

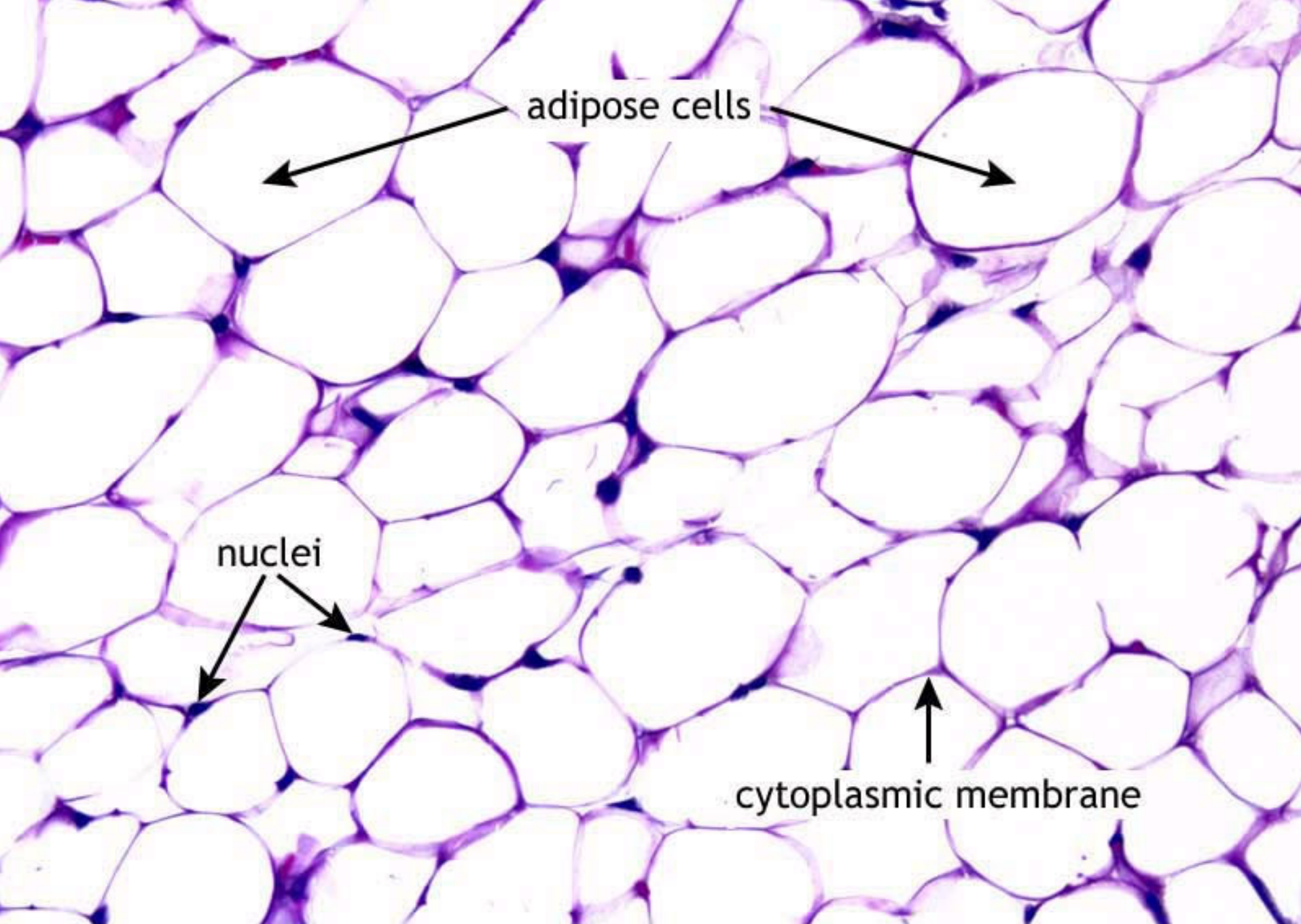
Panniculitis

Paul K. Shitabata, M.D.

Dermatopathologist

APMG

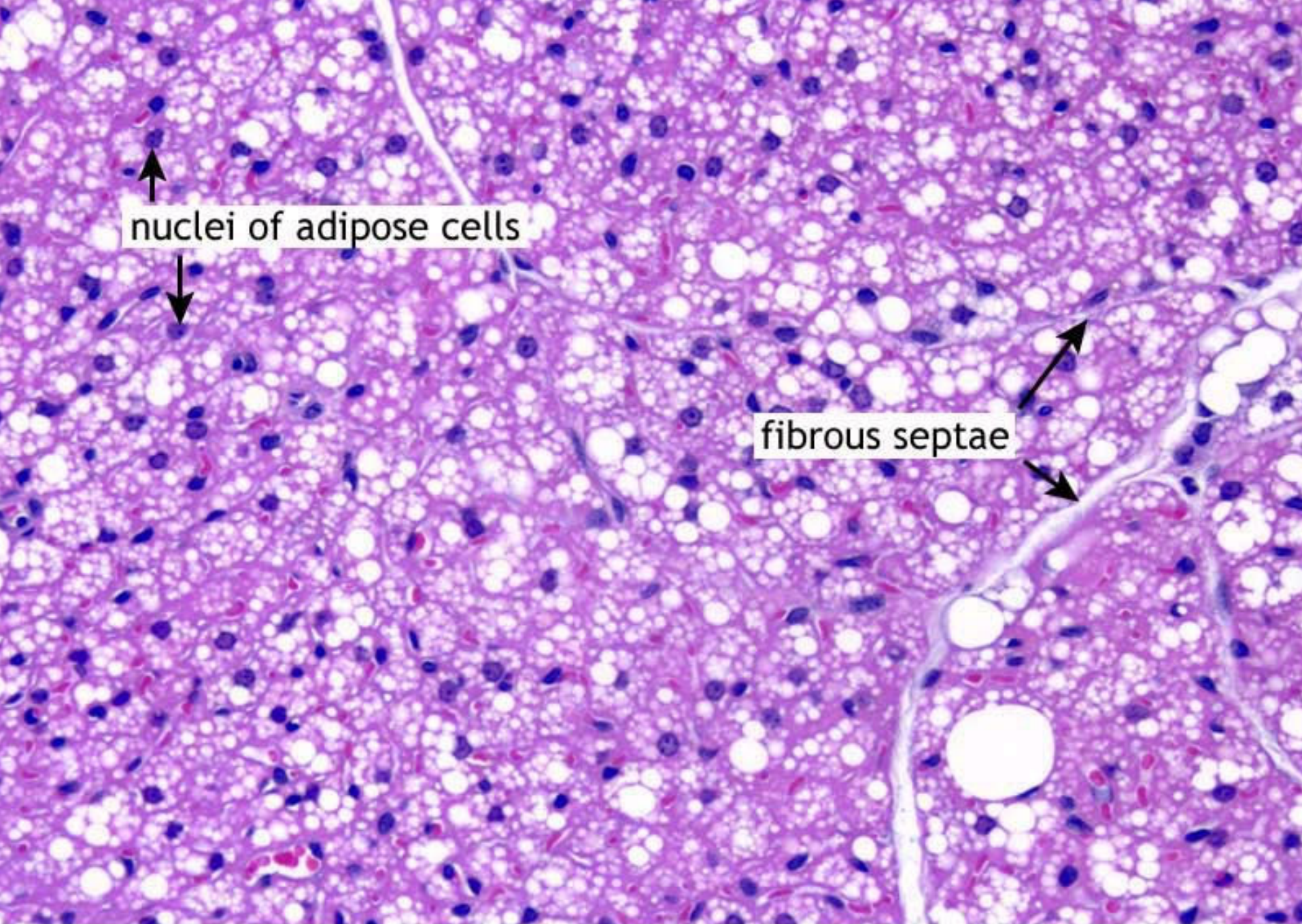




adipose cells

nuclei

cytoplasmic membrane



nuclei of adipose cells

fibrous septae

Are there distinguishing clinical features for a panniculitis?



How do I approach a biopsy to rule out panniculitis?



Pathogenesis

- Fat is divided into lobules by connective tissue septa-Arteriole supplies the center while venules drain the septae
 - Arterial disorder lead to lobular panniculitis
 - Venous disorder lead to septal panniculitis
 - Secondary to large vessel involvement (artery or vein)

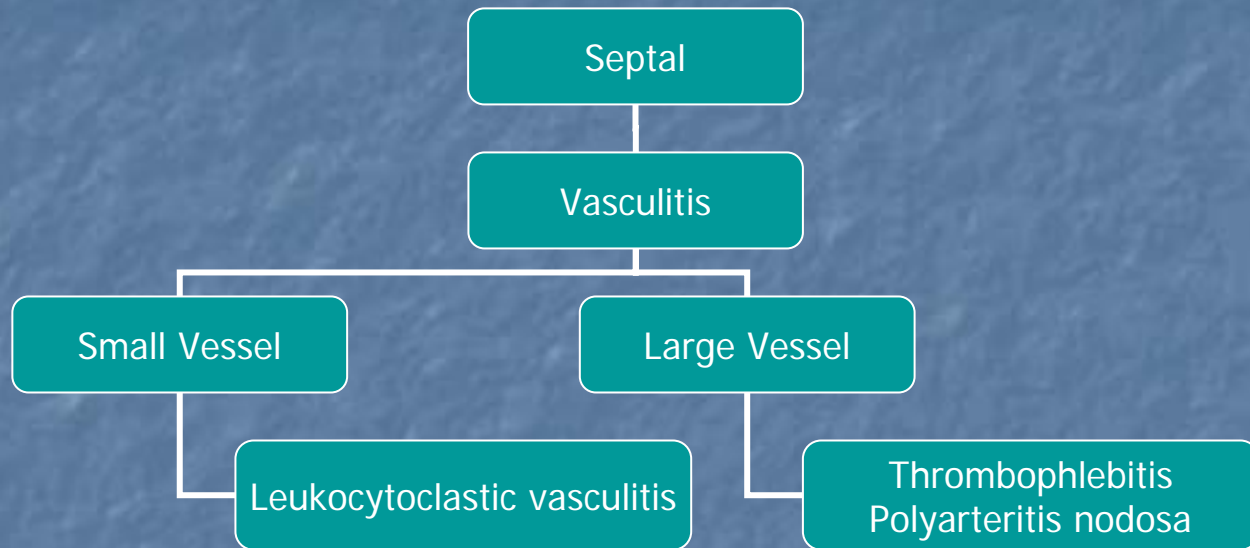
Patterns

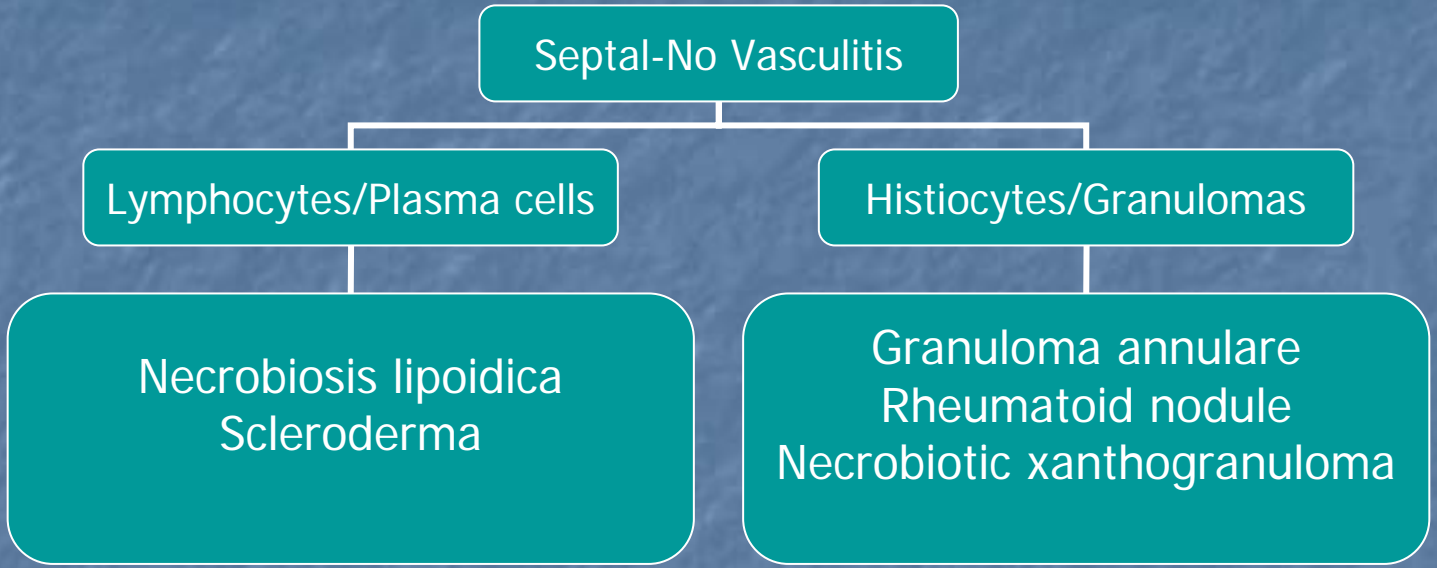
- Predominately lobular
- Predominately septal
- Mixed



Modifiers

- Vasculitis
- Granulomas
- Inflammatory cell type
- Intracellular changes
- Types of necrosis
 - Pseudomembranes
 - Pseudocysts
 - Hyaline material
 - Ghost cells without vasculitis
 - Liquefactive changes
 - Necrotizing granuloma
 - Basophilic material





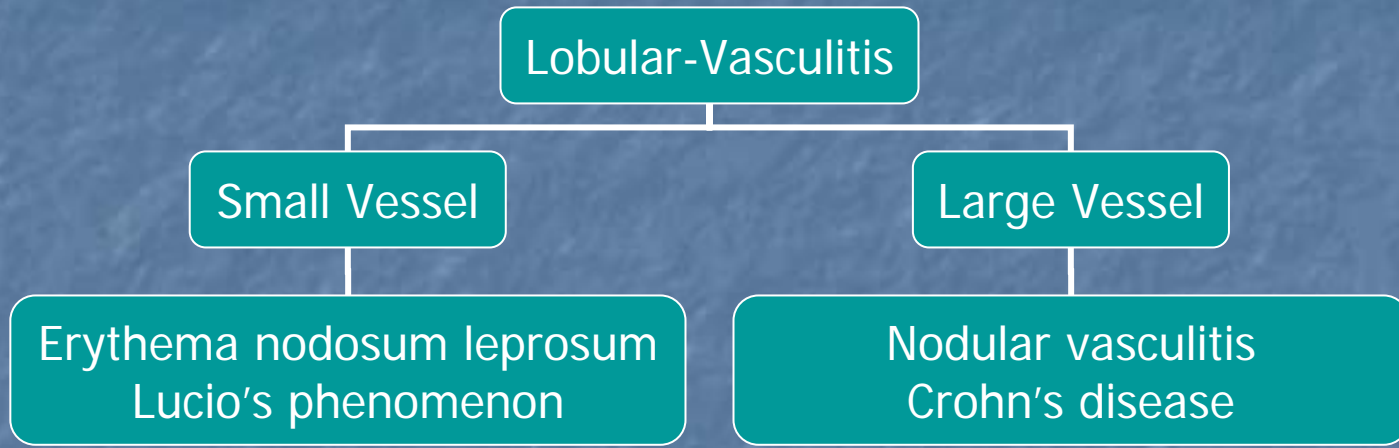
Septal-No Vasculitis

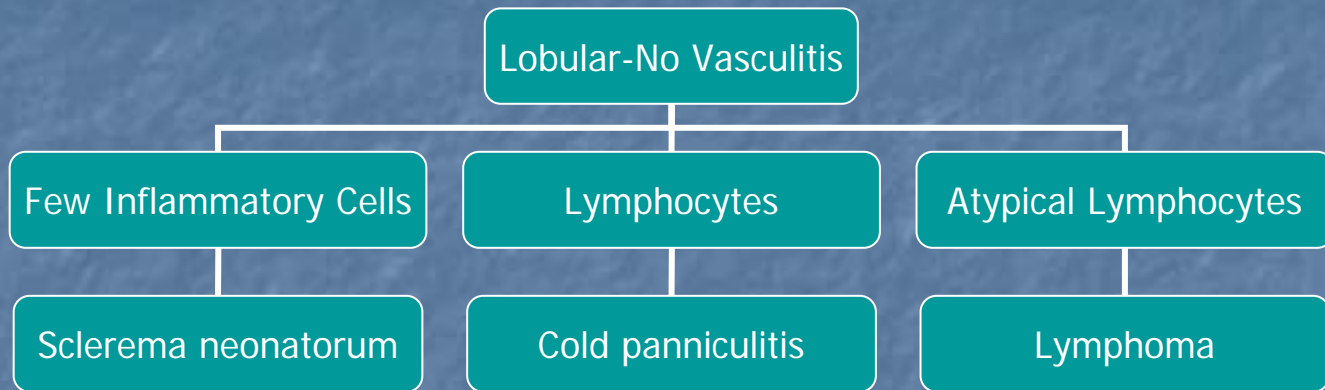
Lymphocytes/Plasma cells

Histiocytes/Granulomas

Necrobiosis lipoidica
Scleroderma

Granuloma annulare
Rheumatoid nodule
Necrobiotic xanthogranuloma





Lobular-No Vasculitis

Neutrophils

Pancreatic fat necrosis
Factitial
Bacterial infection

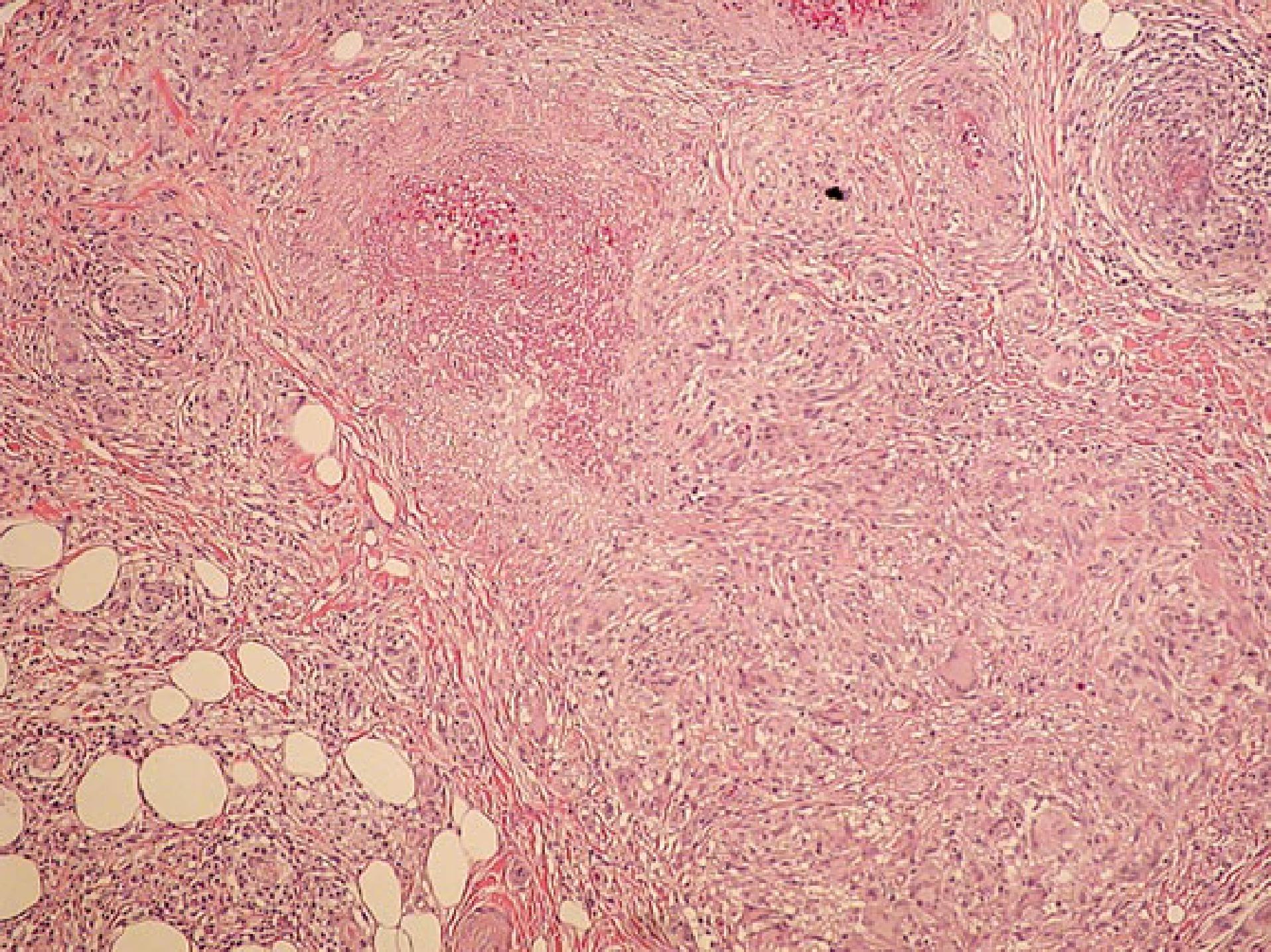
Suppurative Granulomas

Mycobacterial
Fungal
Parasitic

Histiocytes/Granulomas

Sarcoidosis
Trauma
Lipodystrophy
Subcutaneous fat necrosis
Post-steroid





Erythema nodosum

Clinical

- 18-34 years
- Most patients resolve
- Male-to-female 1:4

Clinical Appearance

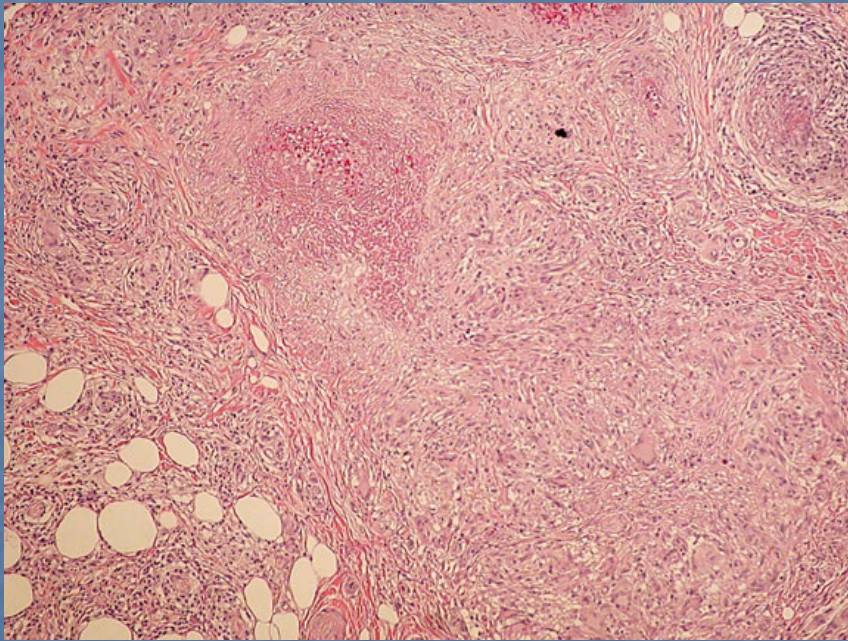


- Red tender nodules with poorly defined borders
 - Vary from 2-6 cm
 - Tense, hard, and painful may evolve to abscess or ulceration
 - New lesions may appear for 3-6 weeks
 - Anterior leg most common
 - Second week from bright red to bluish or livid fades to a yellowish hue
 - Disappears in 1 or 2 weeks as the overlying skin desquamates.
- Arthralgia <50%
 - Ankles, knees, and wrist
 - Synovitis resolves within a few weeks

Disease Associations

- Bacteria
 - Streptococcal infections*
 - Tuberculosis
 - *Yersinia enterocolitica*
 - *Mycoplasma pneumoniae*
 - Leprosy
 - Lymphogranuloma venereum
 - *Salmonella*
 - *Campylobacter*
- Fungal infections include the following:
 - Coccidioidomycosis
 - Histoplasmosis
 - Blastomycosis
- Drugs
 - Sulfonamides and halides
 - Oral contraceptive pills
- Ulcerative colitis and Crohn disease
- Hodgkin disease and non-Hodgkin lymphoma
- Sarcoidosis
- Behçet disease
- Pregnancy

Histopathology



- Septal panniculitis with slight superficial and deep perivascular inflammatory lymphocytic infiltrate
- Septa of subcutaneous fat usually are thickened
- Periseptal fibrosis, giant cells, and granulation tissue appear
- Miescher granulomas
 - Small well-defined nodular aggregates of histiocytes around a central stellate cleft are scattered throughout the lesions

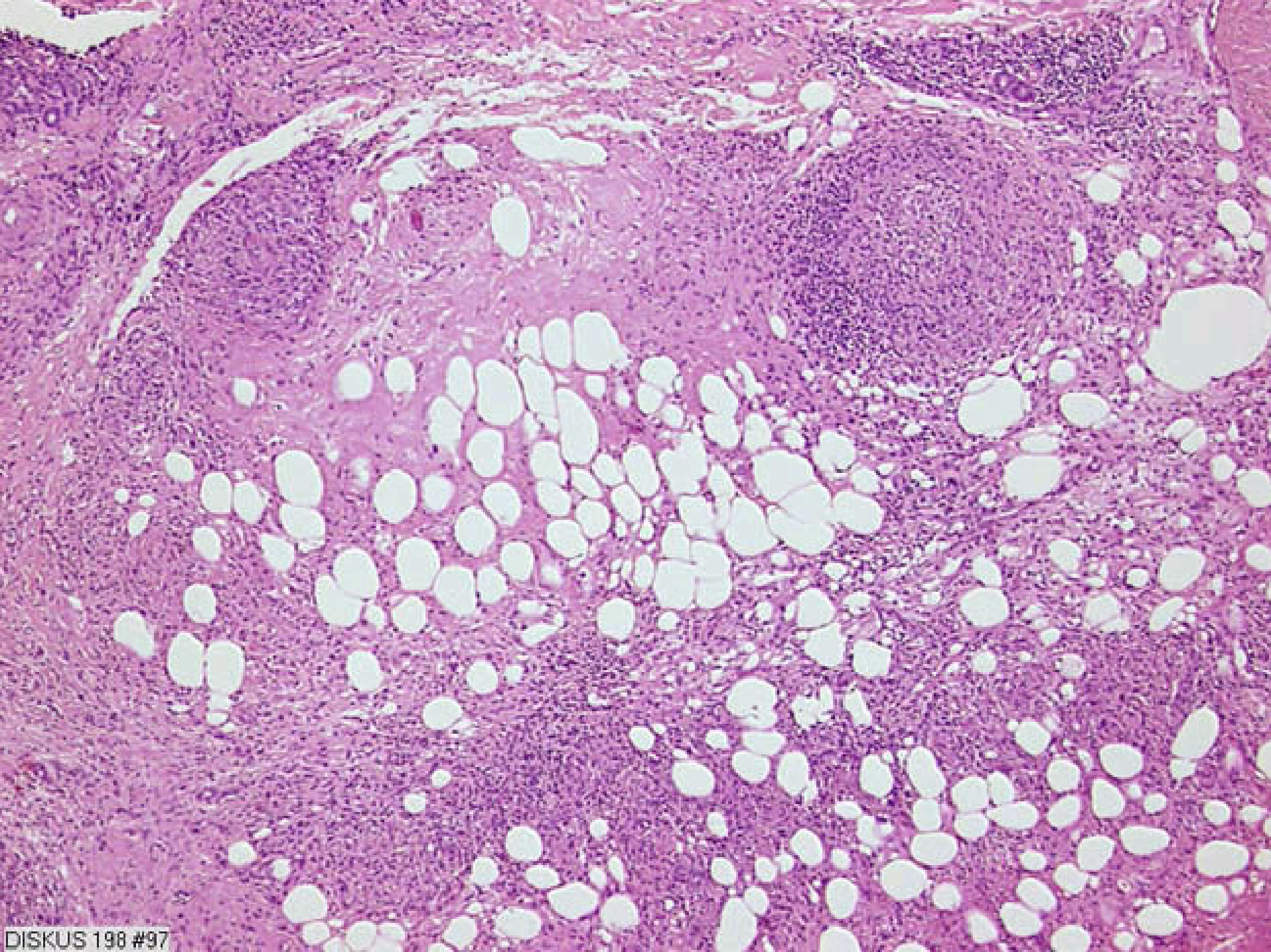
Differential Diagnosis

- Behcet's associated vasculopathy
 - Panniculitis in a lobular or mixed septal lobular pattern
Neutrophils present in all lesions and in all stages of the disease and usually confined to the areas of fat necrosis or around inflamed vessels
 - Vasculitis either leukocytoclastic or lymphocytic with some occurring in same specimen in different vessels

Treatment

- Symptomatic-NSAIDS
- Treat underlying disease





Erythema induratum
(Nodular Vasculitis of Bazin)

Clinical

- Women aged 20-30 years
- Past or present history of tuberculosis at an extracutaneous site ~50% of patients
 - Pulmonary tuberculosis most common.
 - Tuberculous cervical lymphadenitis next most common
- Tender, erythematous nodules are present on the lower legs
 - Chronic, recurrent course
 - Lesions heal with ulcerations or depressed scars
 - Leg edema

Appearance

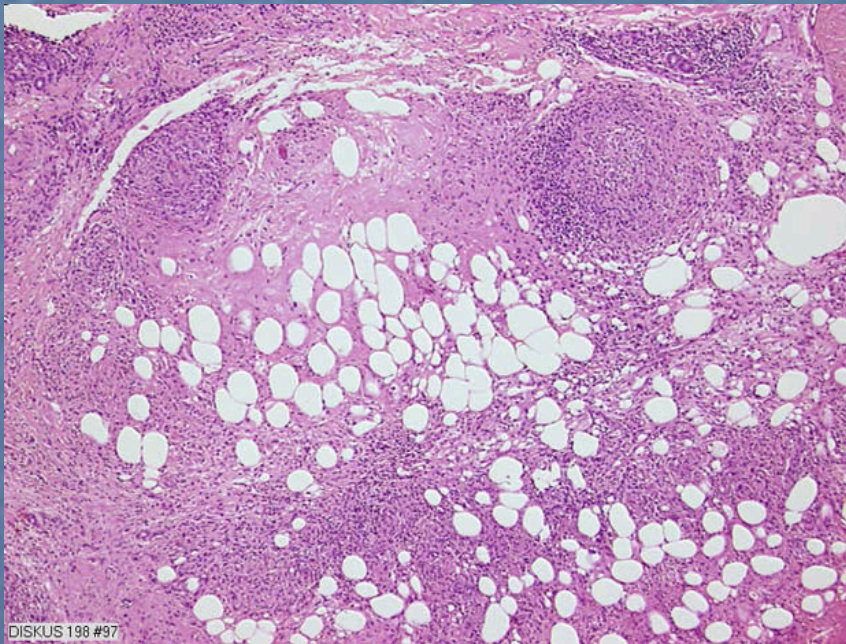


- Crops of small, tender, erythematous nodules
 - Usually shins and calves
 - Lower third of the legs, especially around the ankles
 - Depressed scars or pigmentation due to previously active lesions may be present

Cause

- *Mycobacterium tuberculosis* is the cause
 - Erythema induratum and nodular vasculitis are a hypersensitivity reaction to endogenous or exogenous antigens like the tubercle bacillus
 - Positive tuberculin skin test result and a marked increase in their peripheral T lymphocyte response to purified protein derivative (PPD) of tuberculin

Histopathology



- Mixed septal and lobular granulomatous panniculitis with neutrophilic vasculitis
- Caseationlike necrosis may also be seen
- Vary depending on the age of the lesion
- Vasculitis not always identified and not a requisite for the diagnosis

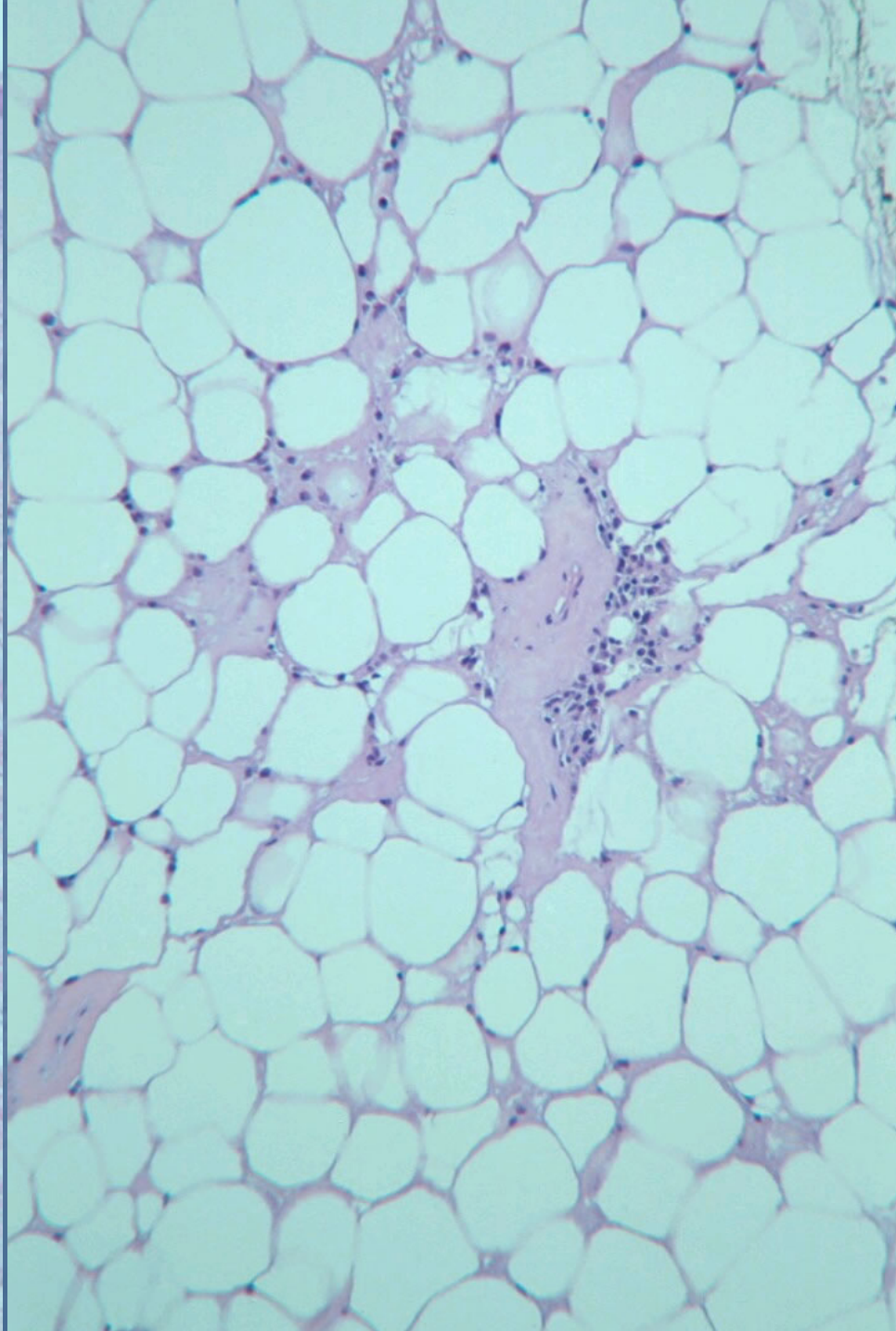
Differential Diagnosis

- Erythema nodosum
 - Primarily septal
- Polyarteritis nodosa
 - Medium vessel vasculitis with minimal lobular inflammation

Treatment

- Erythema induratum of Bazin:
Antituberculous therapy
- Nodular vasculitis with a negative tuberculin skin test result
 - Bed rest with systemic steroids is indicated.
 - Potassium iodide may be used



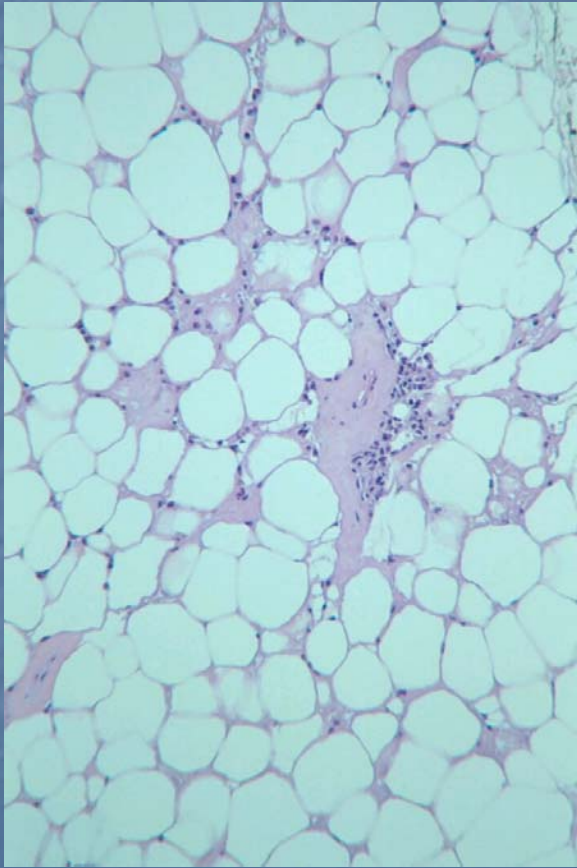


Lupus Panniculitis (Lupus Erythematosus Profundus)

Clinical

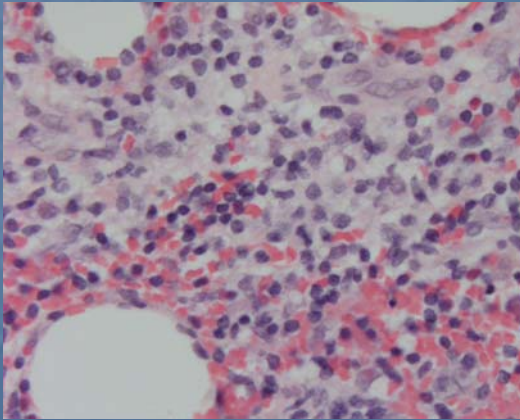
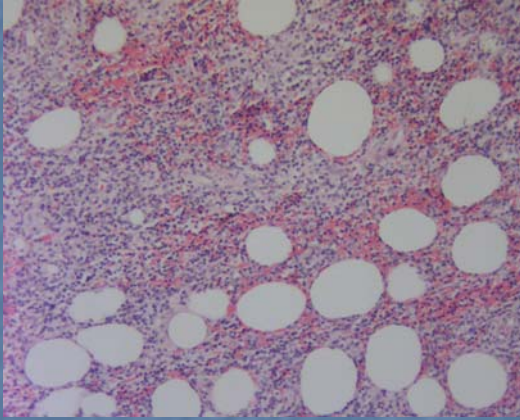
- Women 3-5th decades, occasional infant cases
- Head and neck, upper arms, trunk, and buttocks
Tan to violaceous plaques
- May herald onset of LE or occur in isolation but usually occurs simultaneously with other cutaneous and extracutaneous manifestations
- Occurs with about equal frequency with both DLE and SLE though other studies doubt this with SLE-affects about 1-2% of LE patients

Histopathology



- Infiltration of fat lobule by lymphocytes, histiocytes, and plasma cells with interposed zone of granular necrobiotic alteration
- Lymphoid follicles with tingible body macrophages
- Endothelial necrosis, segmental deposits of fibrin, occlusive luminal thrombi of interstitial capillaries and venules, lymphocytic vasculitis
- Positive Lupus Band with concomittant SLE

Differential Diagnosis

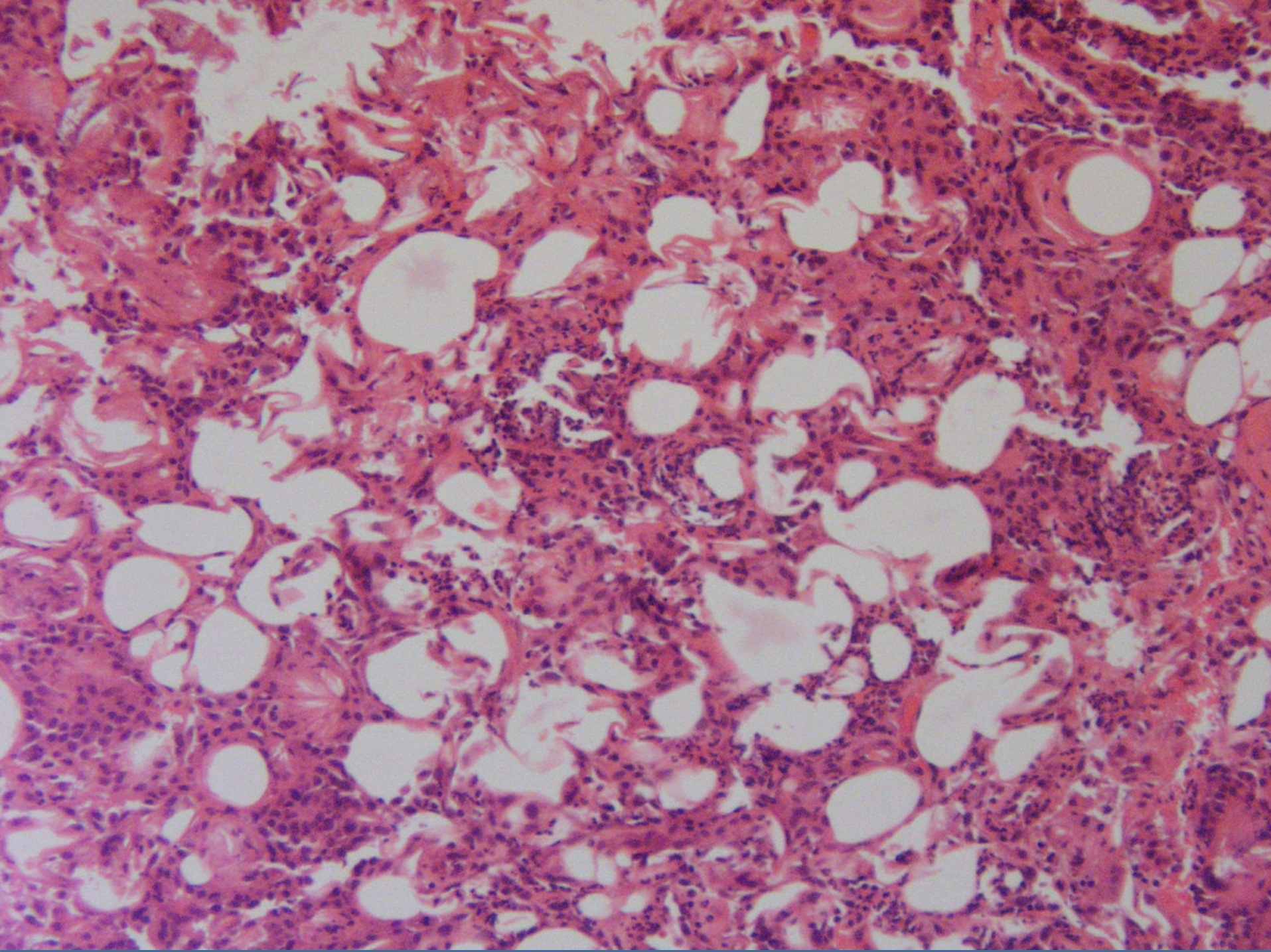


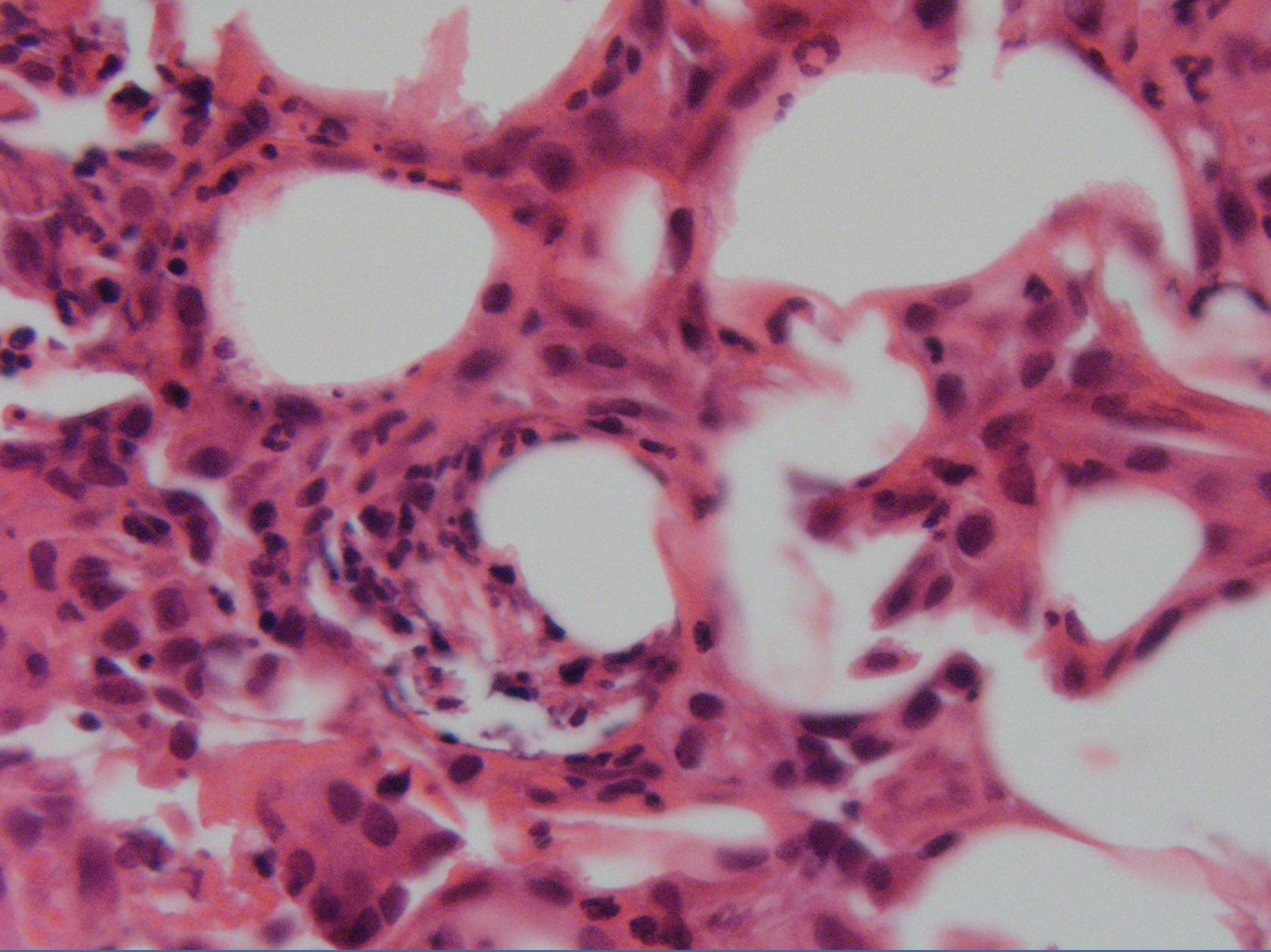
- Subcutaneous T-cell lymphoma
 - Significant percentage may manifest lymphoid atypia

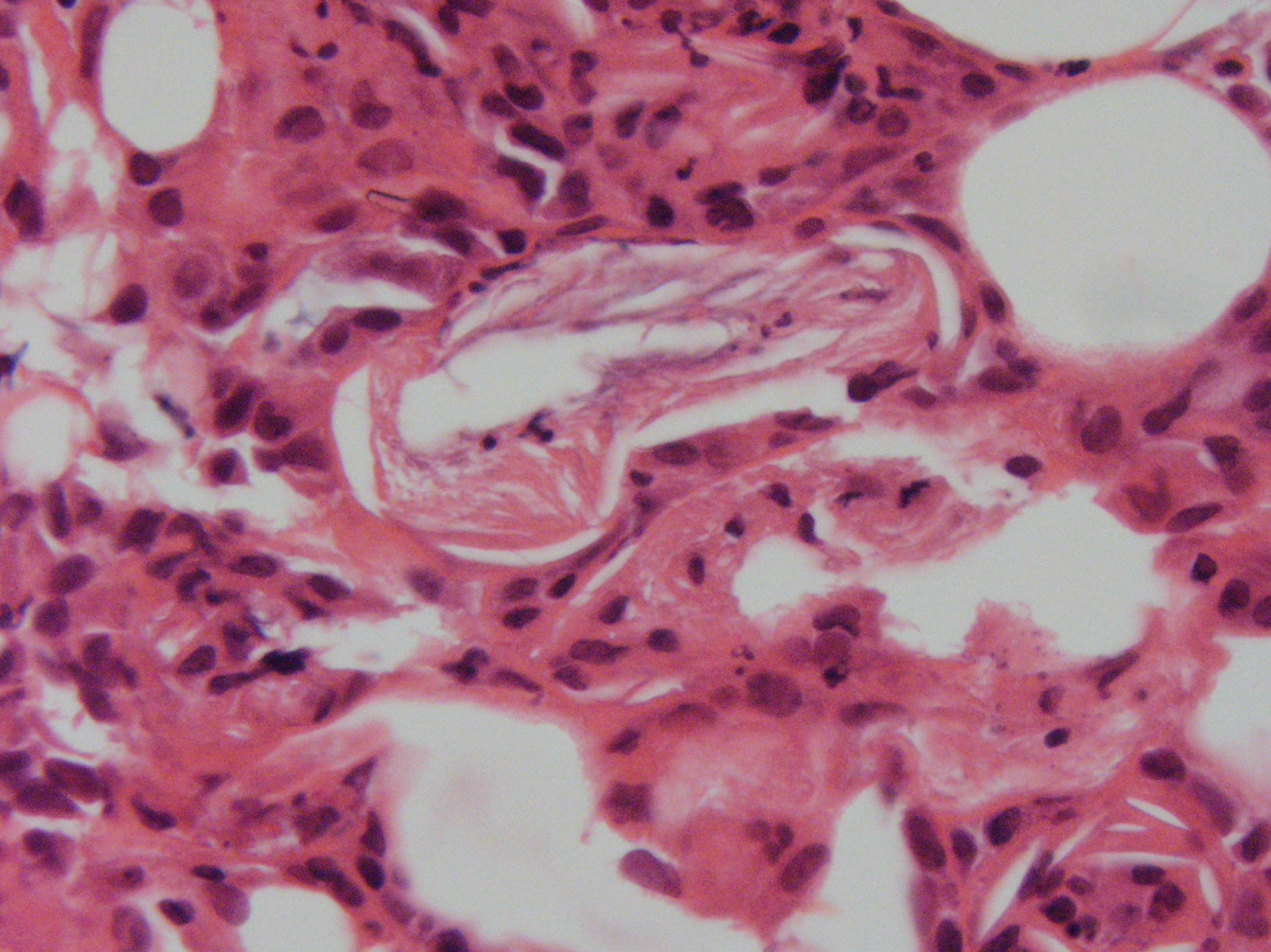
Treatment

- Treat underlying lupus









Subcutaneous Fat Necrosis of the Newborn

Clinical

- Usually are healthy and full-term at delivery with some antecedent obstetric trauma
 - Including meconium aspiration, asphyxia, hypothermia, or peripheral hypoxemia.
- Hard, indurated nodules and plaques with ill-defined overlying erythema develop on the trunk, arms, buttocks, thighs, or cheeks
 - Not warm or painful
 - Appear within the first several weeks of life
- Infants usually appear well and are afebrile
- If severe hypercalcemia, exam may reveal growth and mental retardation, hypertension, seizure activity, and tissue calcification

Cause

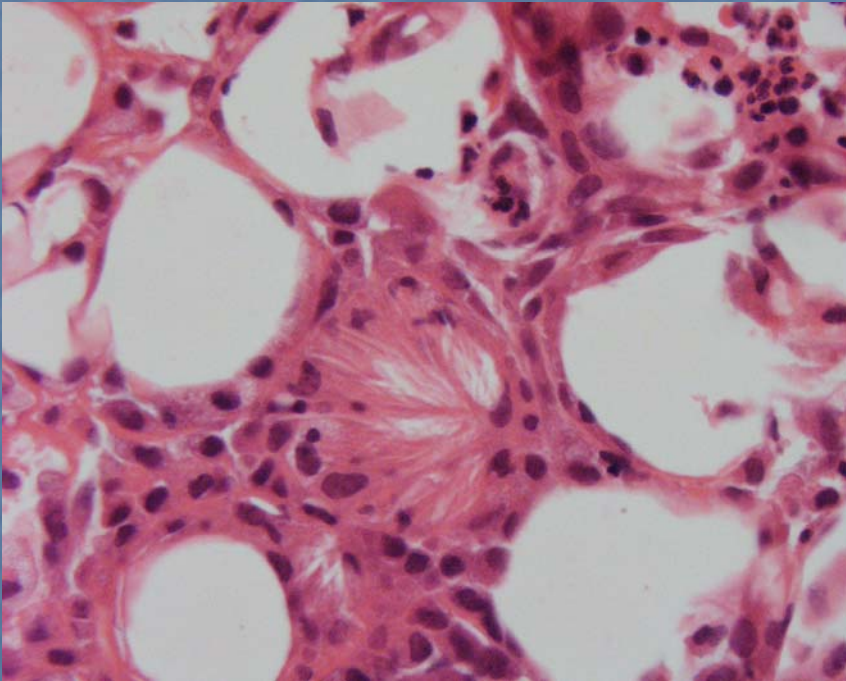
- Unknown, considered response to neonatal stress and hypothermia
- Theories
 - Underlying defect in fat composition or metabolism may be present, whereby inadequately developed enzyme systems involved in fatty acid desaturation result in increased saturated fatty acids within the subcutaneous tissue
 - Neonatal fat is composed of saturated fatty acids (stearic and palmitic acids) with a relatively high melting point
 - Neonatal stress resulting in hypothermia may induce fat to undergo crystallization, leading to necrosis
- Local pressure trauma during delivery from macrosomia, forceps, or prolonged trauma may play a role in the induction of necrosis
 - Has been reported in children delivered by cesarean section, suggesting that pressure necrosis cannot be the only cause

Clinical Appearance



- Begins as an area of edema and progresses to variably circumscribed indurated nodules and plaques
- Skin may be red, purple, or flesh-colored and may look taut and shiny
- Lesions may become fluctuant and spontaneously drain necrotic fat

Histopathology



- Patchy areas of fat necrosis are surrounded by a granulomatous infiltrate of lymphocytes, macrophages, and giant cells
- Many of the fat cells and giant cells contain needle-shaped clefts that often lie in a radial arrangement
- Frozen sections show doubly refractile crystals
- Small foci of calcium are scattered throughout the necrotic fat, and, sometimes, extensive areas of calcification may be present.
- Older lesions may demonstrate fibrosis

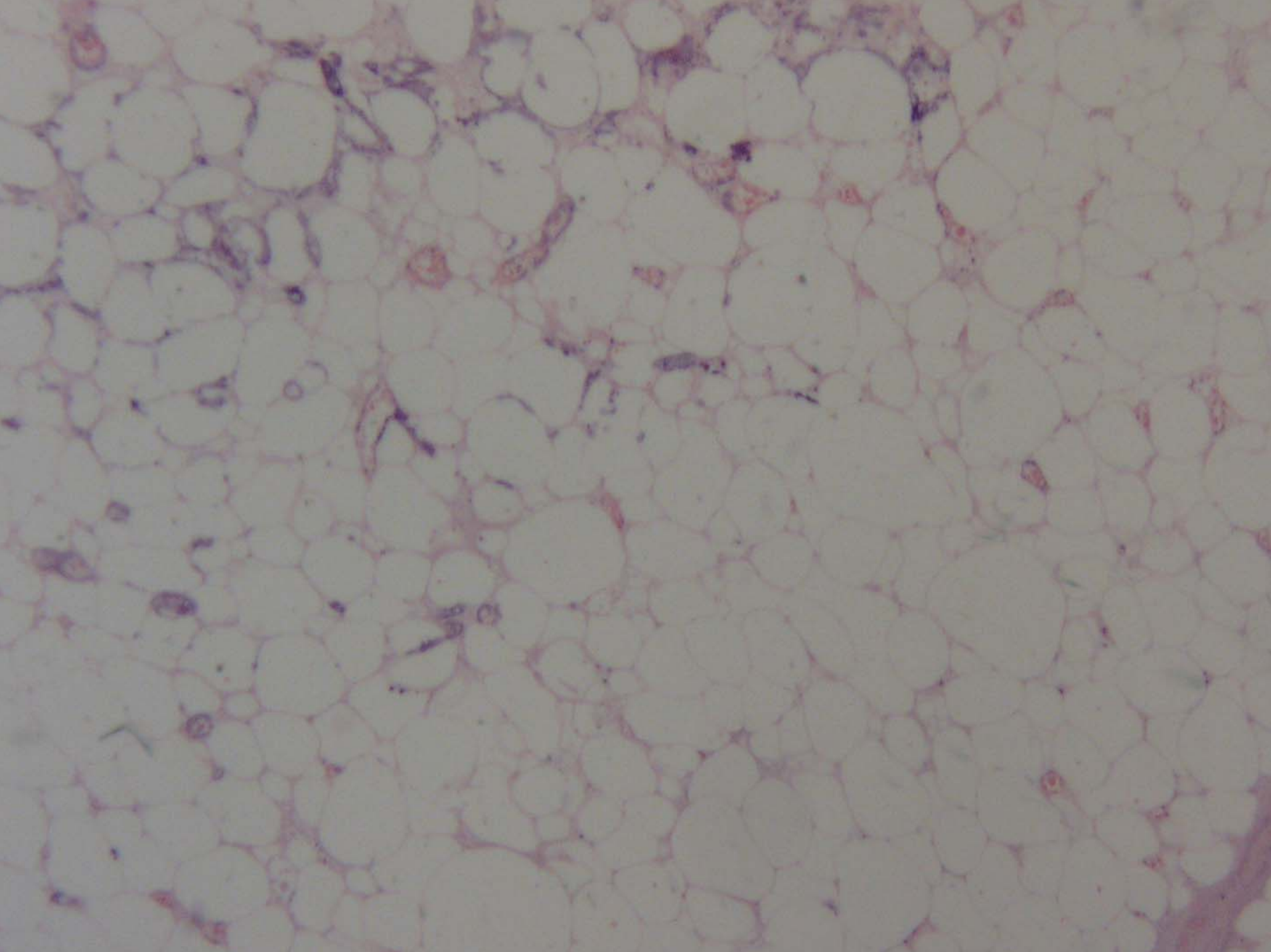
Differential Diagnosis

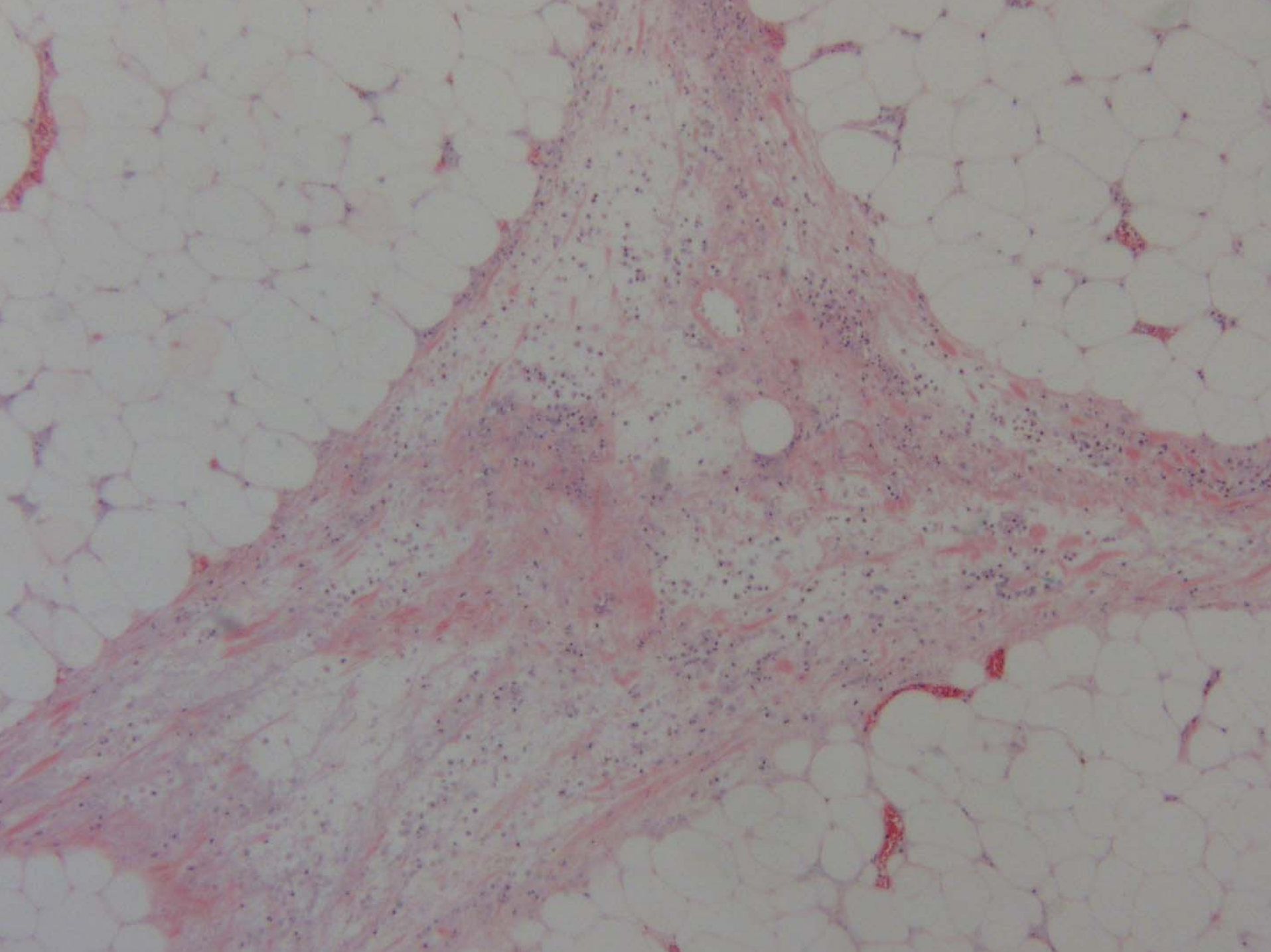
- Corticosteroid withdrawal
- Sclerema neonatorum
 - Thickening of the subcutaneous fibrous septa, and a radial array of fine needlelike clefts in the fat cells
 - No fat necrosis or inflammation

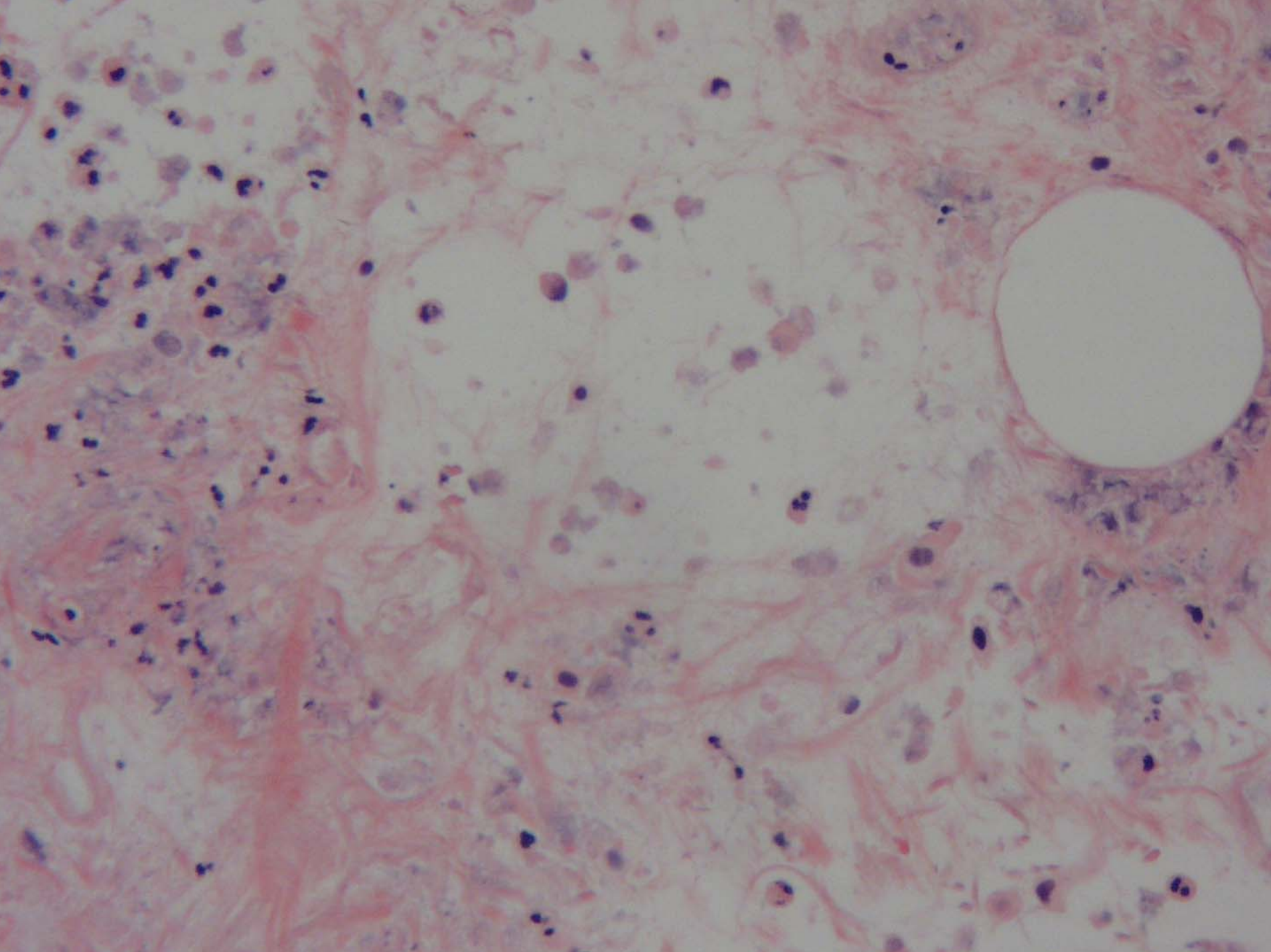
Treatment

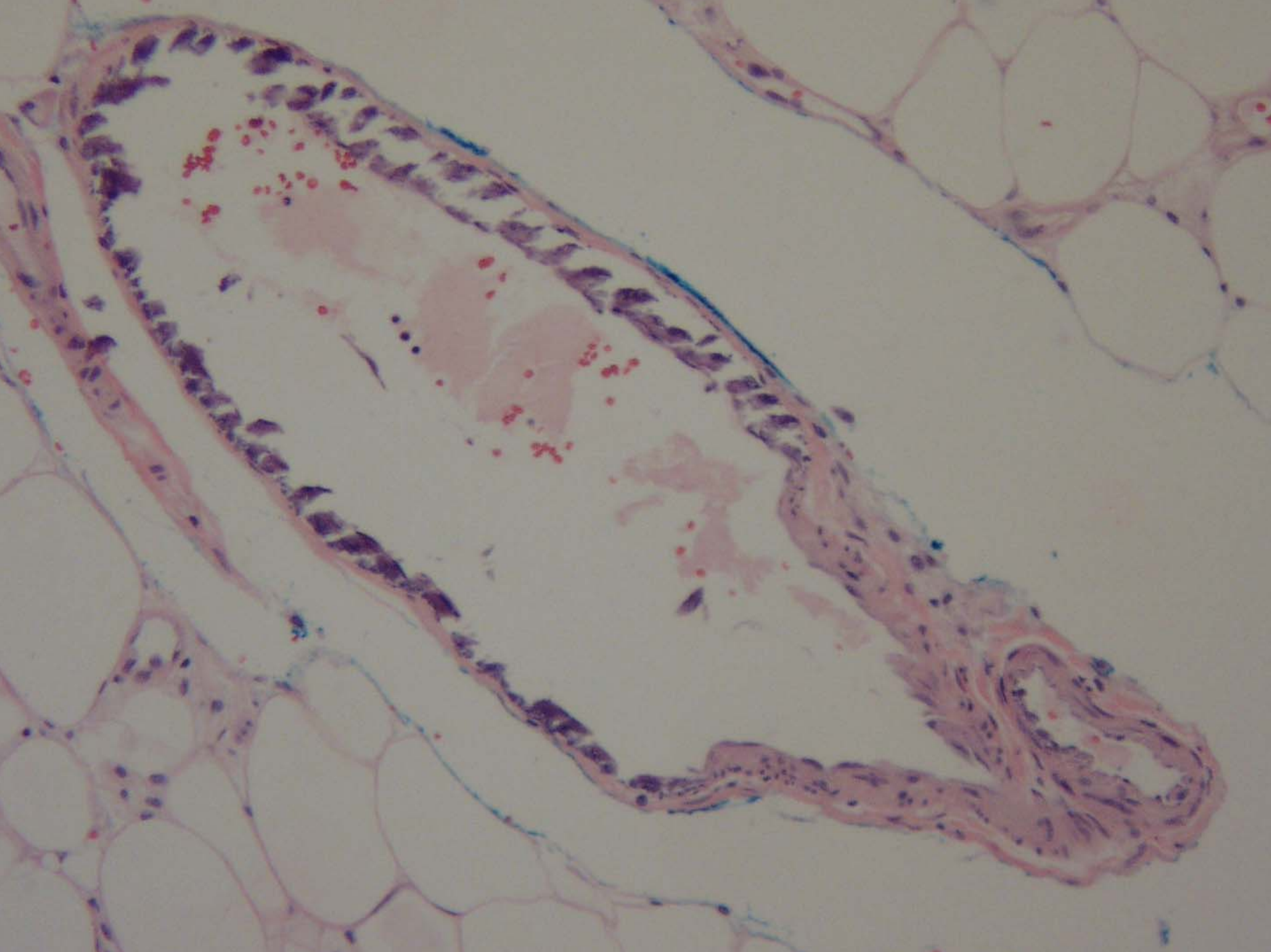
- Supportive
- Treat symptomatic hypercalcemia aggressively

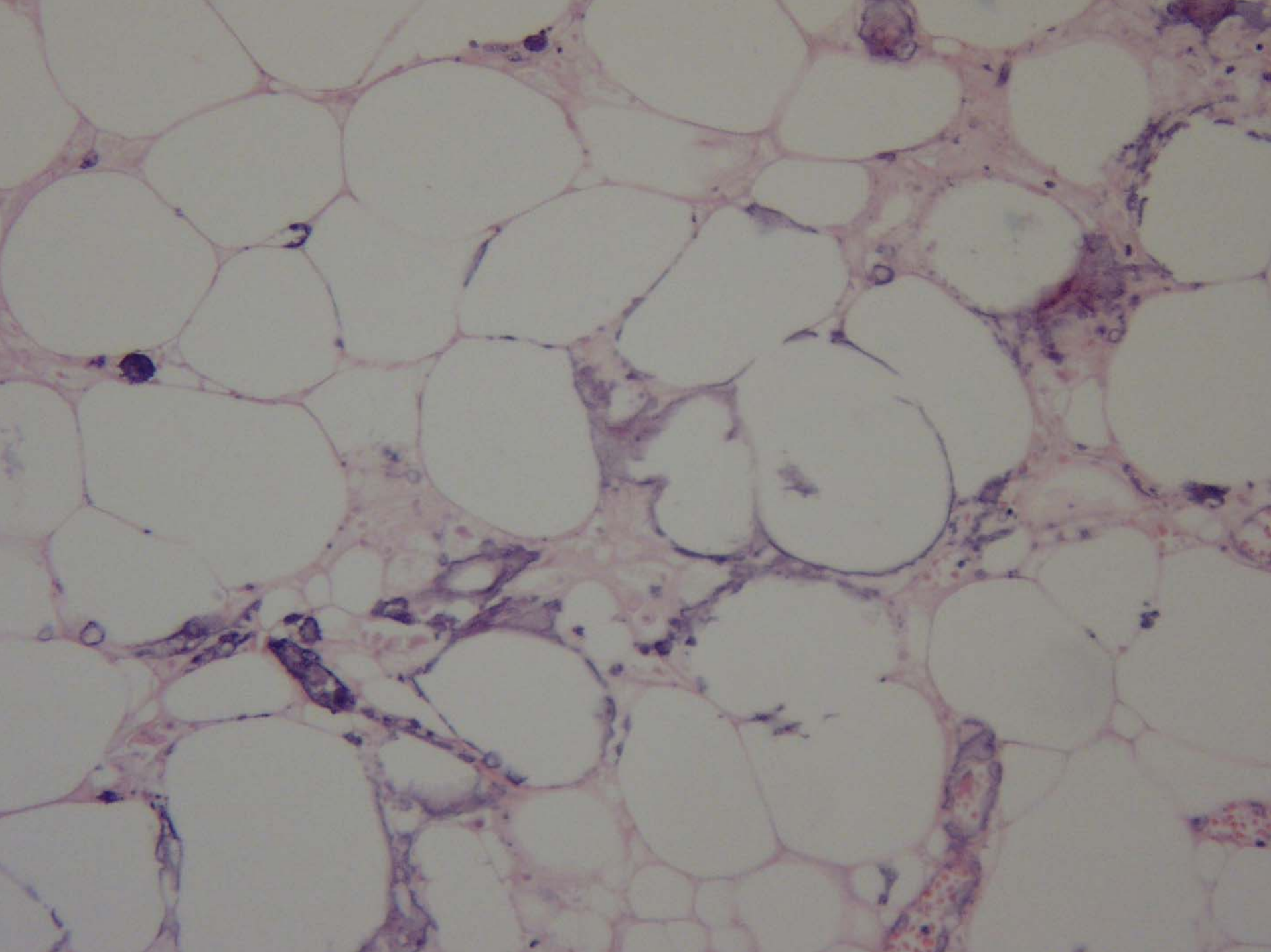


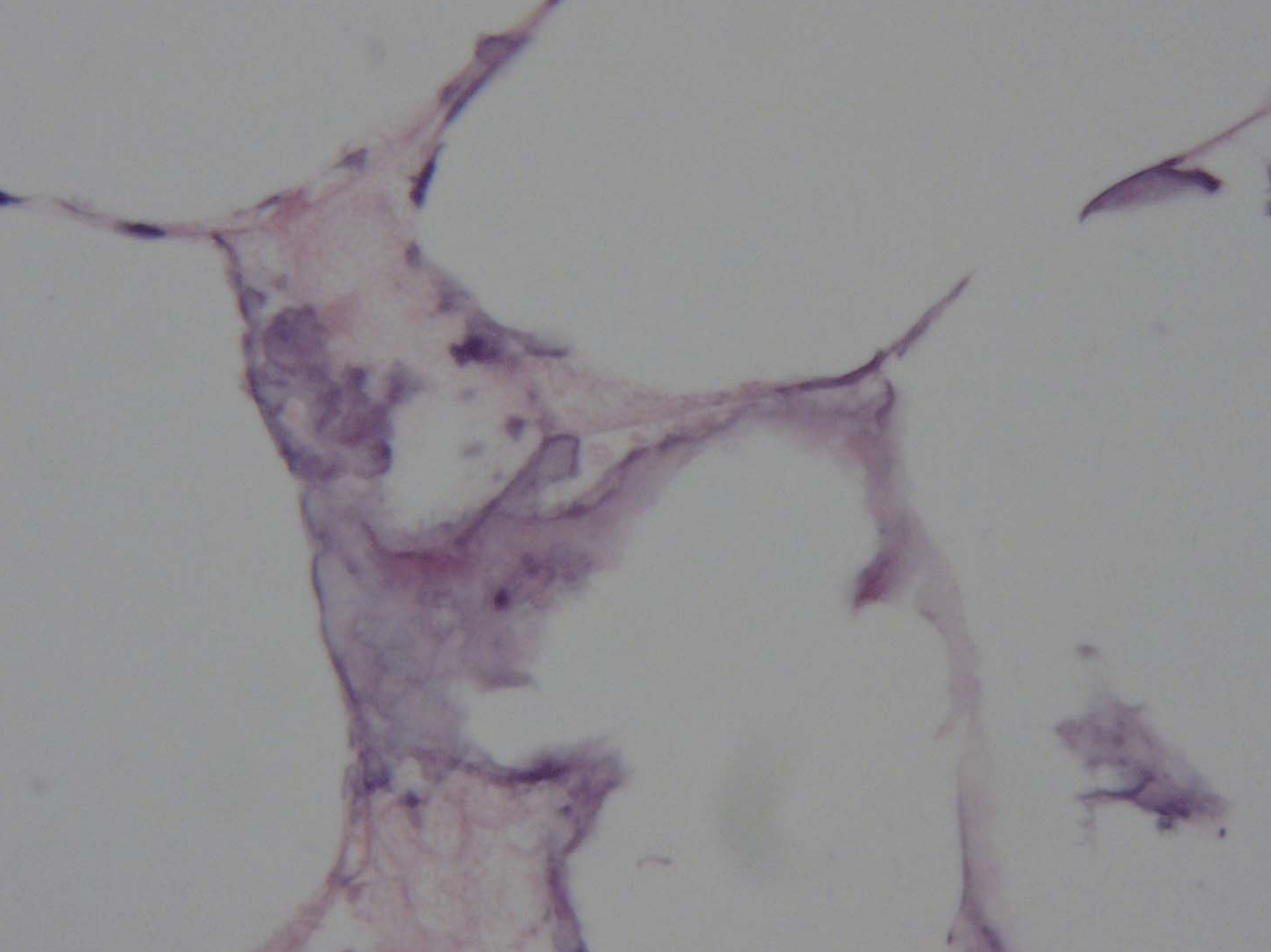


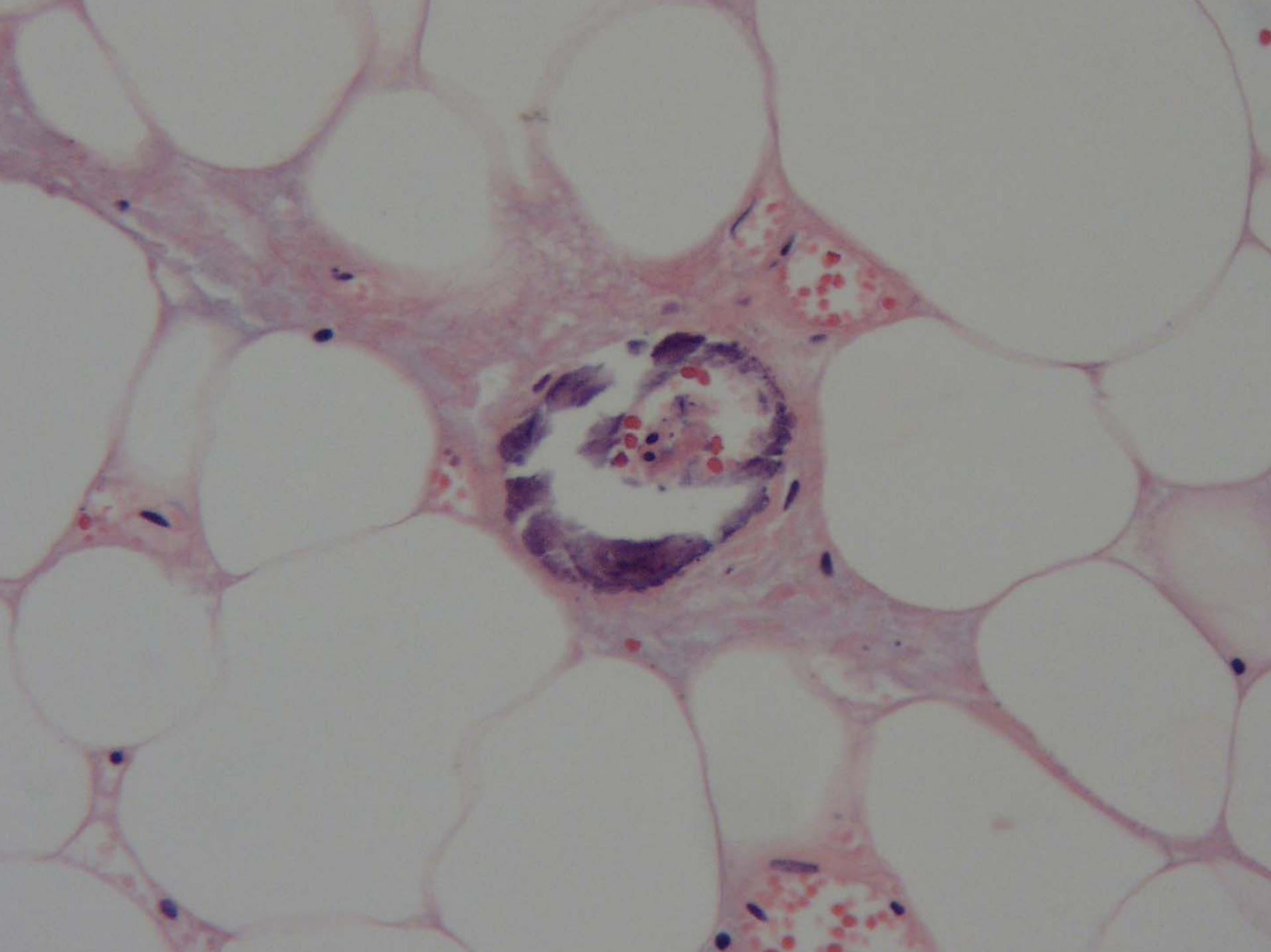


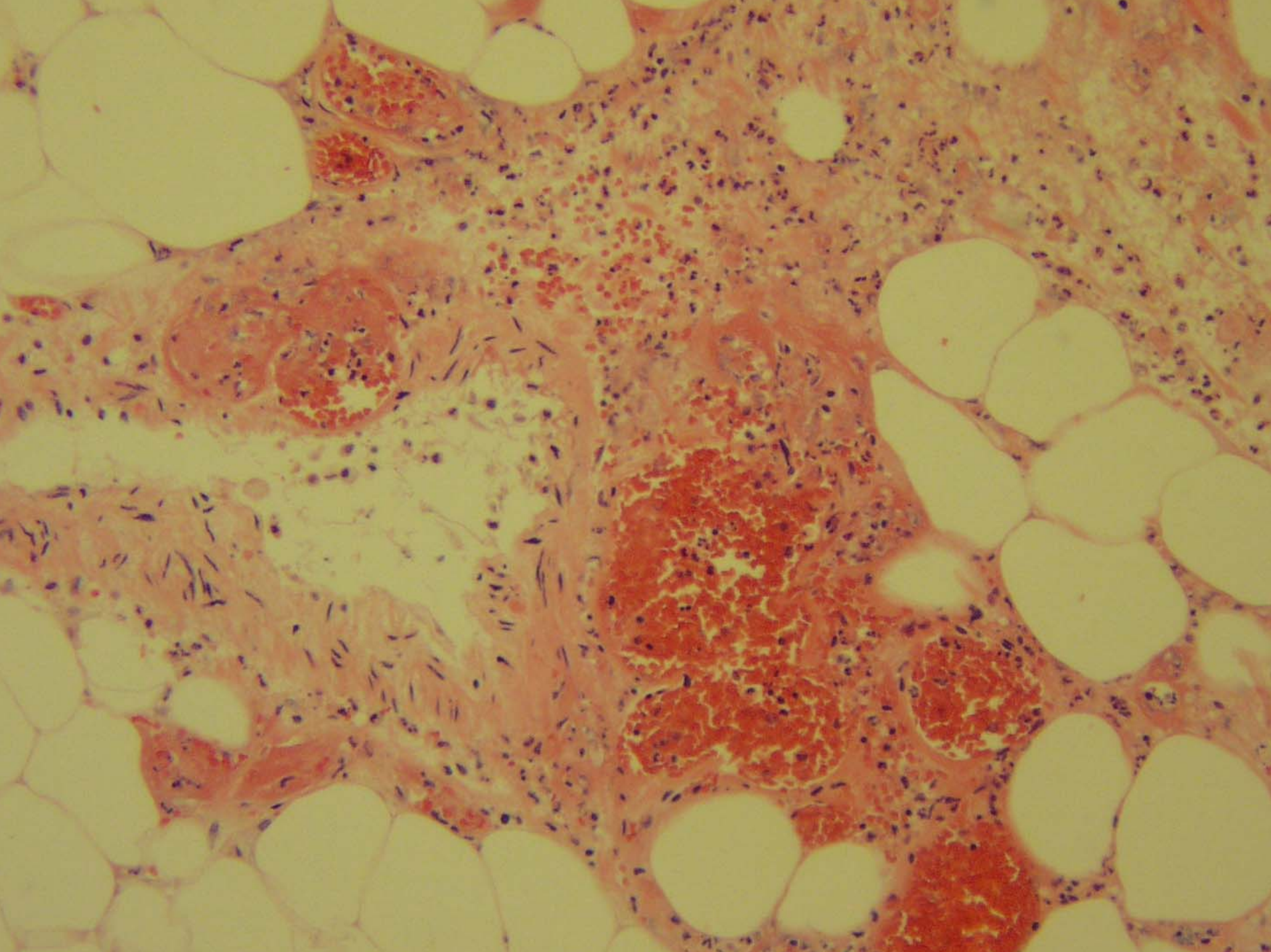


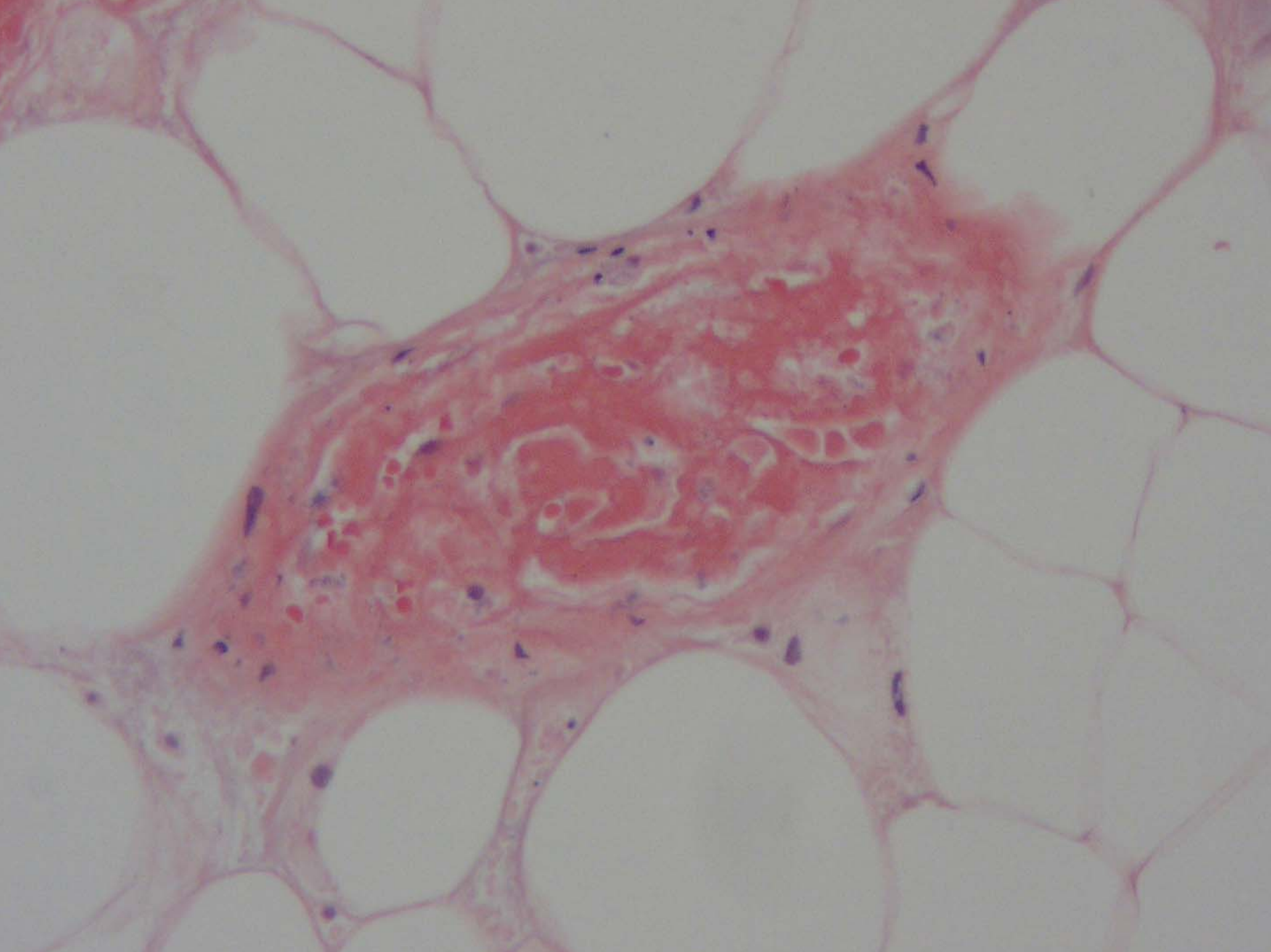


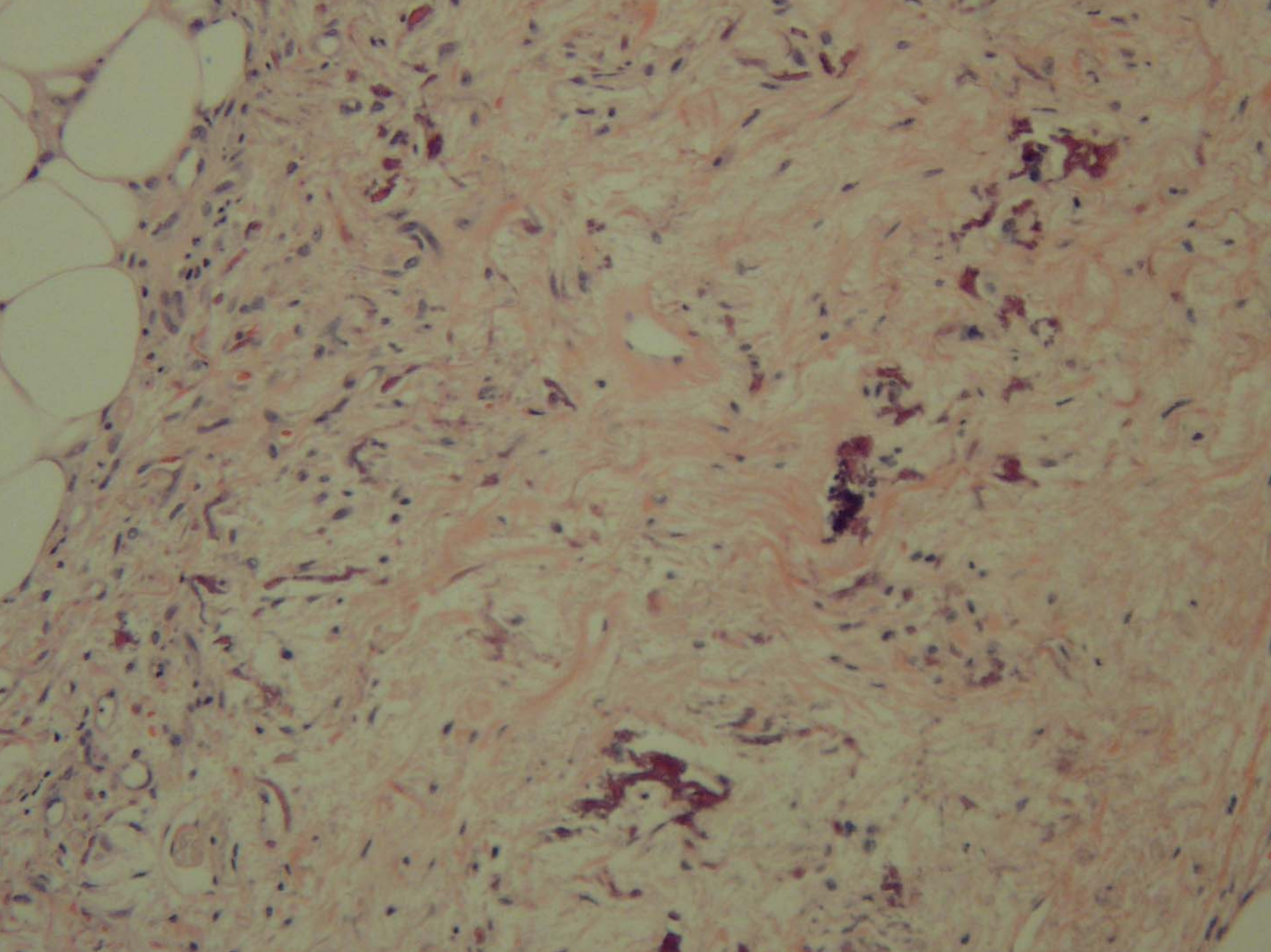


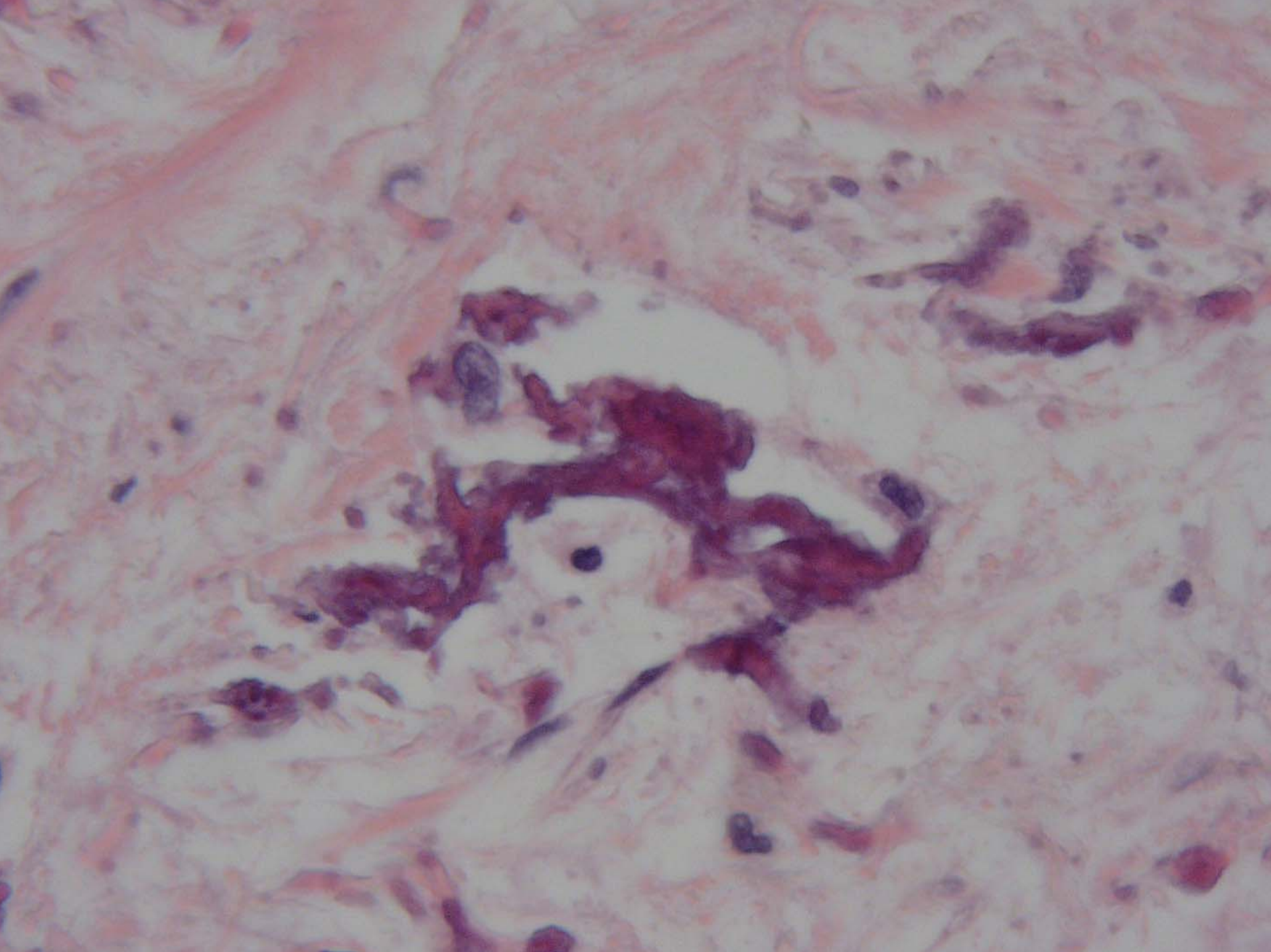












Calciophylaxis

Calciophylaxis

- 1-4% of the ESRD population
 - Probably rare in general population
- Mortality/Morbidity
 - Mortality rate 60-80%
 - Leading cause of death is sepsis from infected, necrotic skin lesions
 - Mortality rate is higher in patients with proximal disease than in those with only distal or acral disease
- More prevalent in whites
- F:M 3:1
- 6 months to 83 years
 - Mean age of 48 years
 - Younger patients with longer duration of renal replacement therapy more predisposed

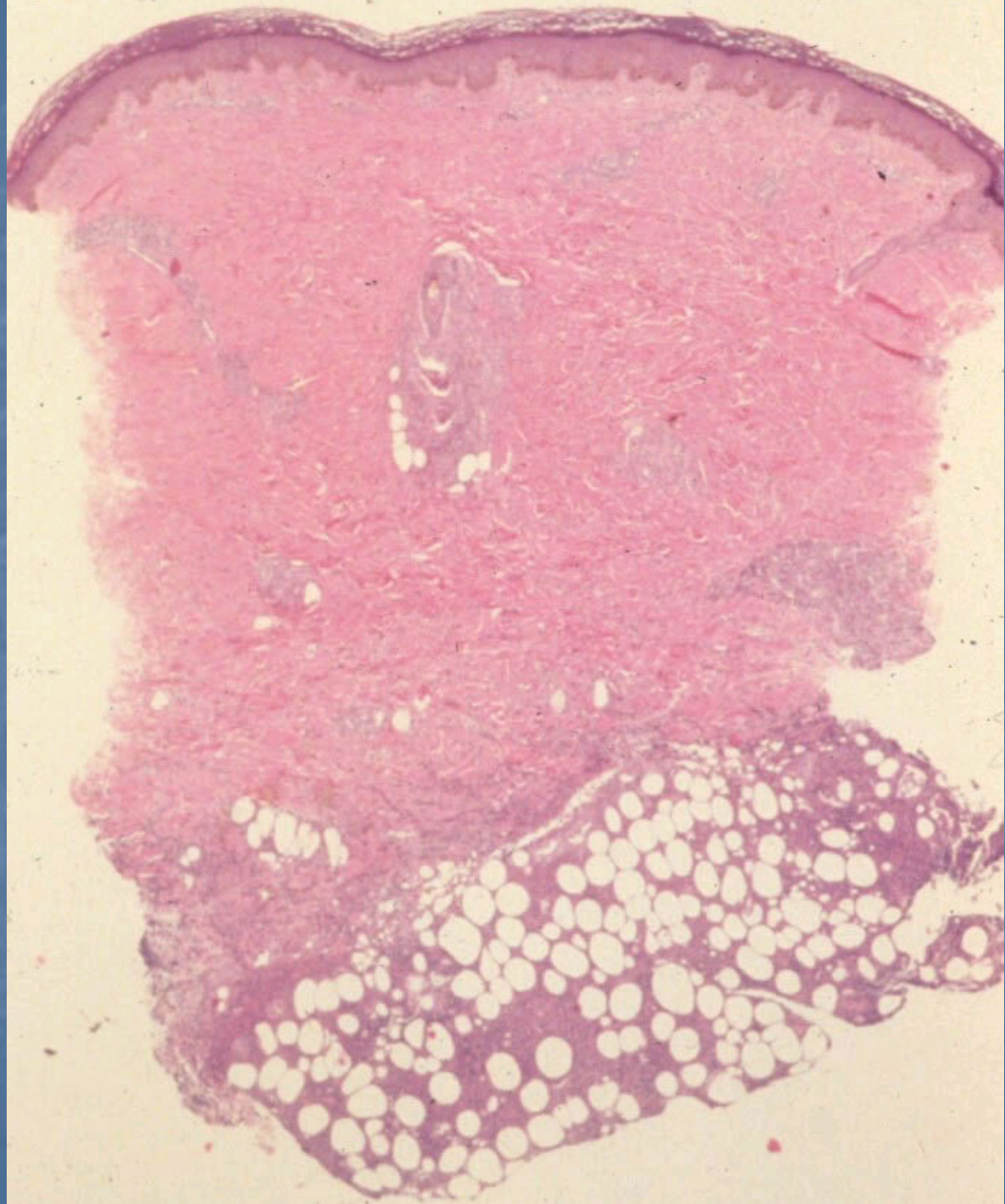
Clinical

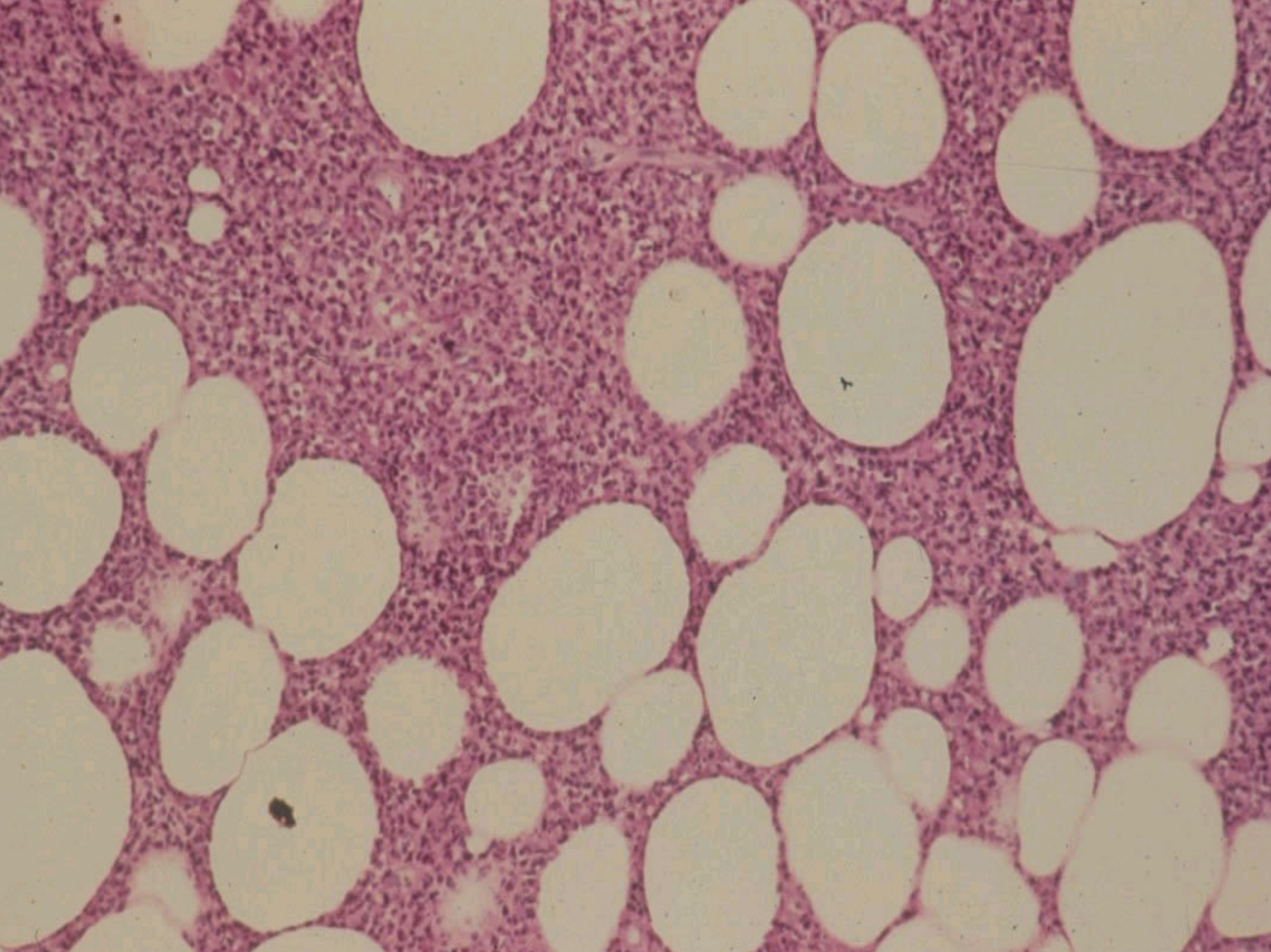
- Increased risk
 - Obesity
 - Increased where body fat is most abundant, the thighs, buttocks and lower abdomen
 - Glucocorticoid exposure

Pathogenesis

- Multifactorial
 - Associated disorders chronic renal failure, hypercalcemia, hyperphosphatemia, an elevated calcium-phosphate product and secondary hyperparathyroidism
 - Hypercoagulable conditions including protein C and protein S deficiencies
 - Sensitizing events and agents included nephrectomy and exposure to parathyroid hormone and vitamin D
 - Challengers included egg albumin and metallic salts







Septic Panniculitis

What do I need to consider in
diagnosing a panniculitis?

Clinical

- Consider in any unexplained panniculitis
- Special stains
- Cultures

Questions



- It is better to know some of the questions than all of the answers.

James Thurber (1894 - 1961)