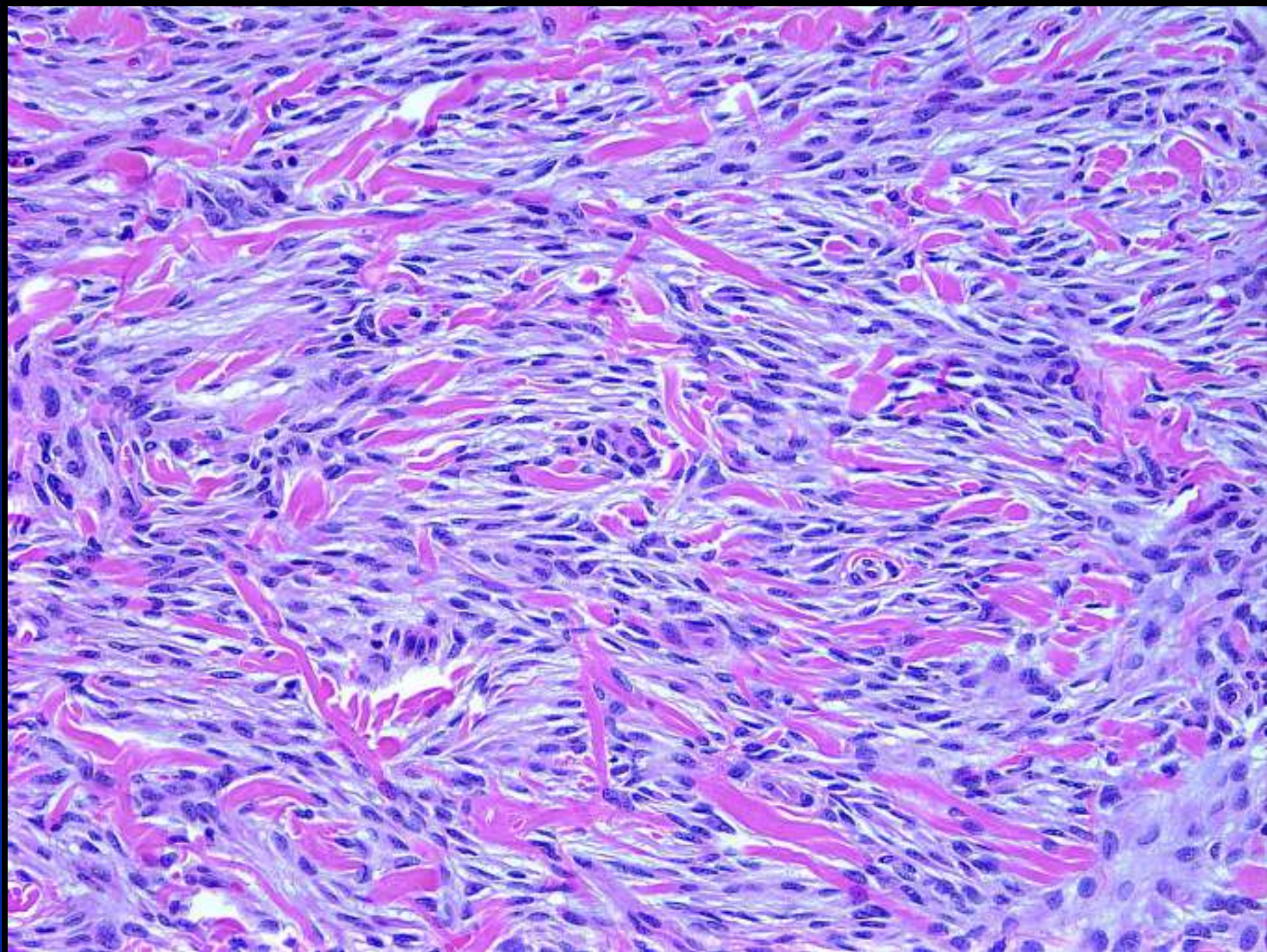
## Pathologic Features

- **Classic type-histology:**
  - Circumscribed, no true capsule
  - Variable amounts of fat
  - Short fascicles of uniform spindle-shaped cells with round to oval, short, stubby nuclei and indistinct cell borders
  - Broad bands of hyalinized collagen

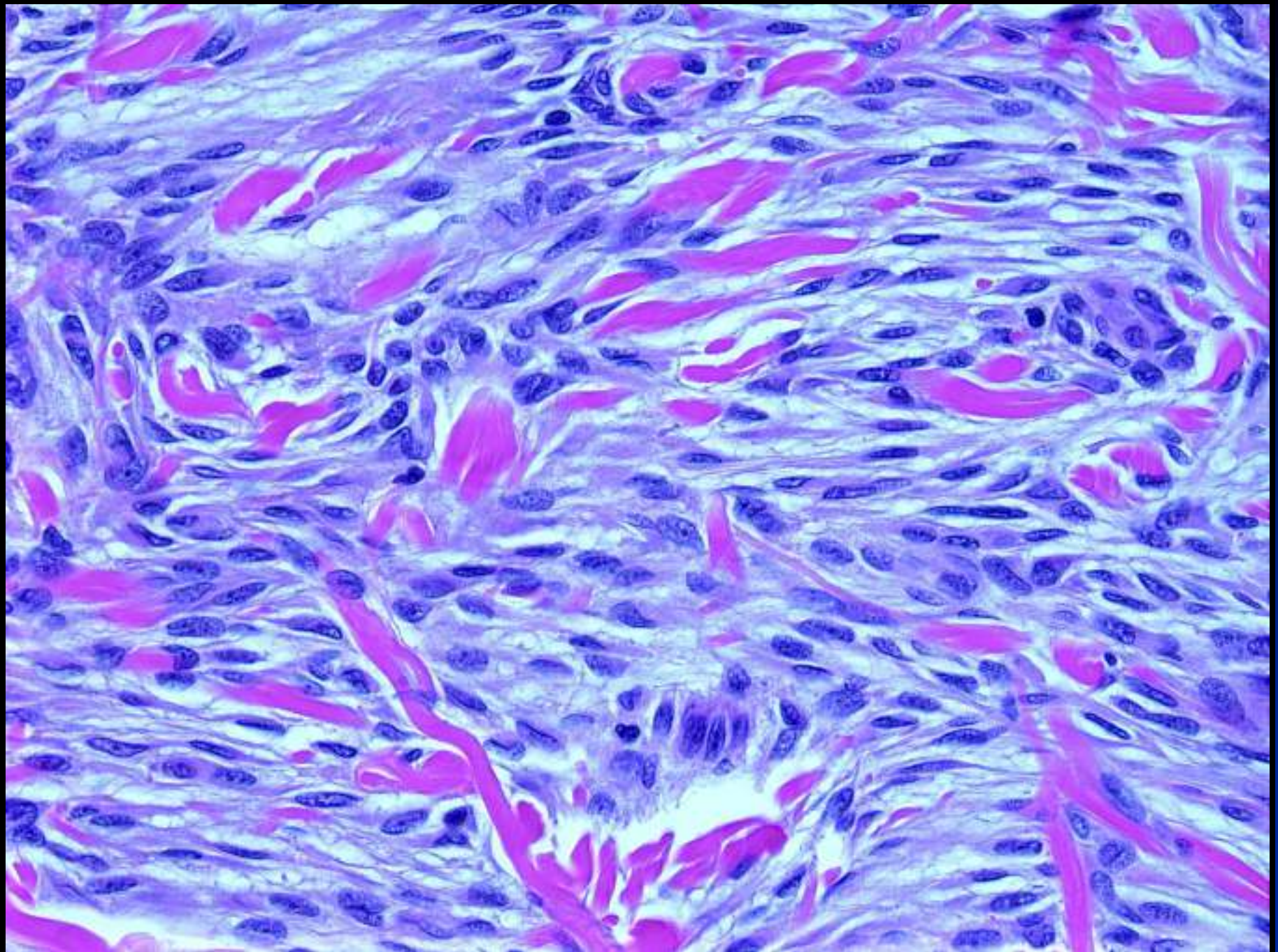












# **Myofibroblastoma**

## **Other Histologic Features**

- **Usually no entrapped mammary ducts/lobules**
- **Perivascular lymphoplasmacytic infiltrates**
- **Mast cells**
- **Myxoid change**
- **Chondroid or smooth muscle metaplasia**



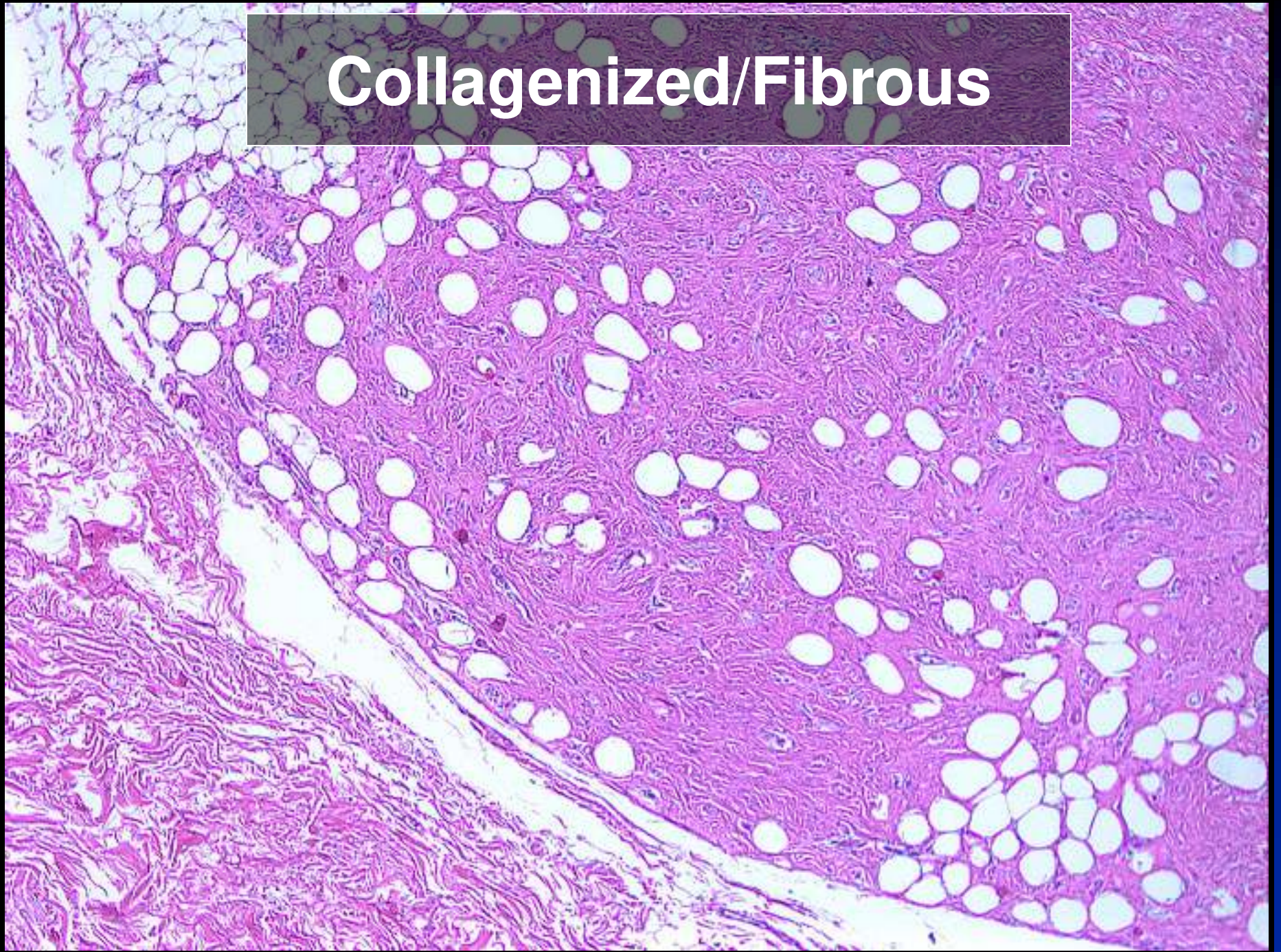
# Myofibroblastoma

## Variants

- **Collagenized/fibrous**
- **Cellular**
- **Myxoid**
- **Lipomatous**
- **Infiltrative**
- **Atypical**
- **Deciduoid**
- **Palisaded**
- **Epithelioid**

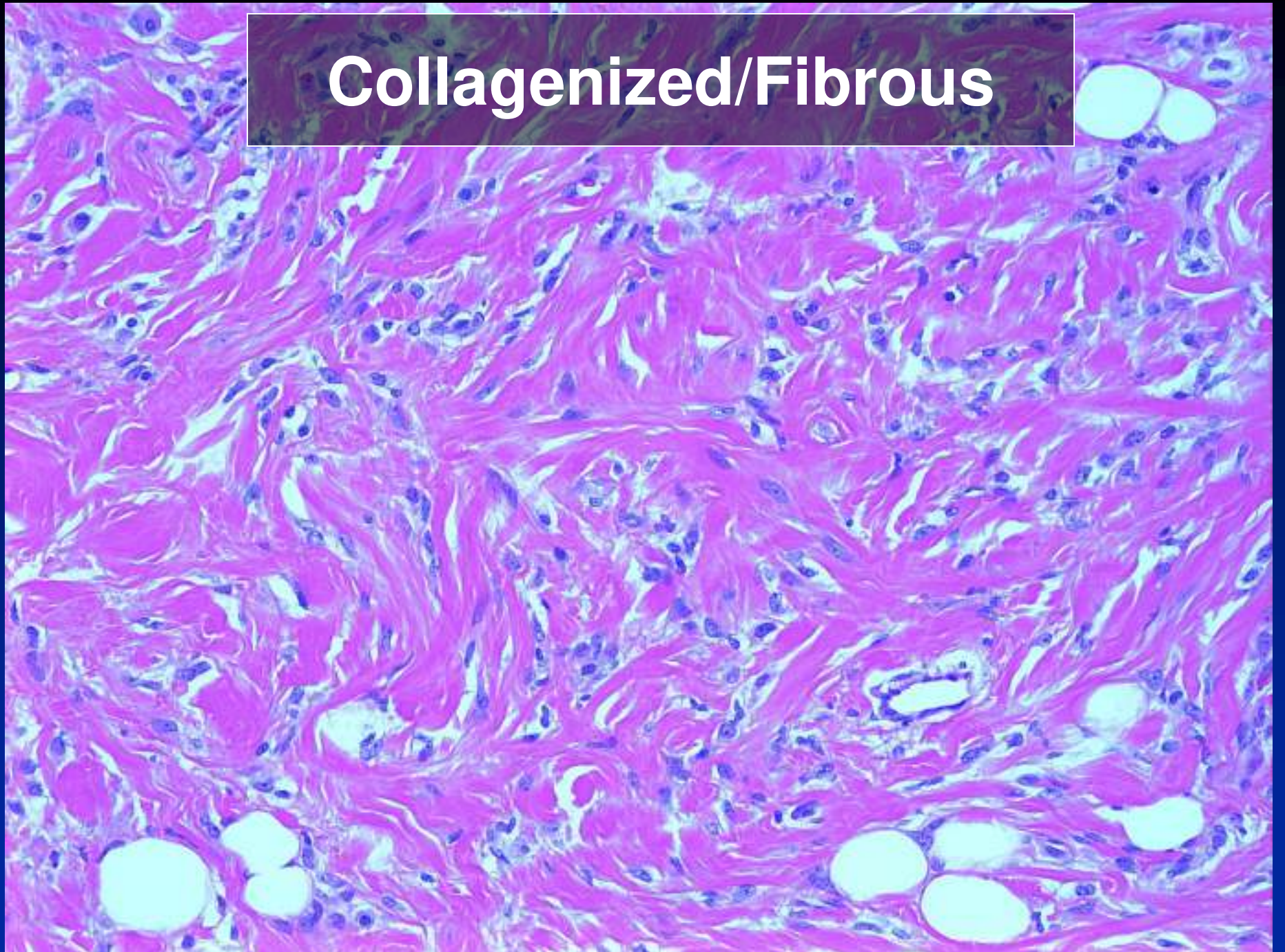


# Collagenized/Fibrous



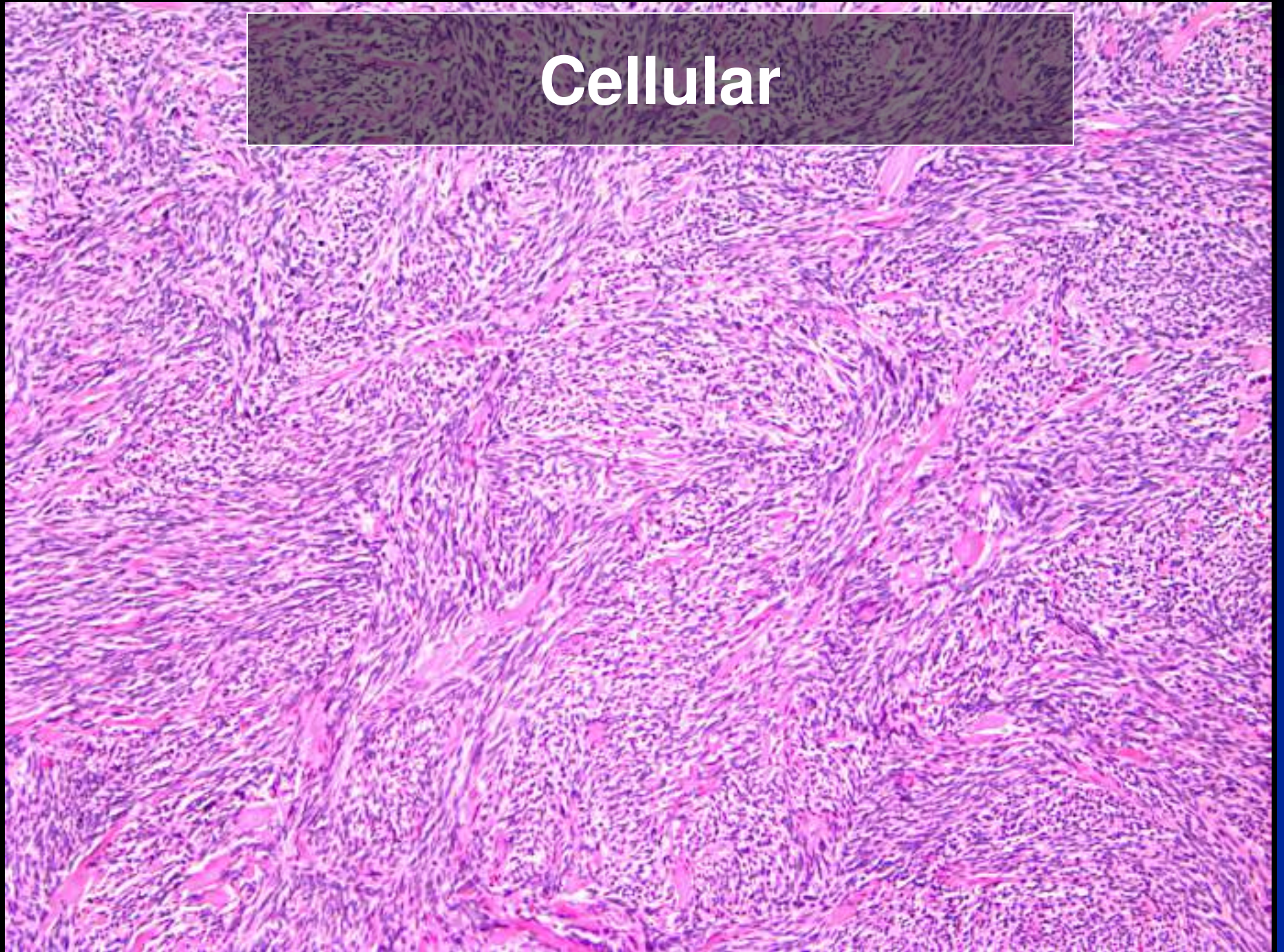


# Collagenized/Fibrous



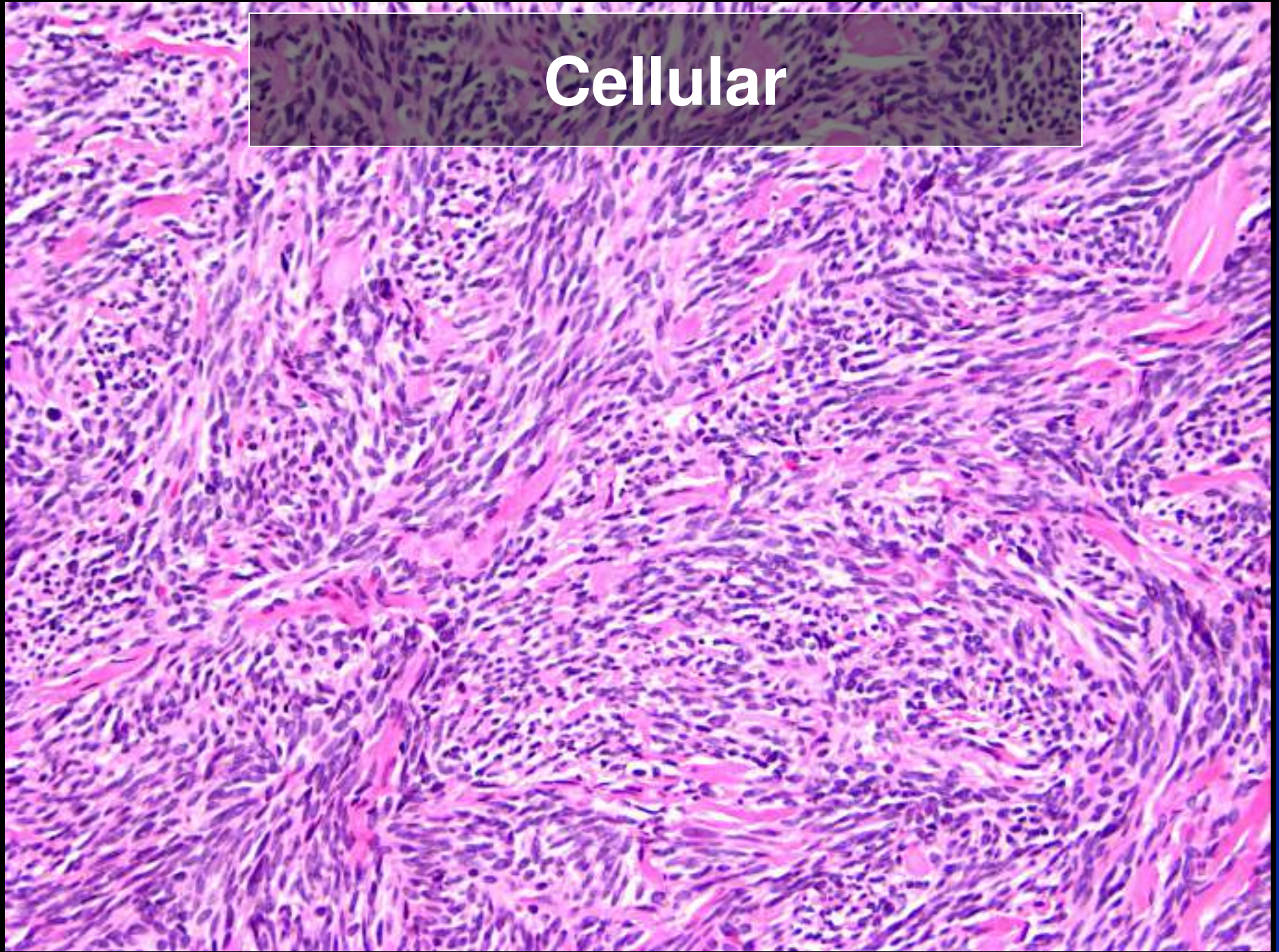


# Cellular



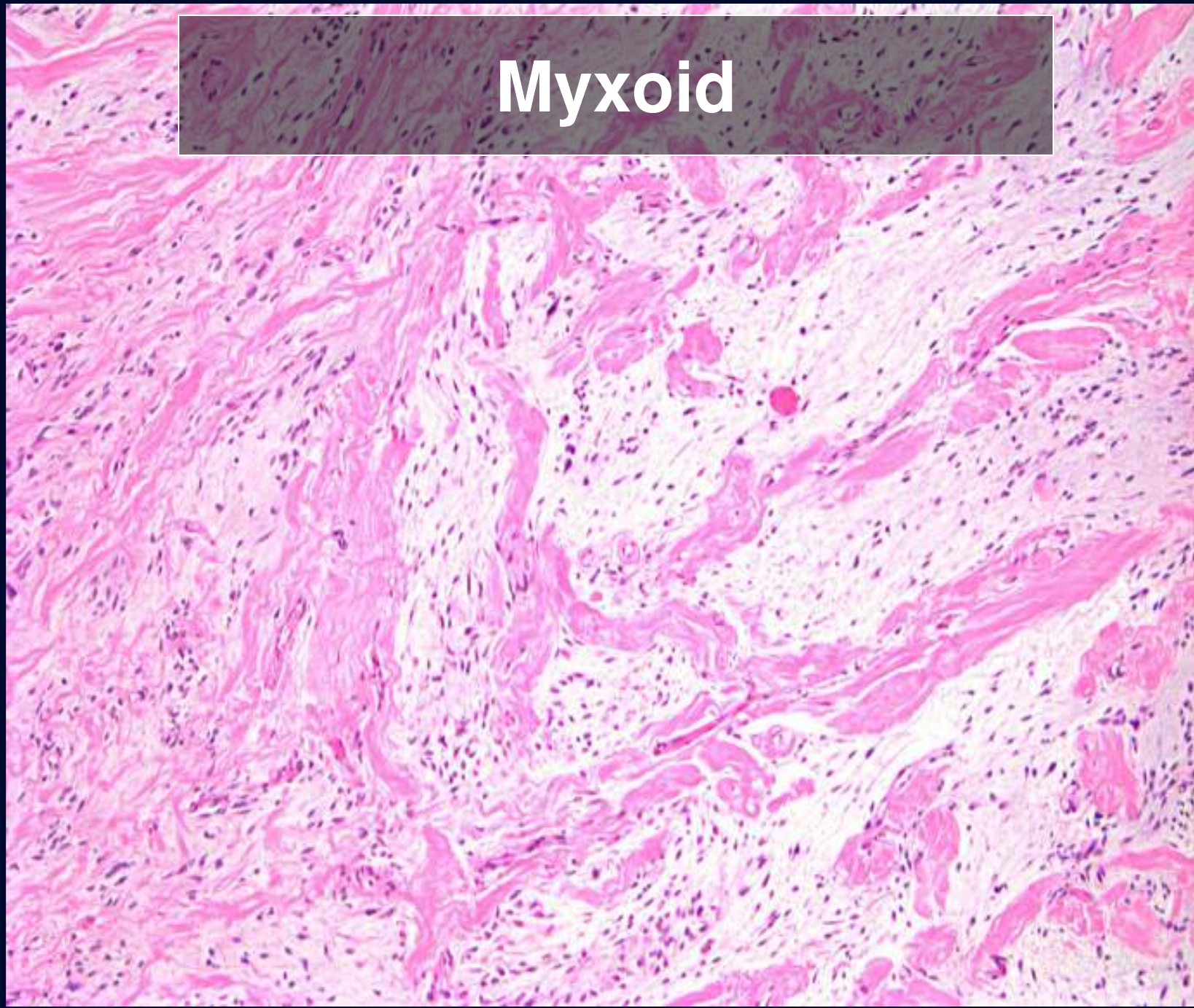


**Cellular**



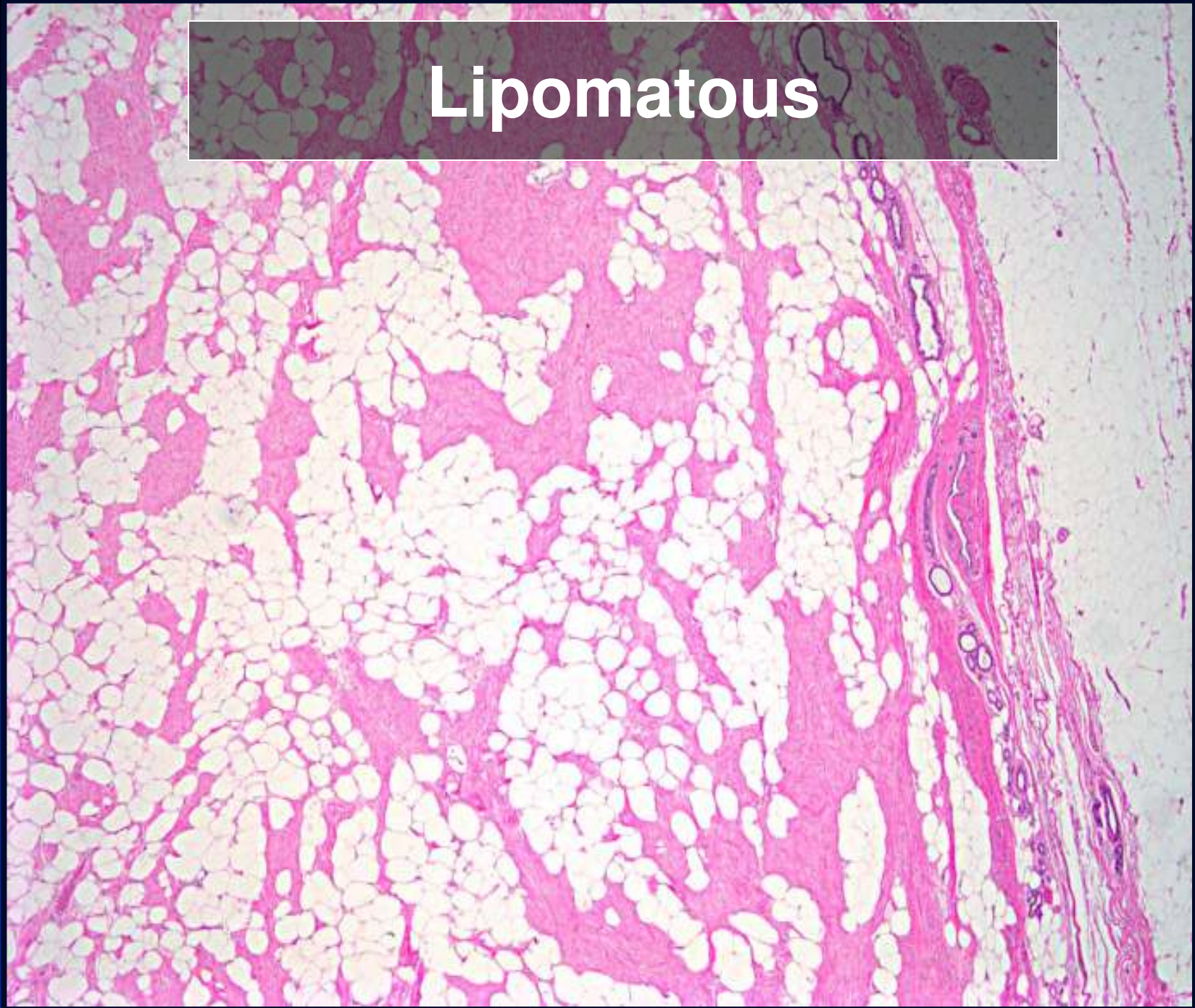


**Myxoid**





# Lipomatous





# Lipomatous

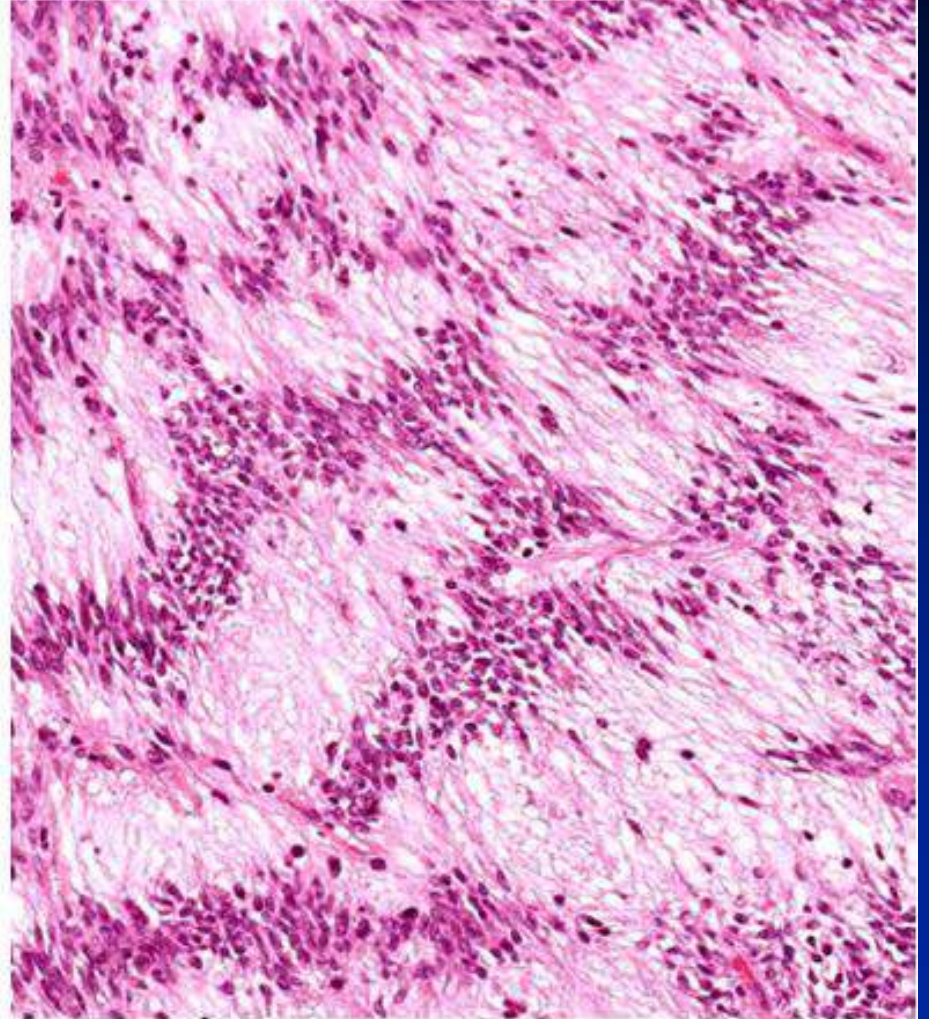
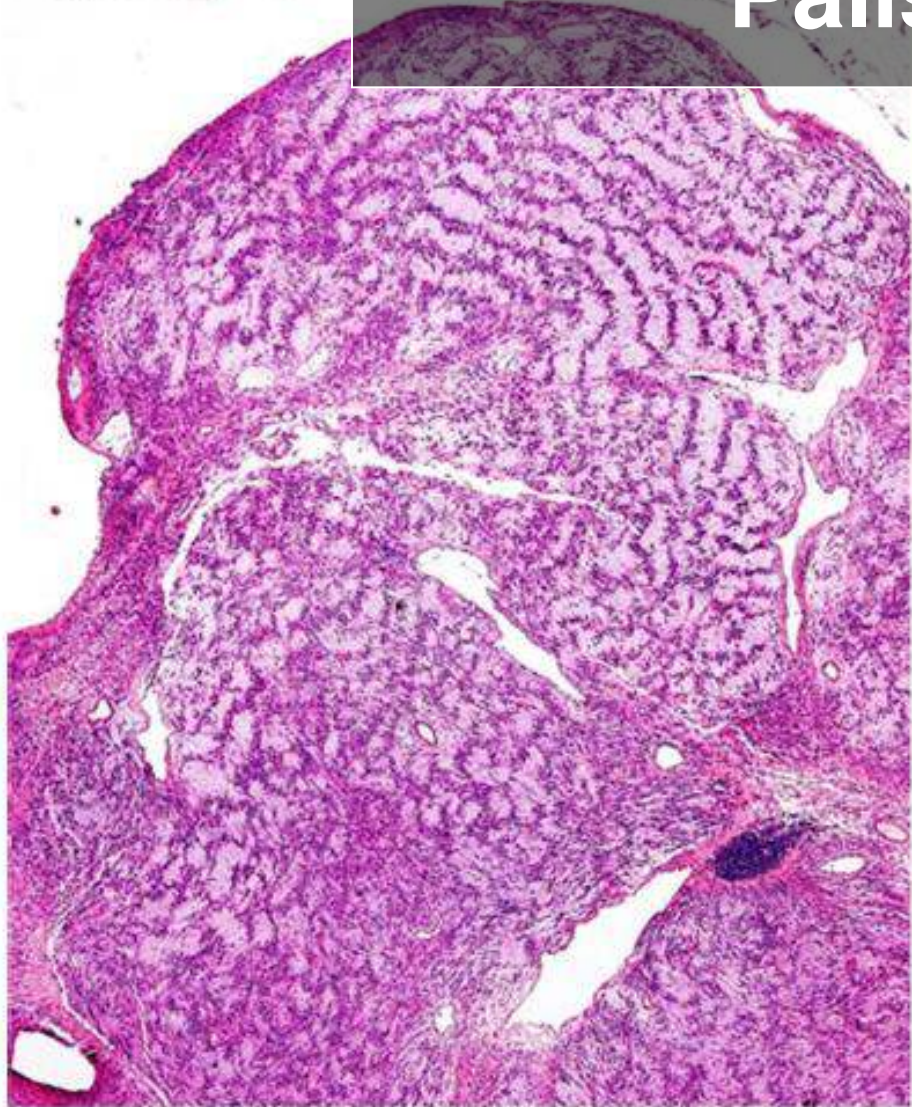




A

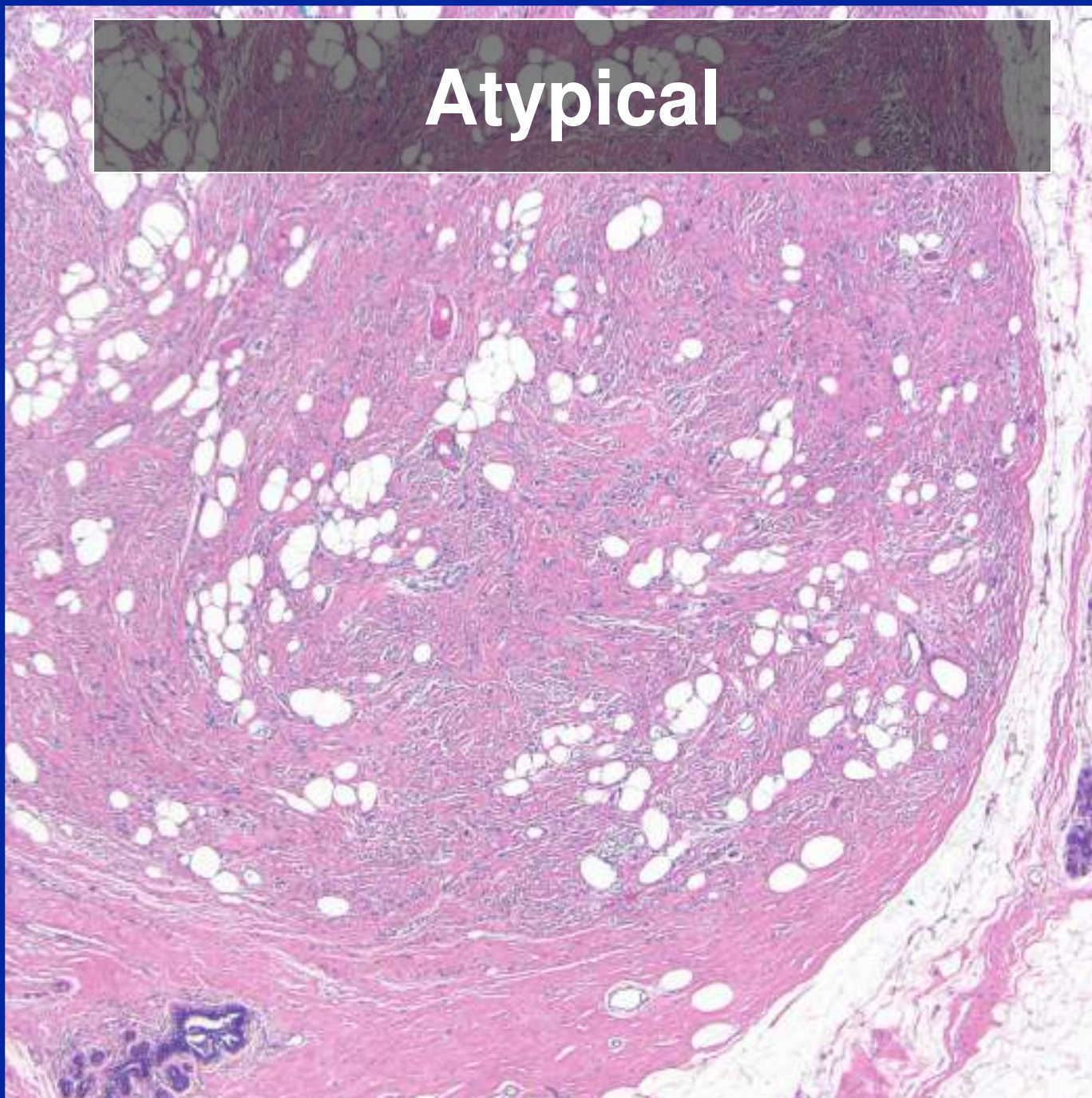
Palisaded

B



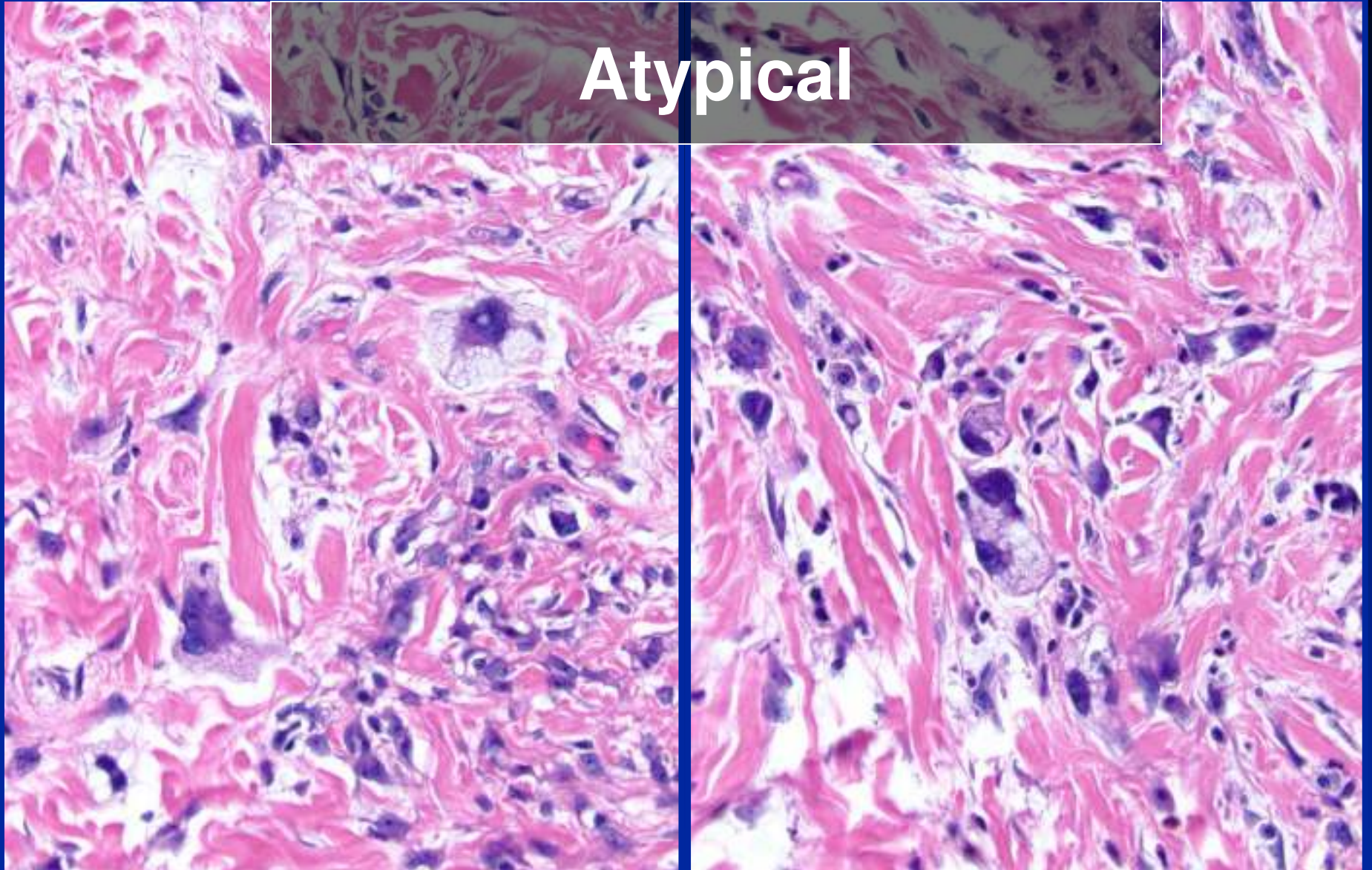


**Atypical**





**Atypical**



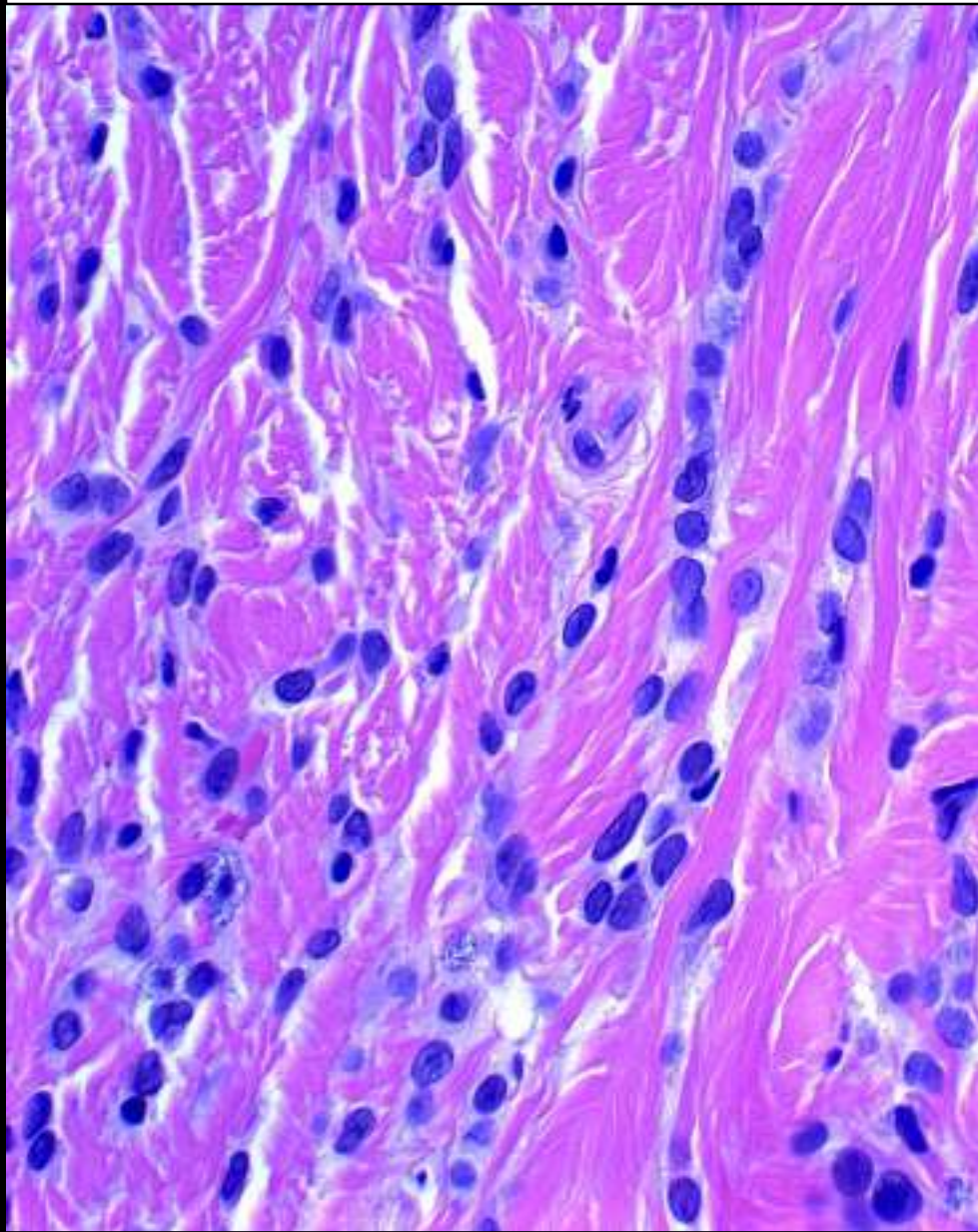


# **Epithelioid Variant of Myofibroblastoma**

- **Polygonal or epithelioid cells arranged in cords or alveolar groups**
- **May constitute predominant growth pattern or be admixed with classic form**
- **Growth pattern may resemble invasive lobular carcinoma**



**Myofibroblastoma**



**Lobular Carcinoma**





# Myofibroblastoma

## Immunophenotype

- **Cells typically positive for**
  - CD34
  - Desmin
  - ER
  - PR
  - AR
  - Actin
  - bcl2
- **Staining may be focal / variable**



# Mammary-type Myofibroblastoma

## *Clinicopathologic Characterization in a Series of 143 Cases*

*Brooke E. Howitt, MD and Christopher D.M. Fletcher, MD, FRCPath*

**AJSP 2016**

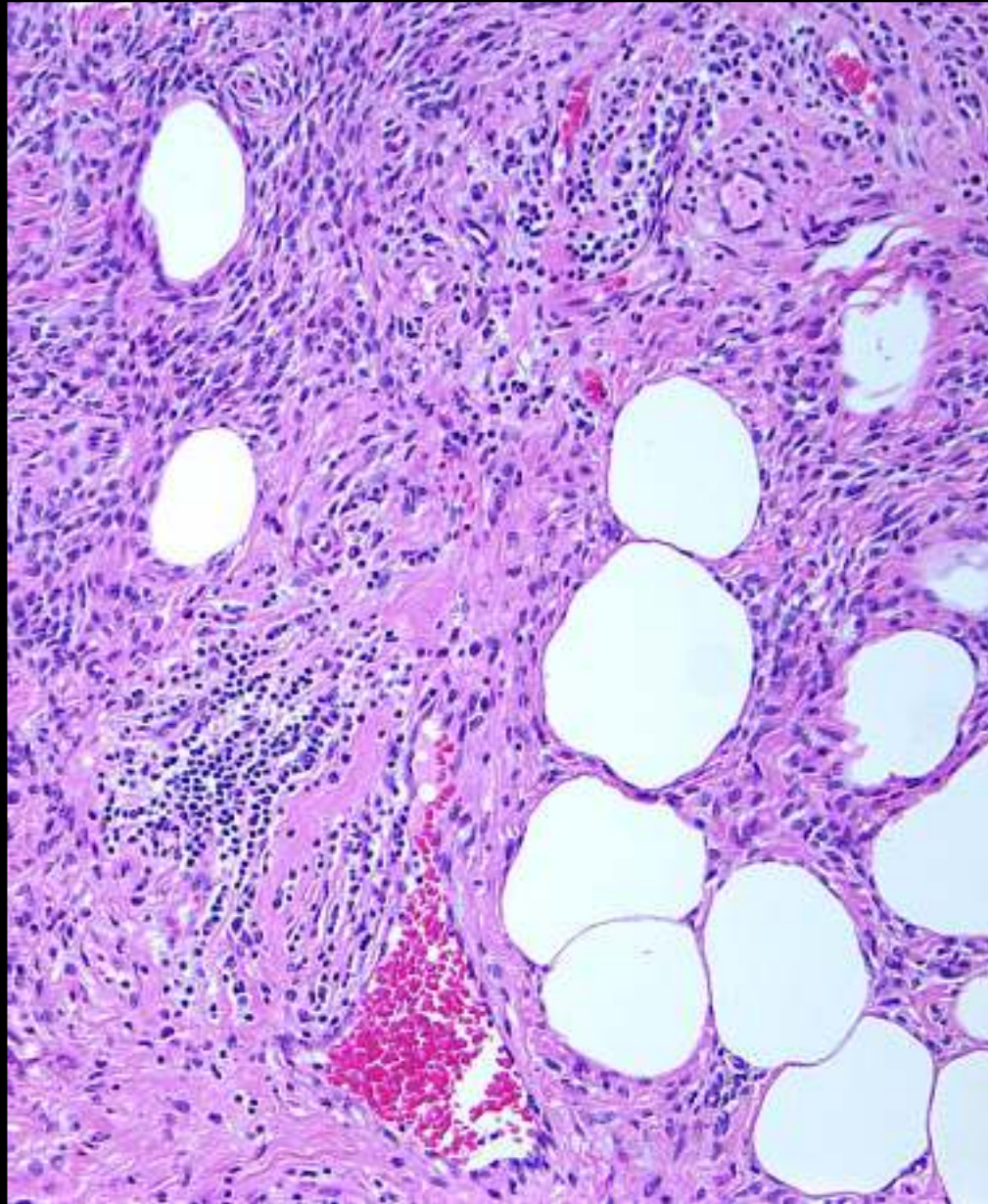
- **57/62 cases available for analysis (92%) showed loss of Rb protein expression**



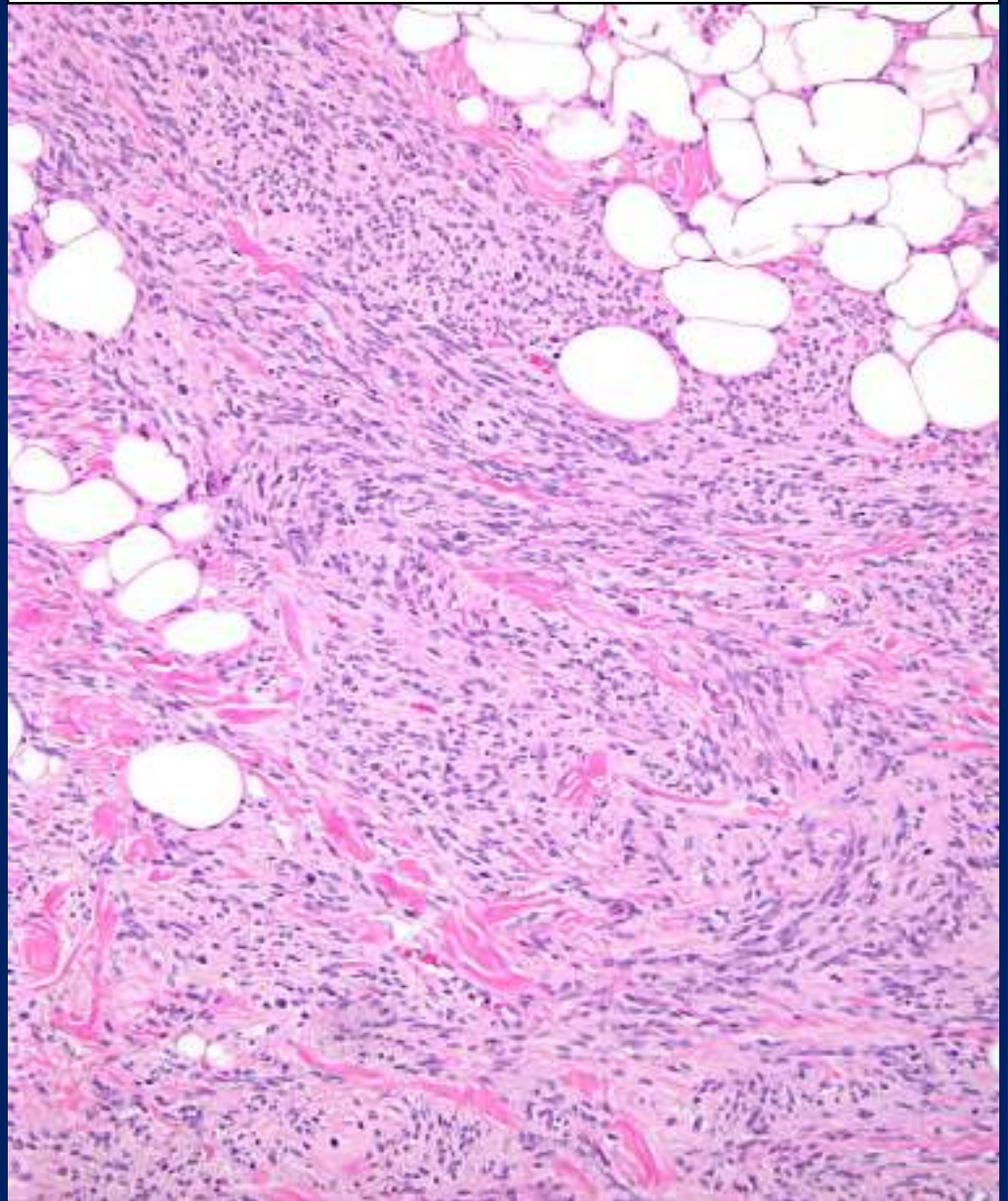
# Myofibroblastoma

- **Relationship to spindle cell lipoma**
  - **Morphologic and immunophenotypic overlap**
  - **“13q/Rb family of tumors”**: deletion or rearrangement of 13q14 with loss of Rb expression by IHC

**Myofibroblastoma**



**Spindle Cell Lipoma**





# Myofibroblastoma

- **Morphologic overlap with some forms of pseudoangiomatous stromal hyperplasia (PASH)**

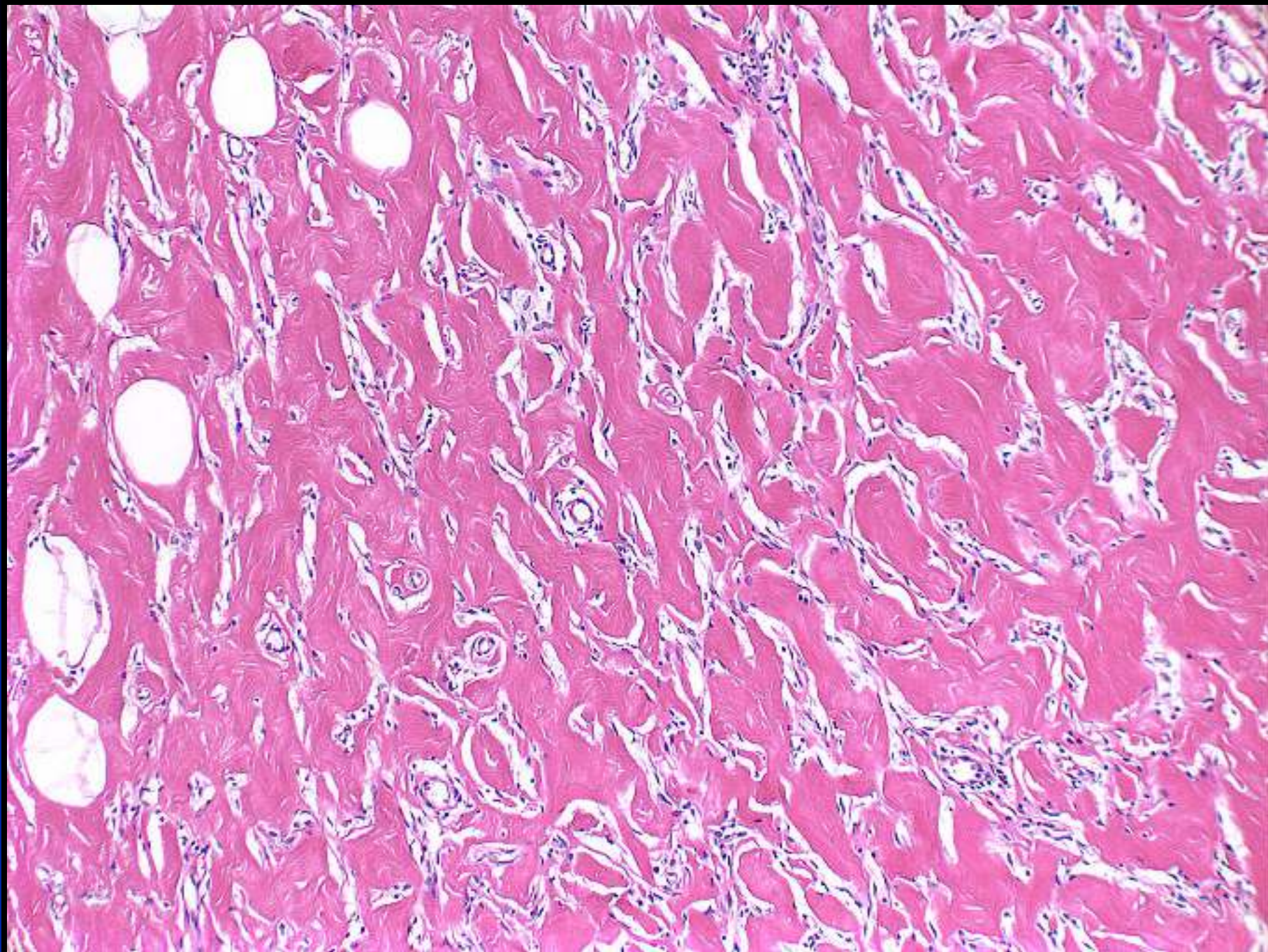
# **Pseudoangiomatous Stromal Hyperplasia (PASH)**

- **Primarily pre-menopausal women**
- **Most commonly seen as incidental microscopic finding (~25% of breast specimens)**
- **Tumor-forming PASH**
  - **circumscribed mass with smooth external surface**
  - **homogeneous tan, gray, or white cut surface**

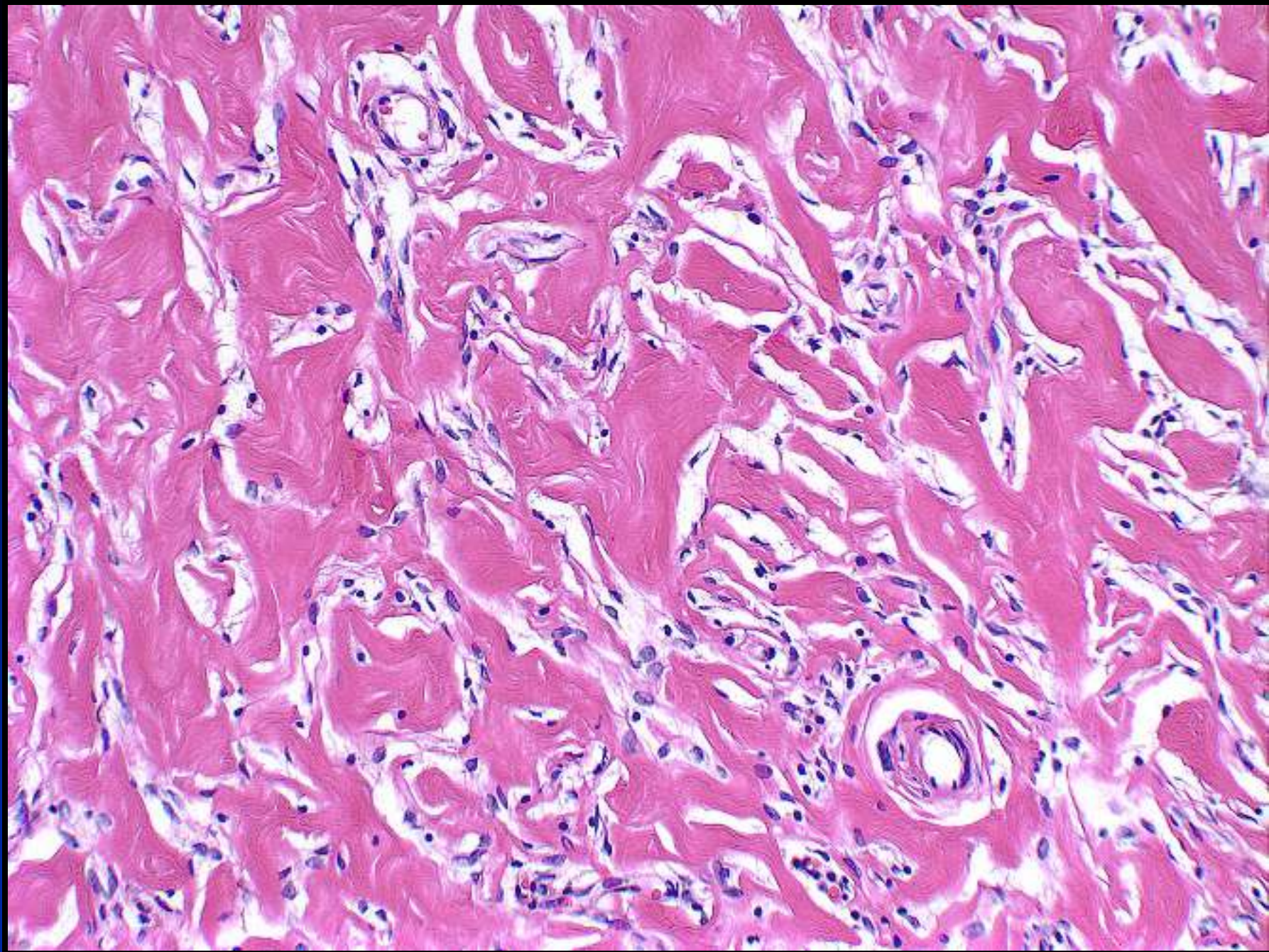


# **Pseudoangiomatous Stromal Hyperplasia (PASH)**

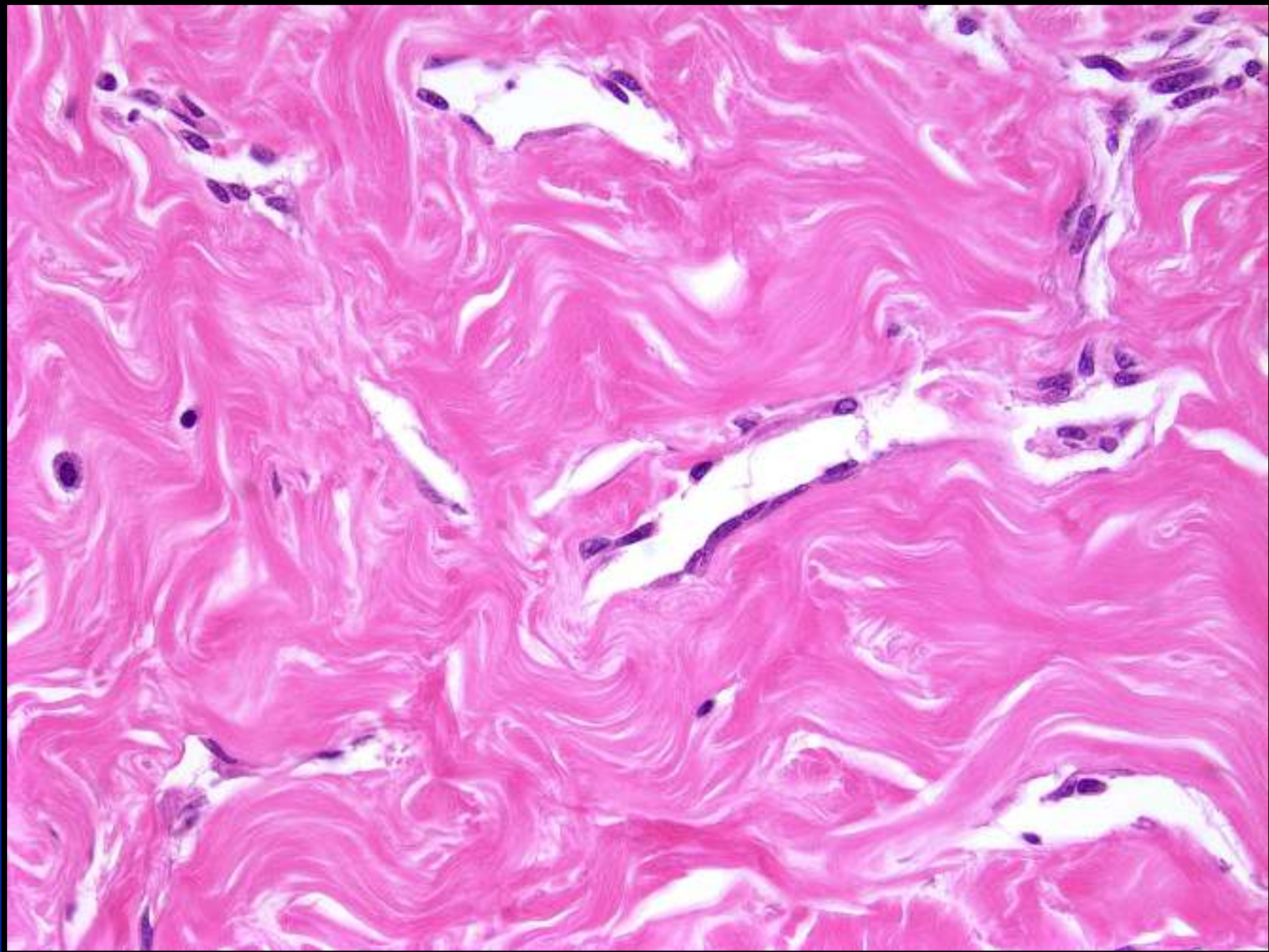
- **Slit-like, often anastomosing spaces in dense collagenous stroma**
- **Myofibroblasts present at edges of spaces may resemble endothelial cells**
  - Positive for vimentin, CD34, actin, desmin
  - Often positive for PR, but usually ER negative
- **Must be distinguished from vascular lesions, esp. angiosarcoma**







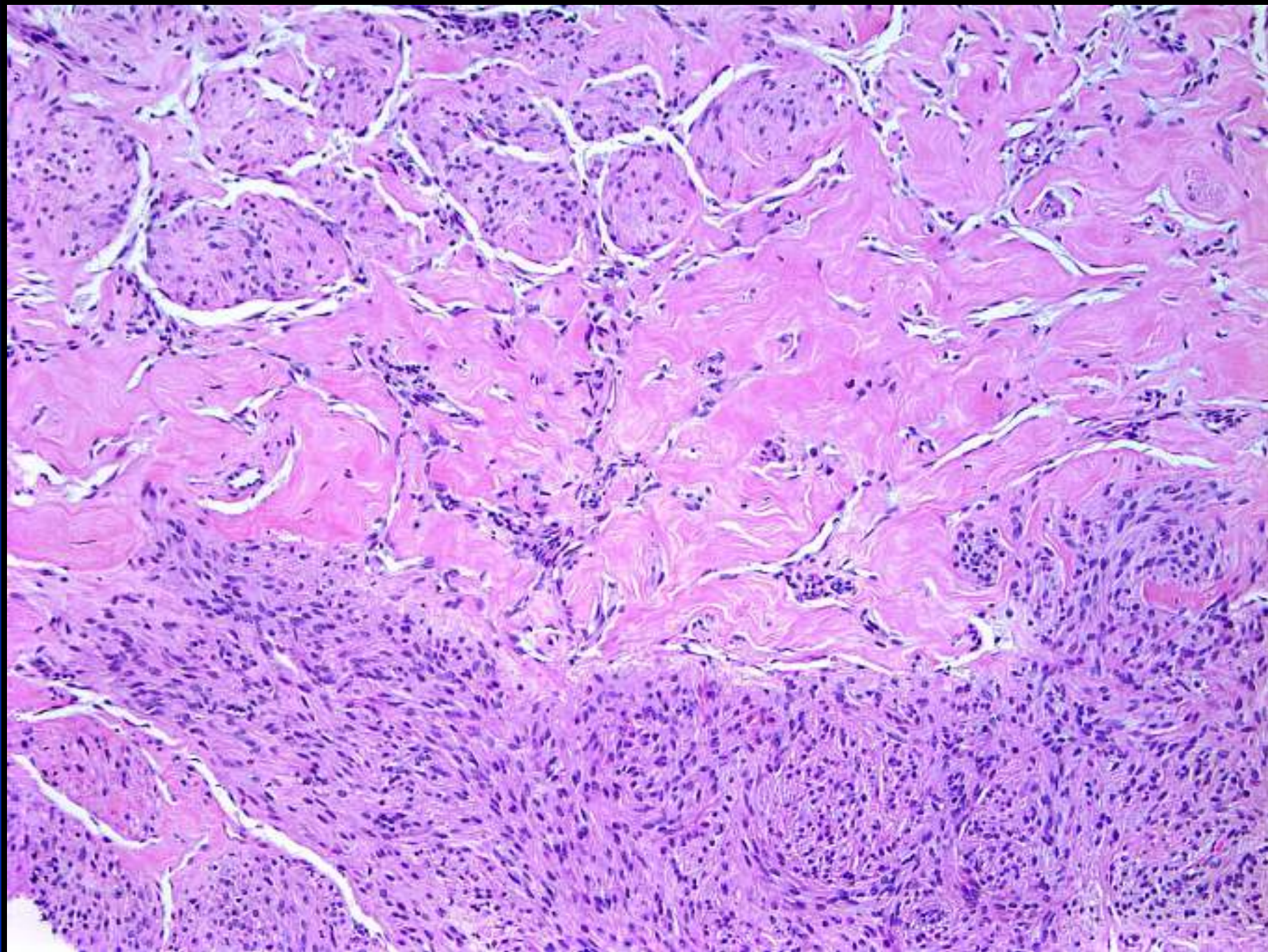




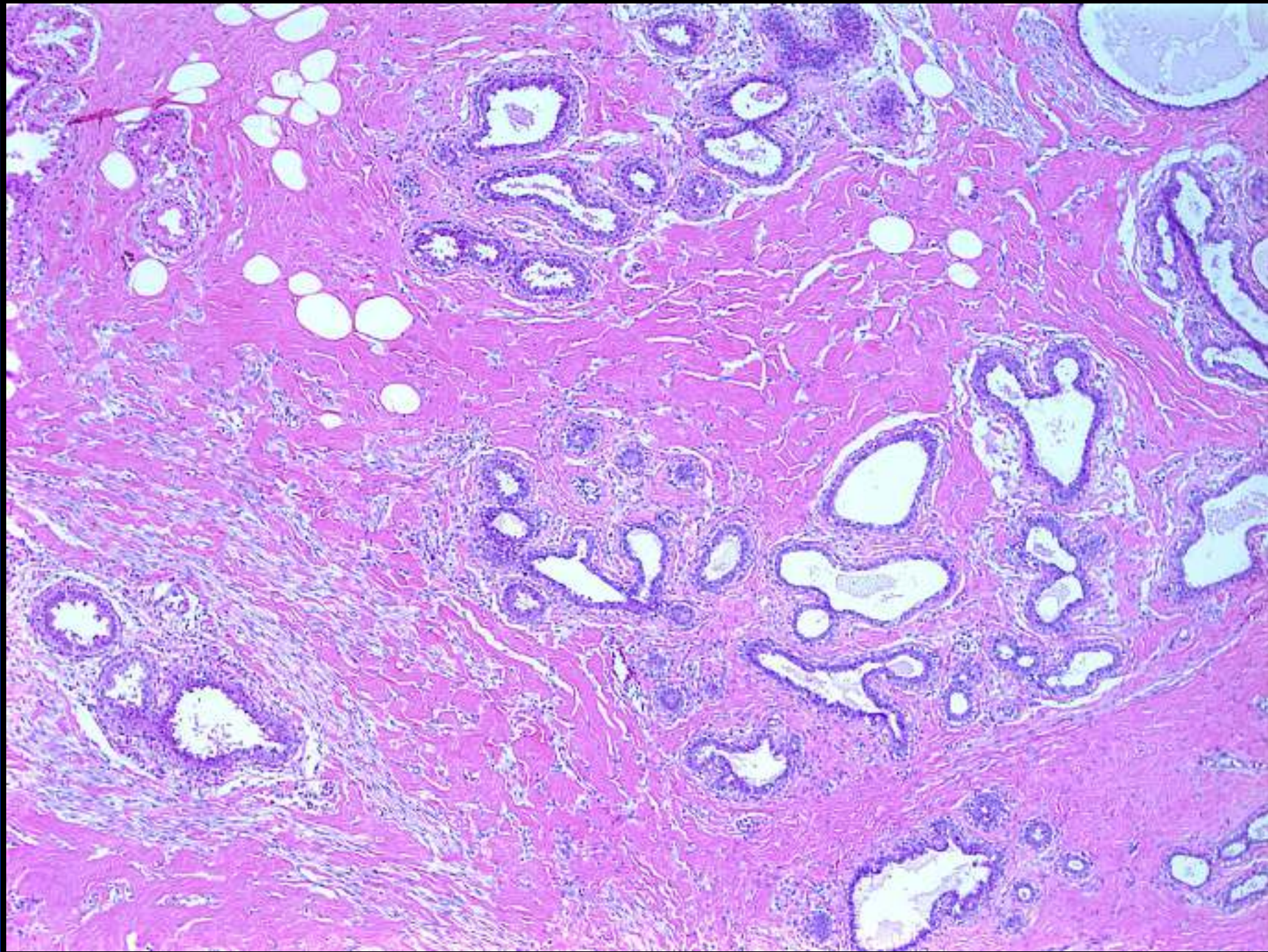


# **Fascicular PASH**

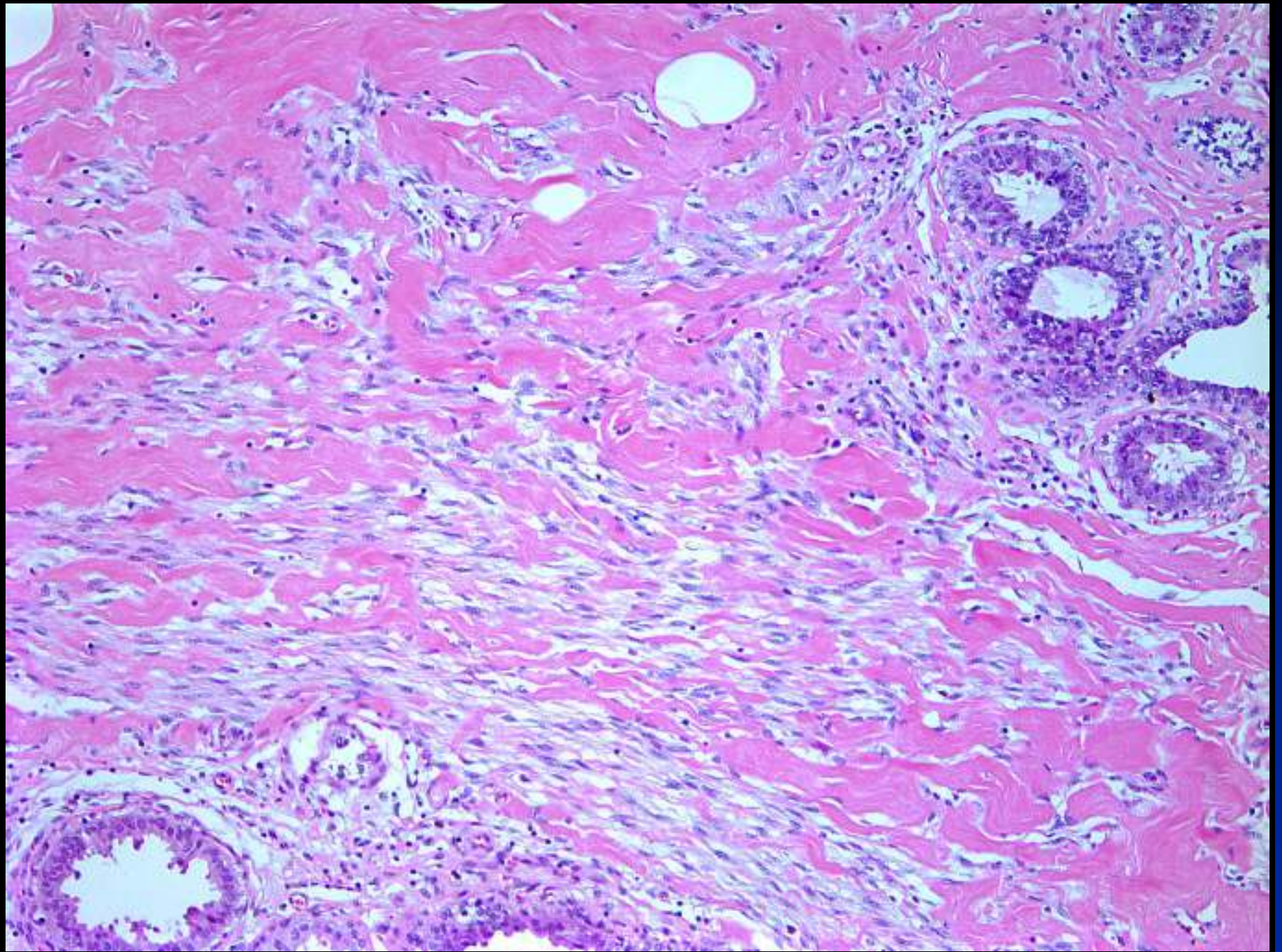
- **Myofibroblasts in distinct fascicles in background of conventional PASH**
- **Most extreme examples have growth pattern similar to myofibroblastoma**



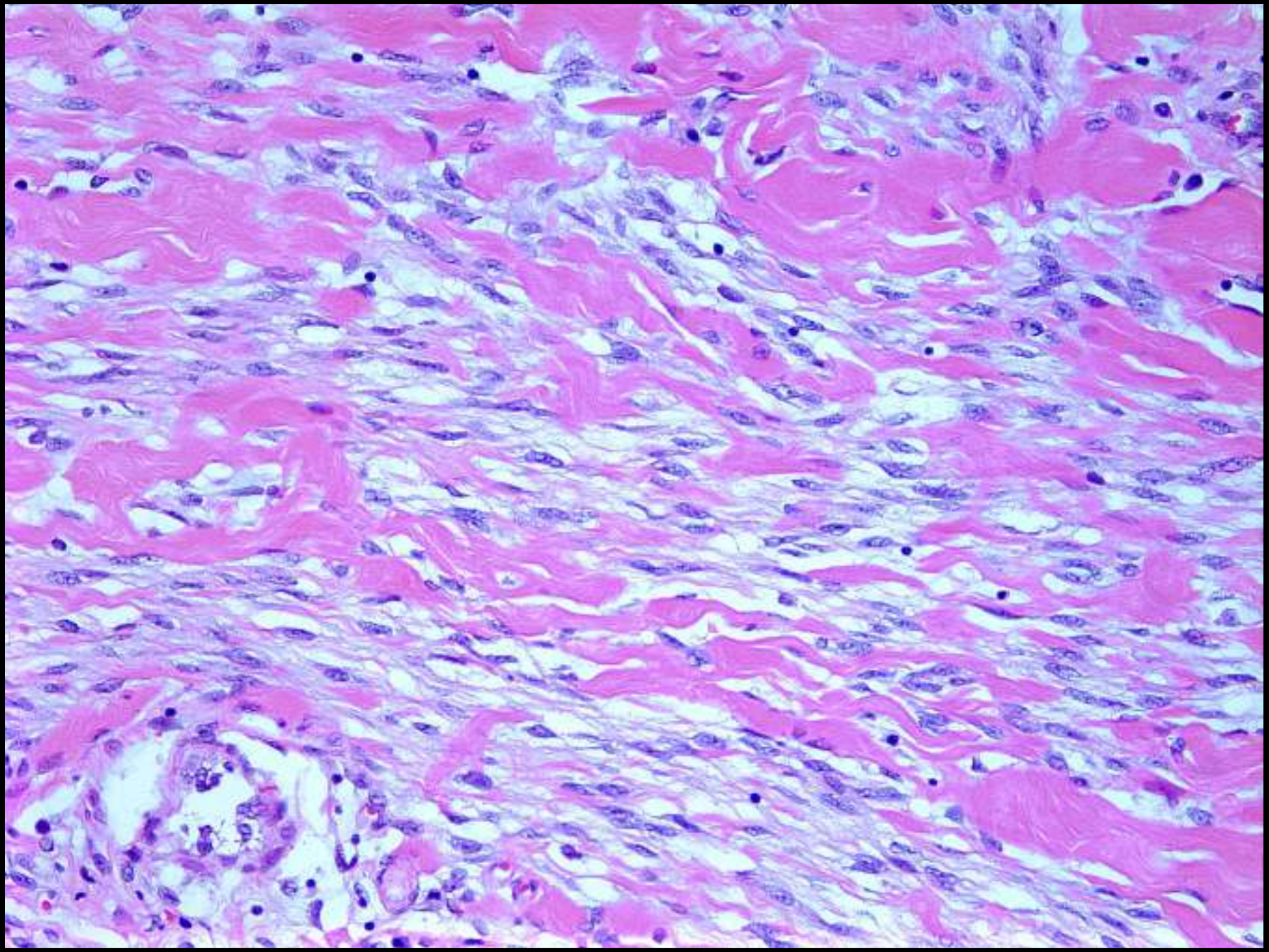






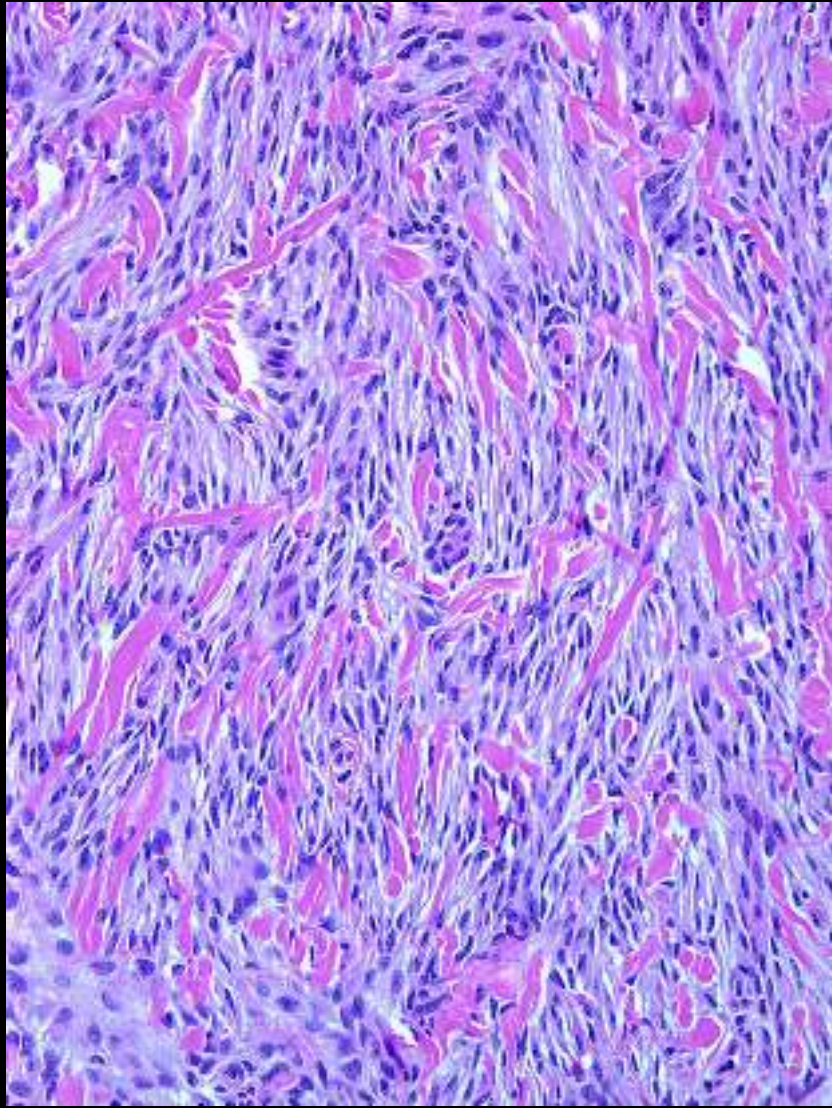




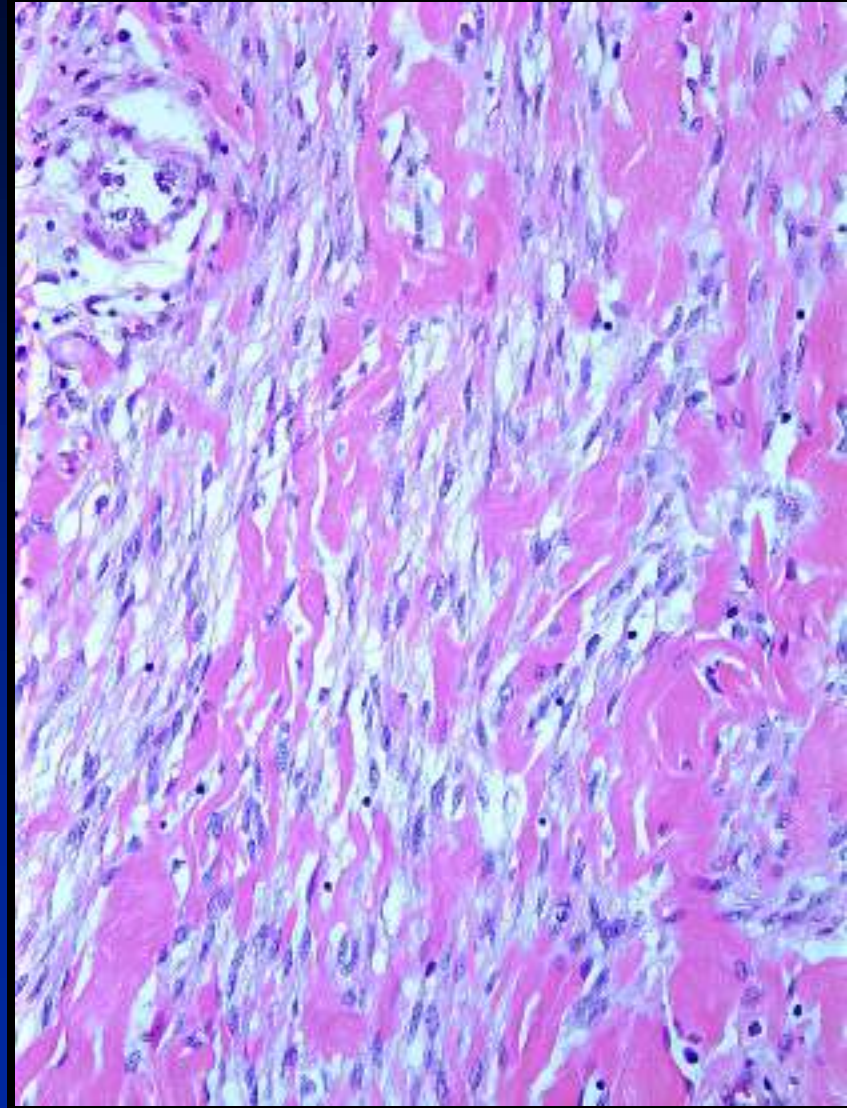




**Myofibroblastoma**



**Fascicular PASH**





# Spectrum of Myofibroblastic Lesions in the Breast

**PASH**

**Fascicular  
PASH**

**Myo-  
fibroblastoma**



# Differential Diagnosis of Myofibroblastoma

- Fibromatosis
- Spindle cell lipoma
- PASH (fascicular variant)
- Solitary fibrous tumor
- Nodular fasciitis
- Spindle cell metaplastic carcinoma
- Schwannoma (palisaded variant)
- Invasive lobular carcinoma (epithelioid variant)



# Case 2

## Diagnosis

**Myofibroblastoma,  
epithelioid variant  
(confirmed on excision)**

