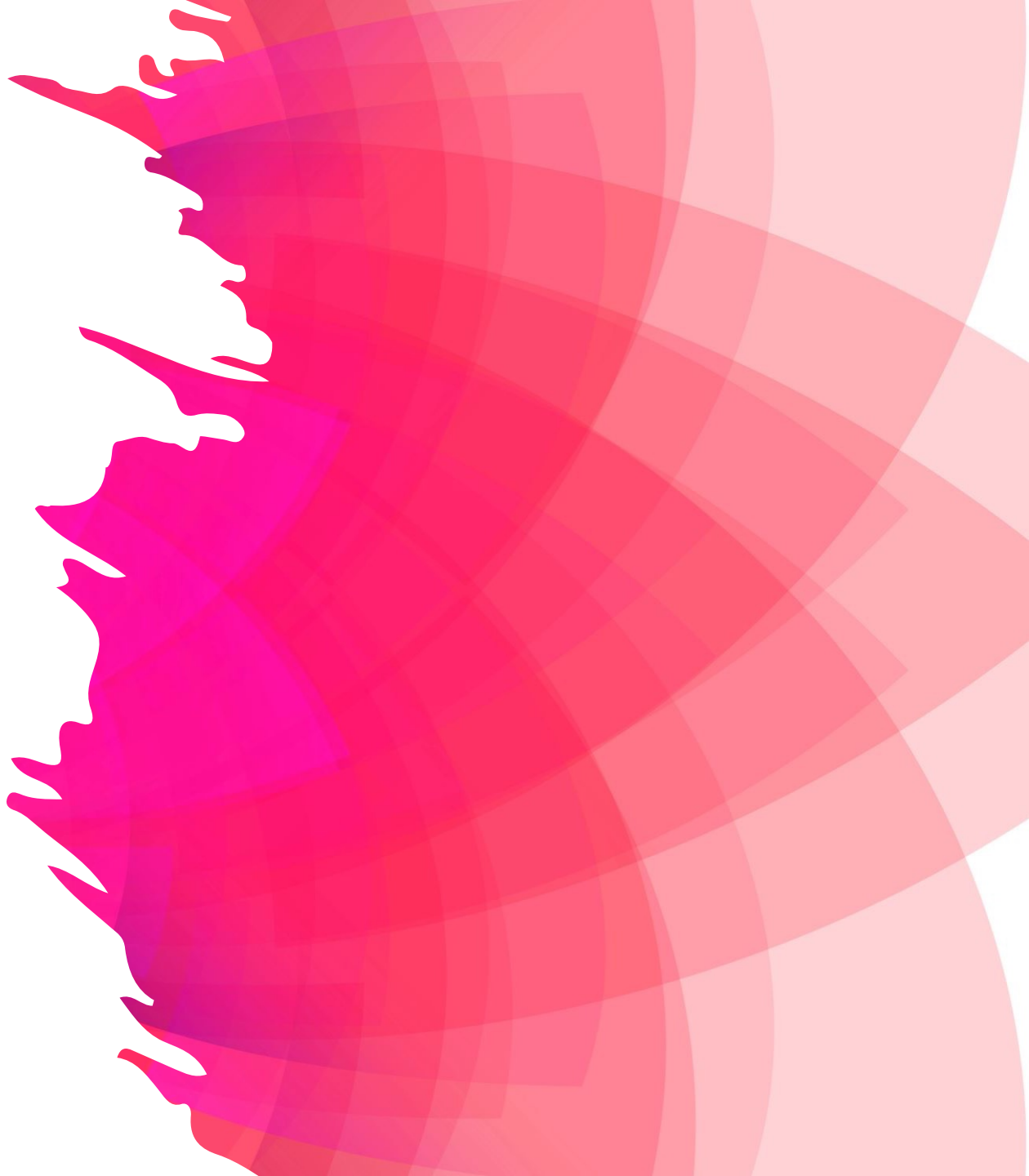
# Inflammatory diseases of the subcutaneous fat

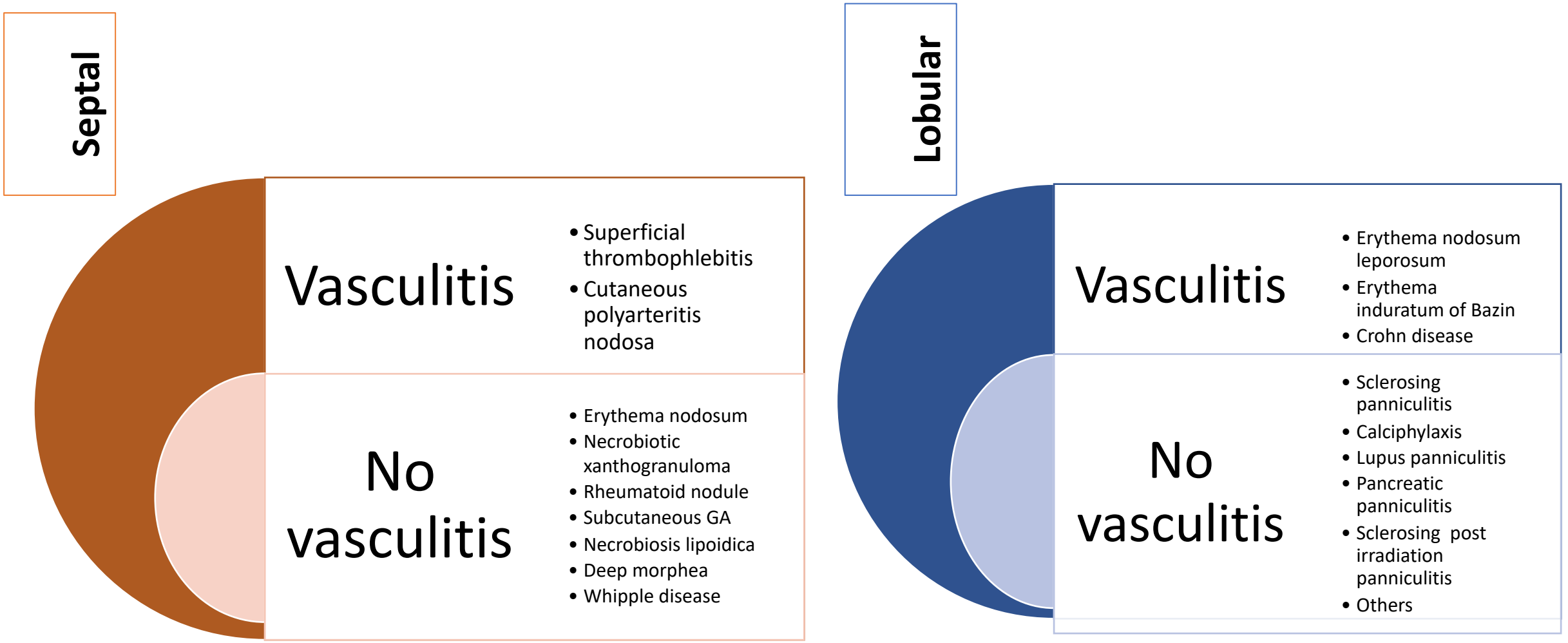
Soheil S Dadras MD-PhD

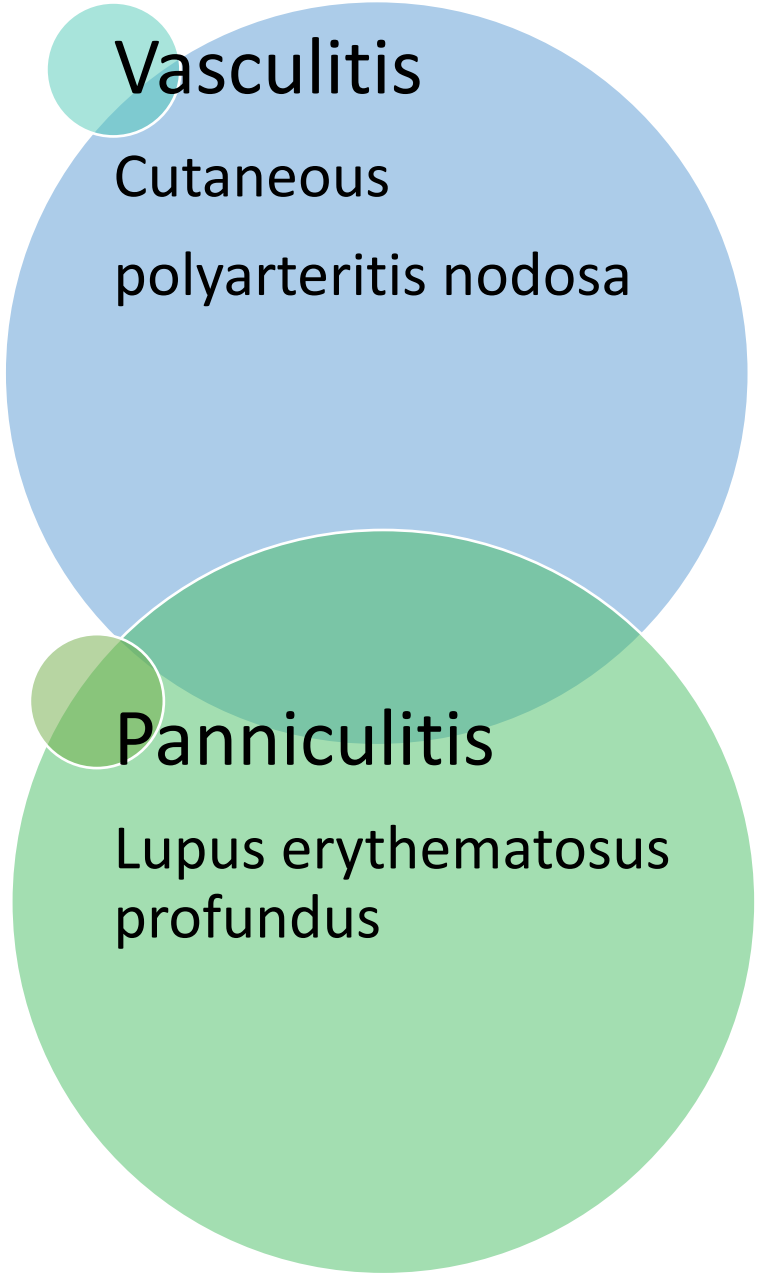


# Inflammatory diseases of the subcutaneous fat: Classification

| | |
|---|---|
| Panniculitis | • Mostly septal ± vasculitis<br>• Mostly lobular ± vasculitis<br>• Often mixed<br>• Others |
| Lipodystrophy | • Localized, e.g., post-irradiation or lupus profundus<br>• Acquired<br>• Familial, e.g., congenital generalized lipodystrophy |

# Classification of panniculitis





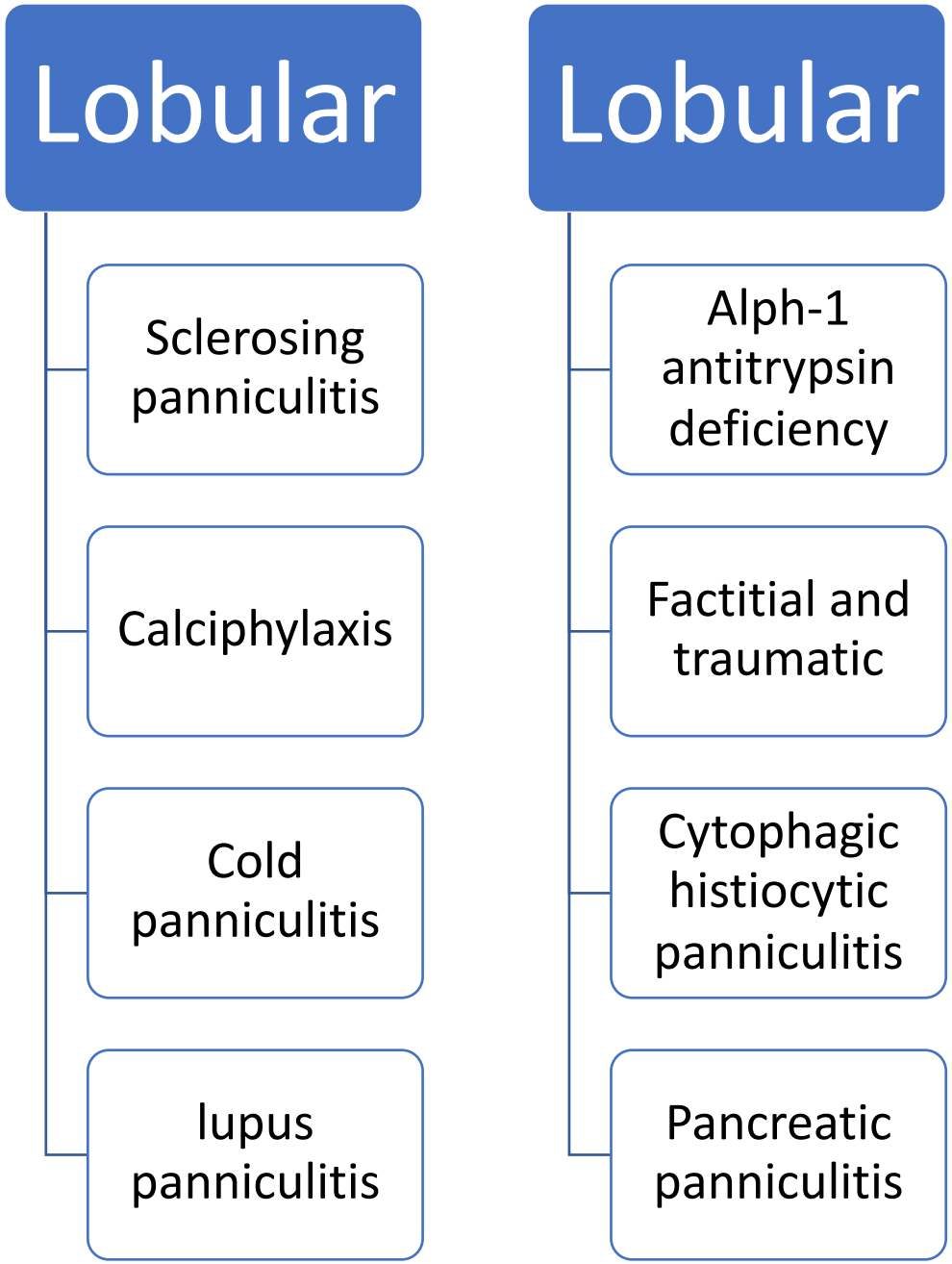

# Panniculitis vasculitis overlap

- Difficult to differentiate the primary process:
  - Leukocytoclastic vasculitis spilling into the panniculus? Or
  - Panniculitis with secondary involvement of leukocytoclastic vasculitis or lymphocytic vasculitis

# Challenges and diagnostic confusion

- Based on outdated literature and classification
- Inadequate biopsy specimens:
  - Too thin/shallow not enough fat!
  - Perform excisional biopsy, avoid punch
- Strict morphologic subdivision: lobular vs. septal
  - Most disorders affect both
- Limited repertoire of histologic reaction pattern to noxious stimuli

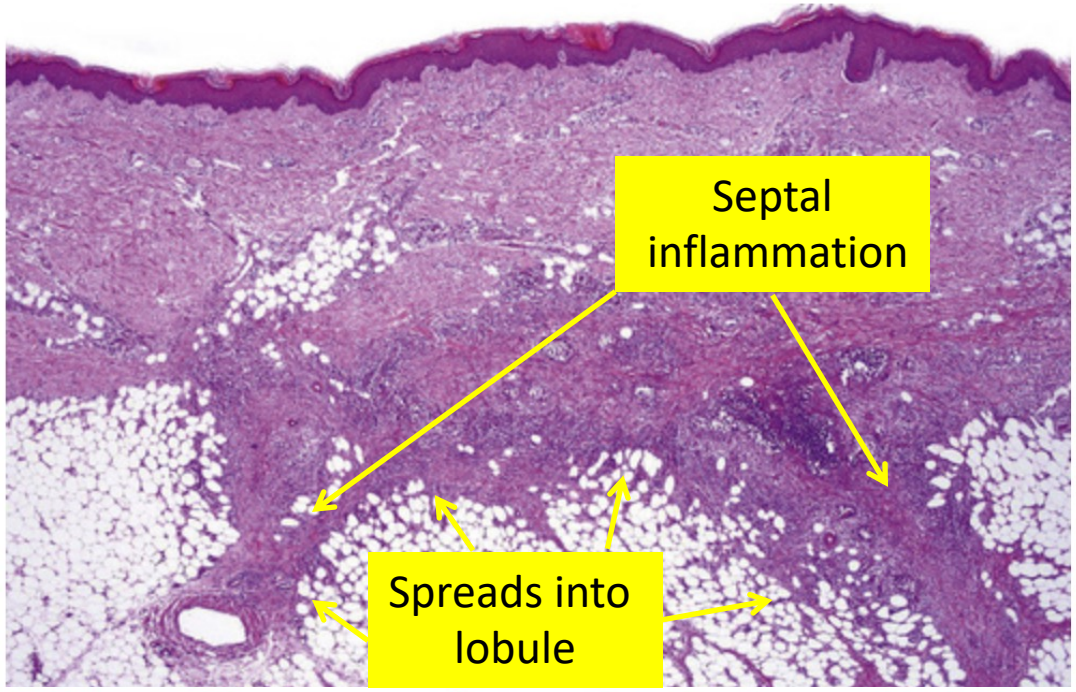
- Histologic patterns:
  1. Fat necrosis, many variants
     a) Enzymatic
     b) Crystalline
     c) Suppurative
     d) Hyalinizing
     e) Microcystic
  2. Inflammation involving septum, lobule or both
  3. Types of inflammatory cells
     a) Neutrophils
     b) Plasma cells
     c) Eosinophils
     d) Lymphocytes or histiocytes (granuloma)
  4. Vasculitis: Leukocytoclastic or lymphocytic

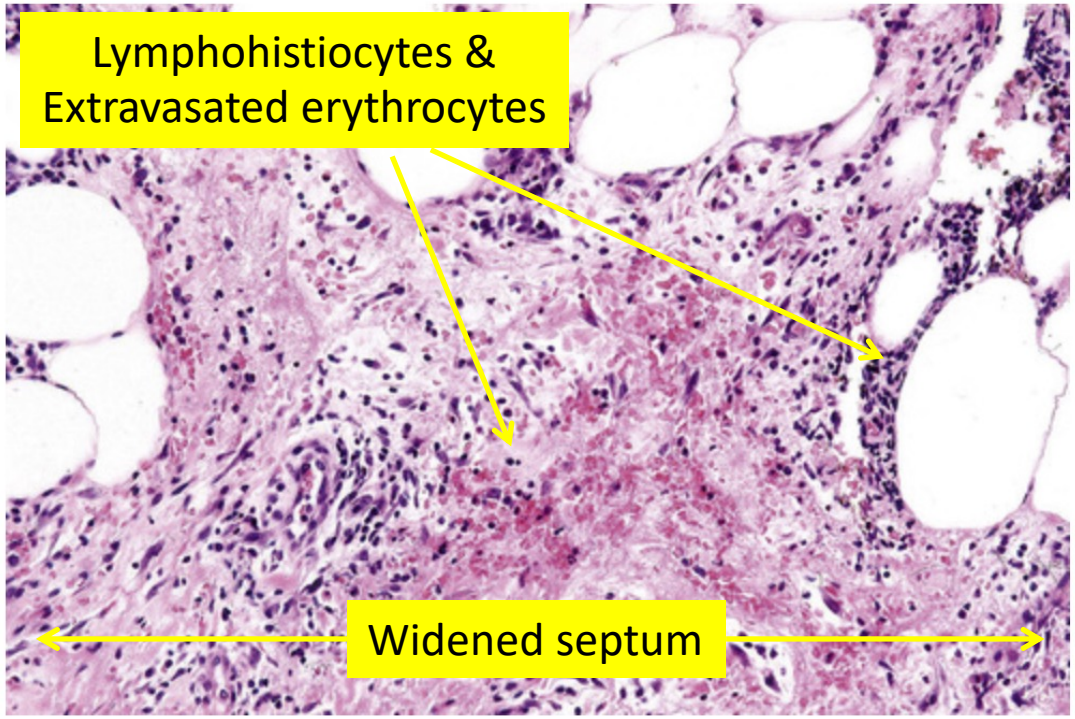



# Mostly lobular panniculitis, without vasculitis

# Erythema nodosum

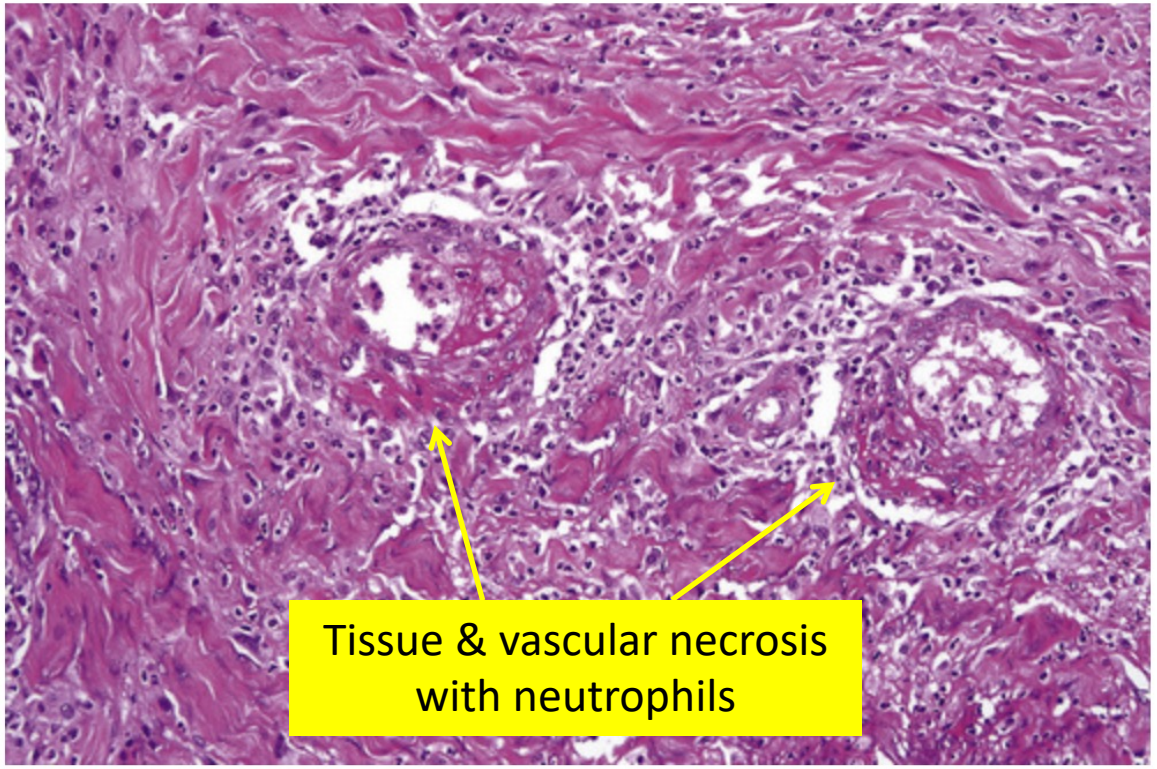
- A syndrome, not a disease
- Etiology: Crohn, drugs to malignancy to sarcoidosis
- Young adult women
- Bright red (bruise-like), warm tender nodules
- Anterior/lateral aspects of lower legs (face, arms, calves and trunk)
- Fever, malaise, & vague aches in the joints

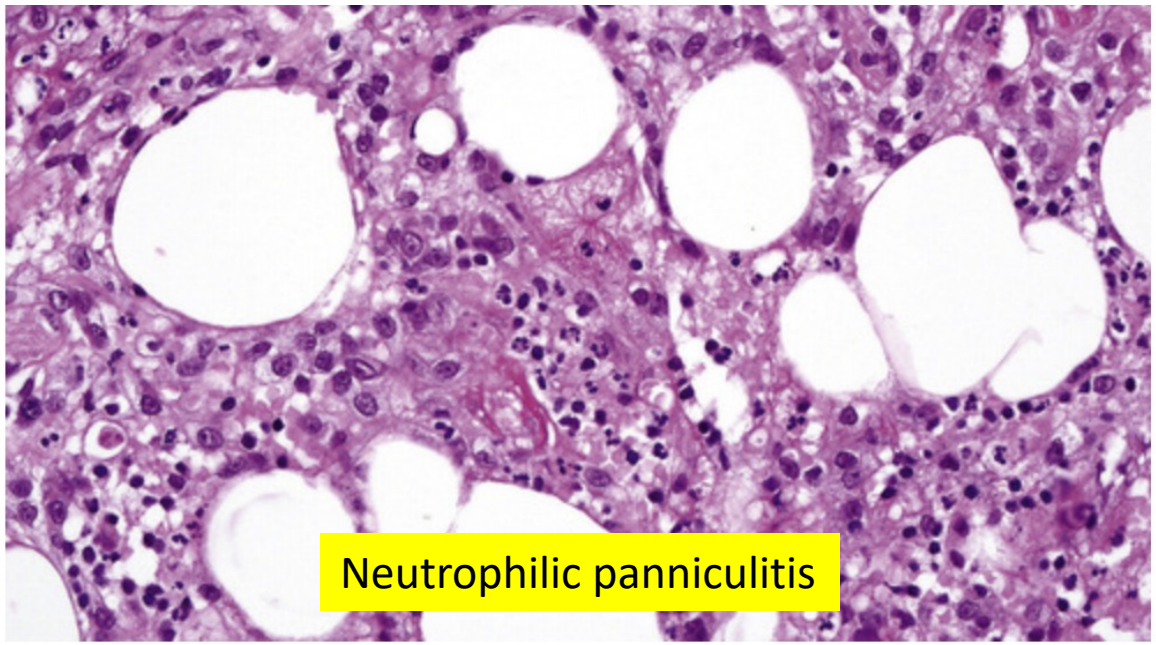


# Alph-1 antitrypsin deficiency-associated panniculitis

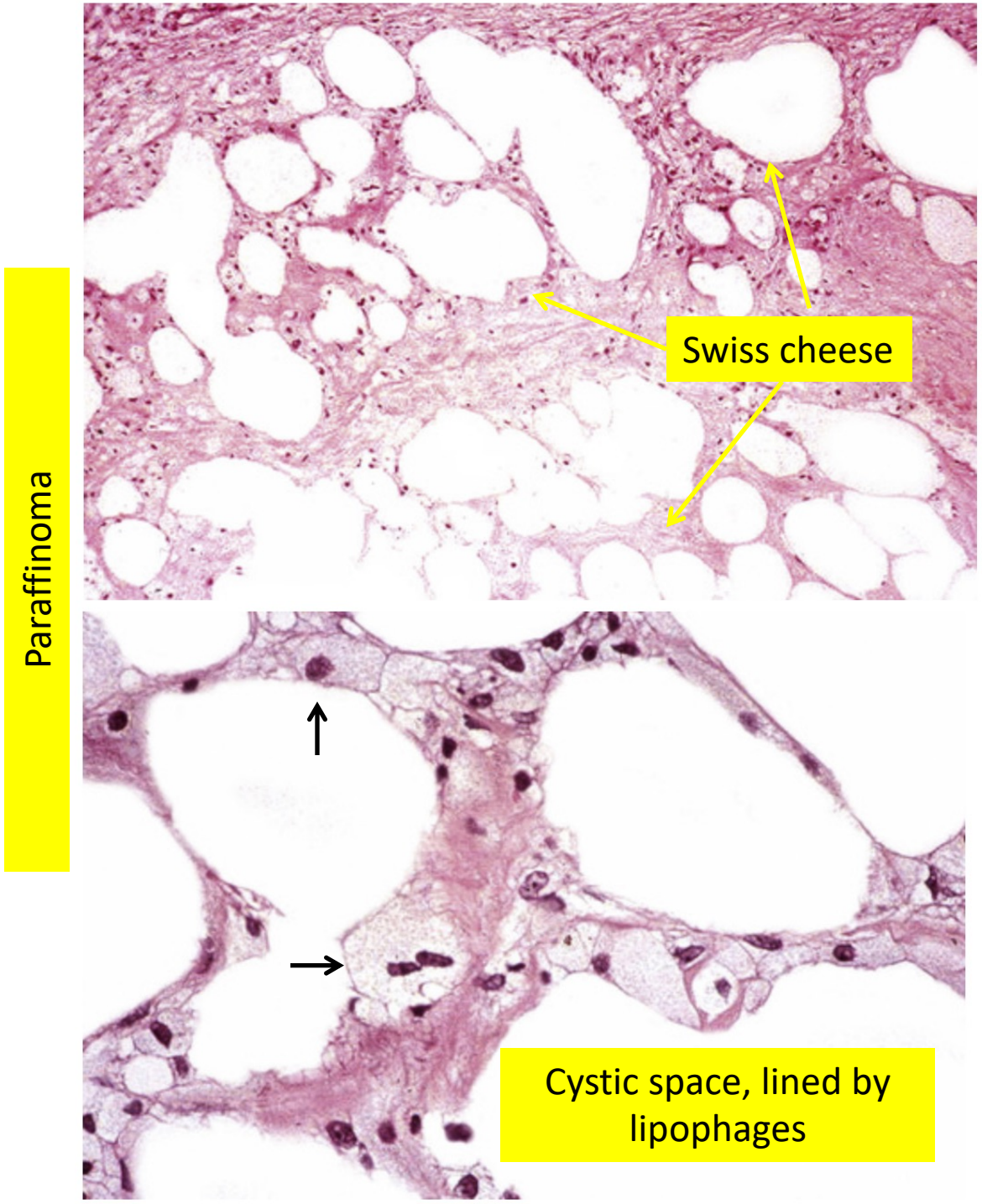
- Hepatic glycoprotein, serine protease inhibitor (autolysis)
- Genetic and acquired
- Recurrent intractable episodes of painful, tender ulcerated nodules
- Males, 7-73 years
- Precipitated by trauma on trunk & proximal extremities (buttocks, chest, back & abdomen)
- (formerly Weber-Christian disease)
- Special stains to r/o infection



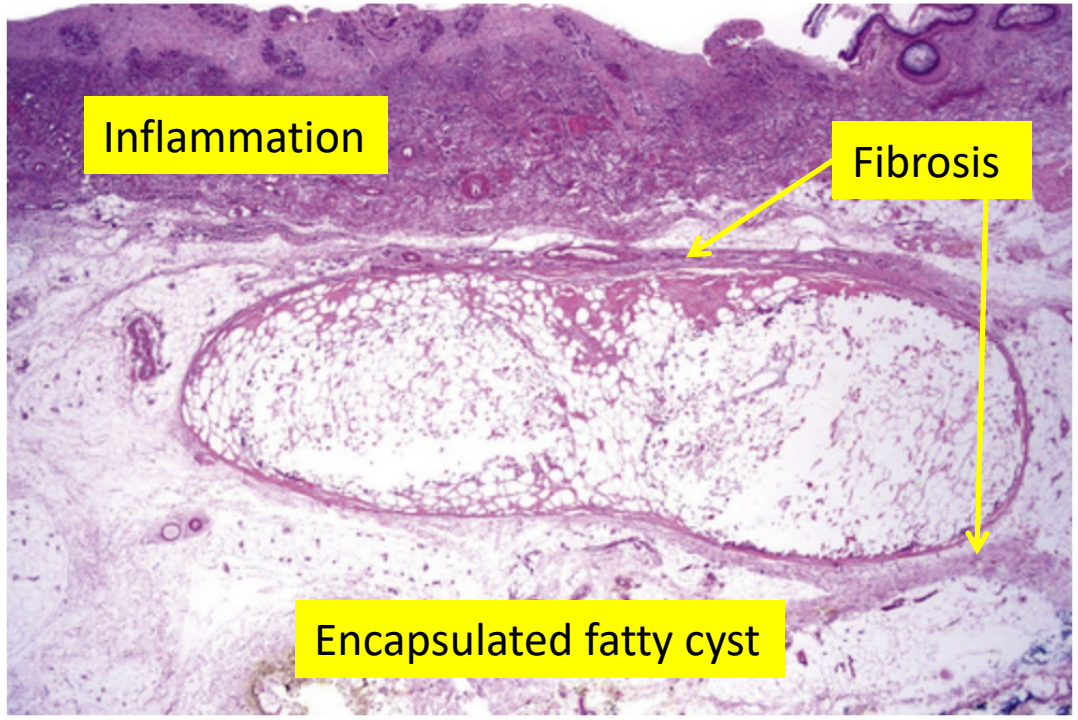
# Factitial & traumatic panniculitis

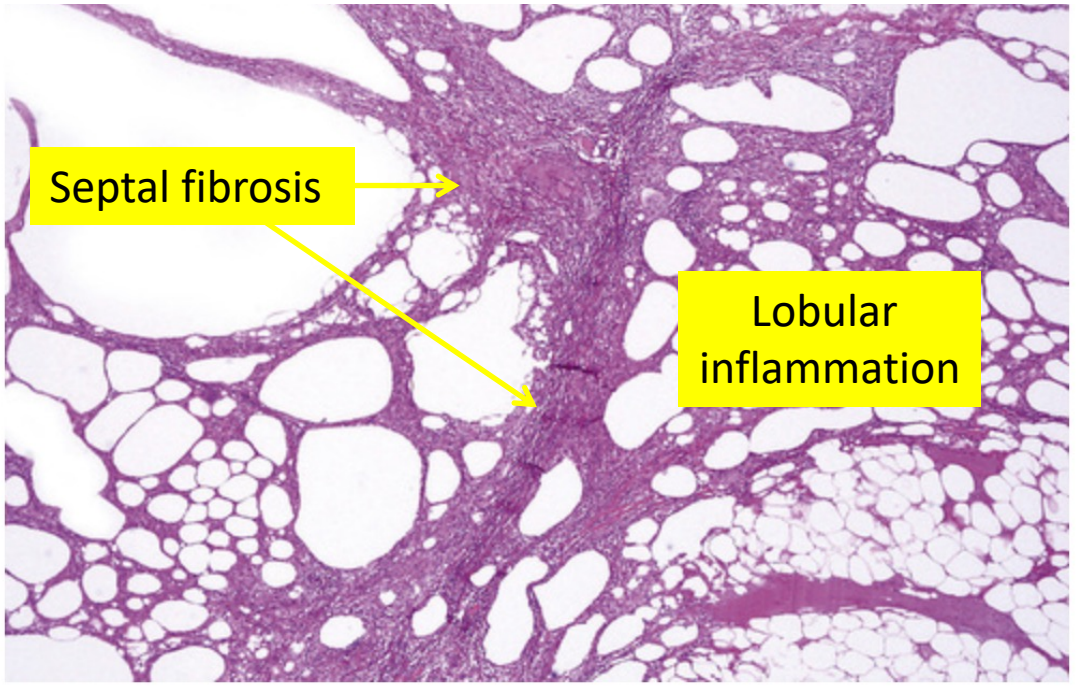
- Self-induced and vigorously denied
  - Accessible sites (buttocks & thighs)
  - Injection of chemical substances: drugs, oily material (paraffin or liquid silicon), & organic matter
- Look for refractile particles
- Posttraumatic: Nodular cystic fat necrosis
  - Adolescent boys & middle-aged or elderly females
  - Iatrogenic injections



# Traumatic fat necrosis

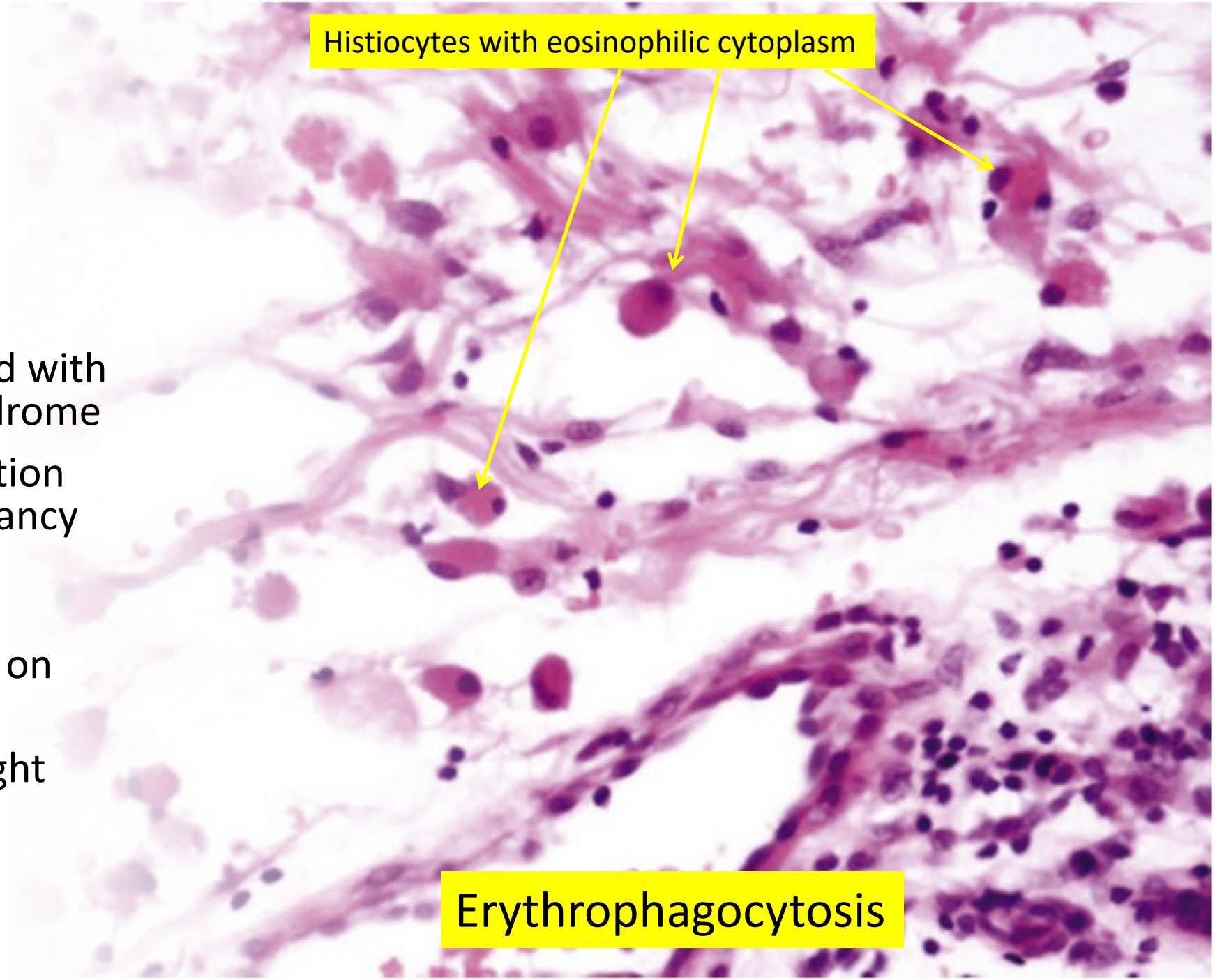
- Fat cysts, followed by fibrosis
- Hemosiderosis
- Variable mixed inflammation
- E.g., Post-surgical panniculitis



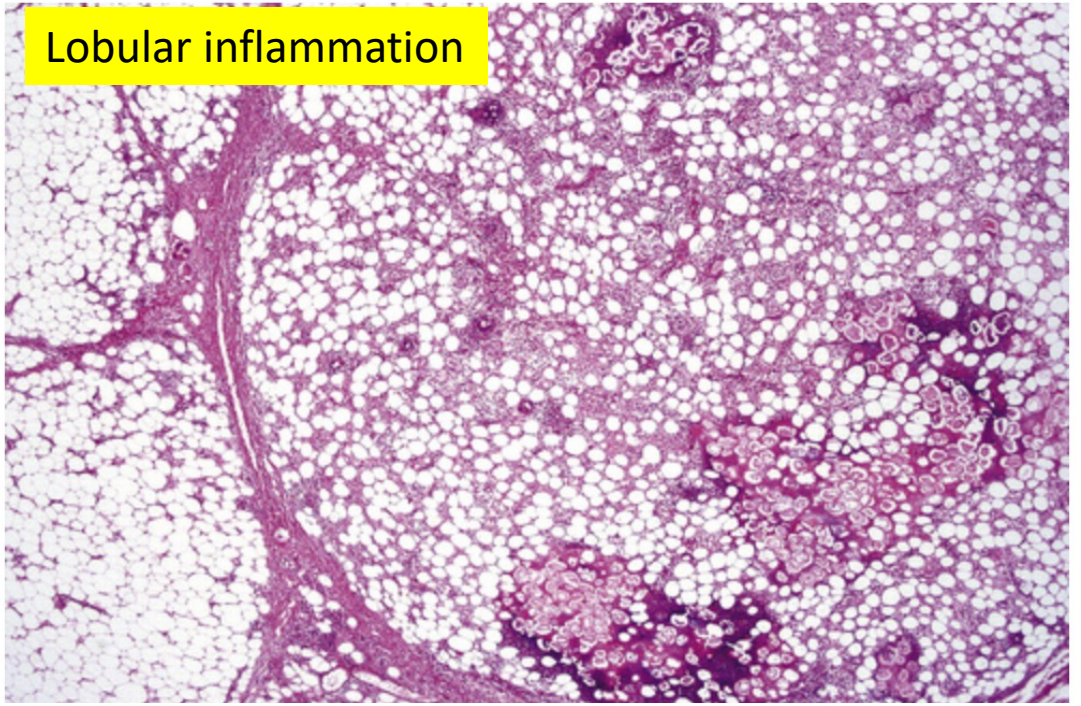
# Cytophagic histiocytic panniculitis

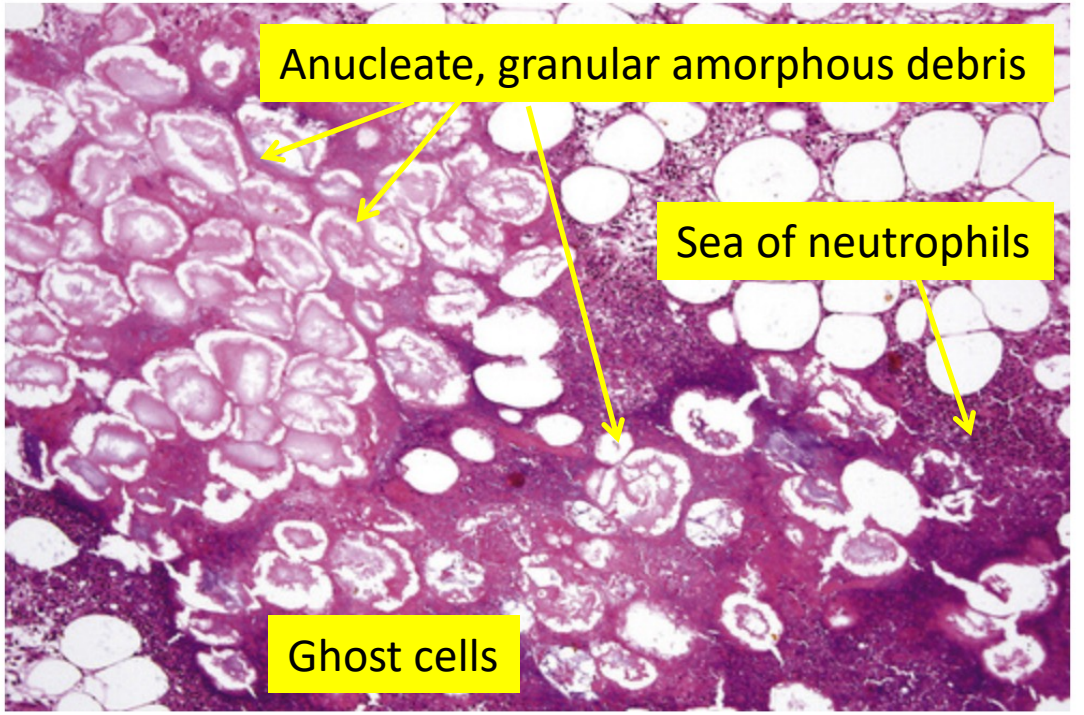
- Panniculitis associated with hemophagocytic syndrome
- Associated with infection (CMV, EBV) or malignancy (T-cell lymphoma)
- Ulcerated violaceous, hemorrhagic nodules on lower limbs & trunk
- Pyrexia, malaise, weight loss, & fatigue



# Pancreatic panniculitis

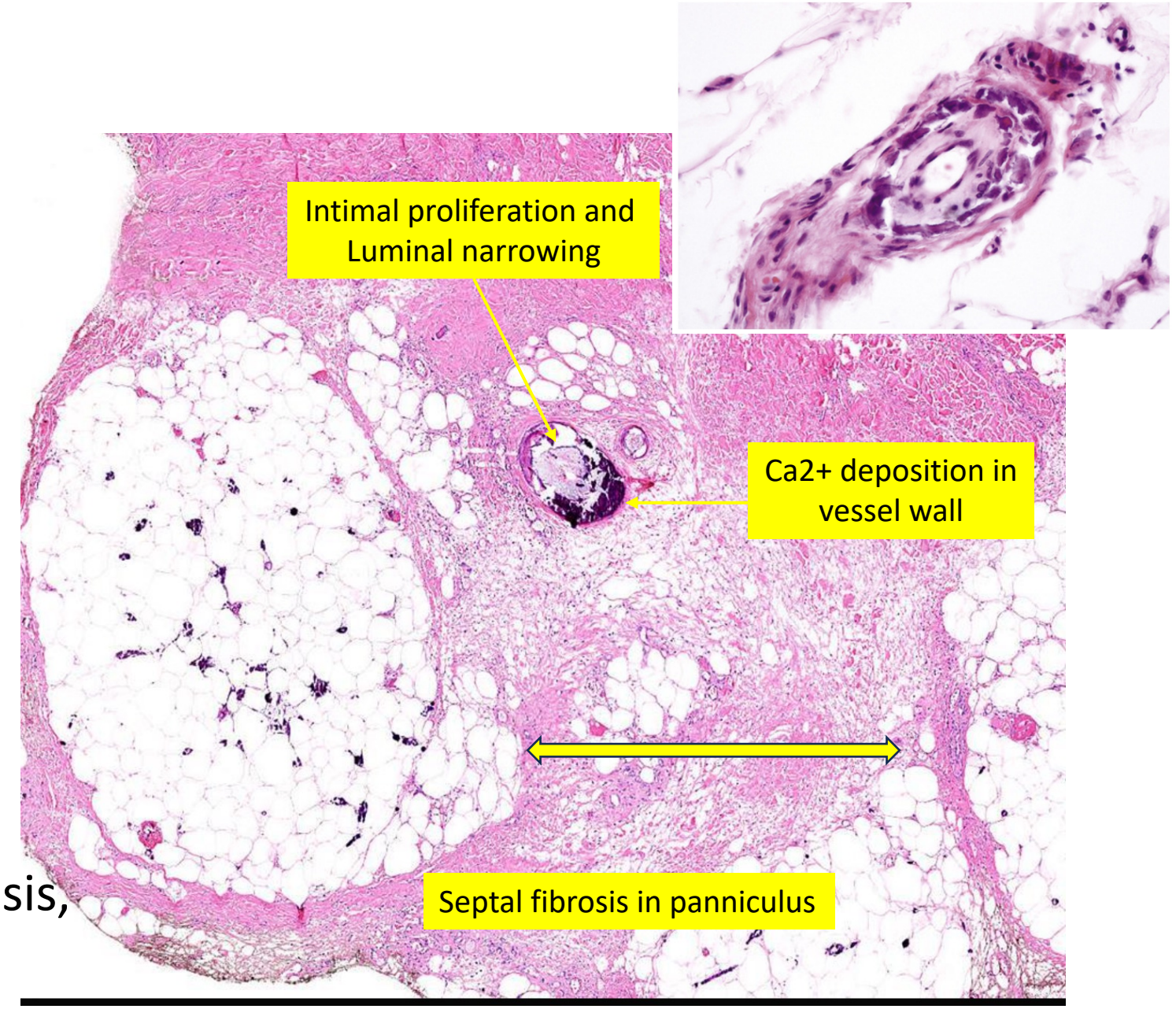
- 1-3% of patients with pancreatic disease
- Presenting sign in pancreatic disorder (35%)
- Males 40-60 years of age
- Violaceous tender nodules with creamy, oily discharge
- Ankles, knees, elbows, and wrists
- Associated with high mortality: pancreatitis (42%); carcinoma (100%)
- Rim of eosinophilia & stippled basophilia
- Splendore-Hoeppli reaction
- DDX: infection (aspergillosis) and cancer



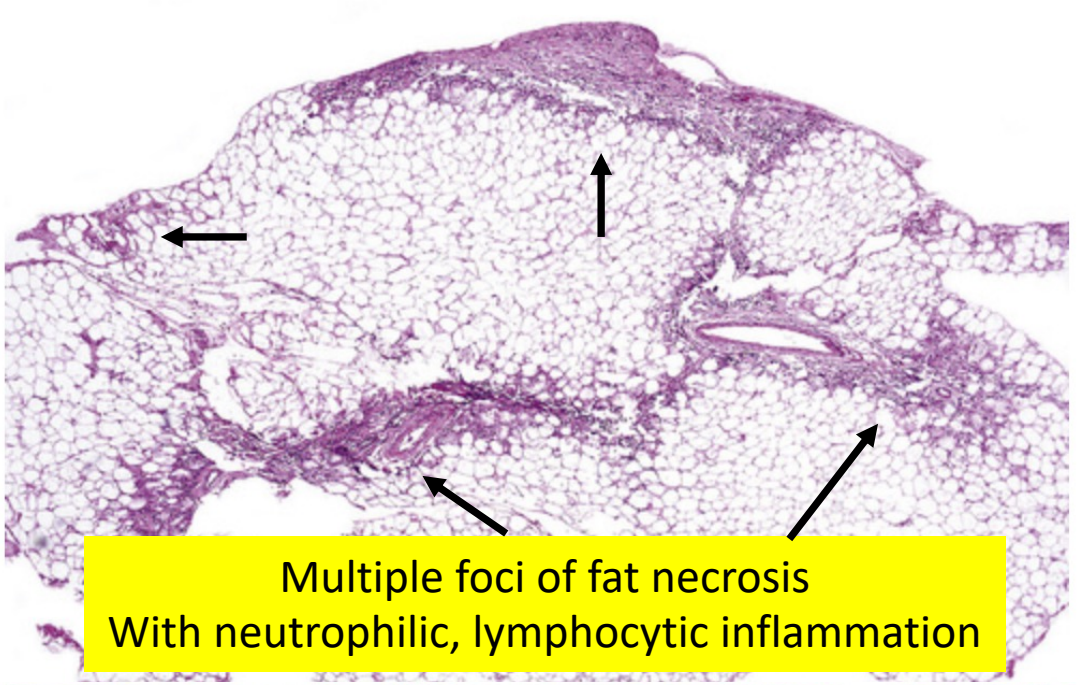
# Calciphylaxis

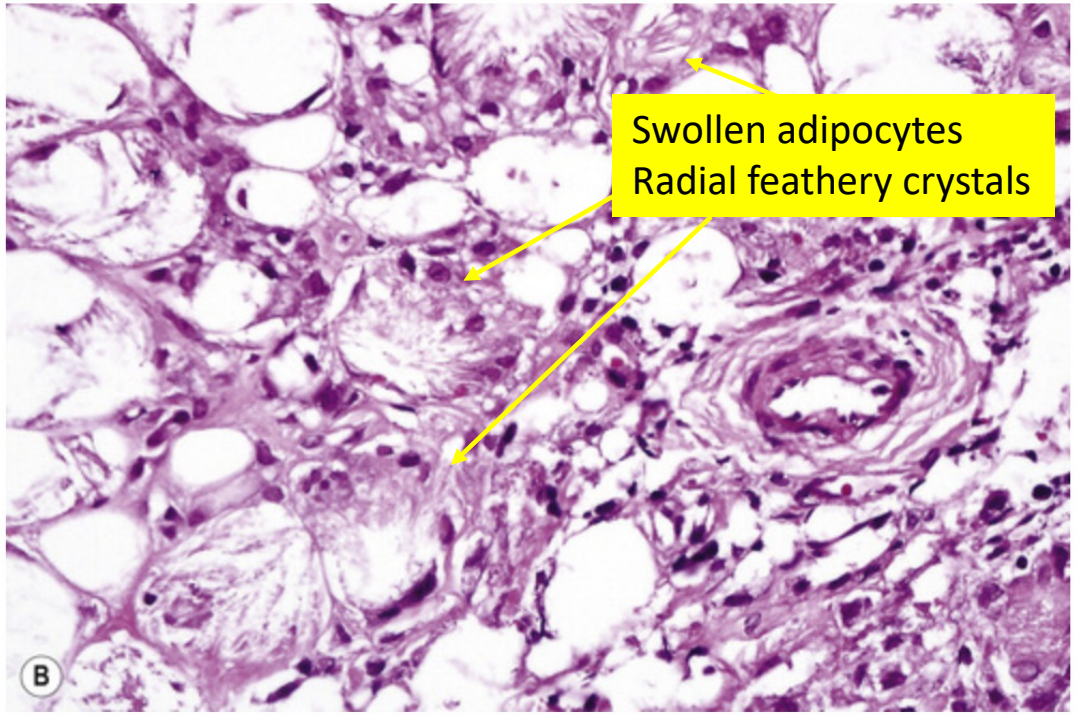
- Abnormality of Ca2+/PO4- metabolism
- End-stage renal disease
- Calcification of vasculature >>> thrombosis >>> necrosis
- Females 50 years of age
- Bilateral symmetrical painful eruption on the lower limbs
- Livedoid, violaceous plaques/nodules
- DDX: nephrogenic systemic fibrosis, peripheral vascular disease, diabetes mellitus



# Subcutaneous fat necrosis of the newborn

- Full-term neonates, first few weeks of life
- Symmetrical painful subcutaneous violaceous fluctuant nodules on the cheeks
- Benign, self-limiting
- Hypercalcemia > dyslipidemia



# Newborn panniculitis

**Sclerema neonatorum**

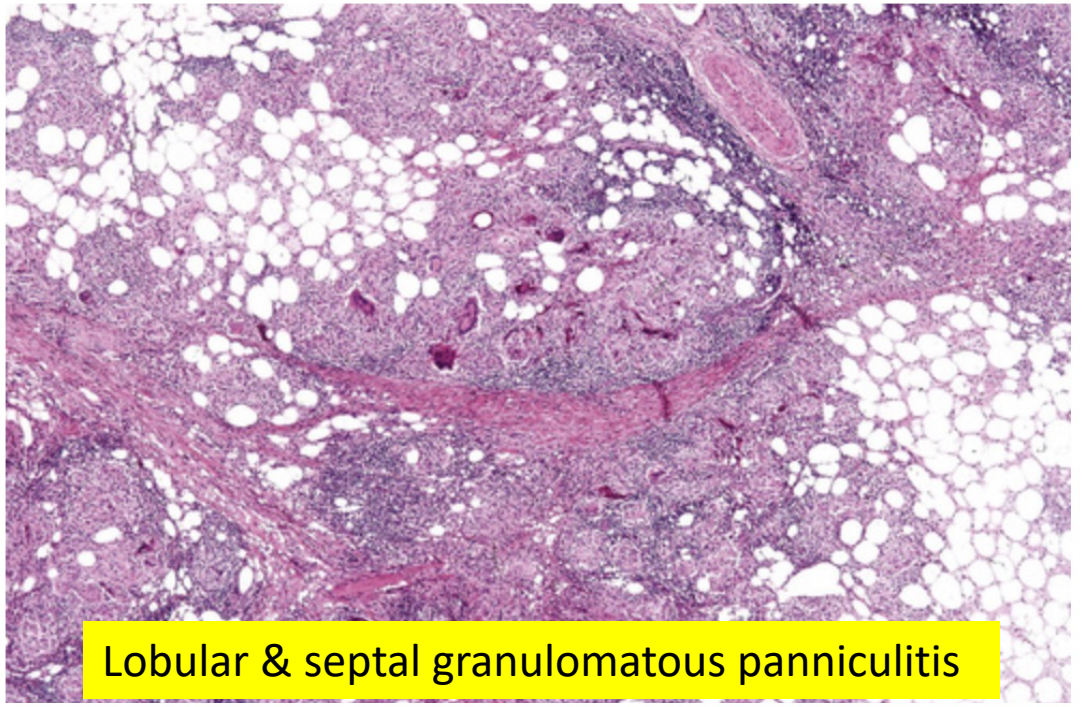
- Premature
- Diffusely cold, rigid, wax-like thickening of skin
- Death common
- Feathery eosinophilic crystals in swollen adipocytes
- Septal fibrosing panniculitis
- Pauci-inflammatory

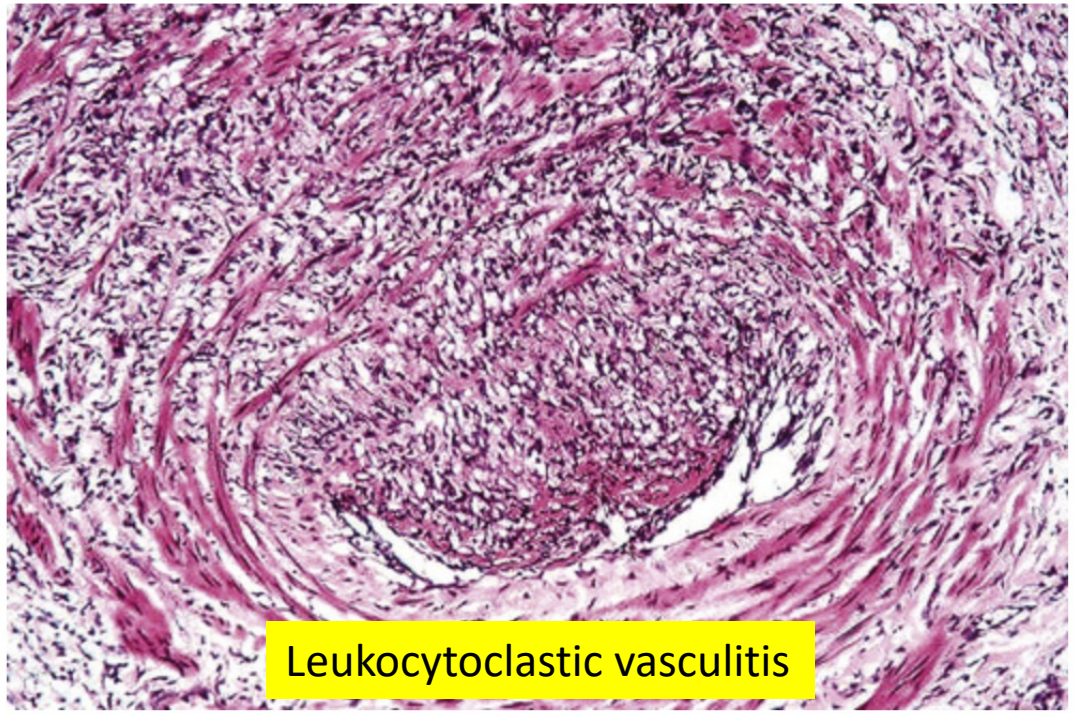
**Subcutaneous fat necrosis of the newborn**

- Full-term
- Discrete subcutaneous fluctuant nodules
- Benign, self-limiting
- Feathery eosinophilic crystals in swollen adipocytes
- Lobular inflammatory panniculitis

# Nodular vasculitis (erythema induratum)

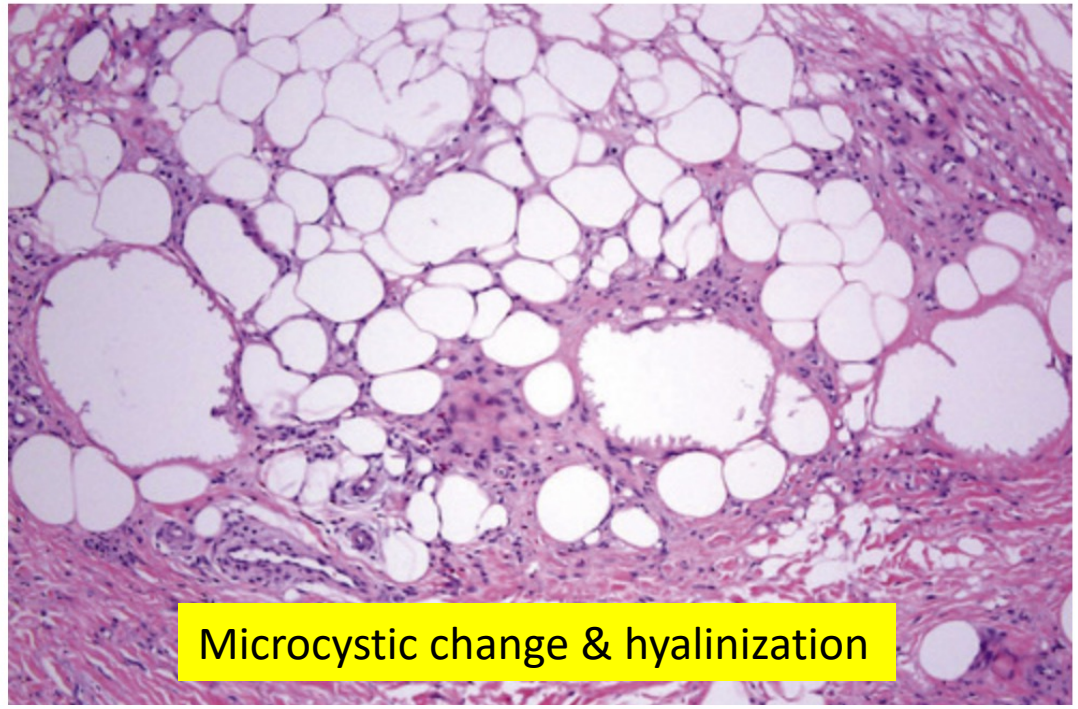
- Manifestation of underlying tuberculosis (Bazin disease)
- Occult tuberculosis: hypersensitivity reaction to mycobacterial (and others) antigens
- Young to middle-aged women
- Painful, tender violaceous nodules lower (fat calves) and upper limbs in winter months
- DDX: infective panniculitis (fungal, mycobacterial) and subcutaneous sarcoidosis

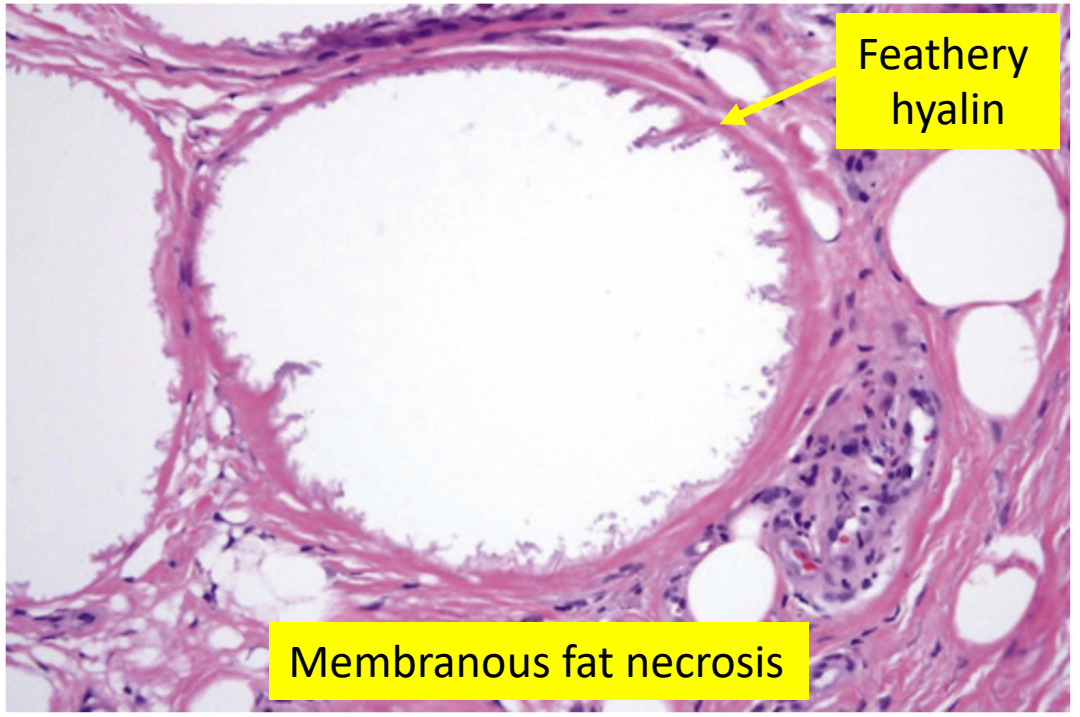


# Sclerosing panniculitis (lipodermatosclerosis)

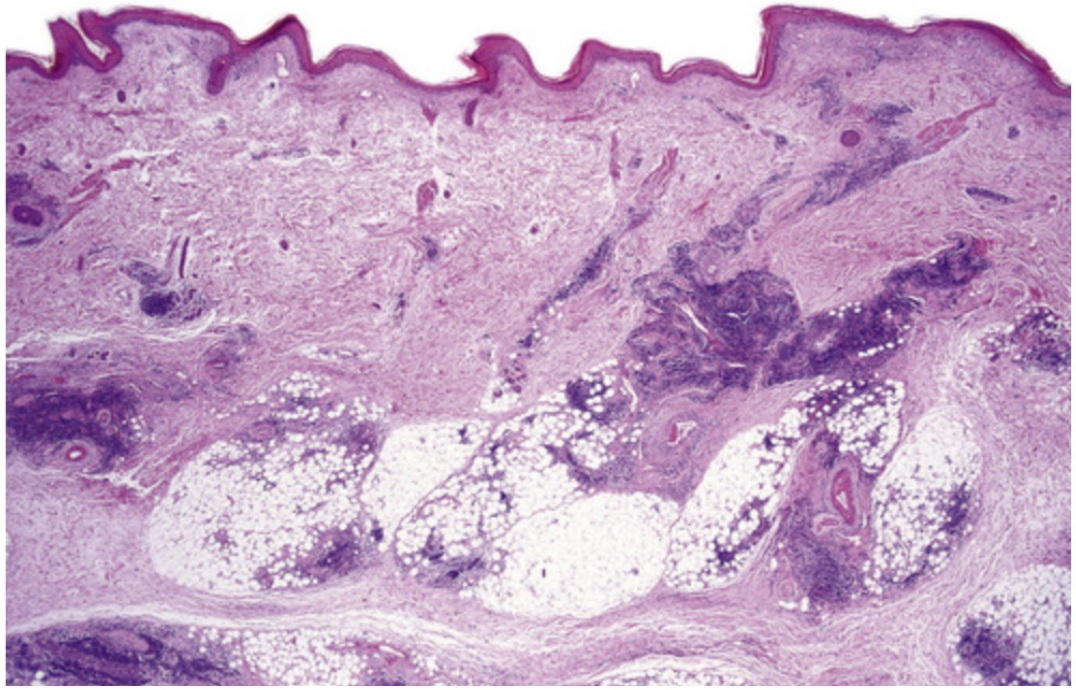
- Stasis-associated, peripheral venous disease
- Middle-aged to elderly overweight females
- Painful, erythematous swollen plaques in stocking distribution in lower limbs (inverted bottle)
- Stasis dermatitis: lobular capillary proliferation, hemosiderosis, fibrosis, lymphocytic inflammation
- Membranous fat necrosis: non-specific change in a variety of conditions especially vascular insufficiency

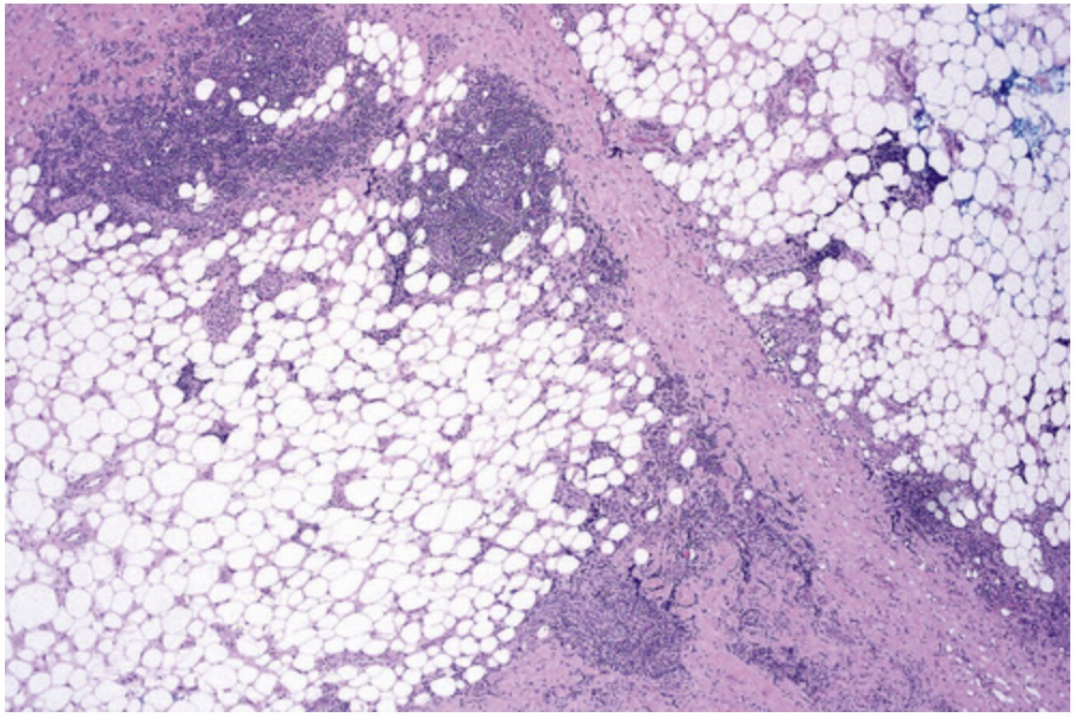


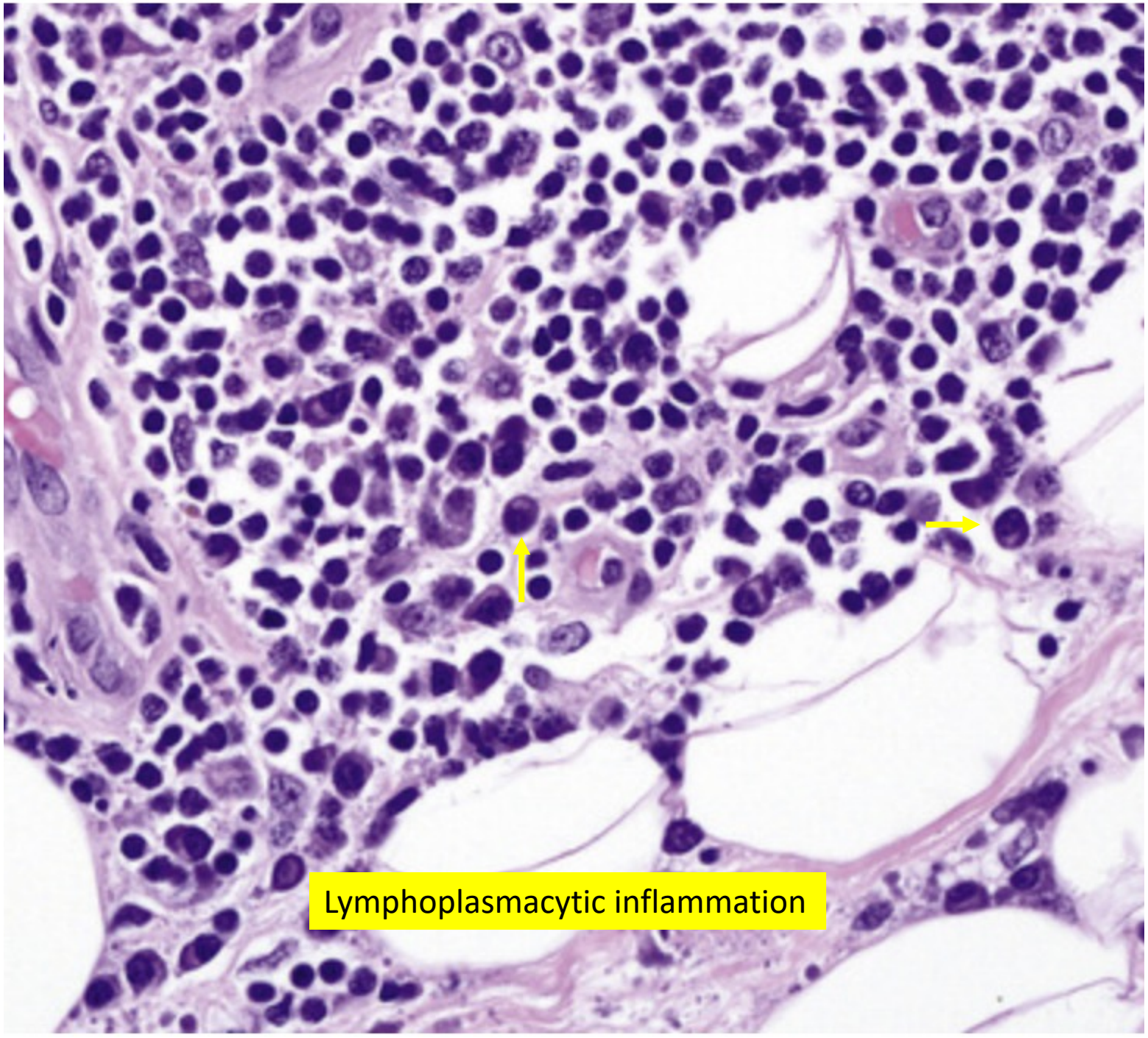



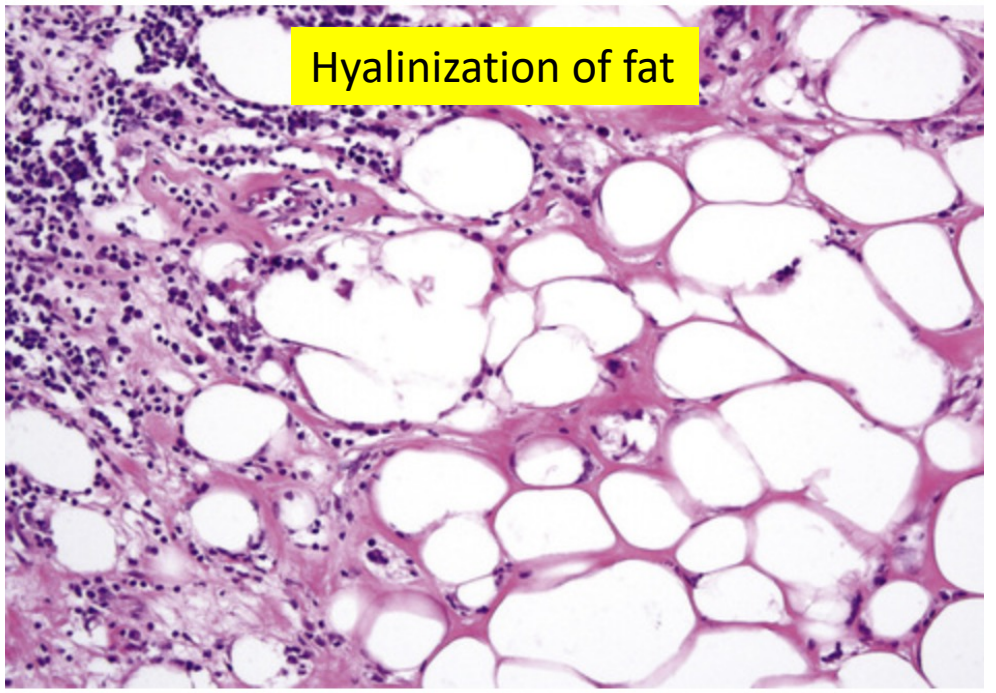
# Lupus erythematosus panniculitis (profundus)

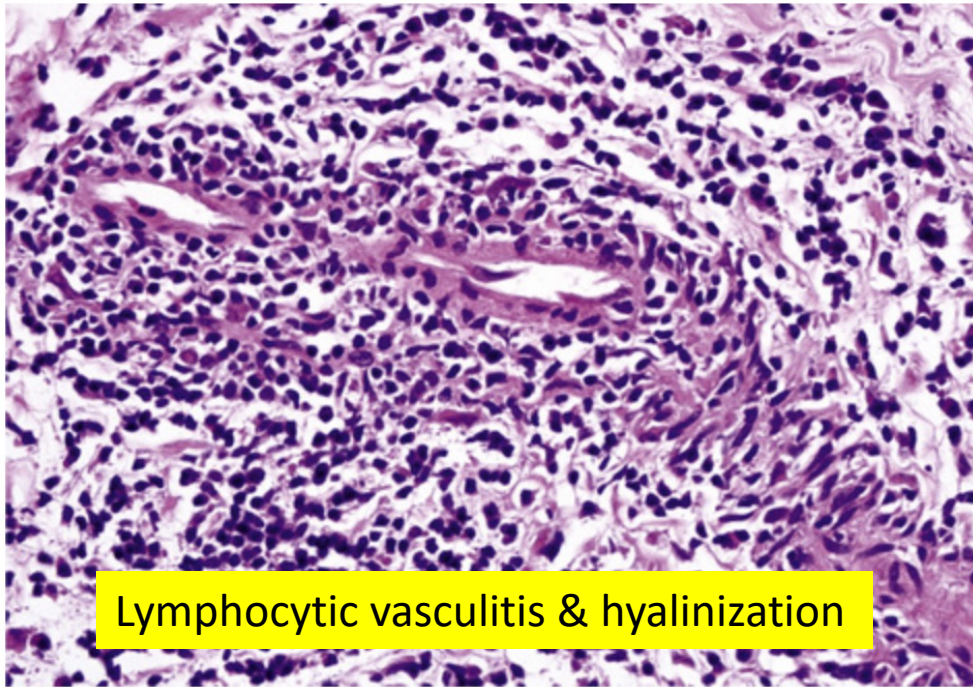
- In association with discoid (33-70%) or systemic (2-10%) LE
- May present without other manifestations
- Middle-aged females
- Firm subcutaneous nodules
- DDX: morphea profunda, mixed connective tissue disease, SPTCL (co-exist), cold panniculitis, & Sjögren syndrome





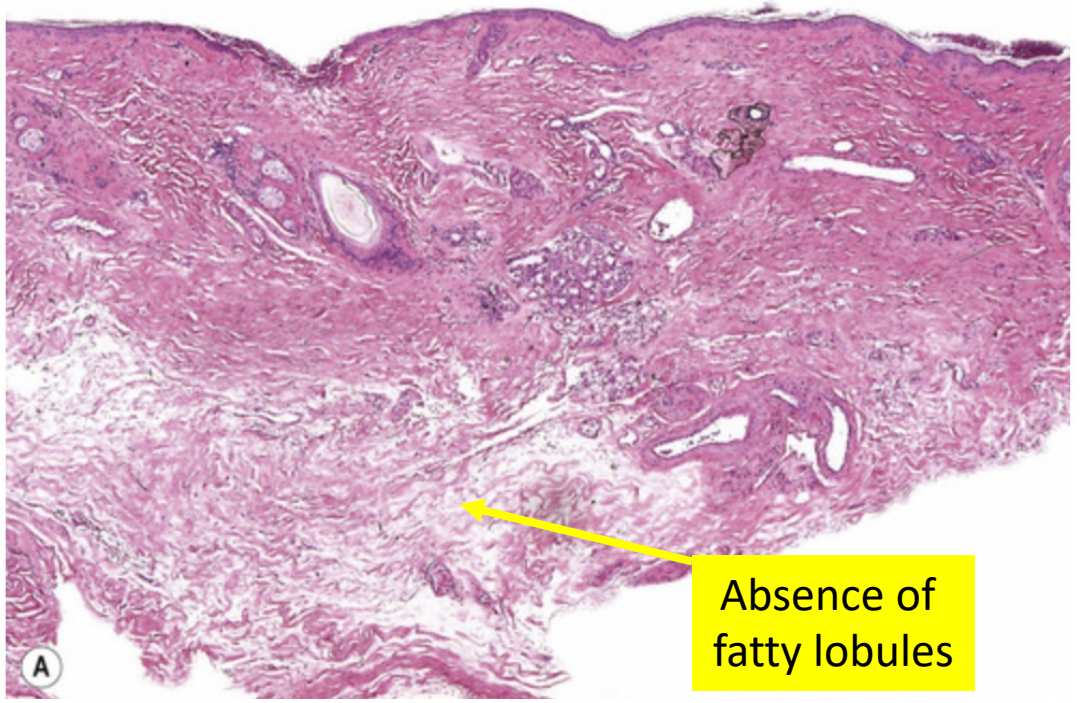

Lymphoplasmacytic inflammation

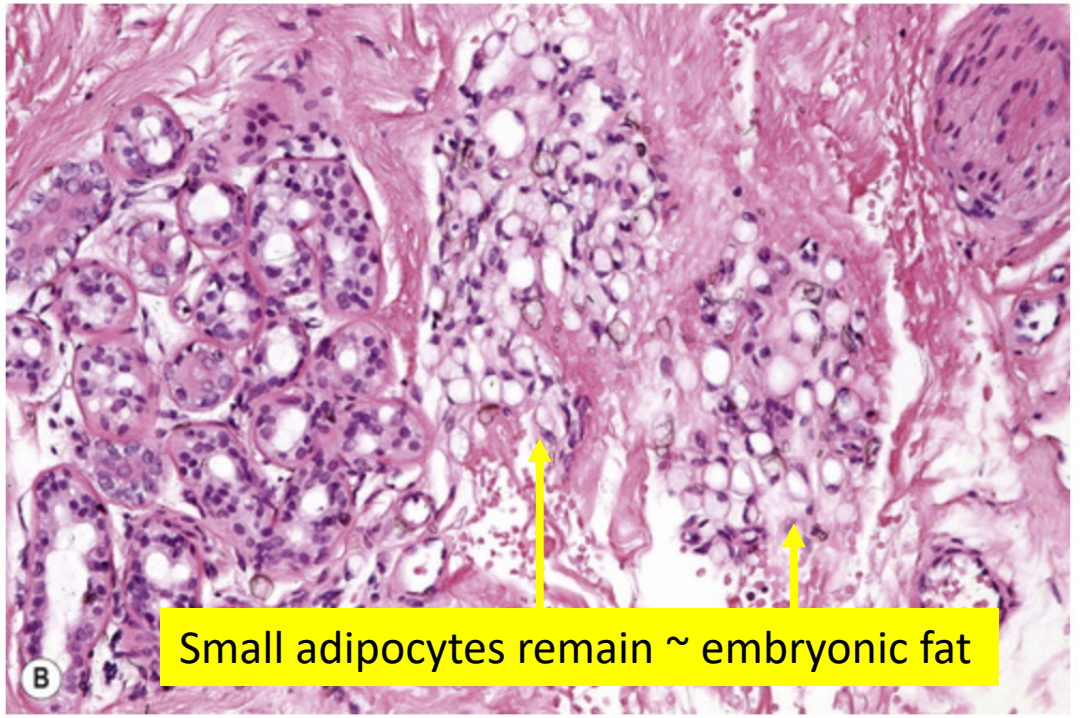

Hyalinization of fat


Lymphocytic vasculitis & hyalinization

# Lipodystrophy/ lipoatrophy

- Reported under many synonyms
- Classification
  - Familial
  - Acquired, e.g., HIV-associated
  - Localized
- Localized: trauma or injurious stimuli: insulin, penicillin, etc.
  - Complication of connective tissue diseases
- Unimpressive histopathology
  - Noninflammatory, loss of fatty lobules



# Digital Skin Pathology

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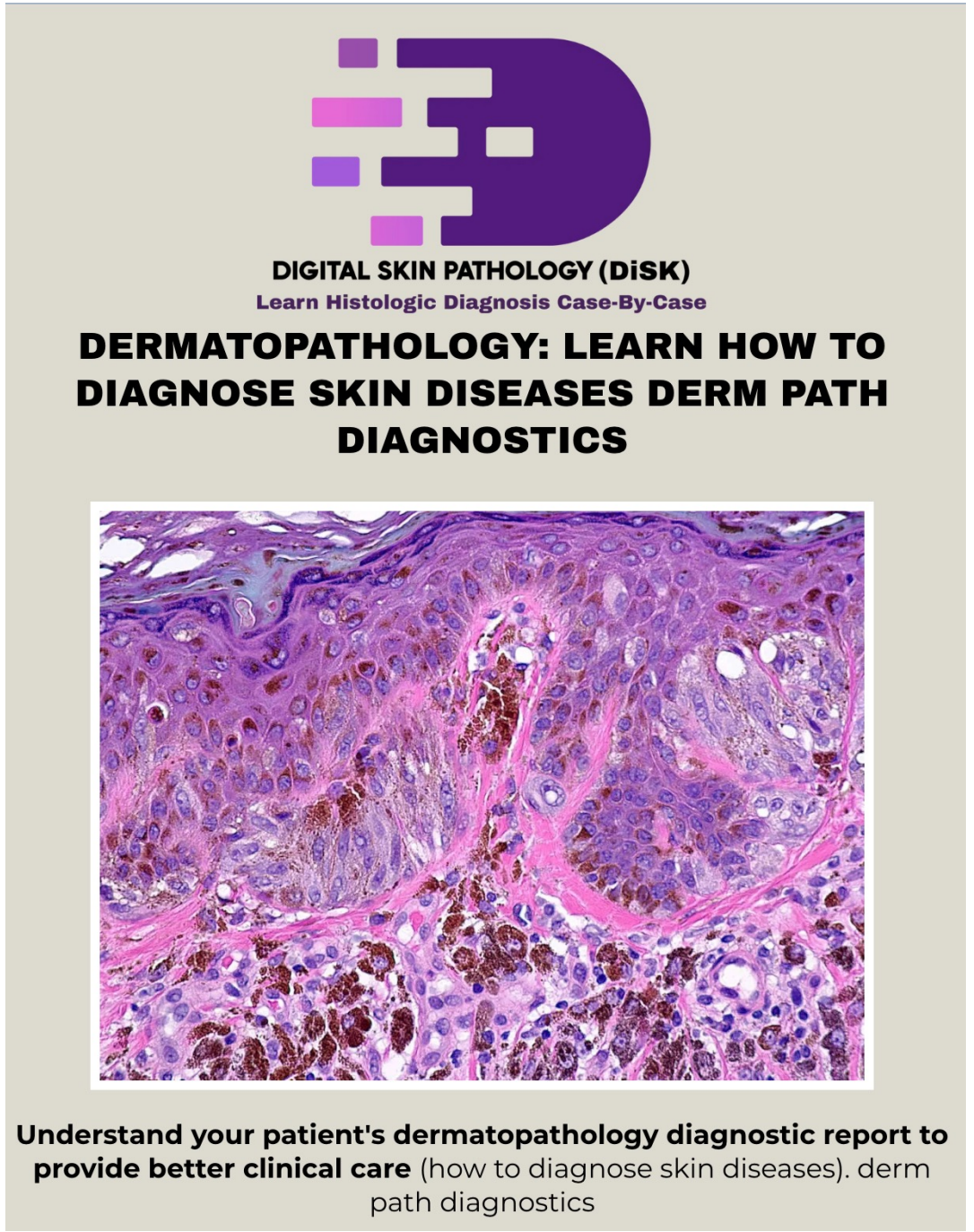
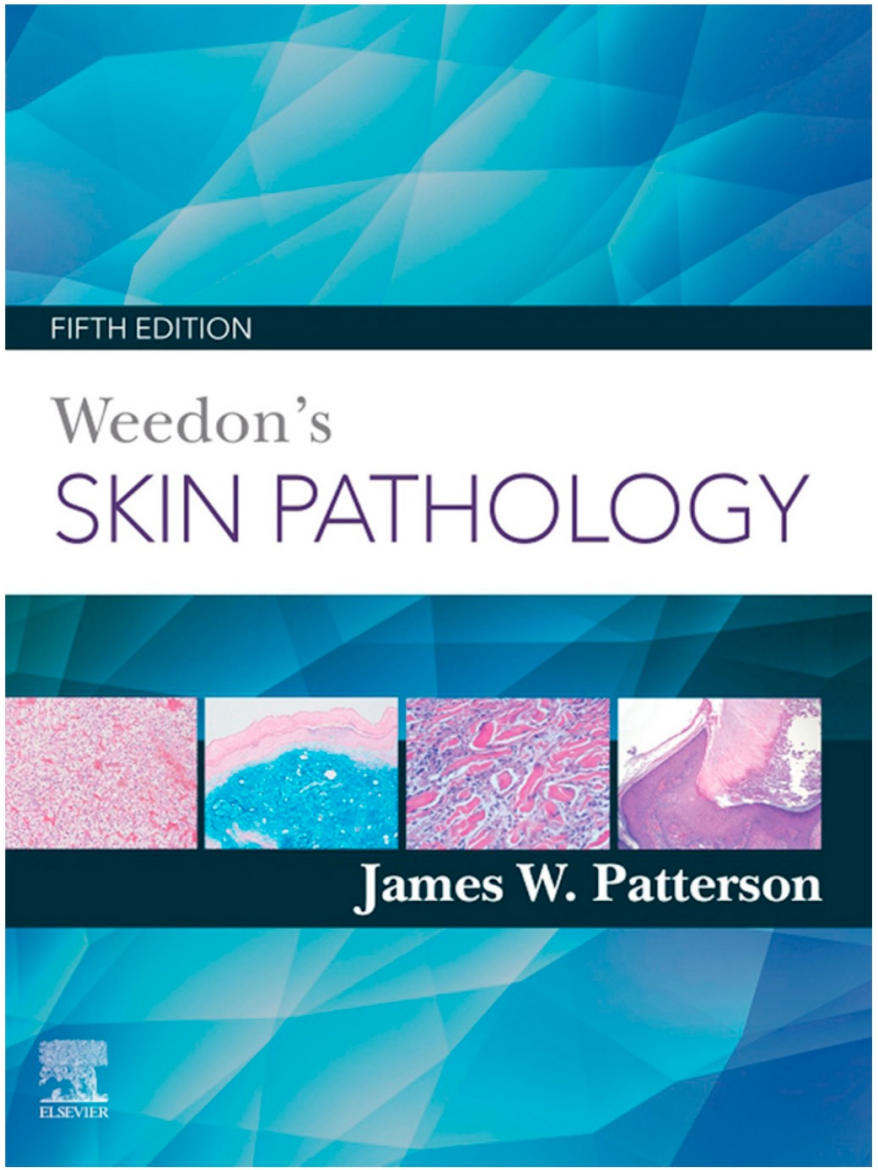
- Meet the challenges of the growing needs for dermatopathology knowledge
- Learn Dermatopathology based on actual real-life cases
- Residents of Dermatology and Pathology
- Dermatology PAs and NPs
- Primary MDs and general surgeons






# References

- Weedon's skin pathology
- McKee's pathology of the skin