

Author(s): Gerald Abrams, M.D., Stephen Ramsburgh, M.D., 2009

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Pathology

- Etiology of disease
- Pathogenesis of disease
- Structural alterations resulting from disease (gross and microscopic)
- Natural history of the disease process
- Functional consequences of disease

Pathology

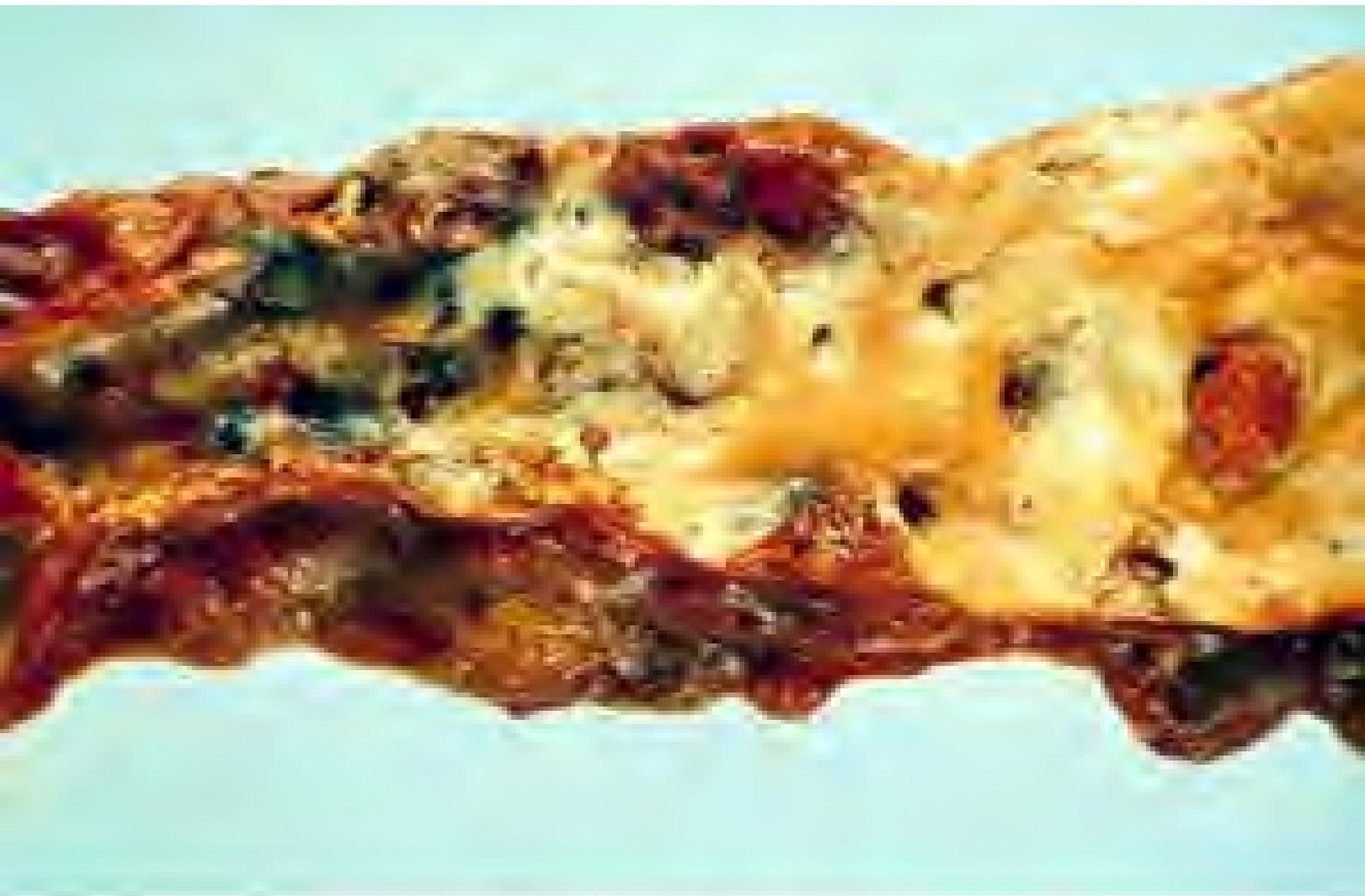
- Systemic Pathology
 - Specific Diseases in Specific Organs
- If you understand basic disease process such as
 - cell death, inflammation, and neoplasia, the
 - questions of etiology, pathogenesis, natural
 - history and functional consequences of specific
 - diseases will fall into place in a rather common
 - sense fashion.

M-2 Cardiovascular Laboratory - 1

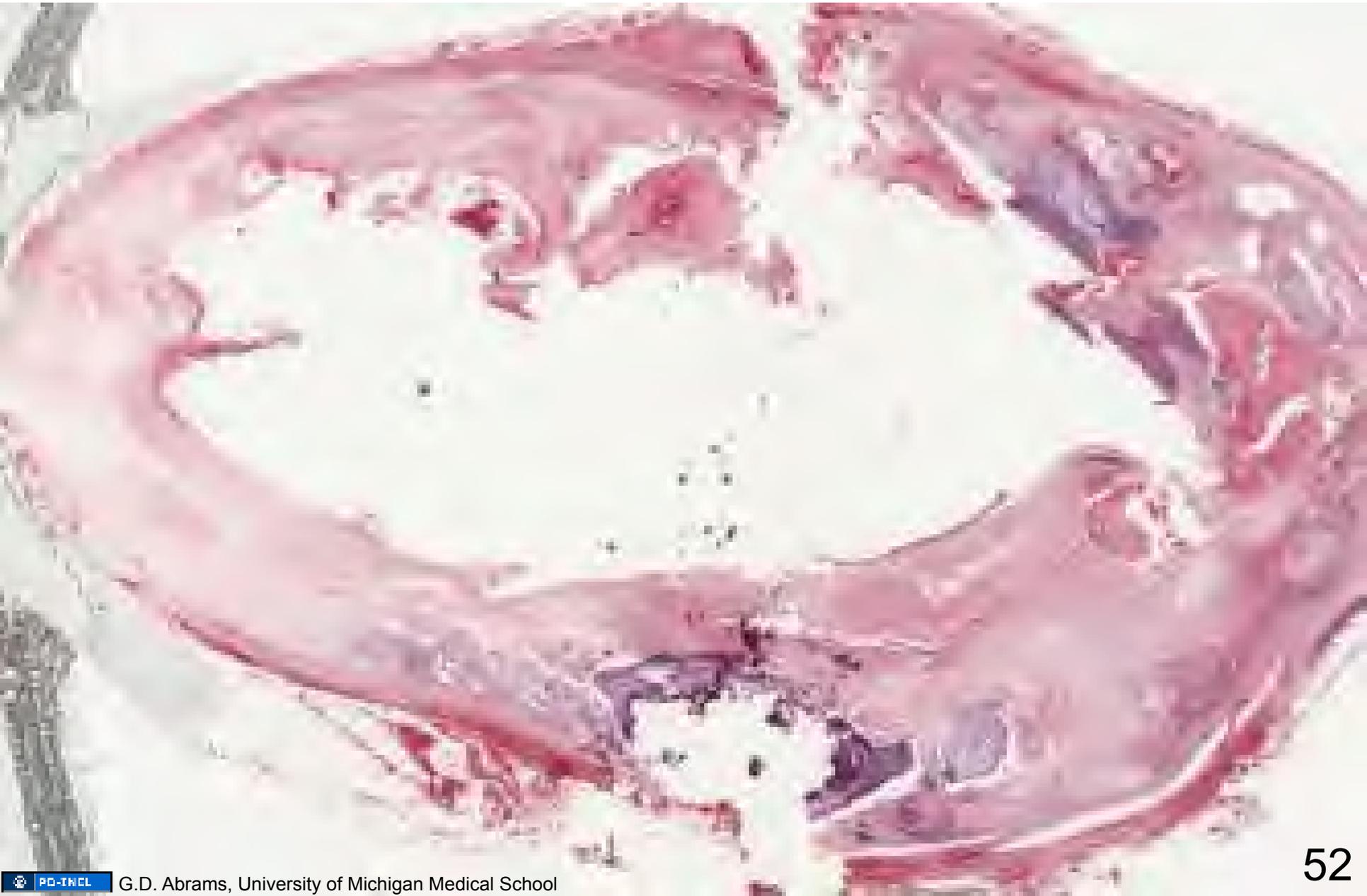
- 52** **Aortic atherosclerosis**
- 53** **Coronary atherosclerosis**
- 57** **Hyperplastic arteriolosclerosis**
- 14** **Hyaline arteriolosclerosis**
- 56** **Polyarteritis nodosa**
- 55** **Aortic dissection**

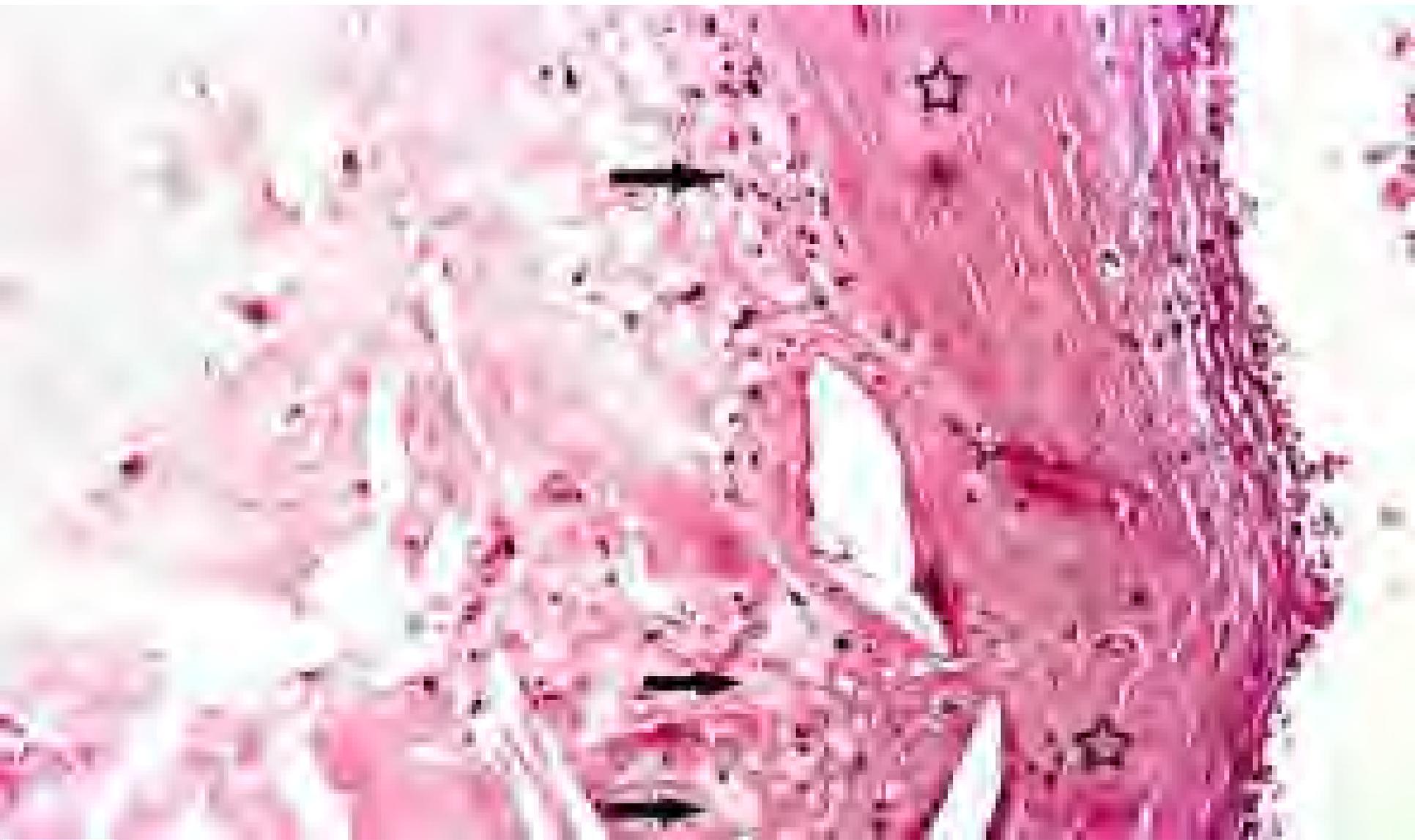
Aortic Atherosclerosis



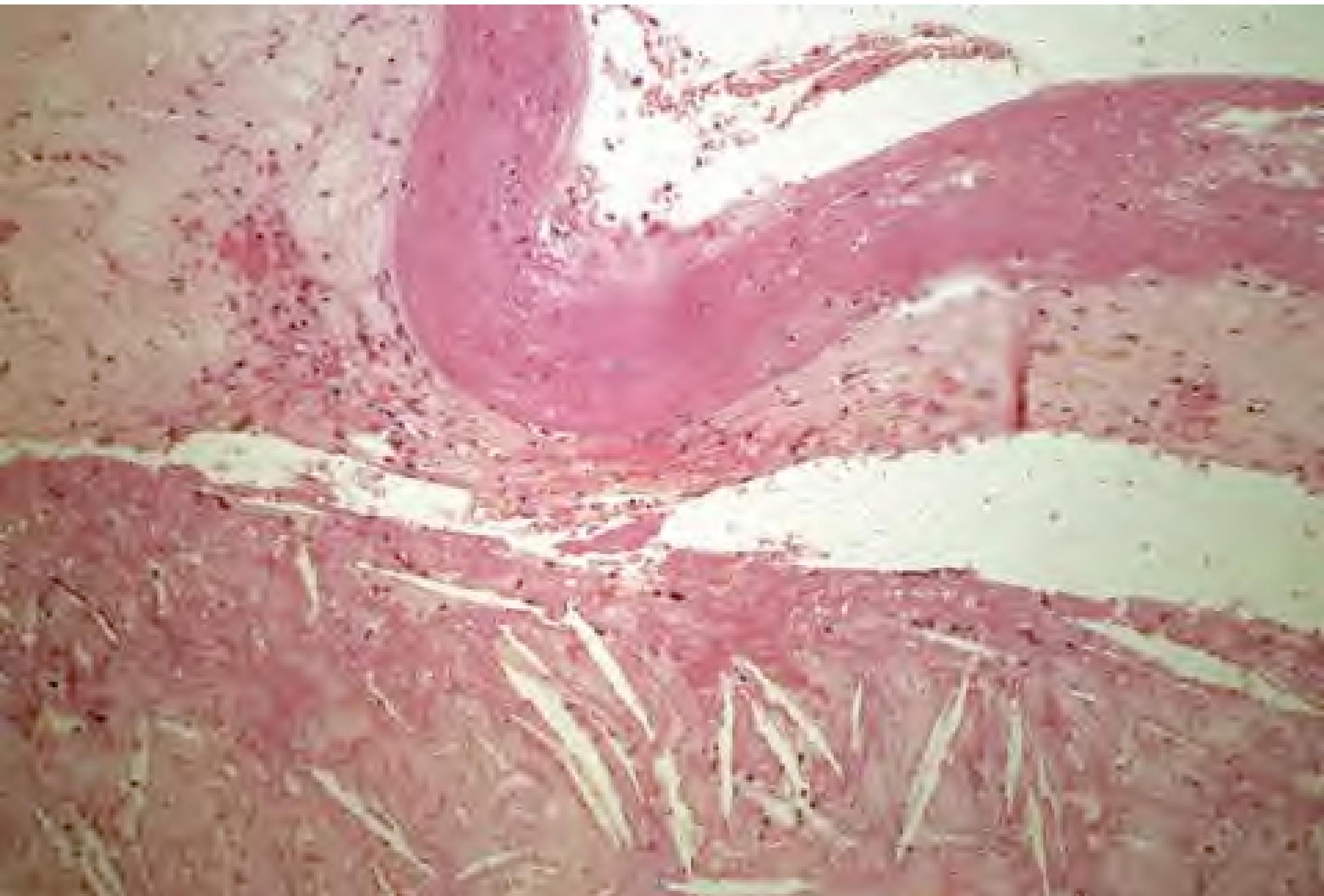


Aortic Atherosclerosis

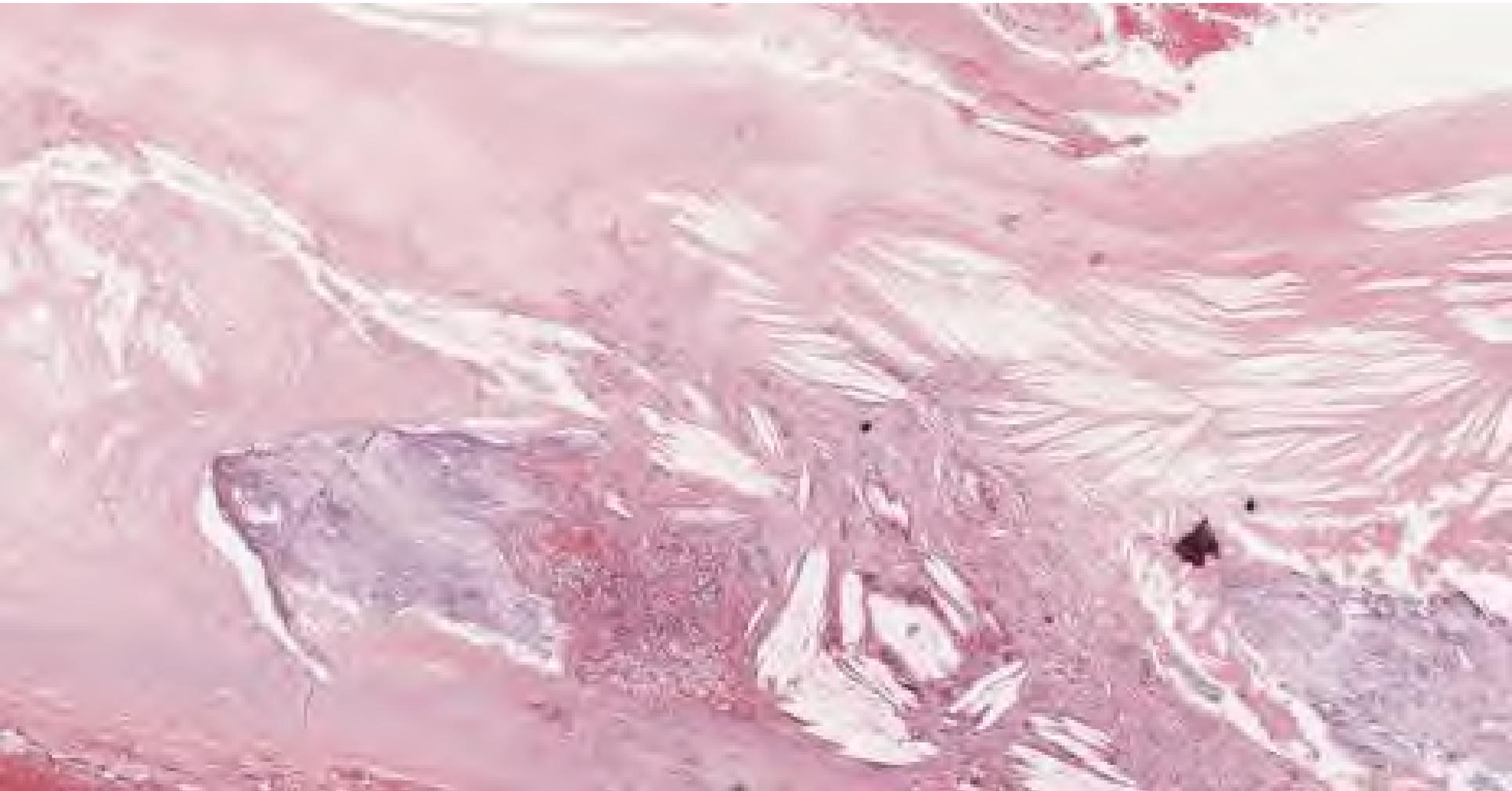


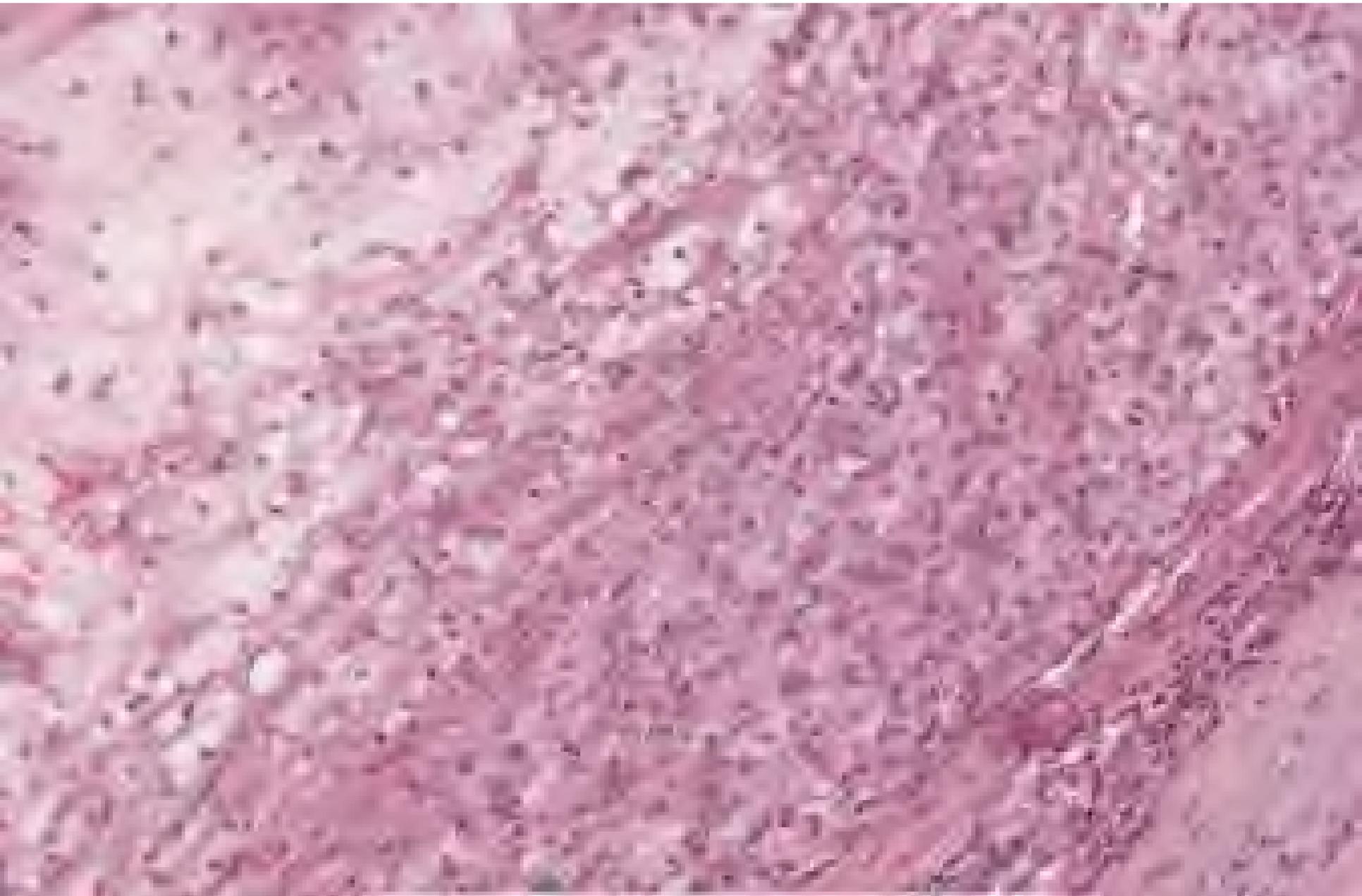


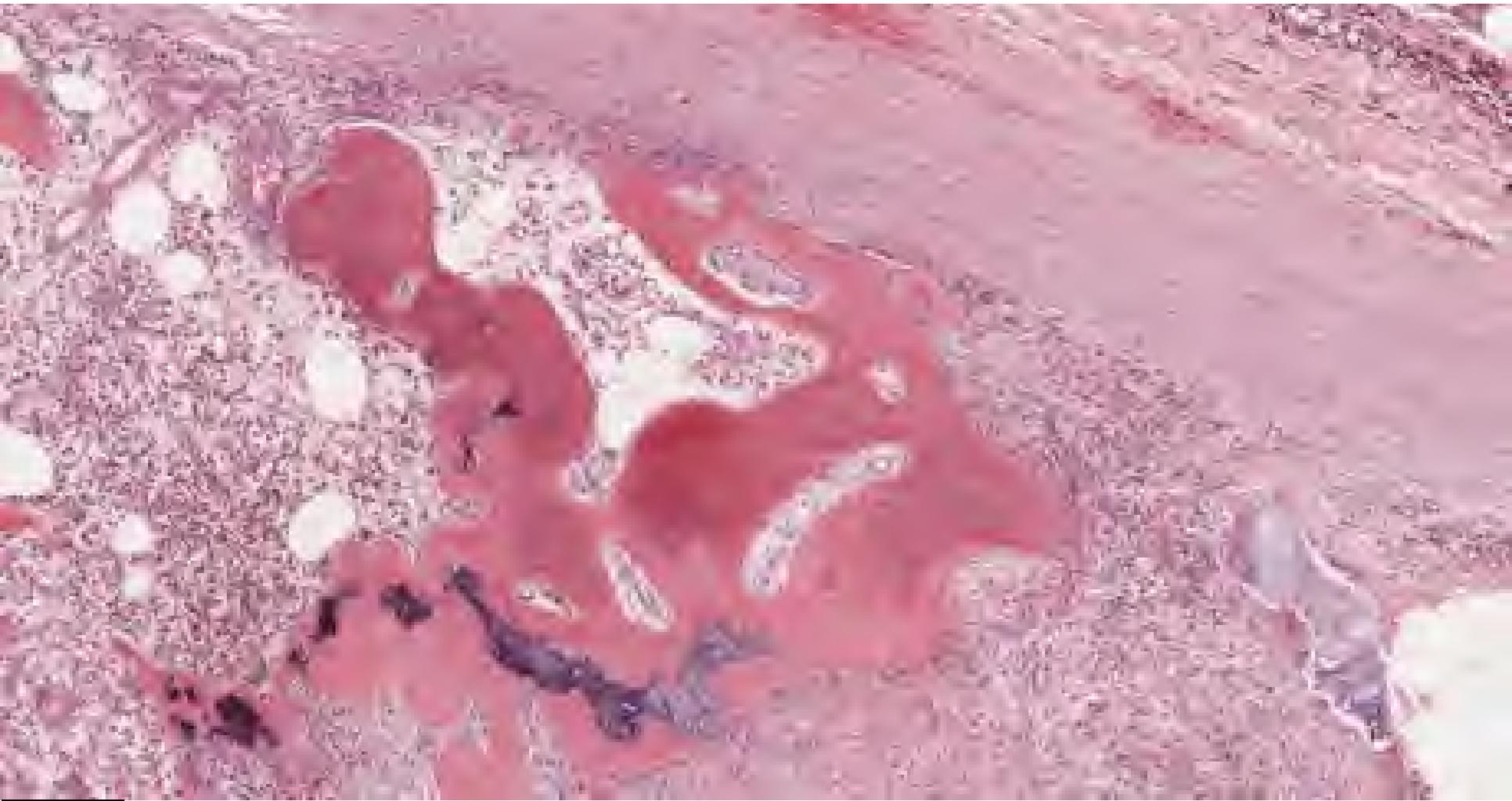












Coronary Atherosclerosis

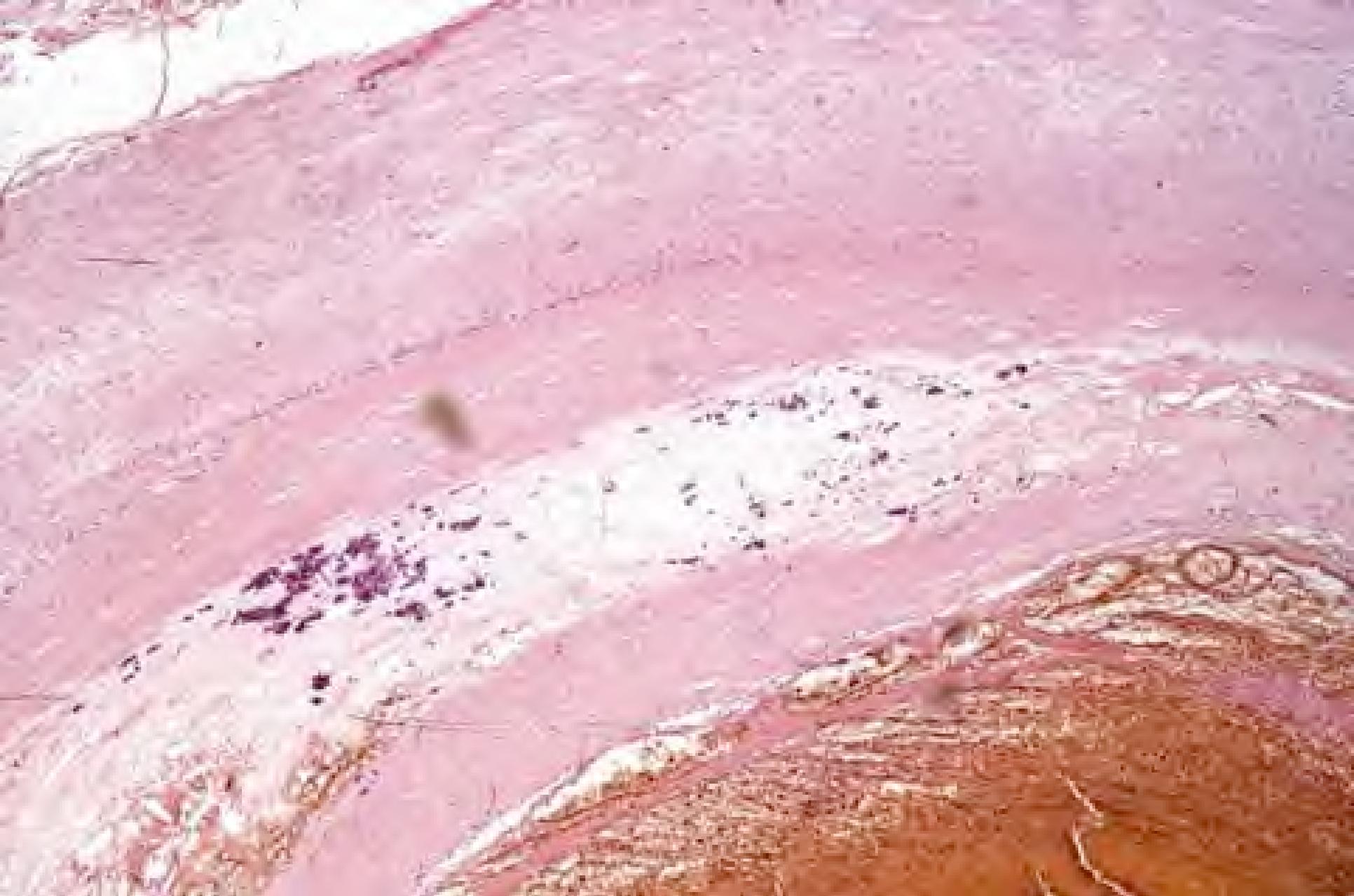




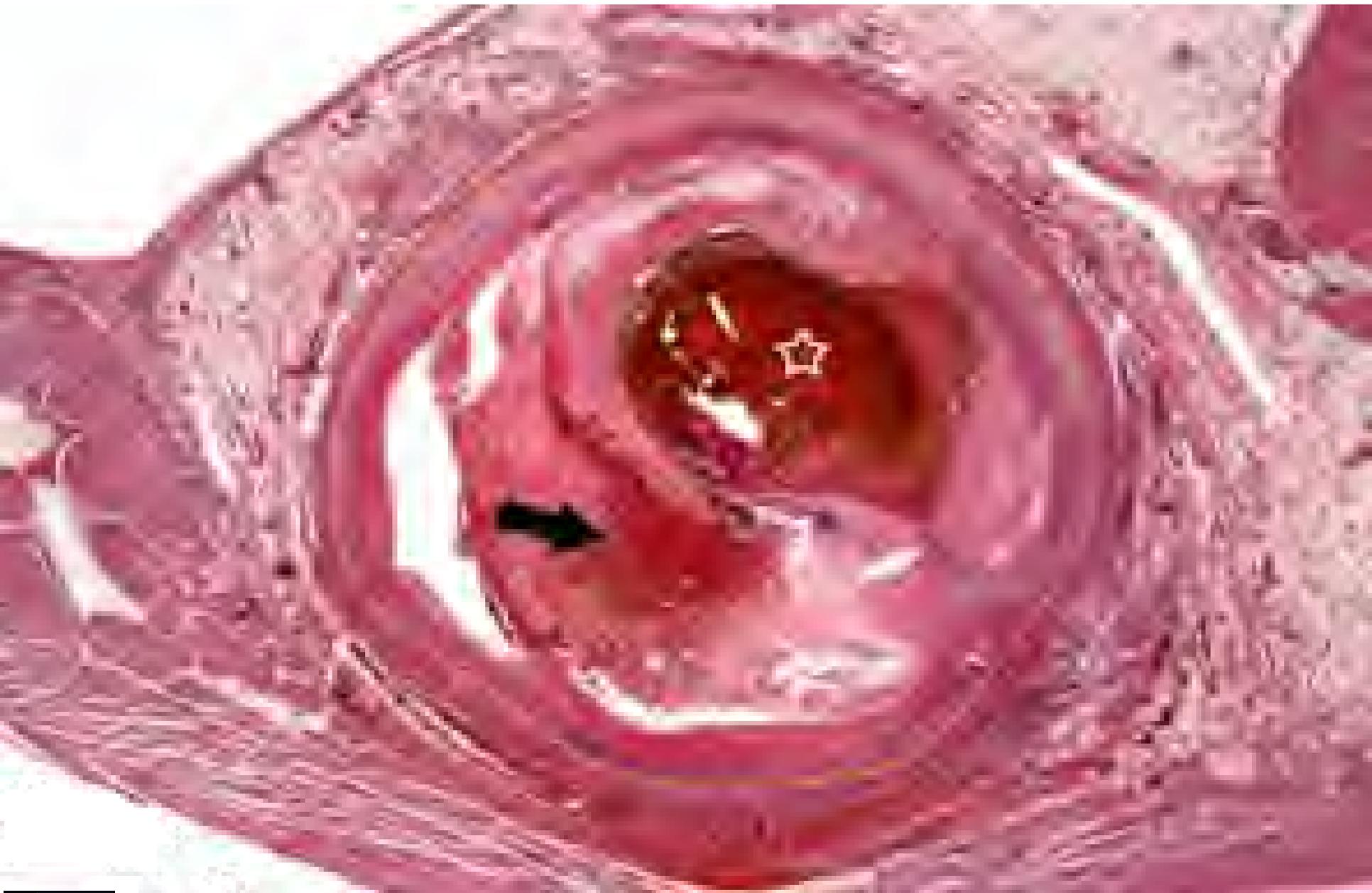


Coronary Atherosclerosis



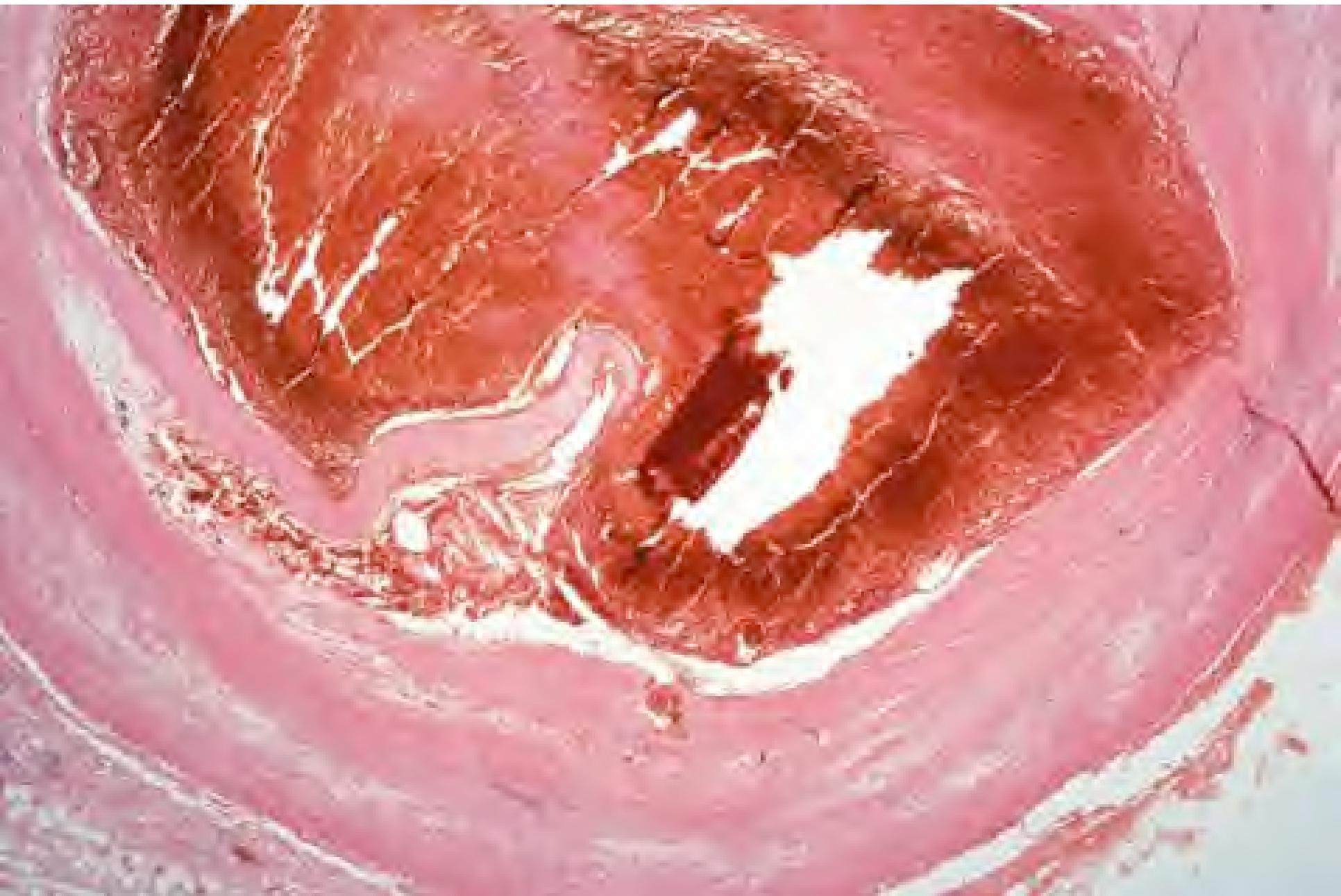


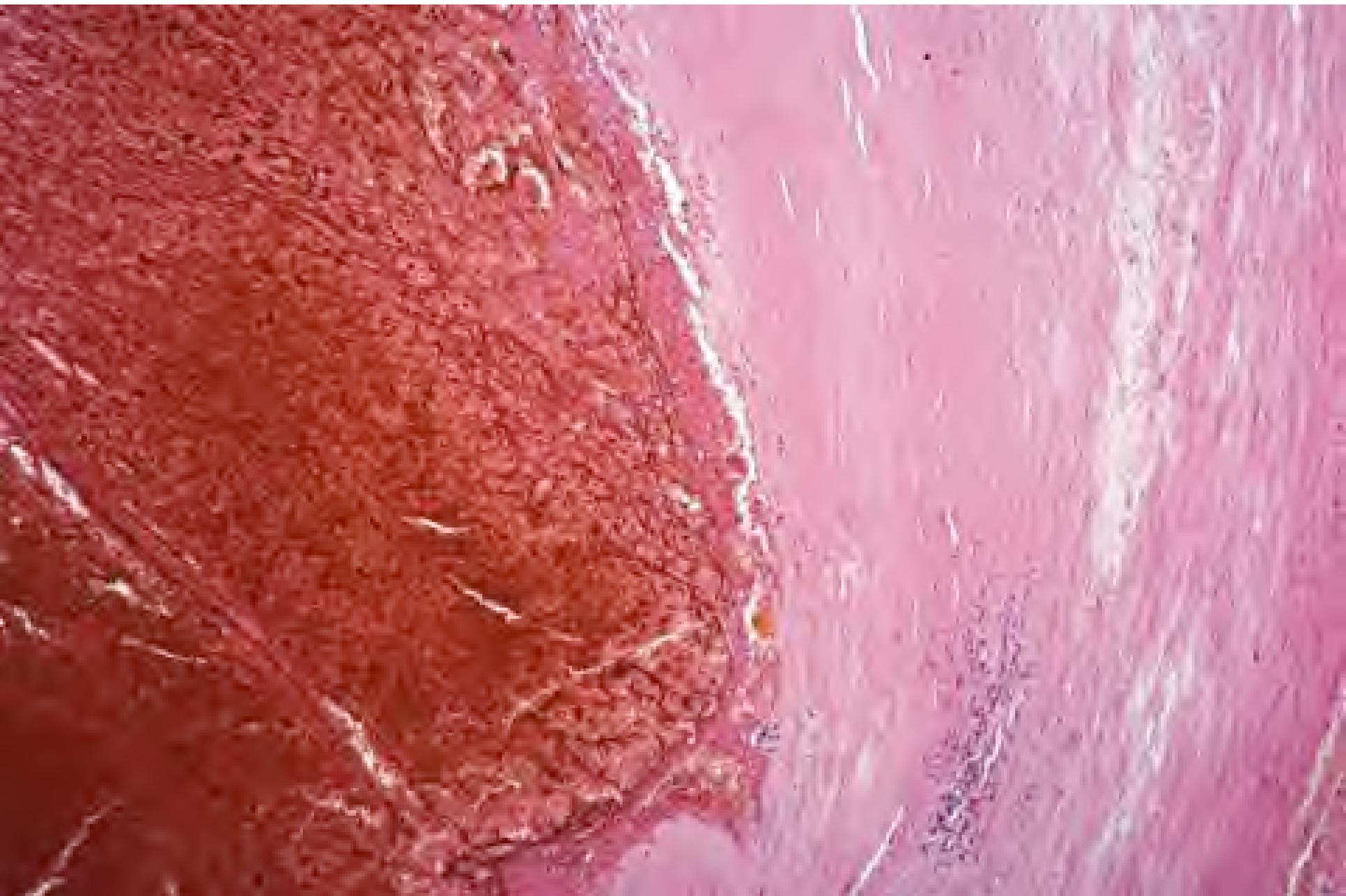




thrombus





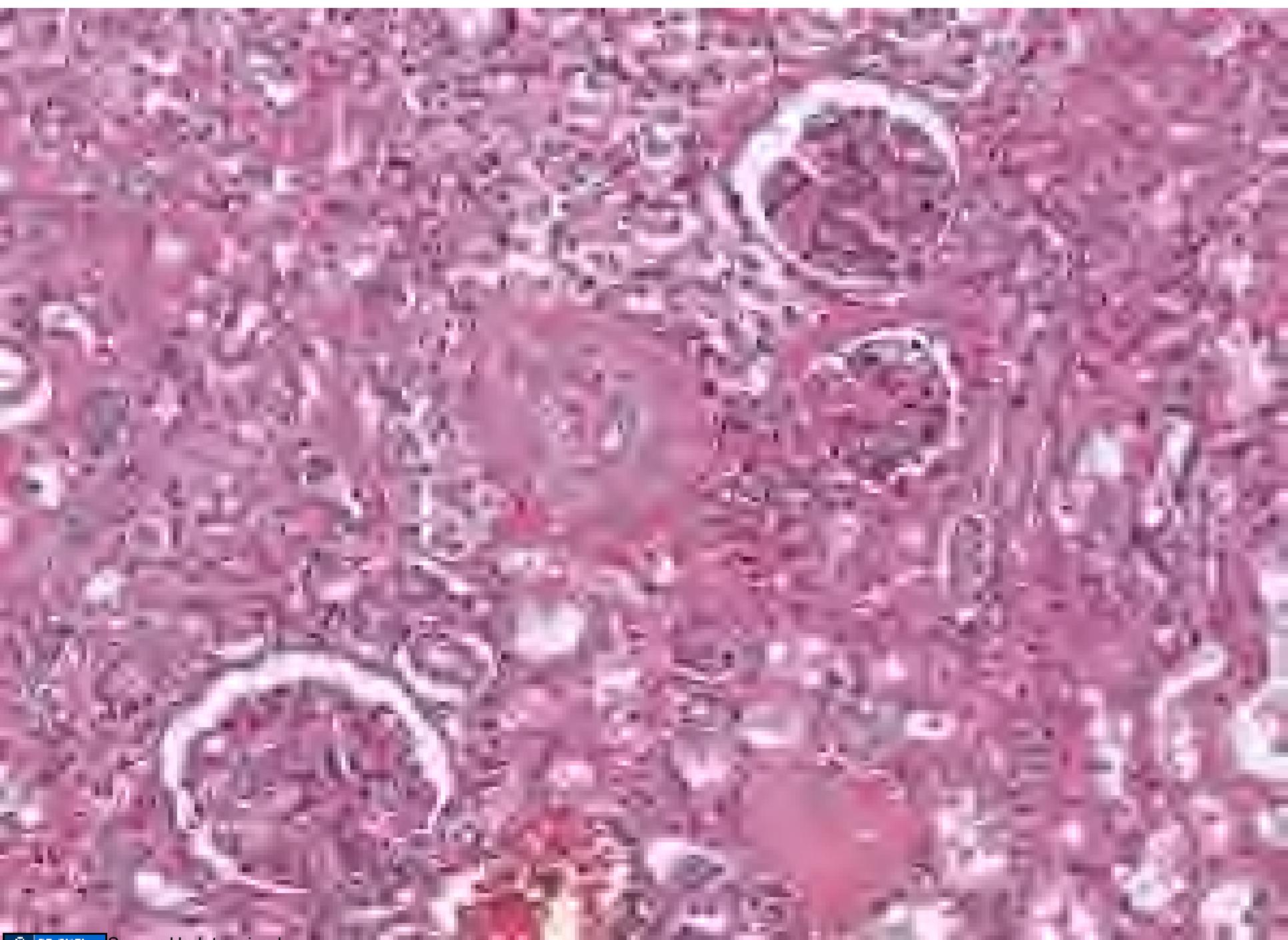


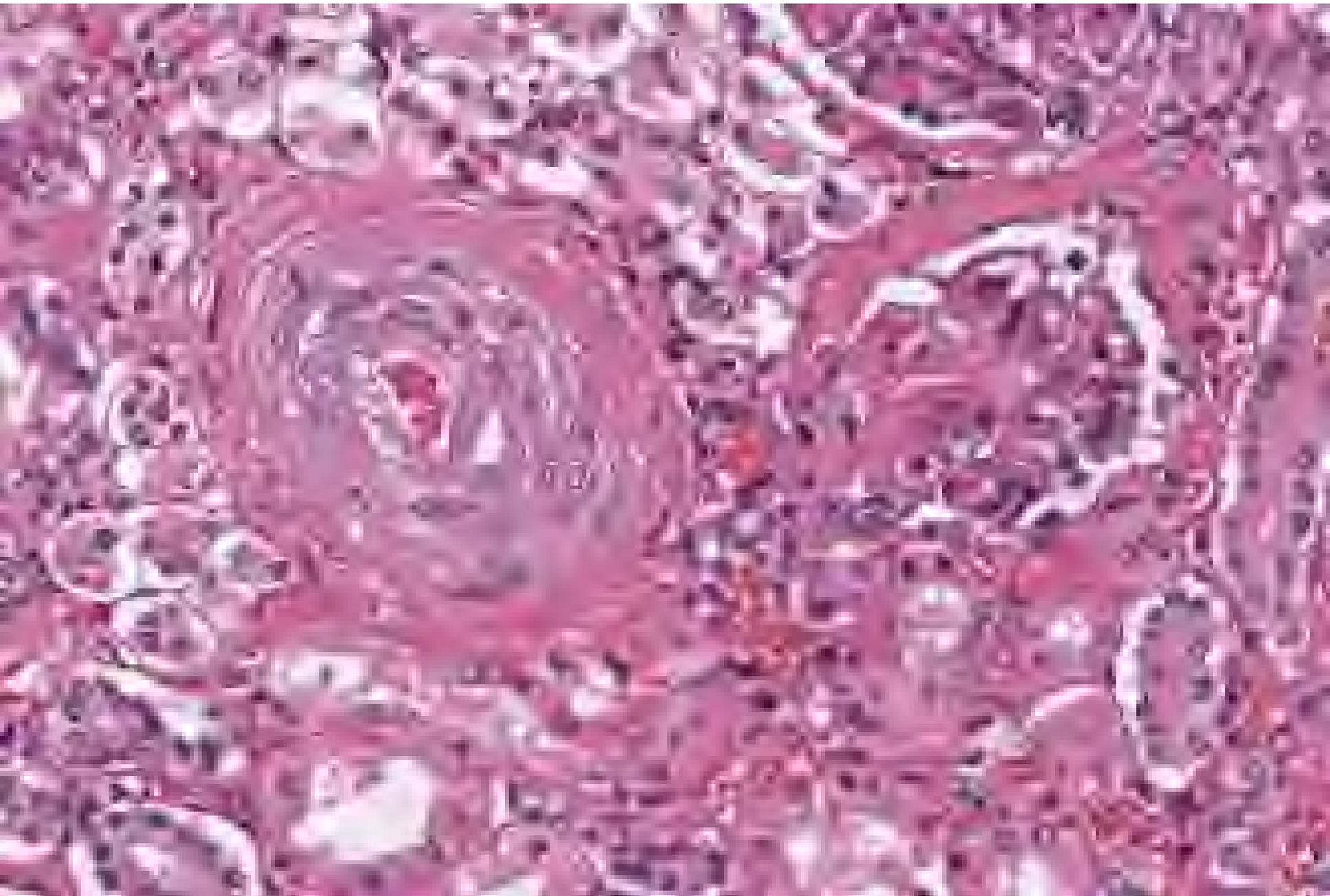
Hyperplastic Arteriolar Sclerosis

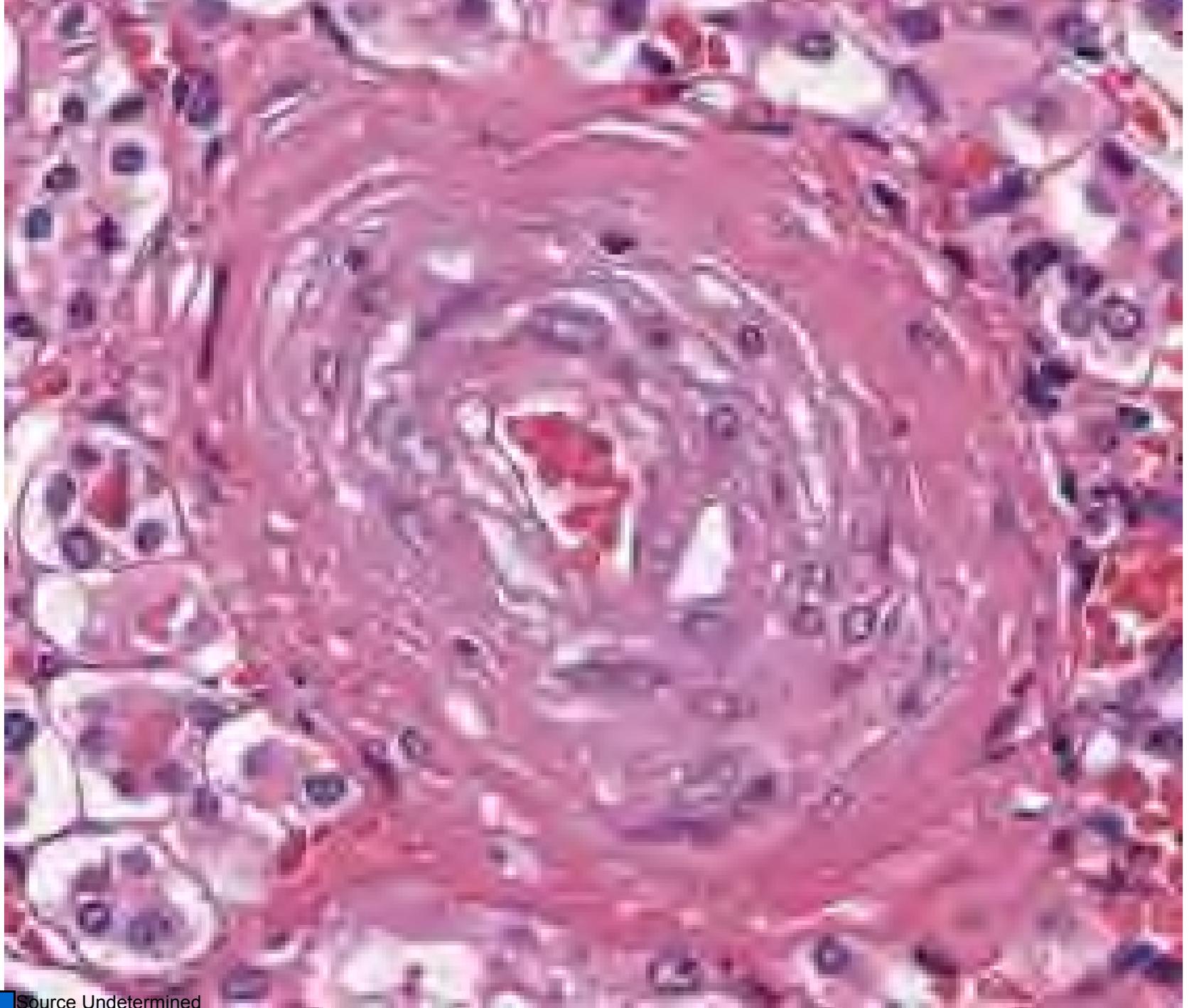


Normal Arteriole

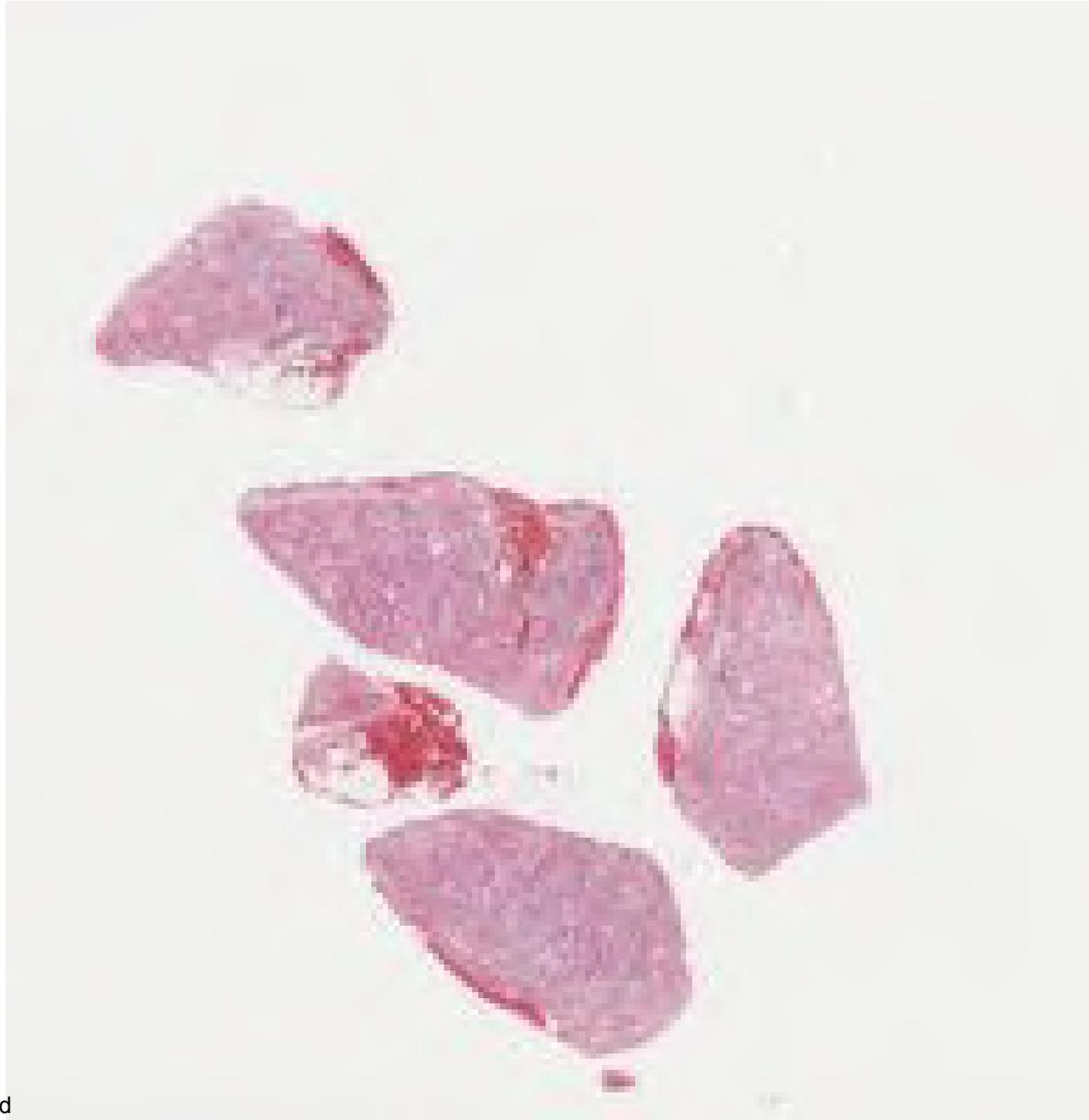


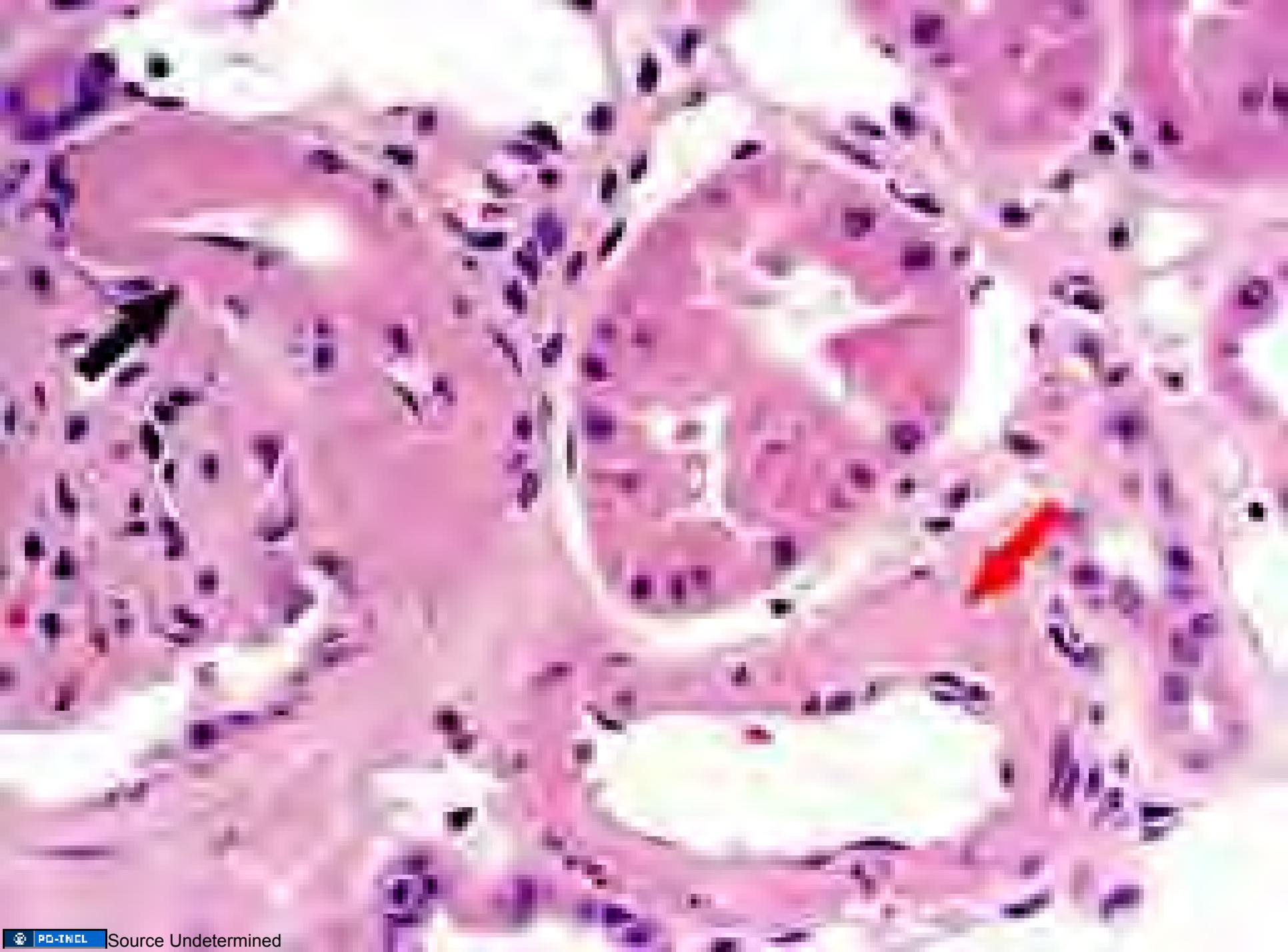


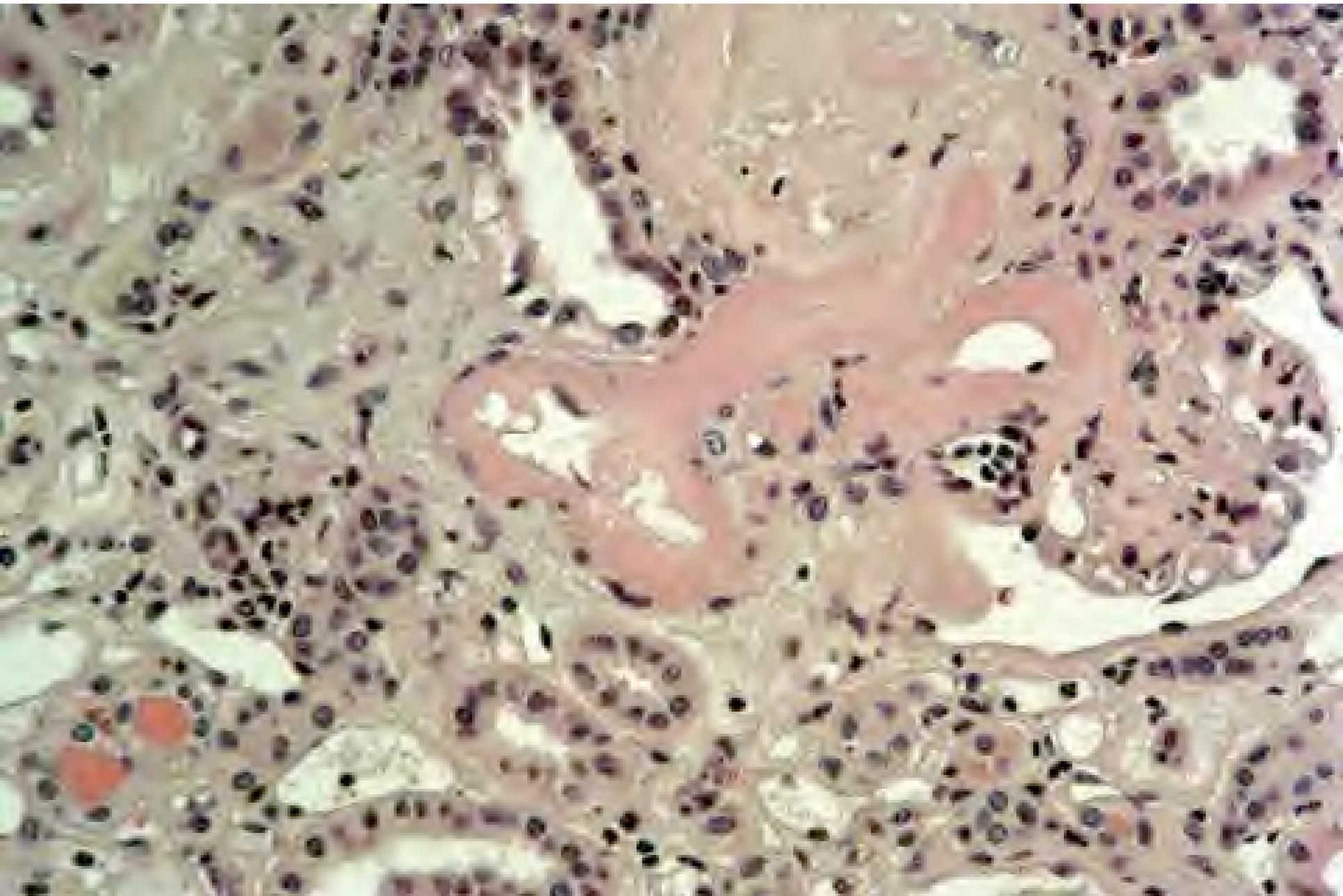


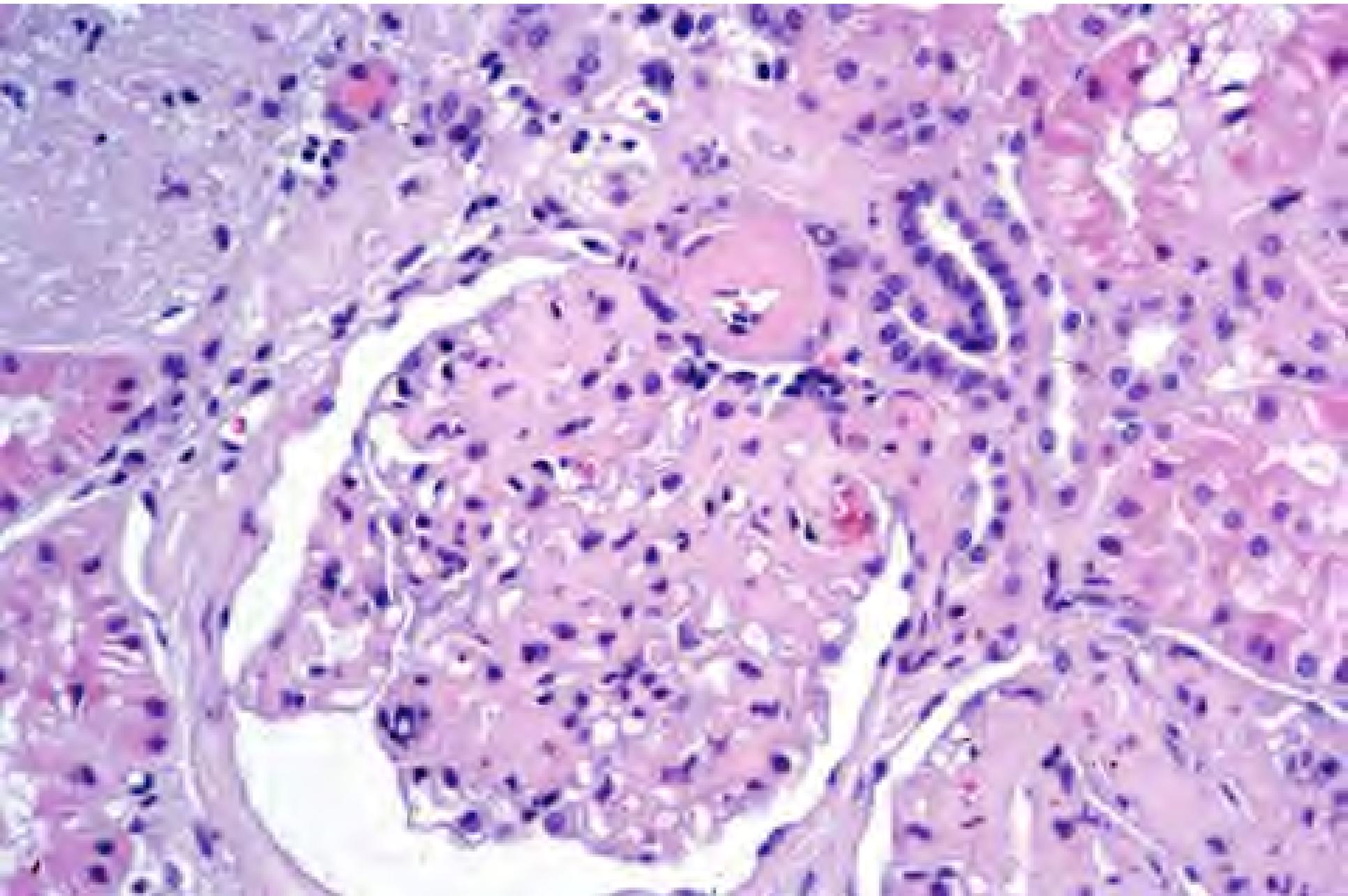


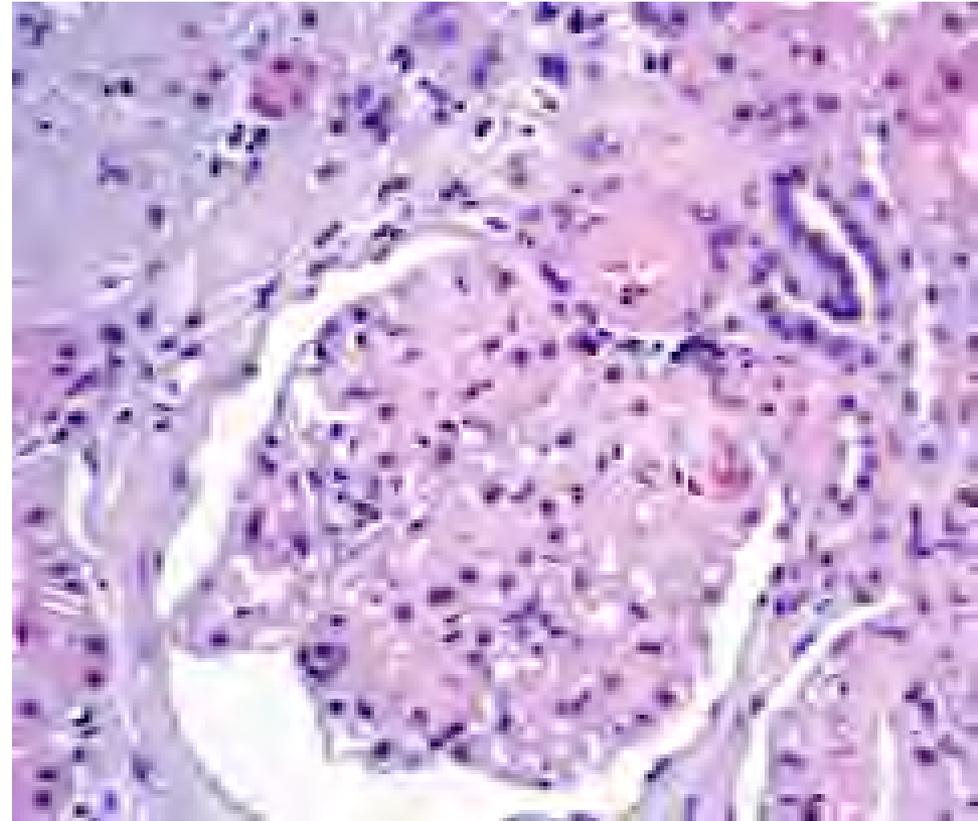
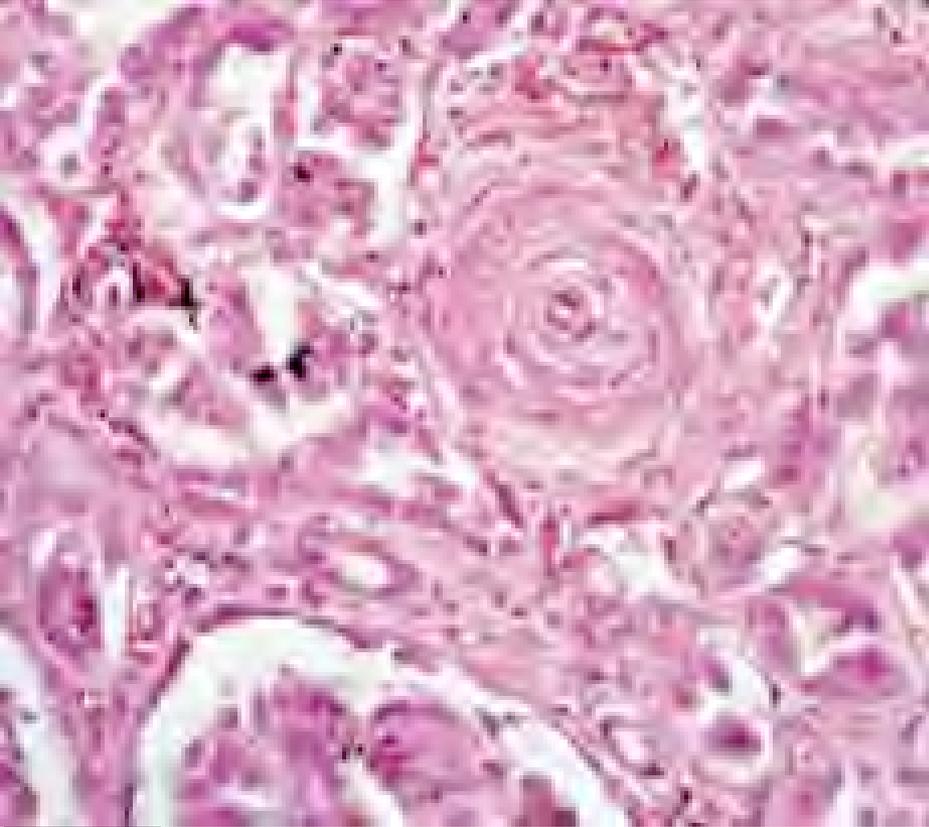
Hyaline Arteriosclerosis





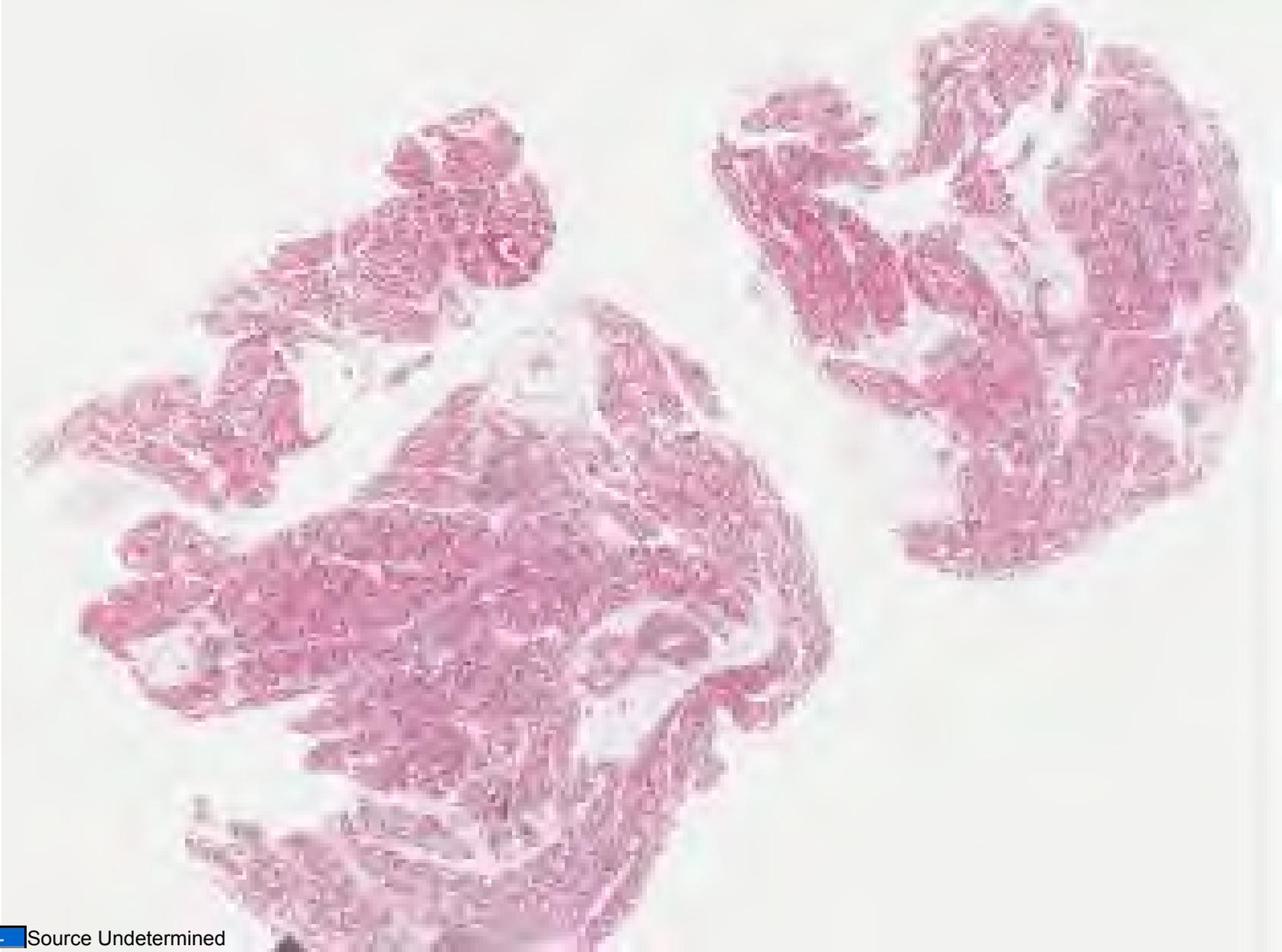


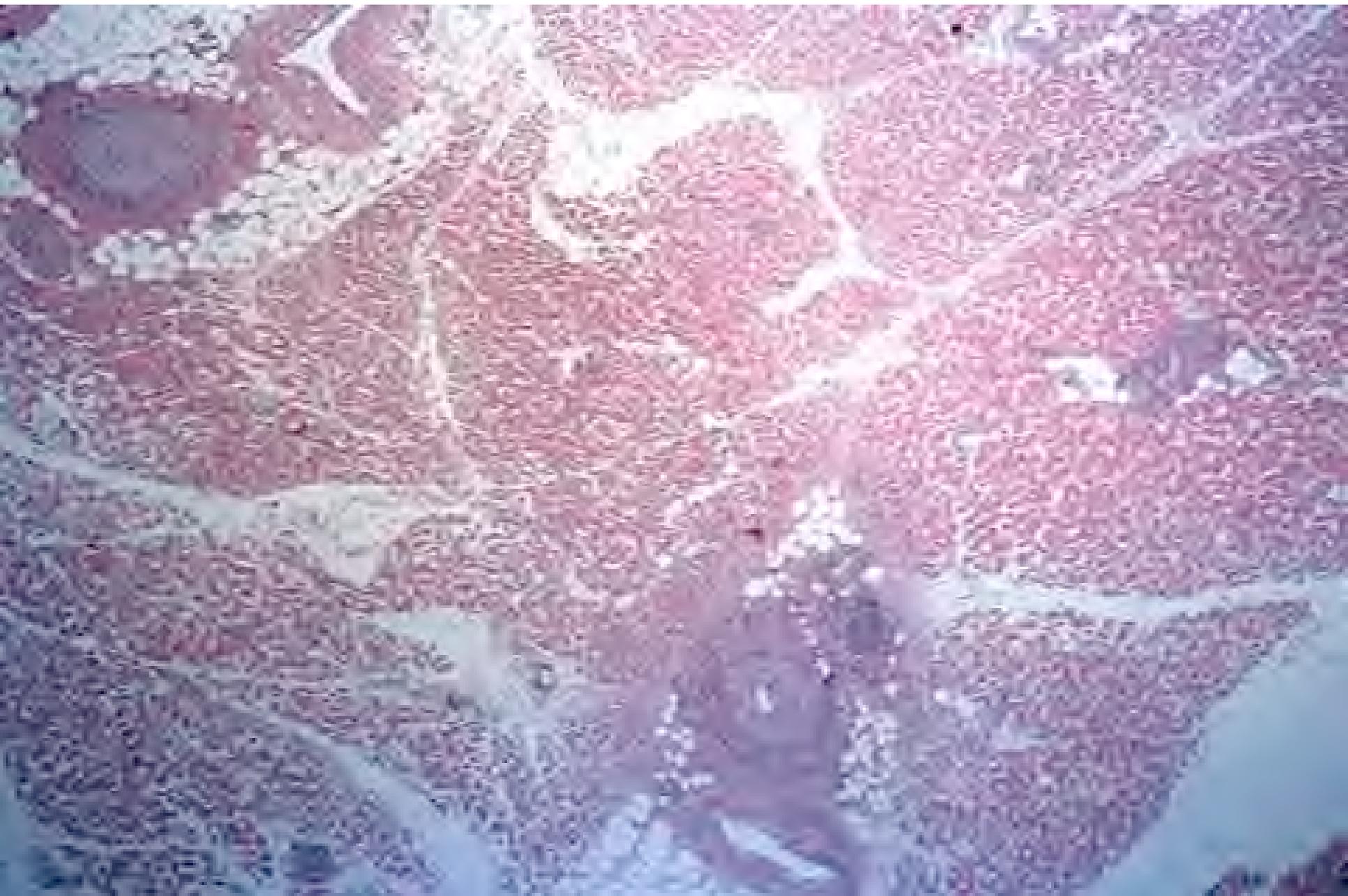


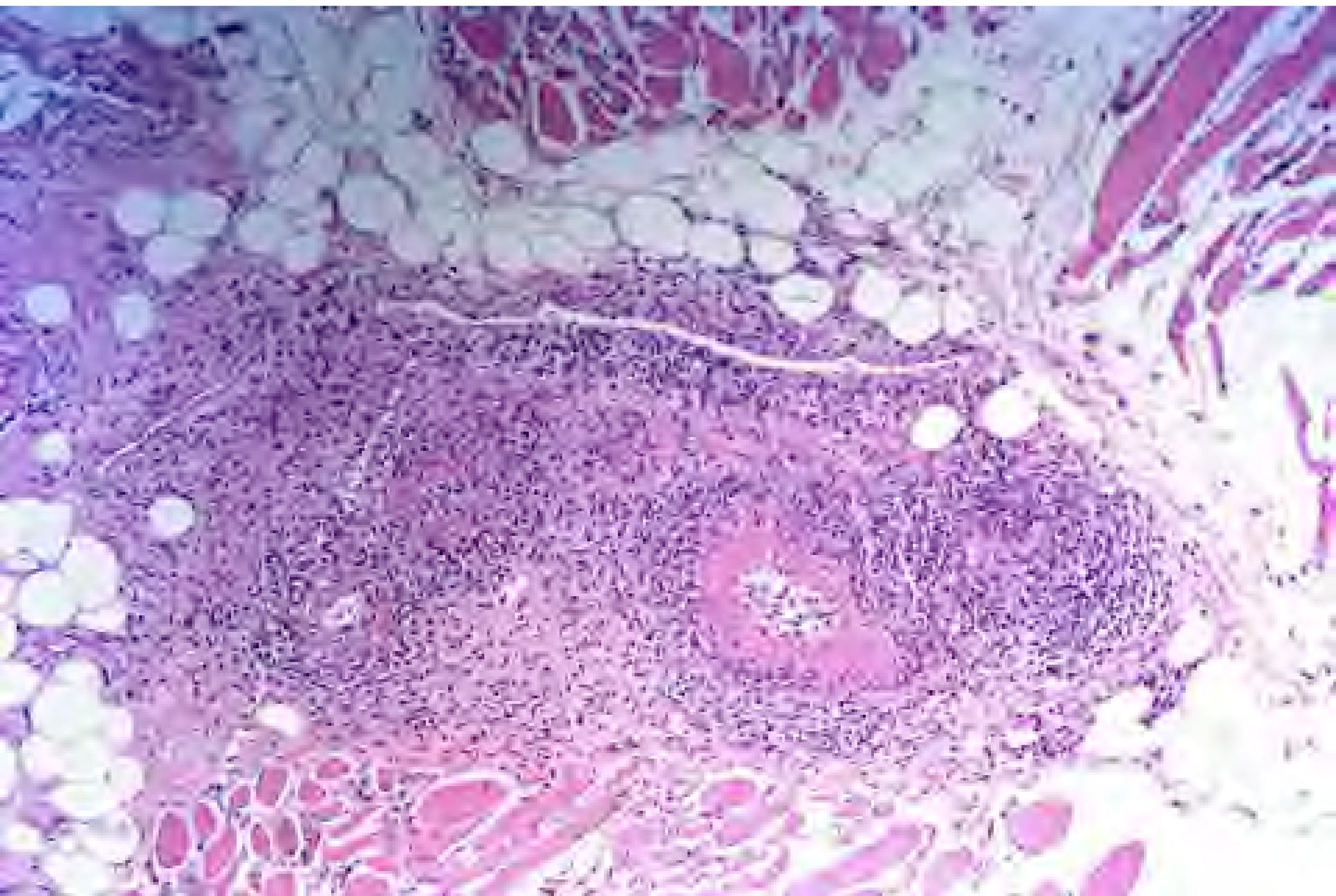


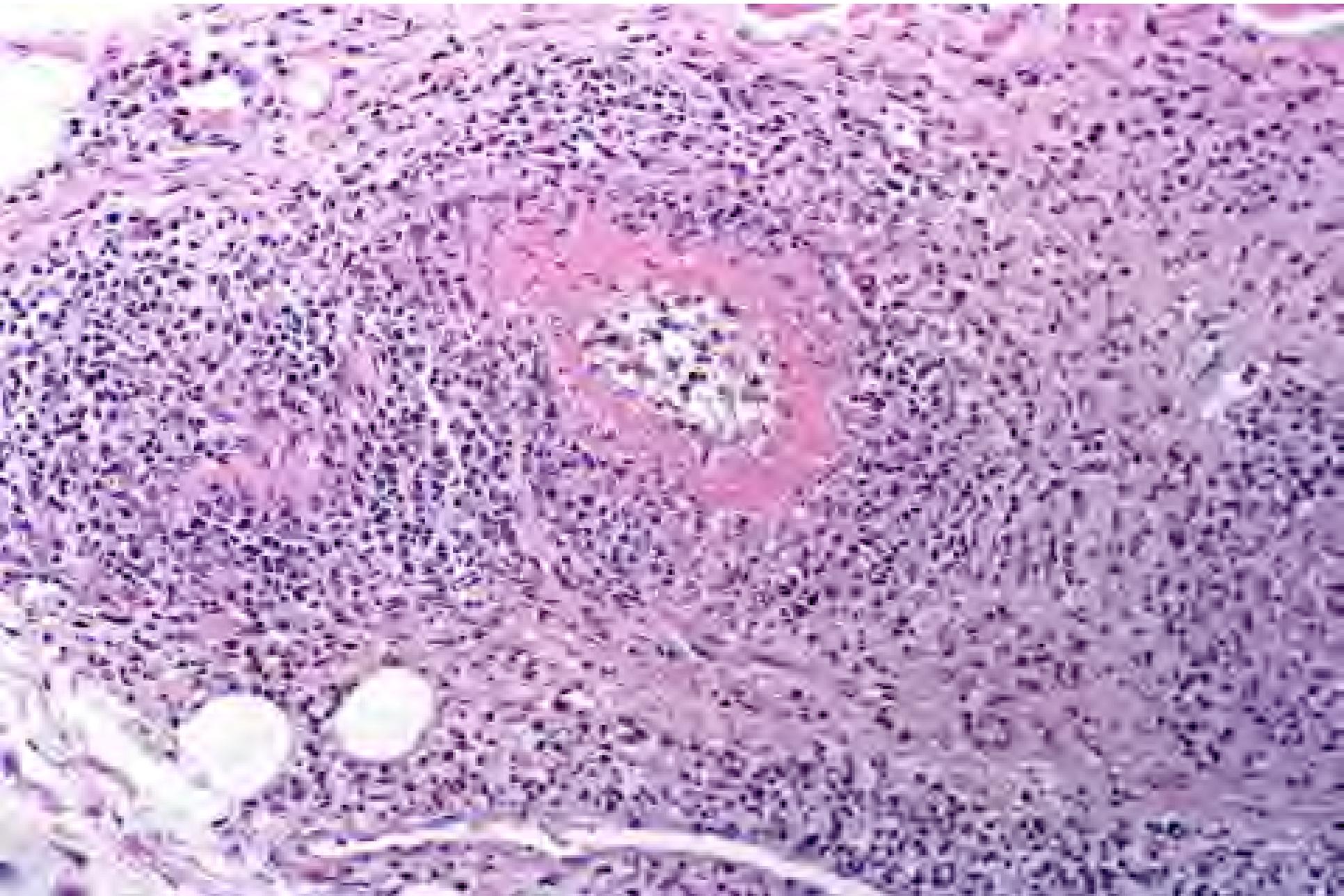
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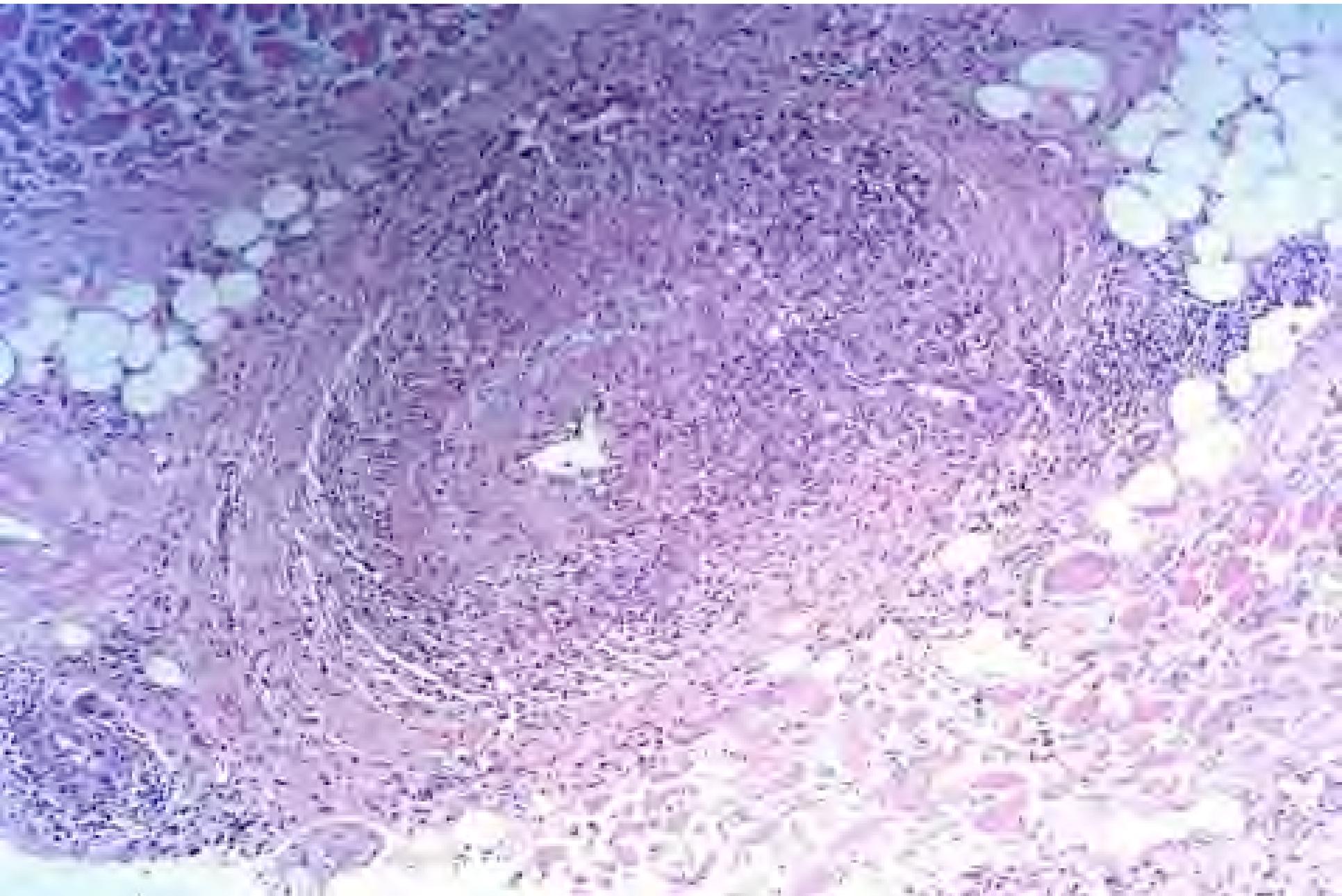
Polyarteritis Nodosa

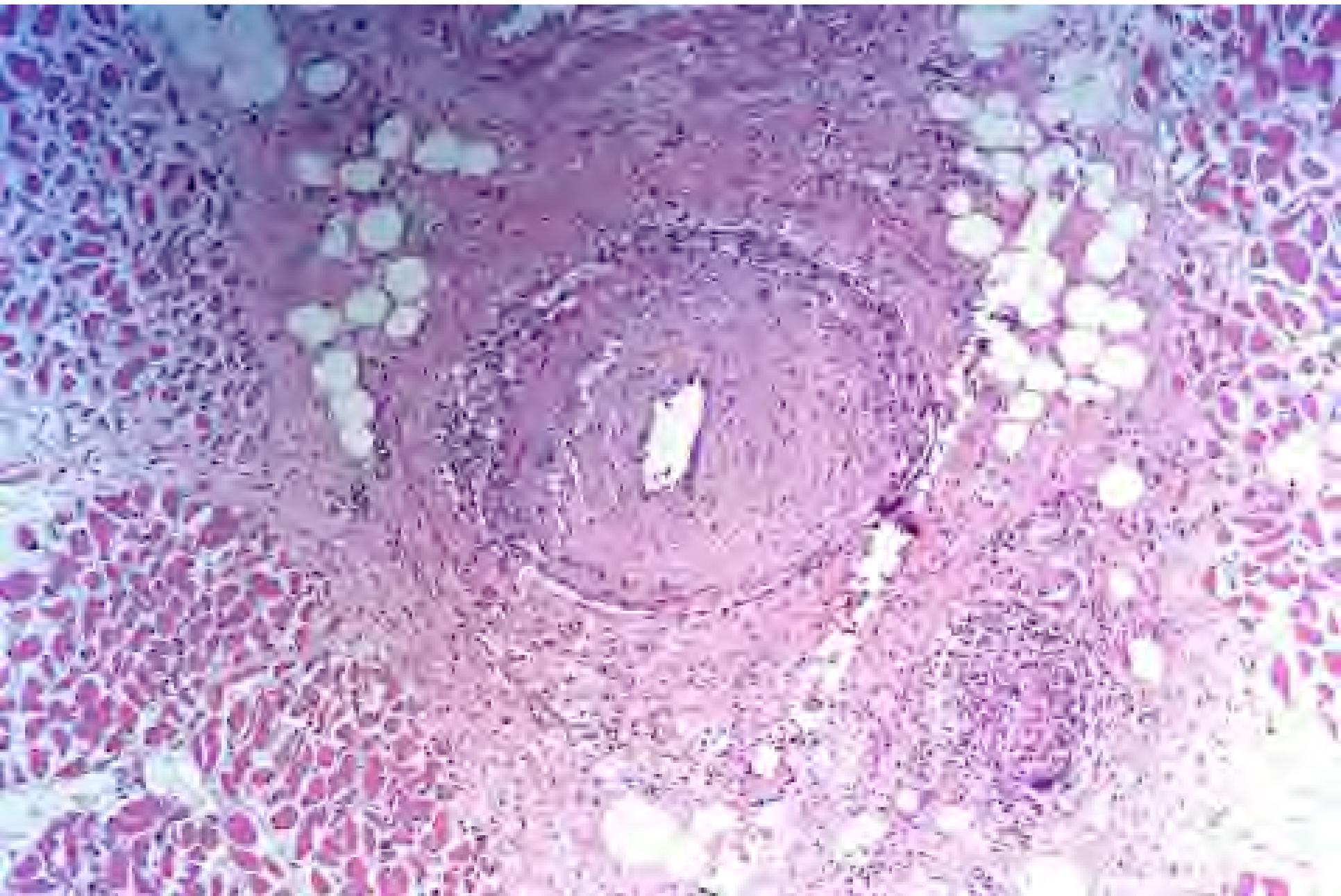


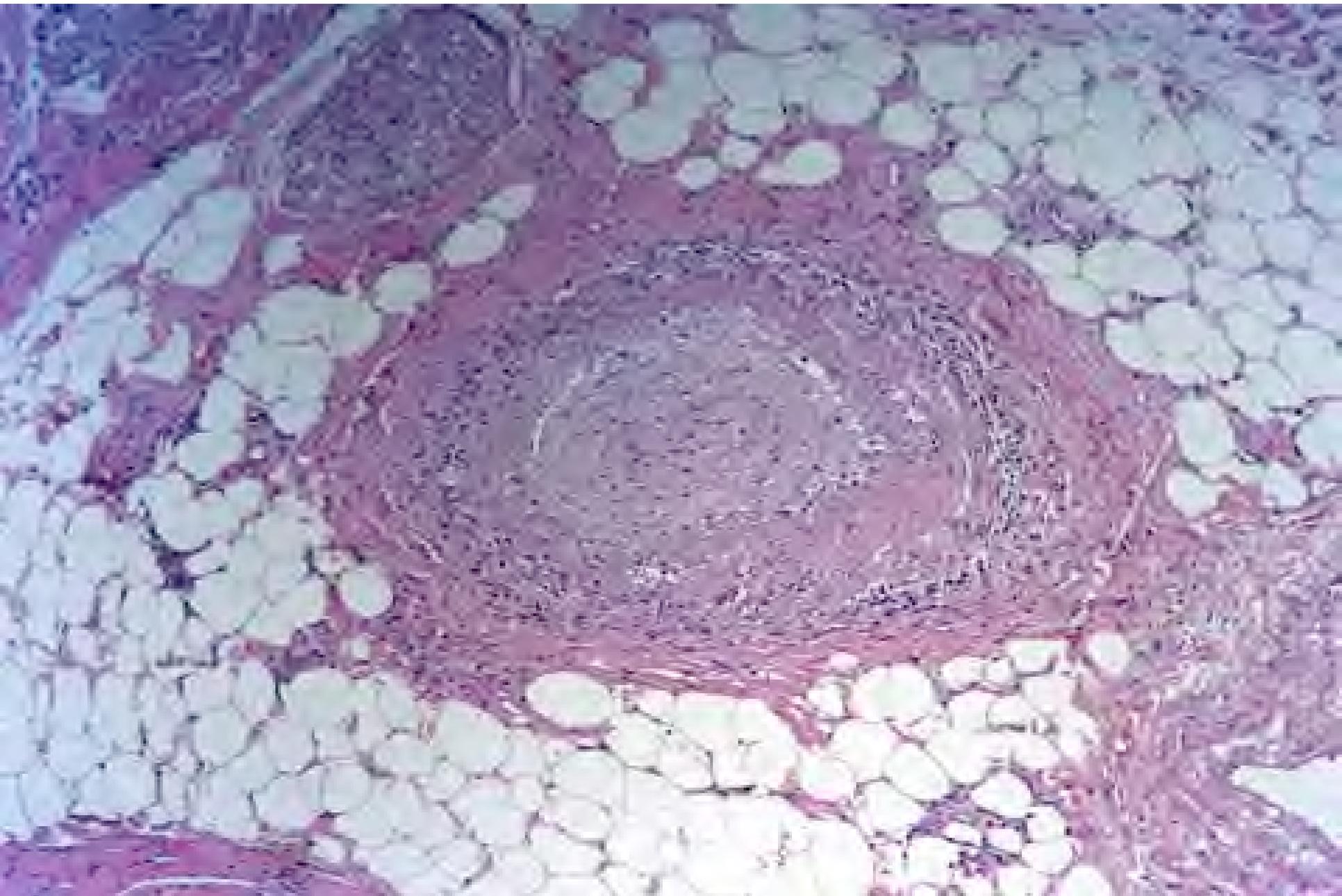




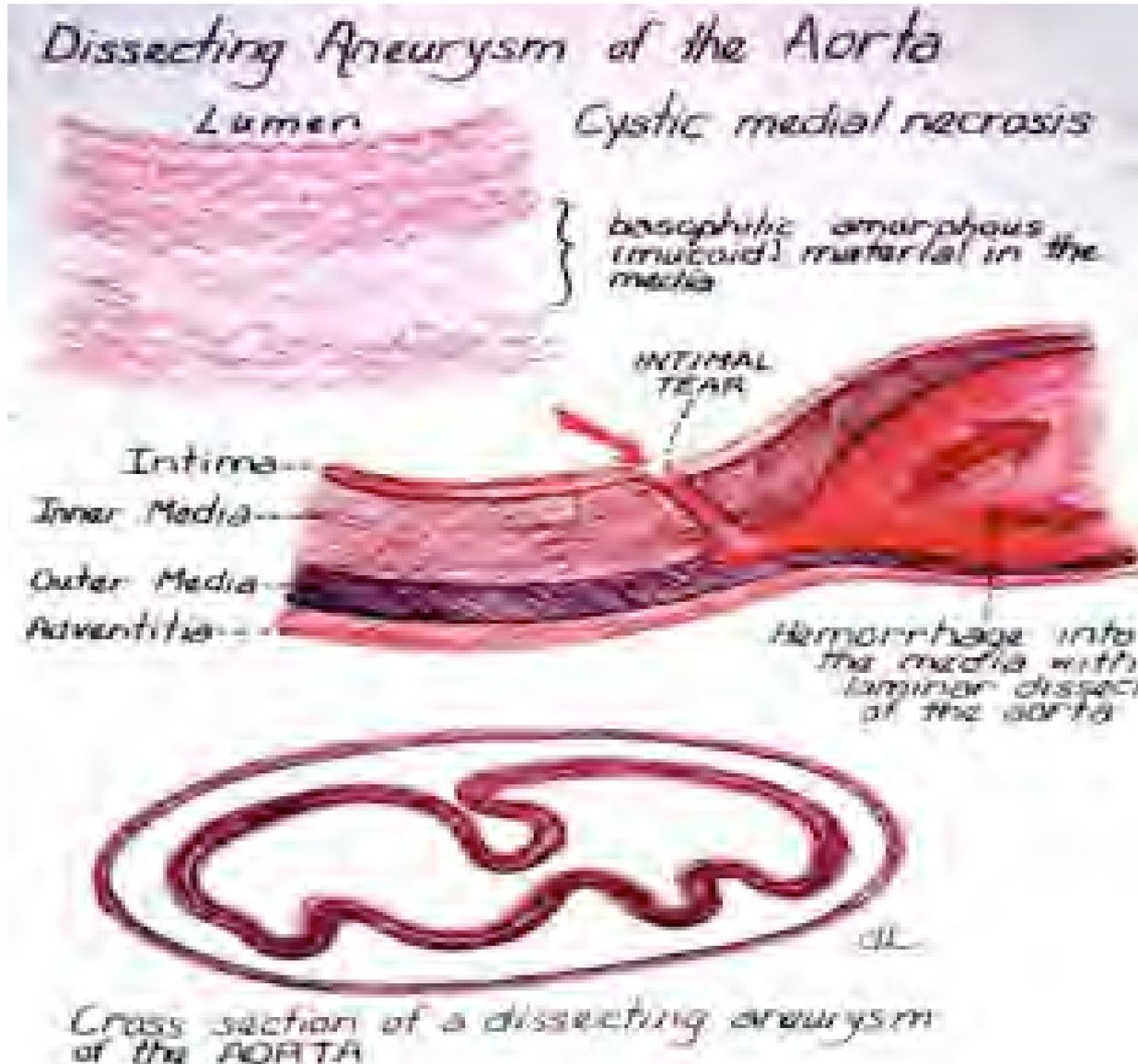








Aortic Dissection



Type A



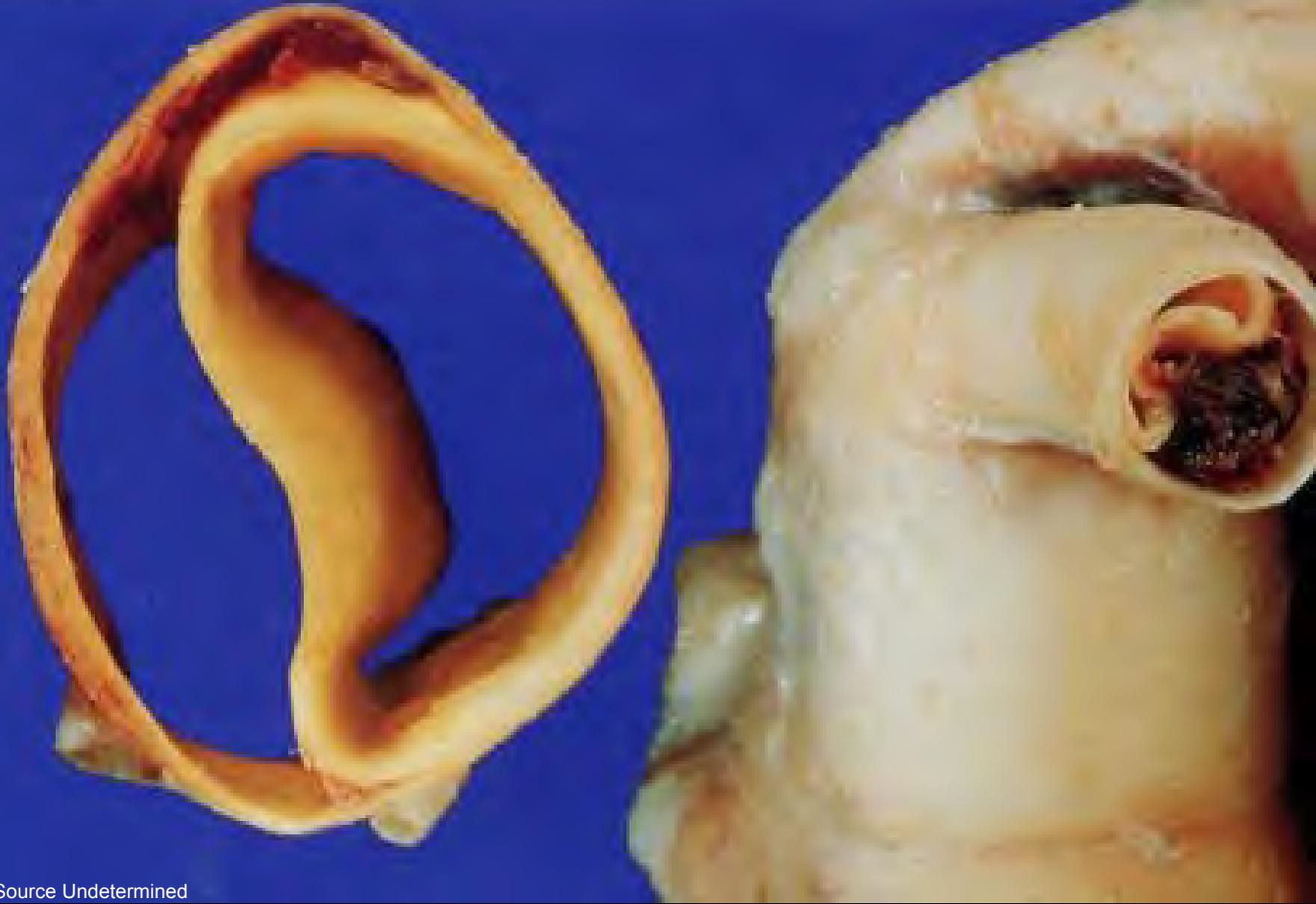
Type B



Heart and Aortic Arch

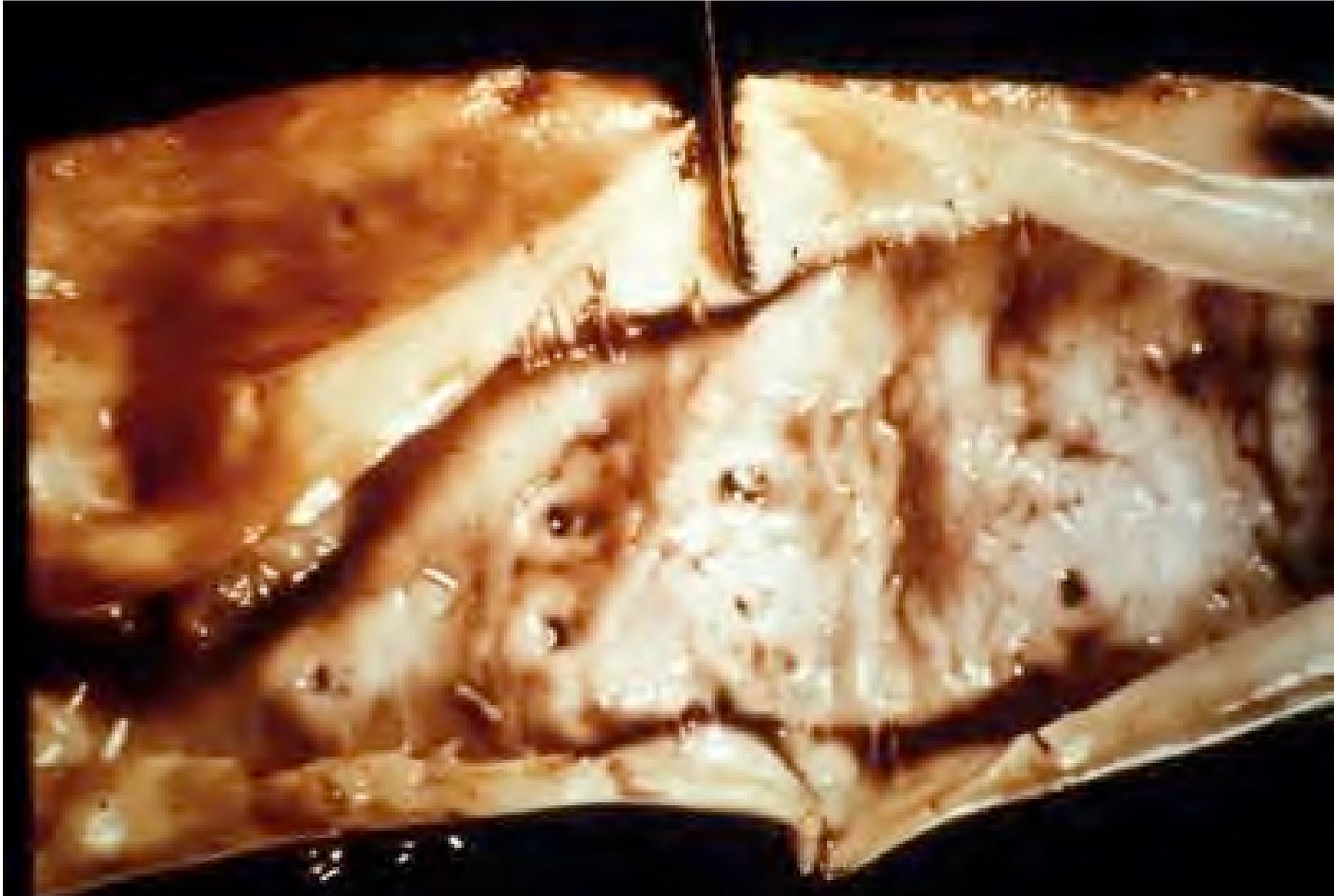


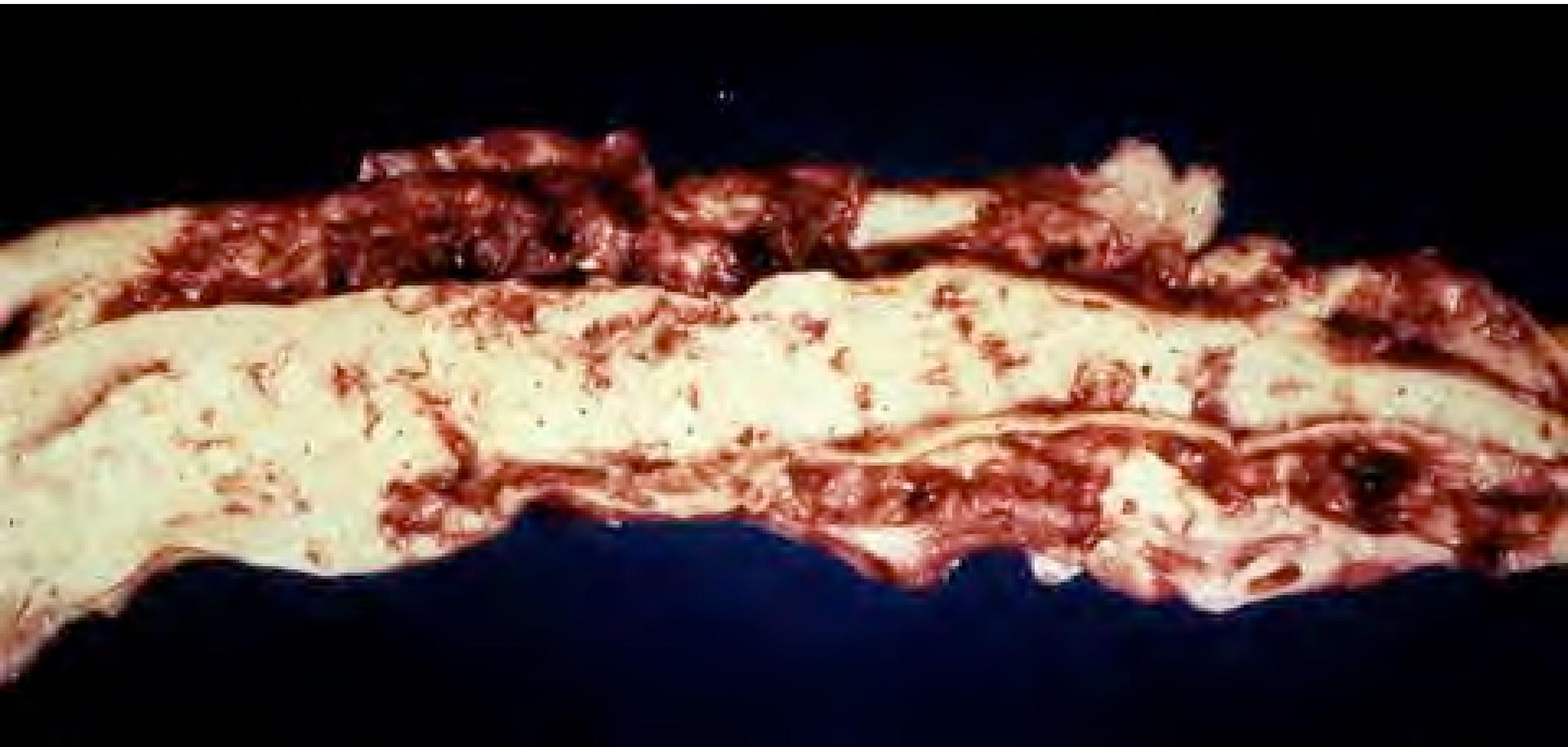
Left Subclavian Artery





Aortic Dissection

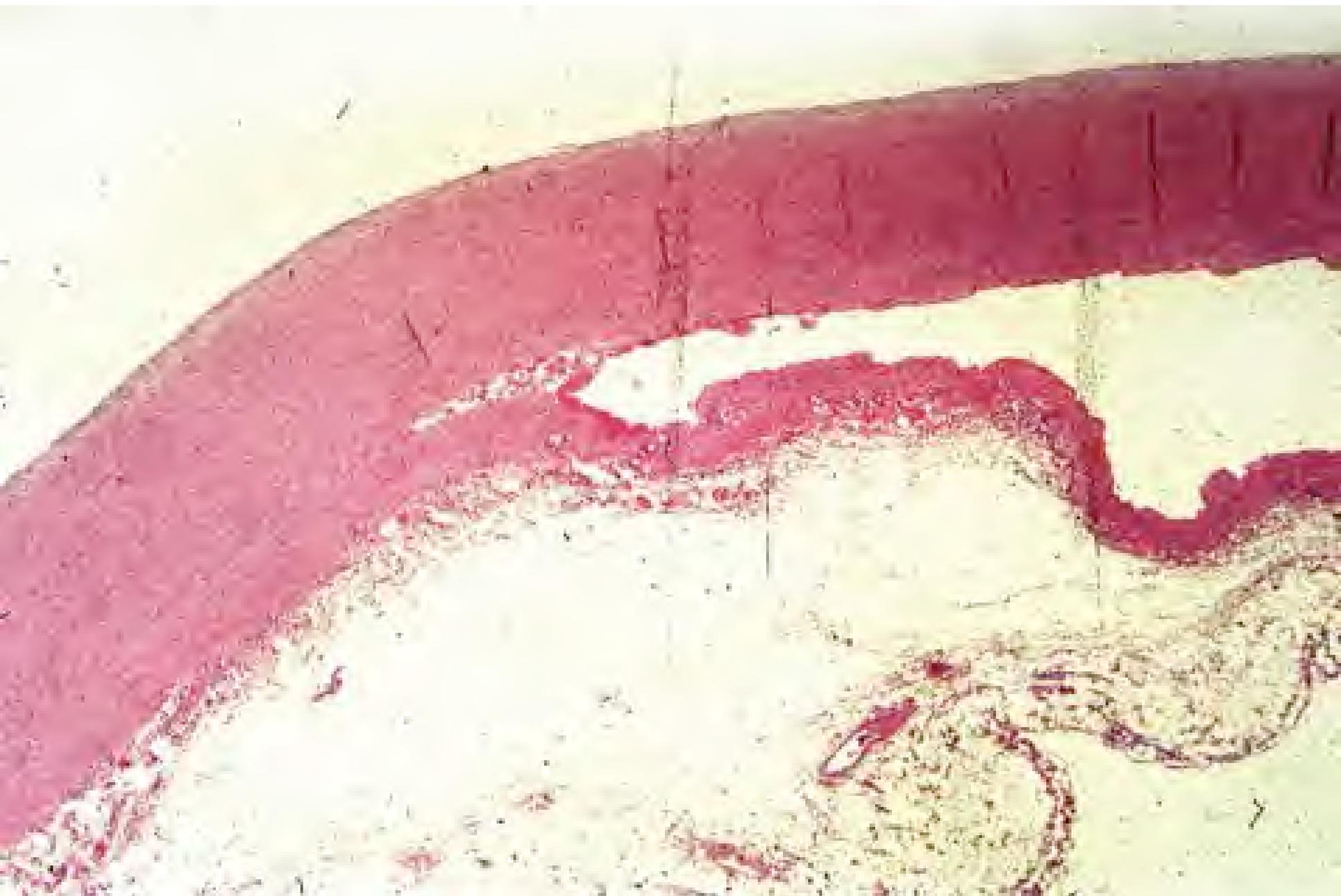


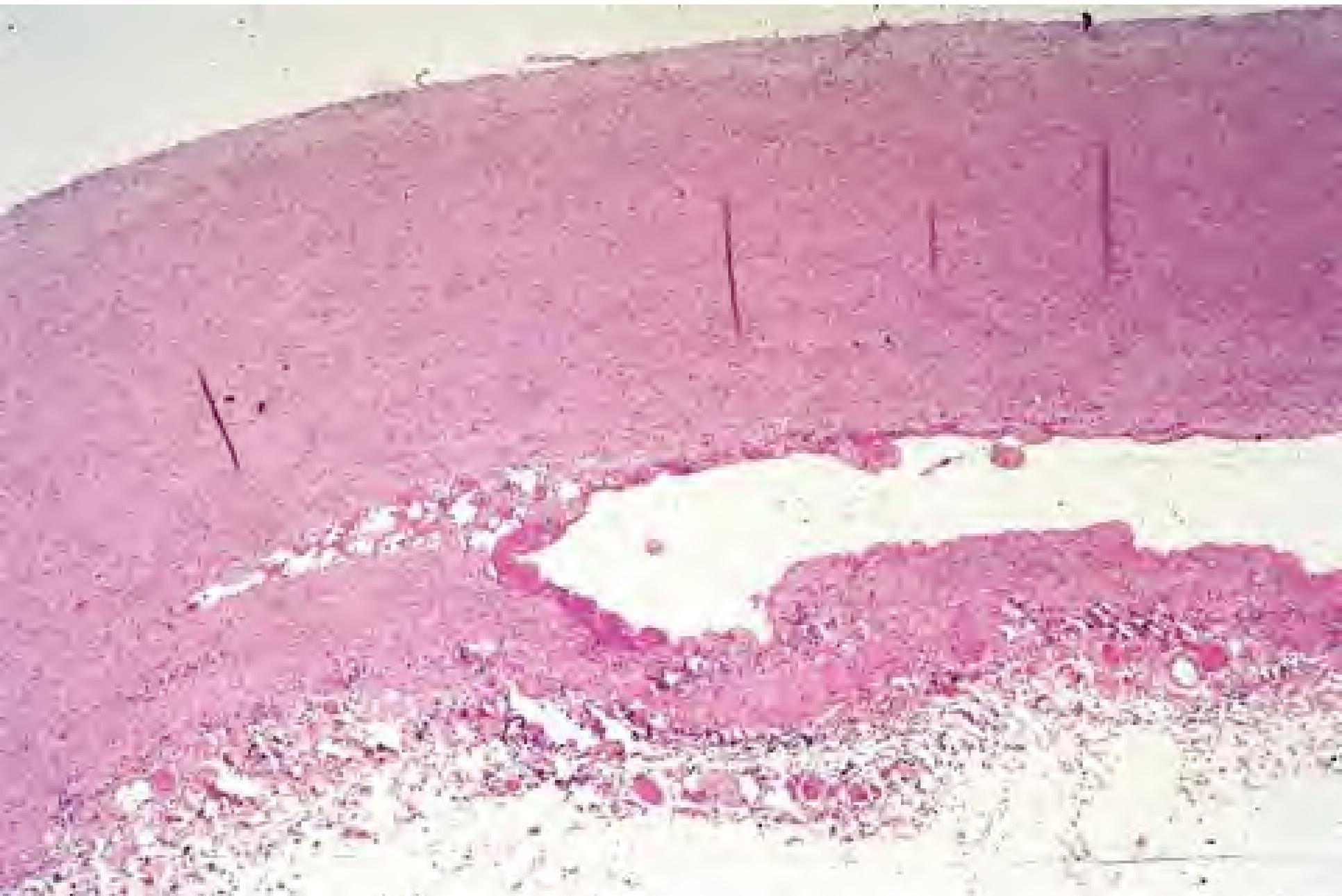


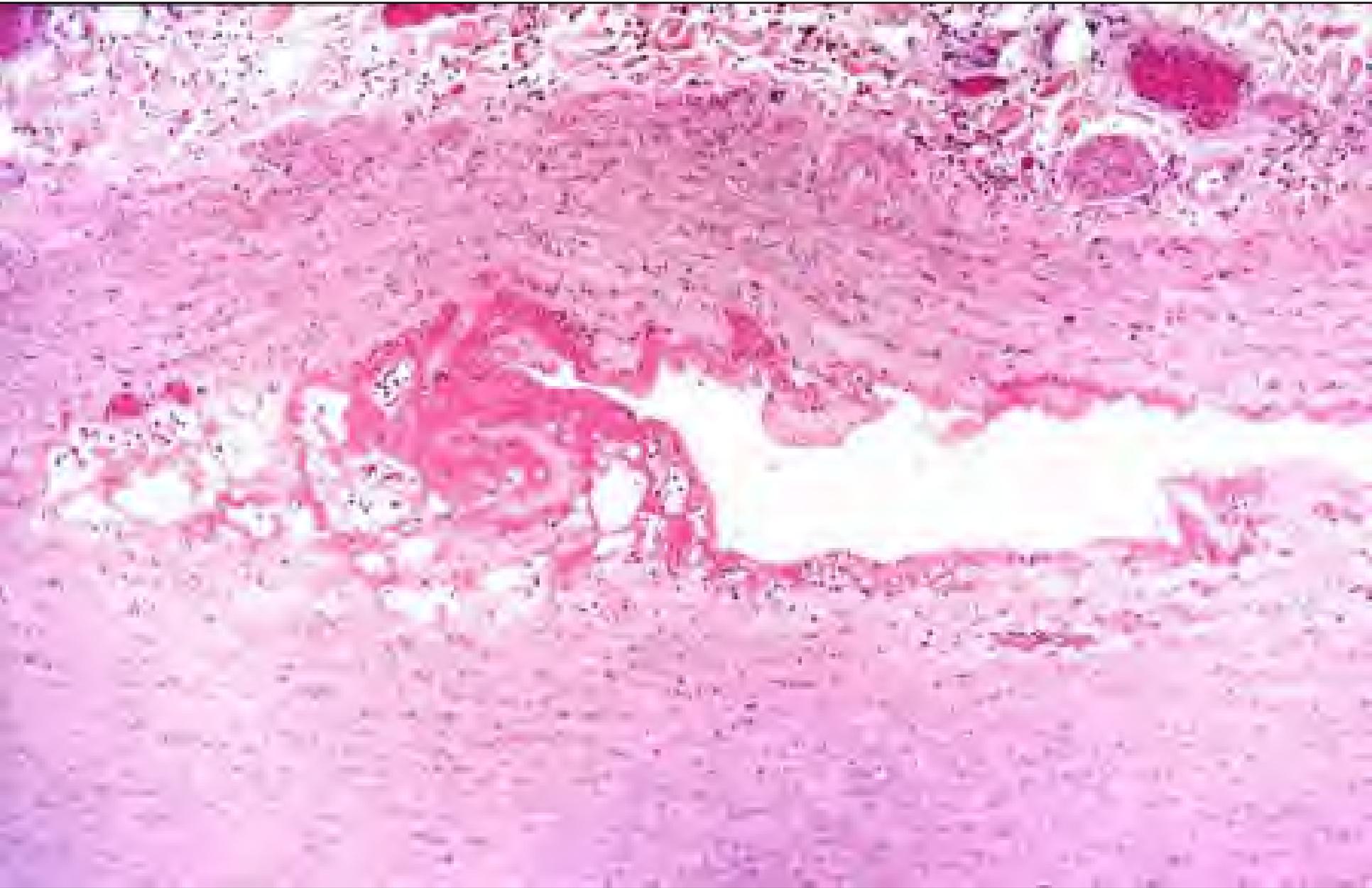
Aortic Dissection

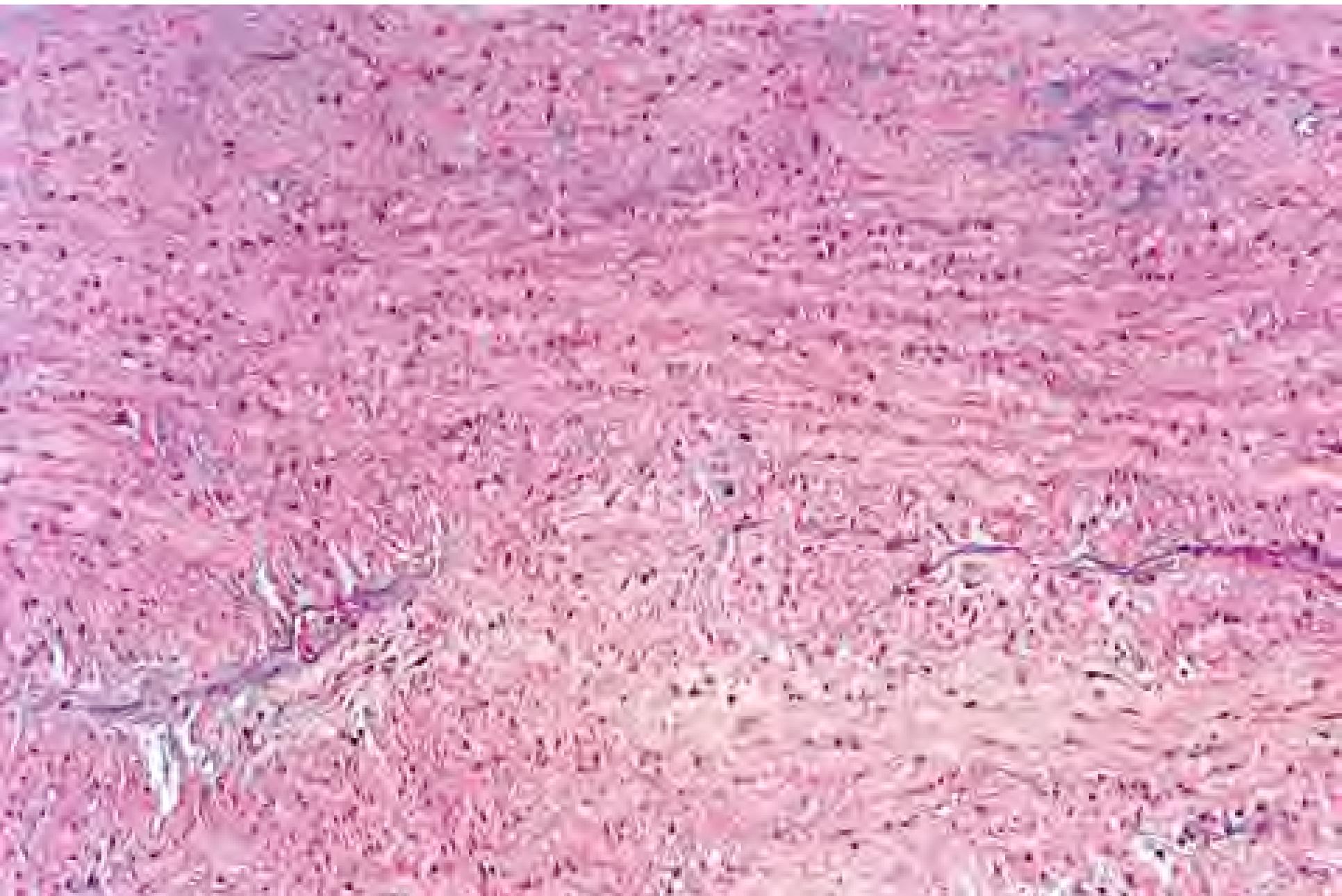


PO-INCL G.D. Abrams, University of Michigan Medical School

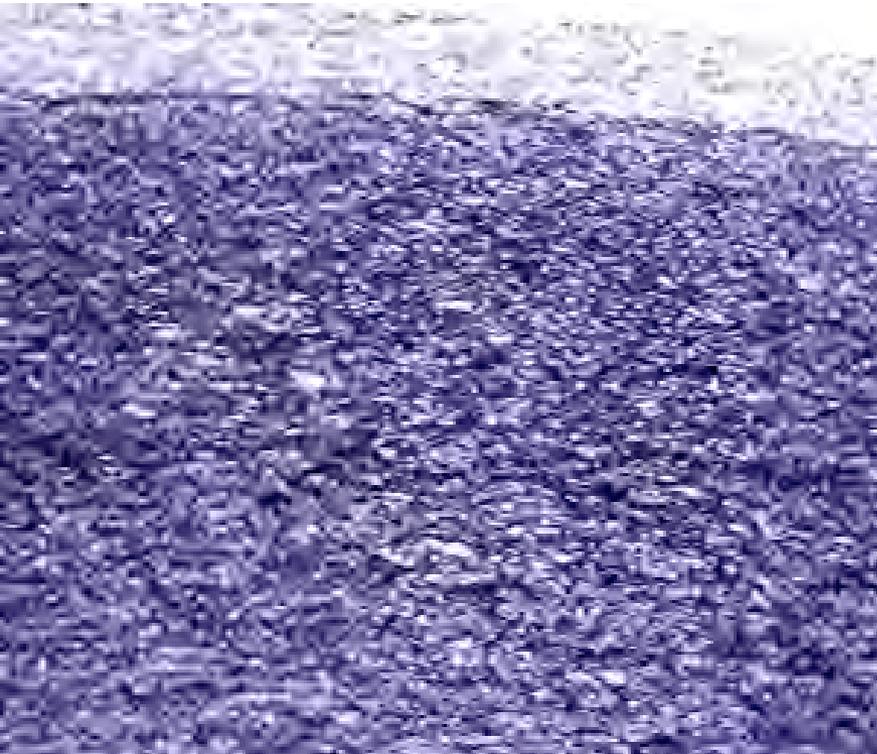








Normal Aortic Elastin



Fragmented Aortic Elastin Marfan's



Abdominal Aortic Aneurysm



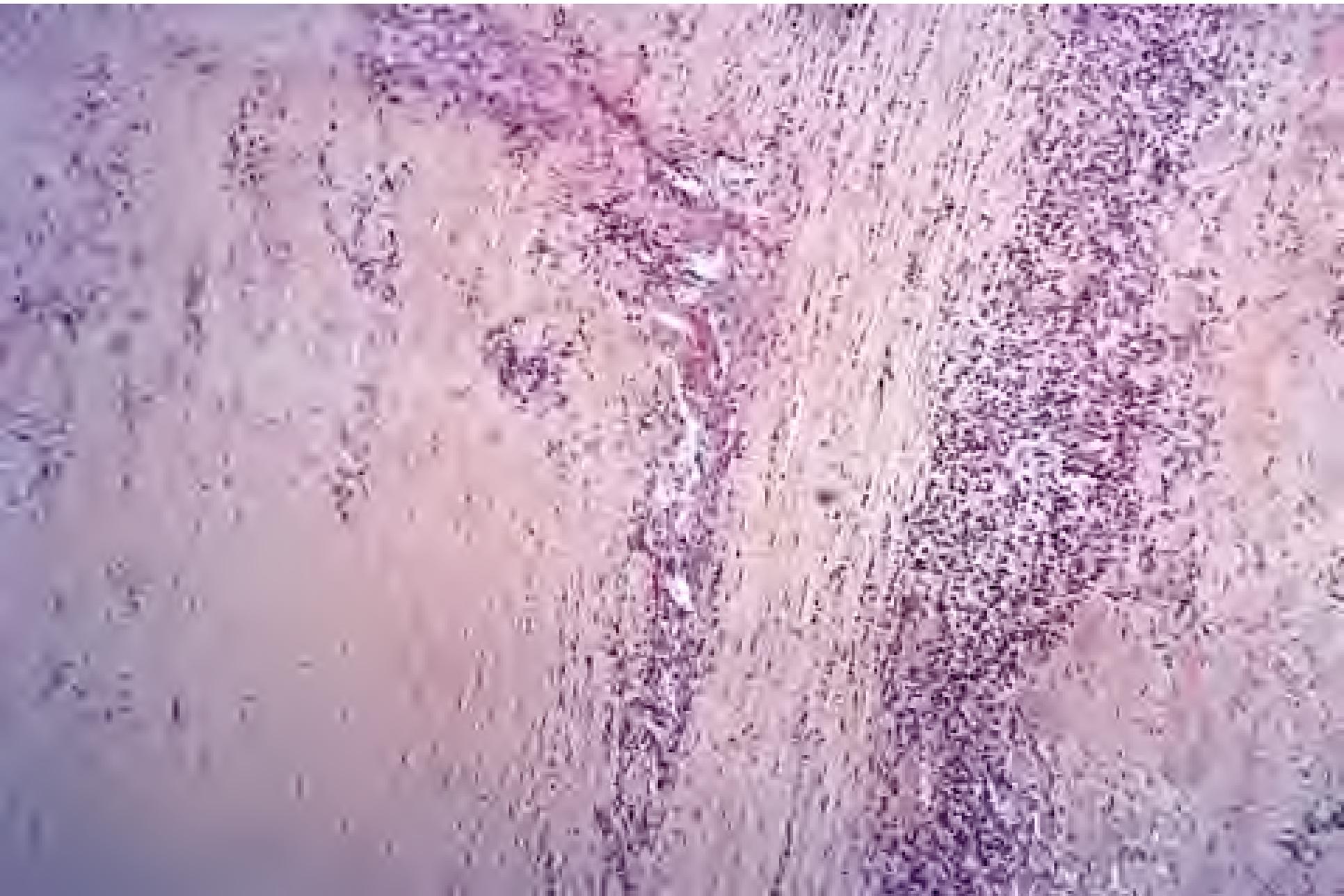
Syphilitic Aortitis

Aneurysm



Syphilitic Aortitis





M-2 Cardiovascular Laboratory - 2

- 54** **Myocardial infarction**
- 35** **Thrombus in IVC**
- 36** **Pulmonary infarction**
- 5** **Renal infarction**

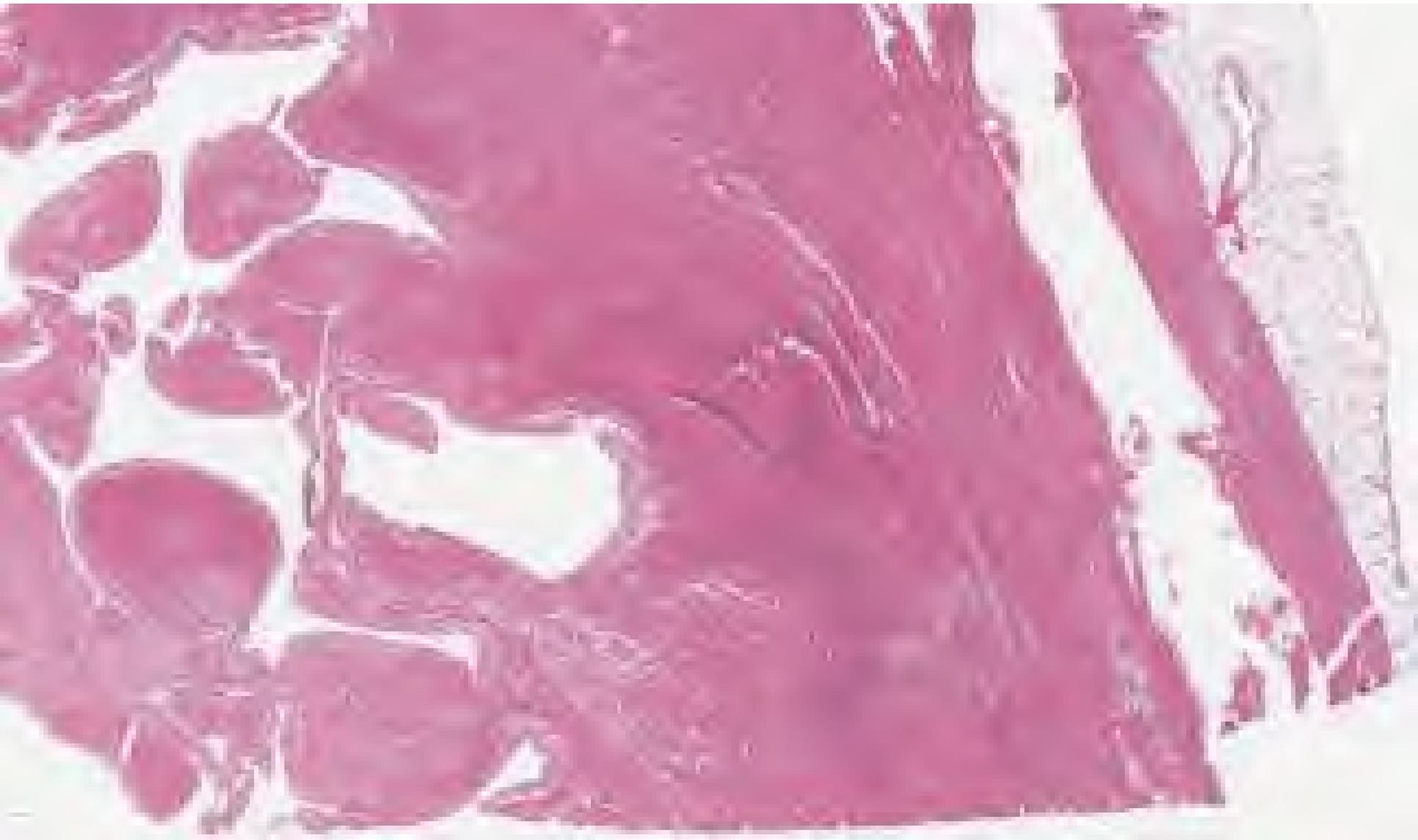
Recent Myocardial Infarction

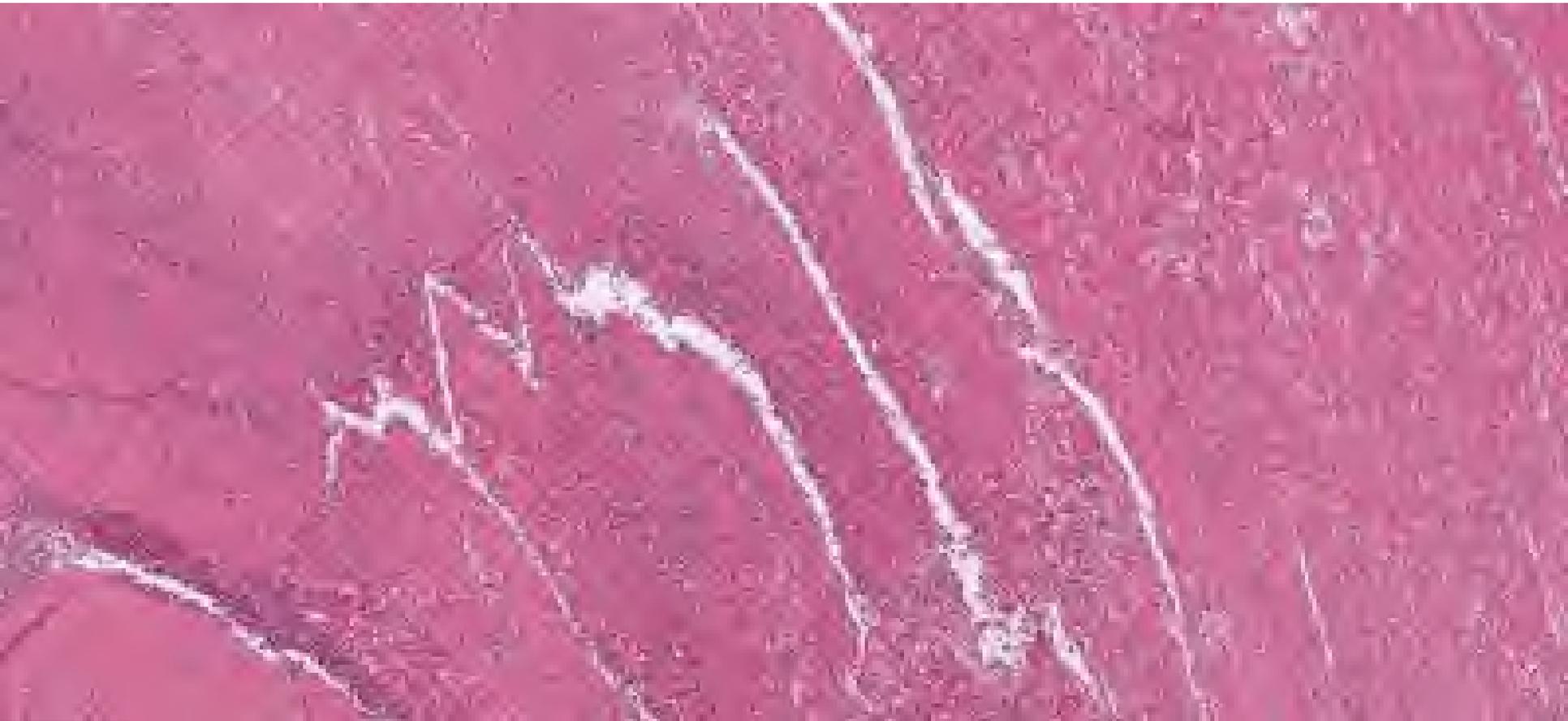


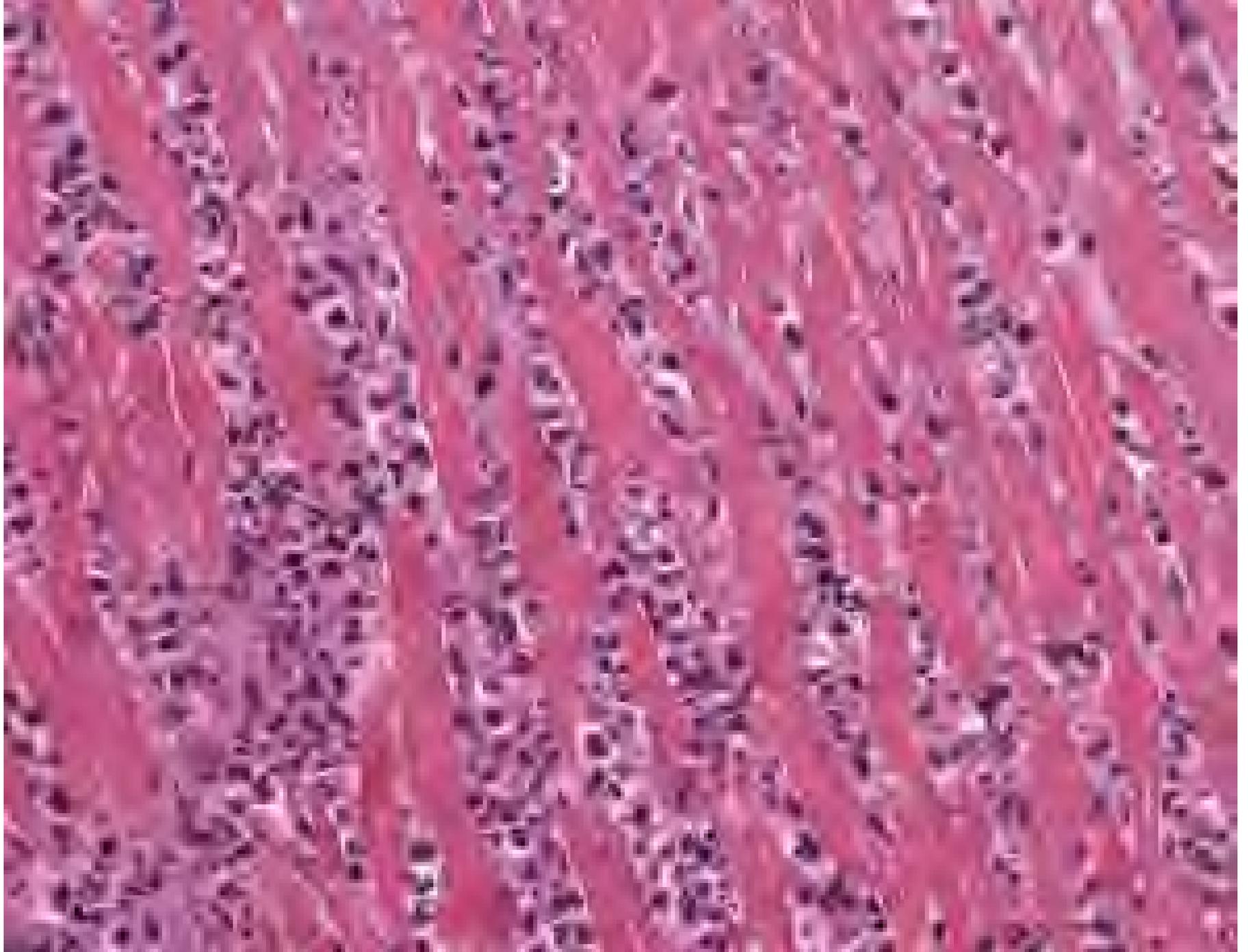


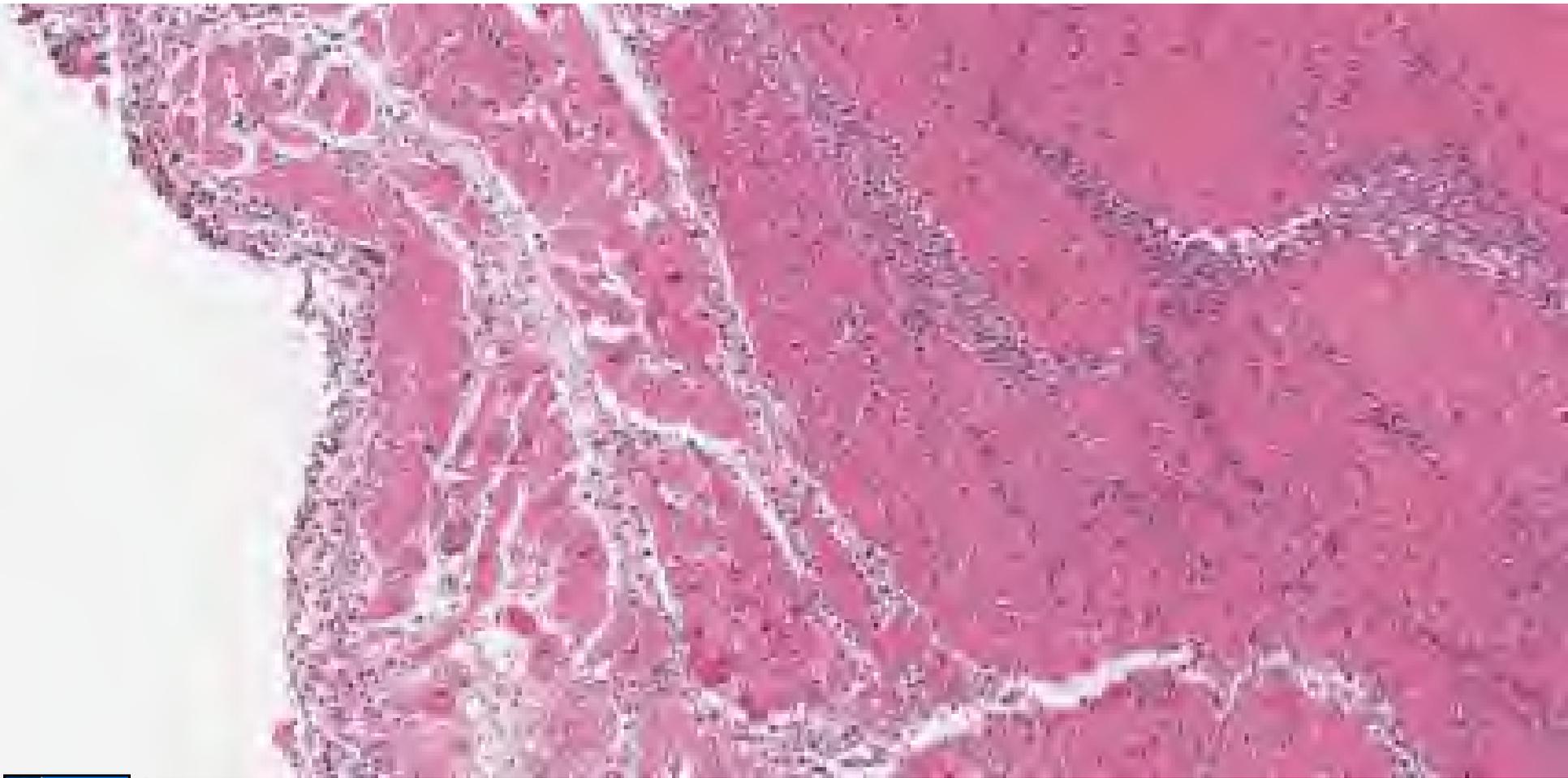
Myocardial Infarction

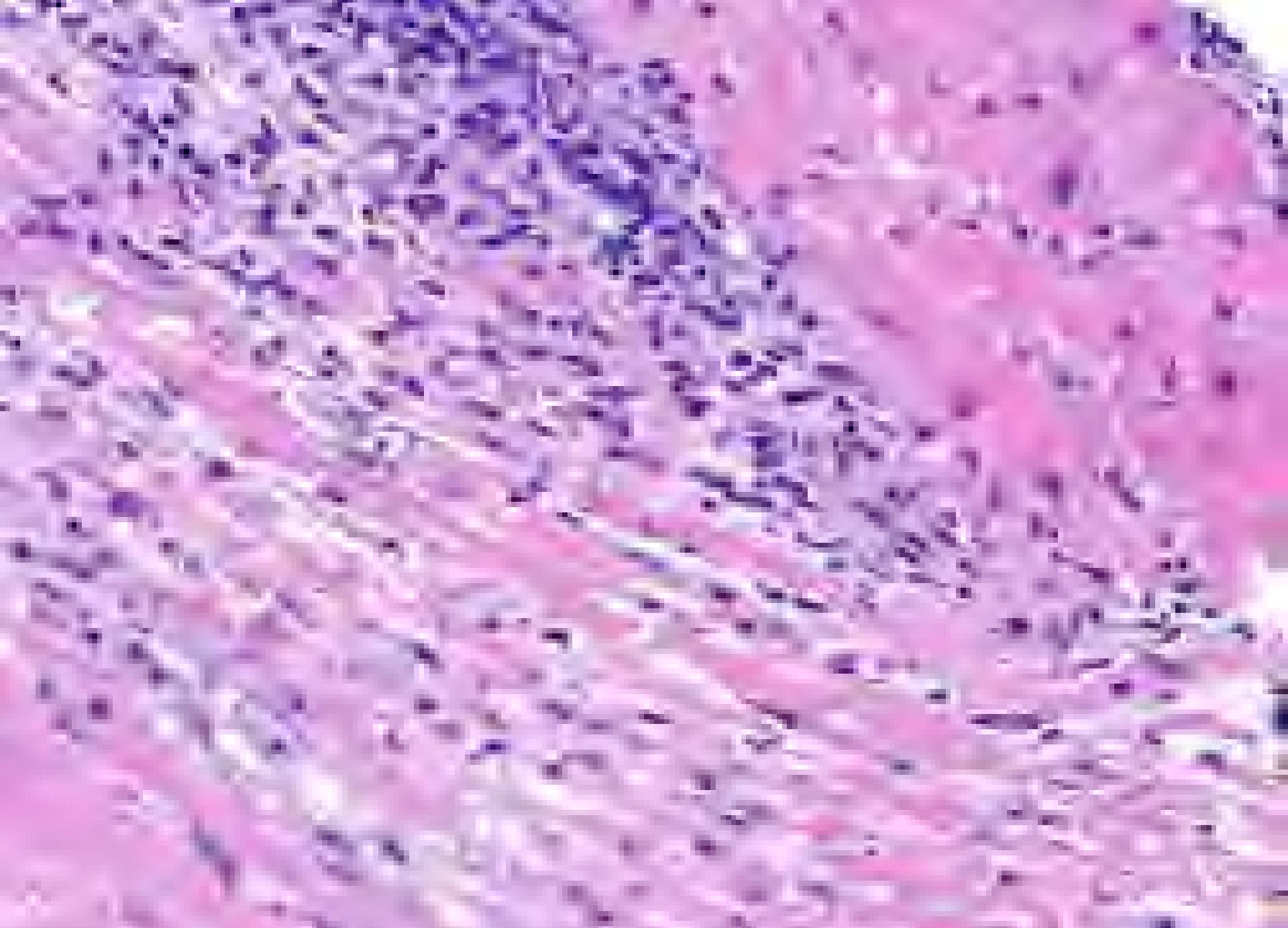












After ~ 40 minutes of ischemia myocardial cells die and membranes leak enzymes and proteins.

	Onset	Peak*	Return
Cardiac creatine kinase (CK-MB)	2 - 4 hours	24 hours	72 hours
Cardiac troponins (-I and -T)	2 - 4 hours	48 hours	7 - 10 days

***Peak accelerated if myocardium reperfused
(enzyme “washout” from necrotic myocardium)**

Histological Evolution of Myocardial Infarct

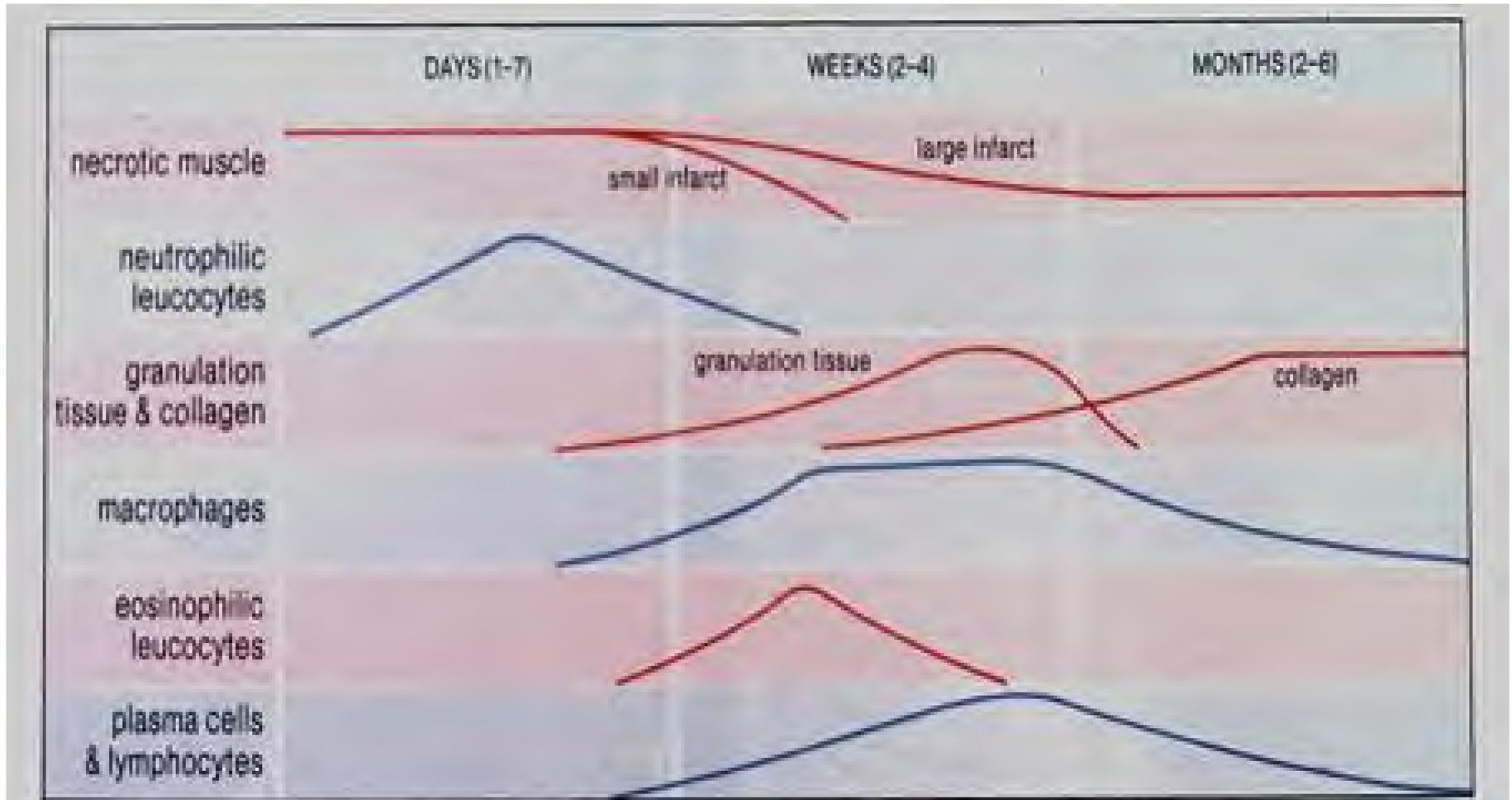
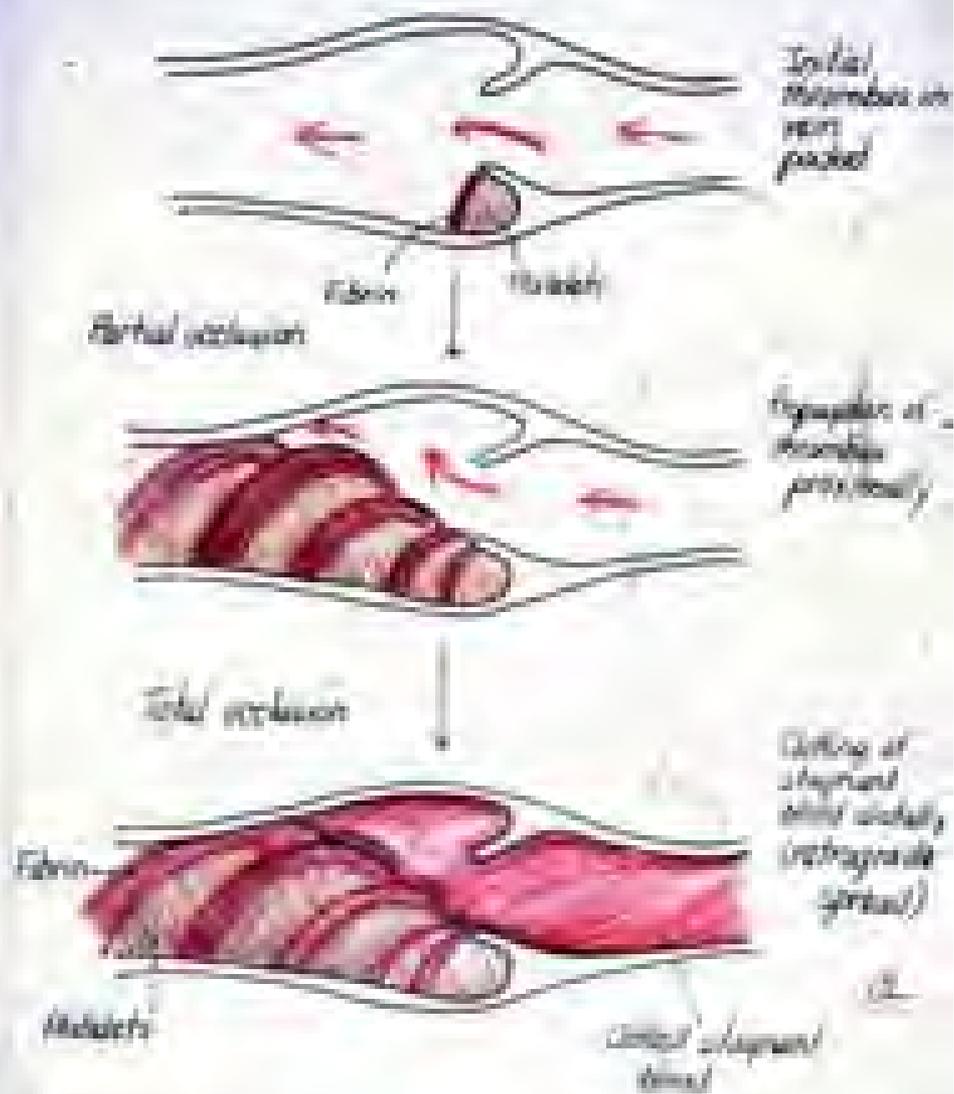


Fig. 3.49 Diagram of histology at various stages of infarct repair.

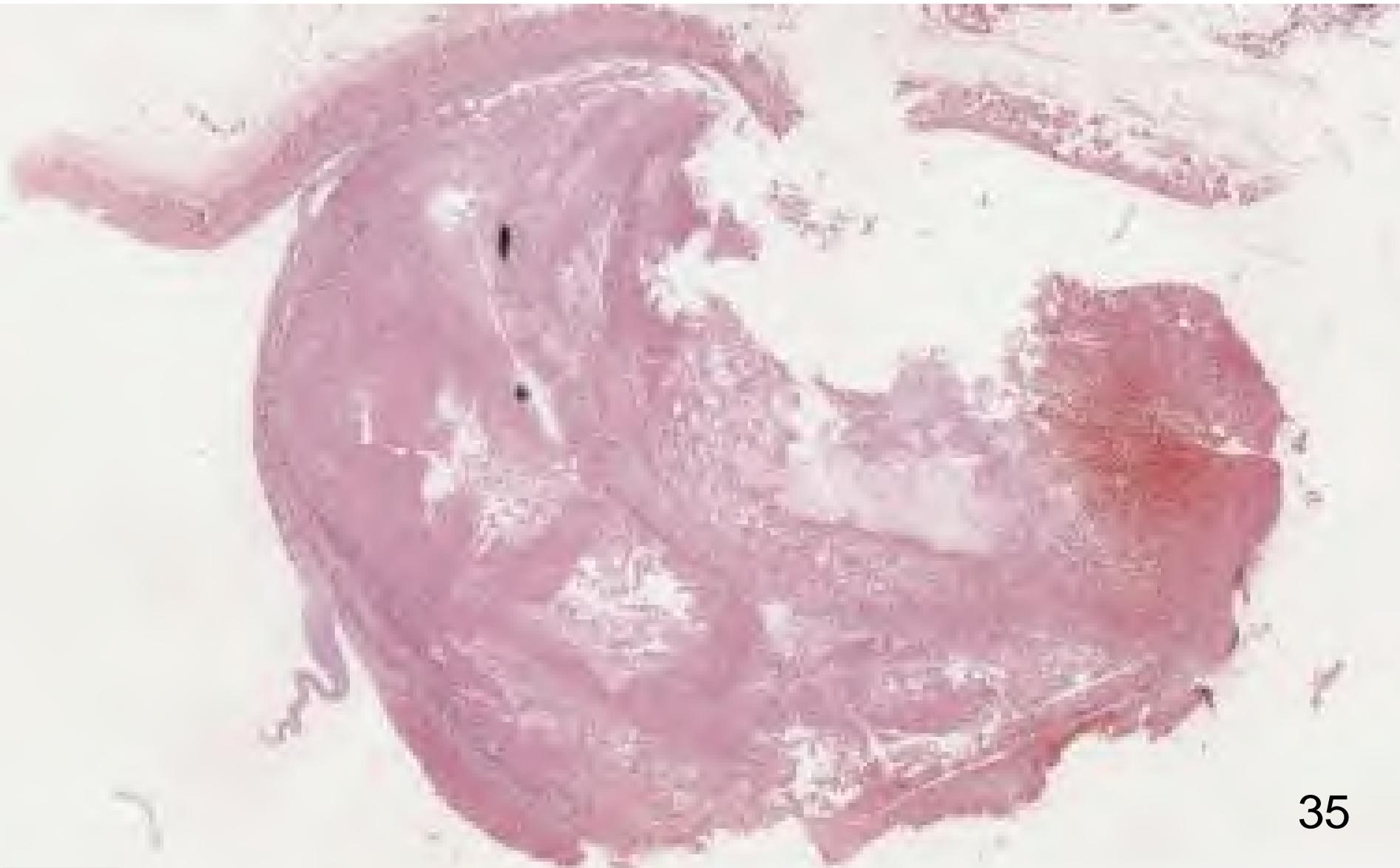
Antemortem Thrombus/Embolus



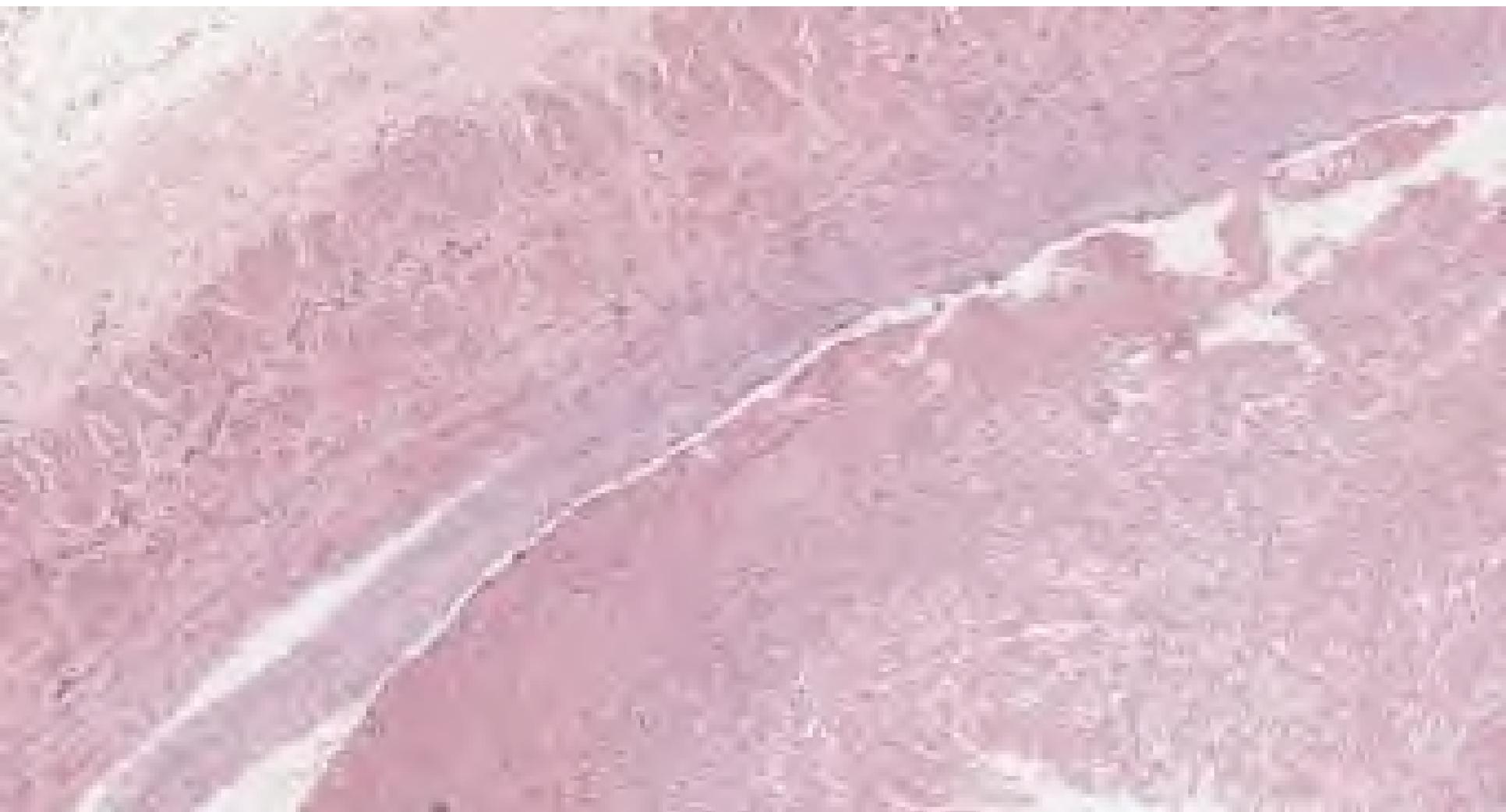
The Stages of Venous Thrombosis

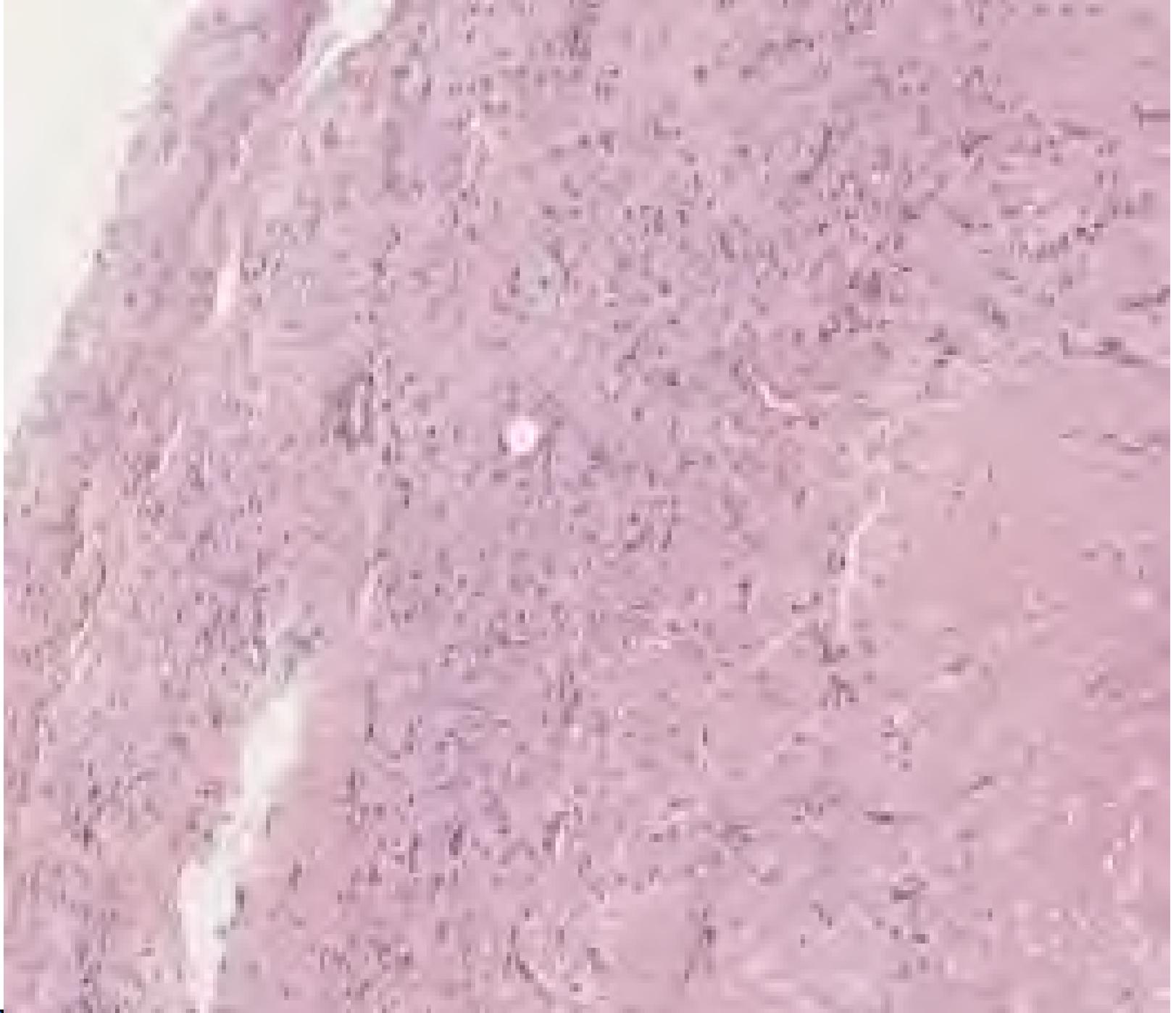


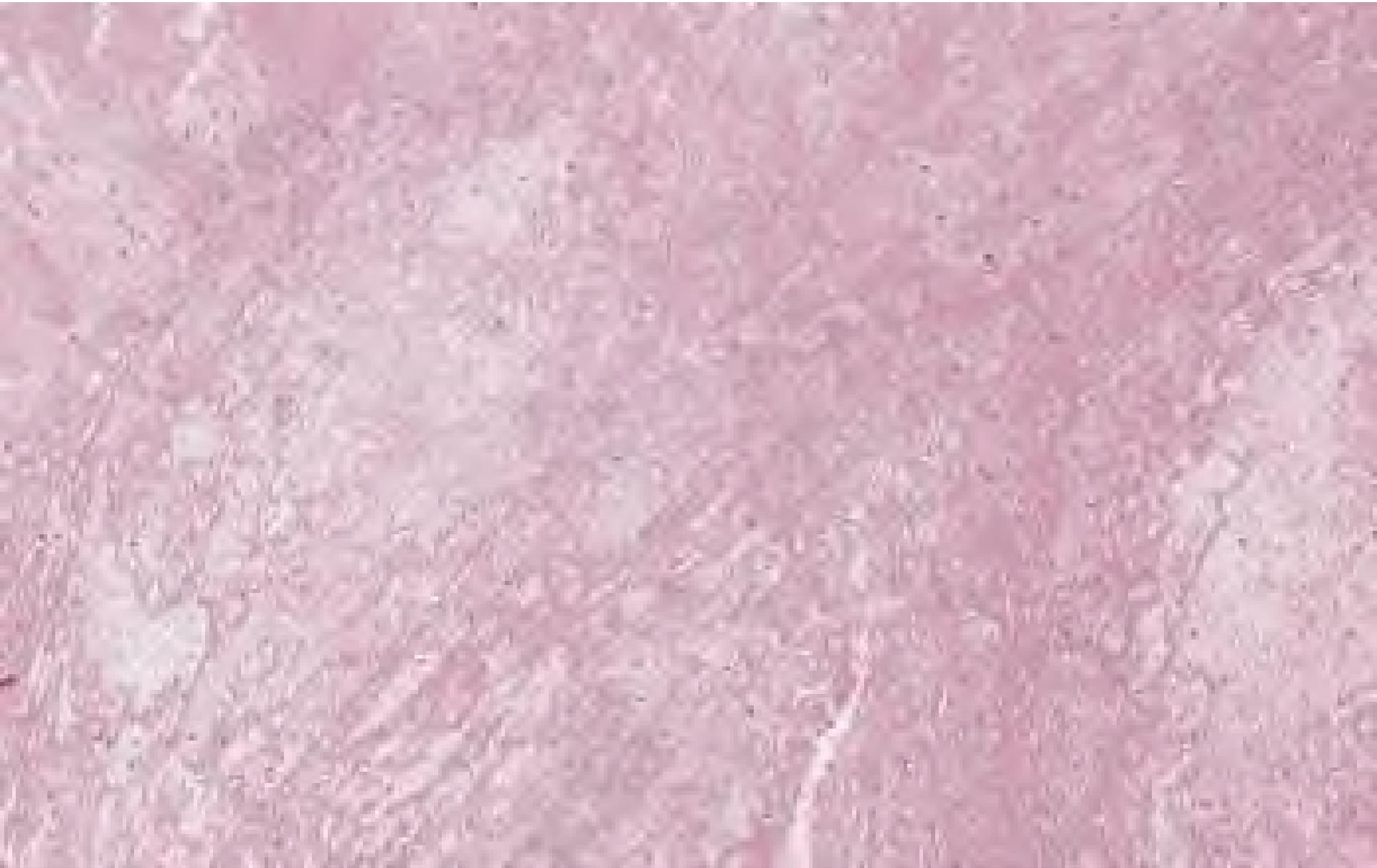
Thrombus in IVC

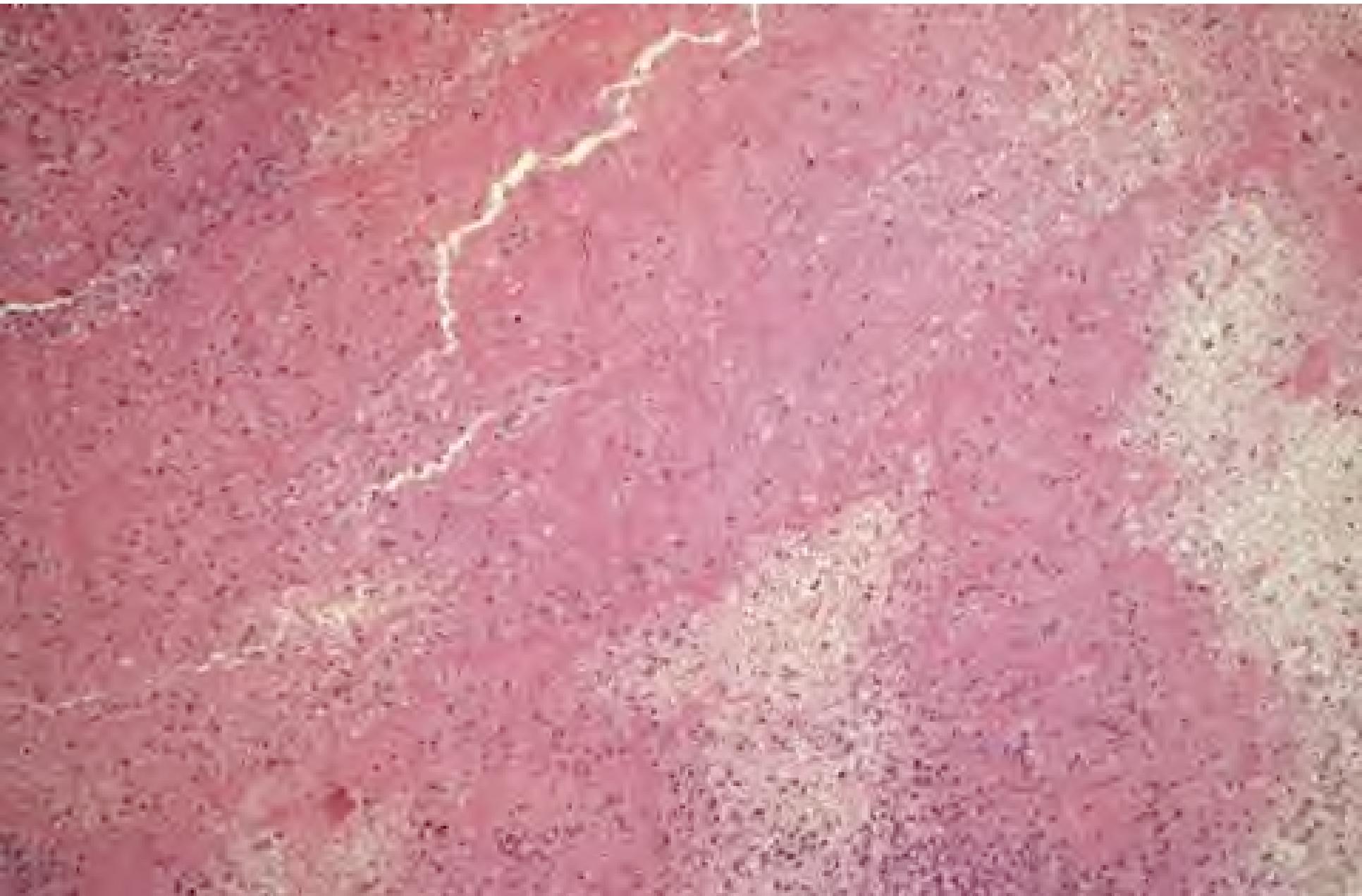


35

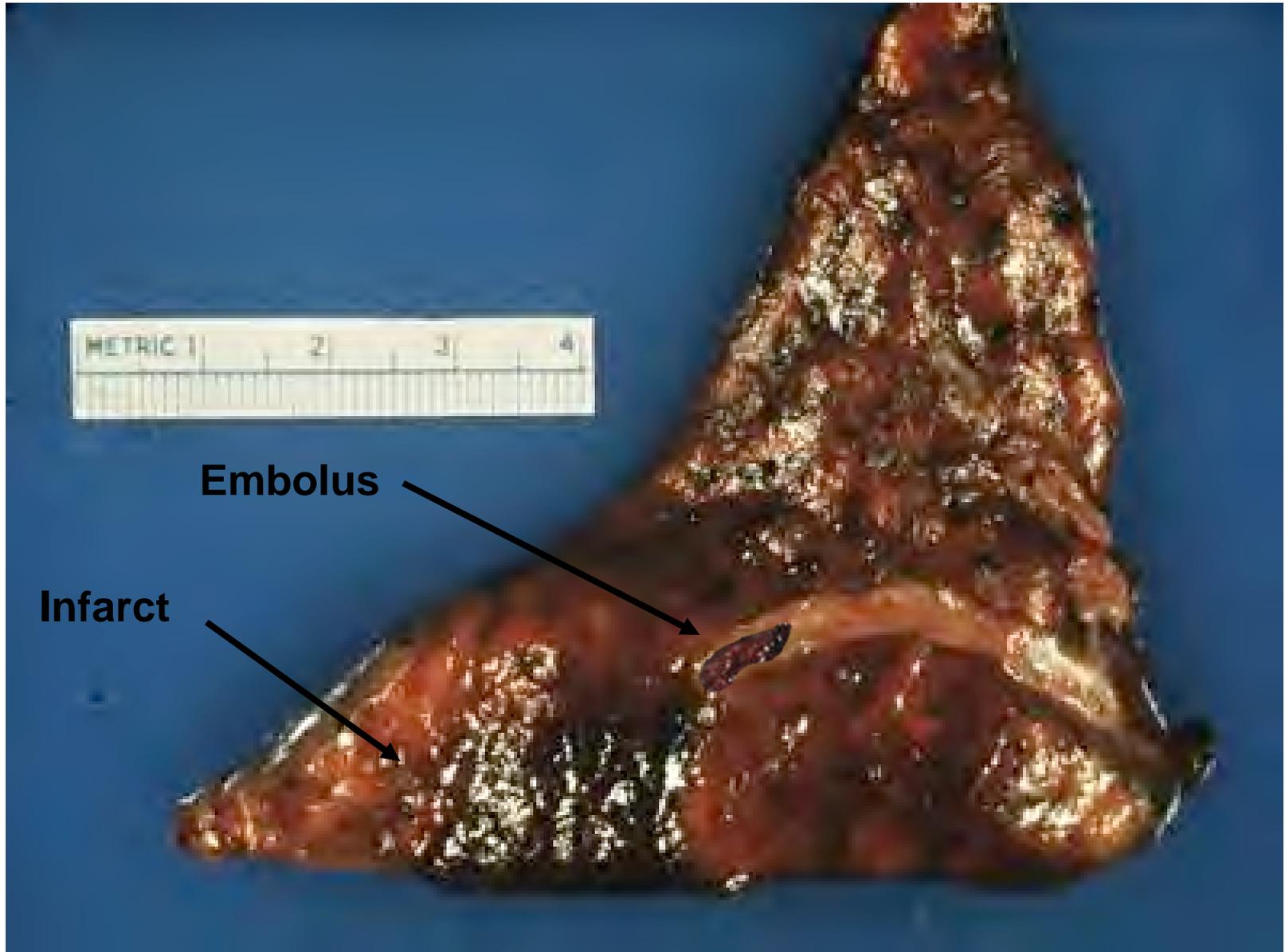






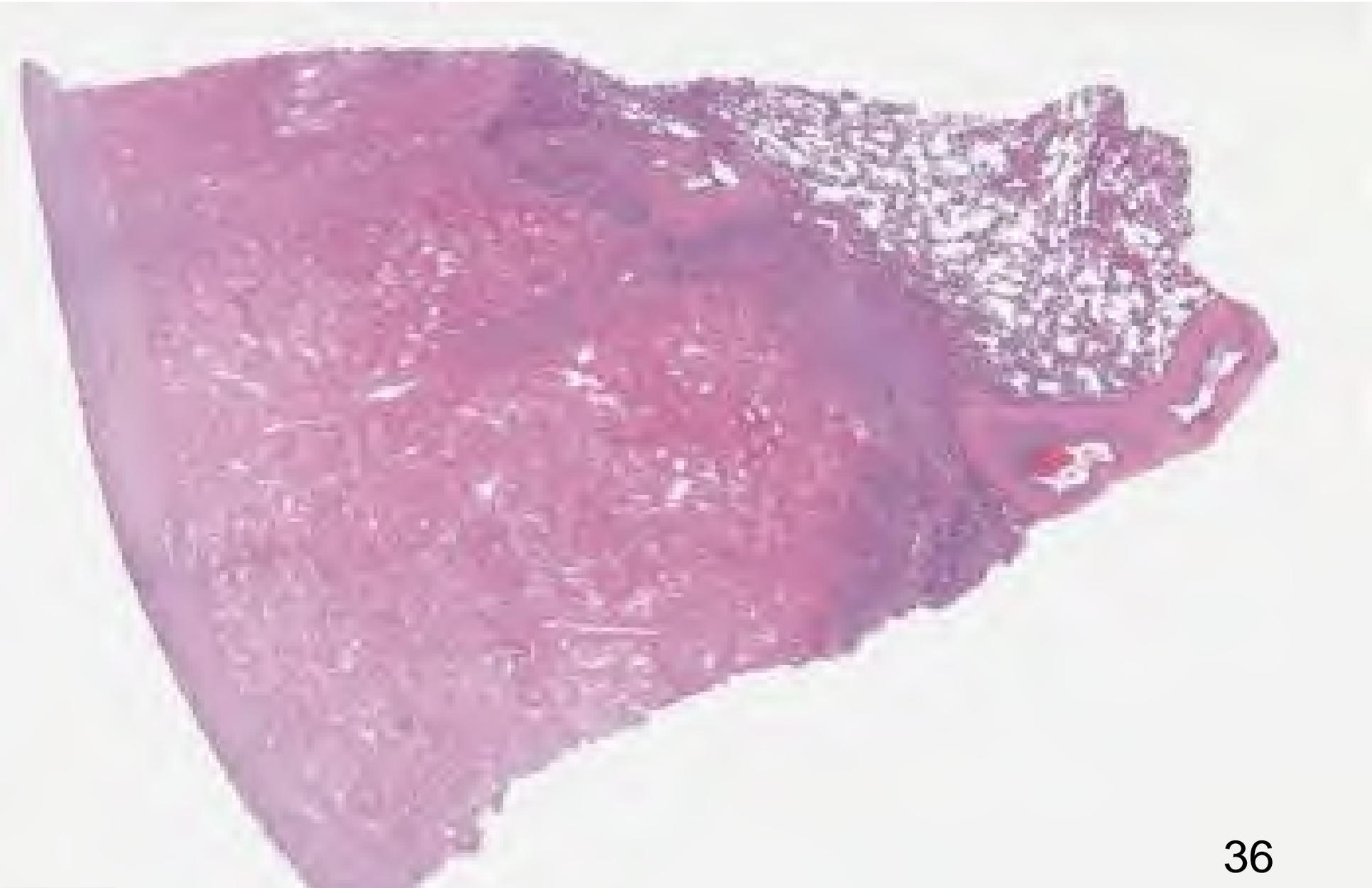


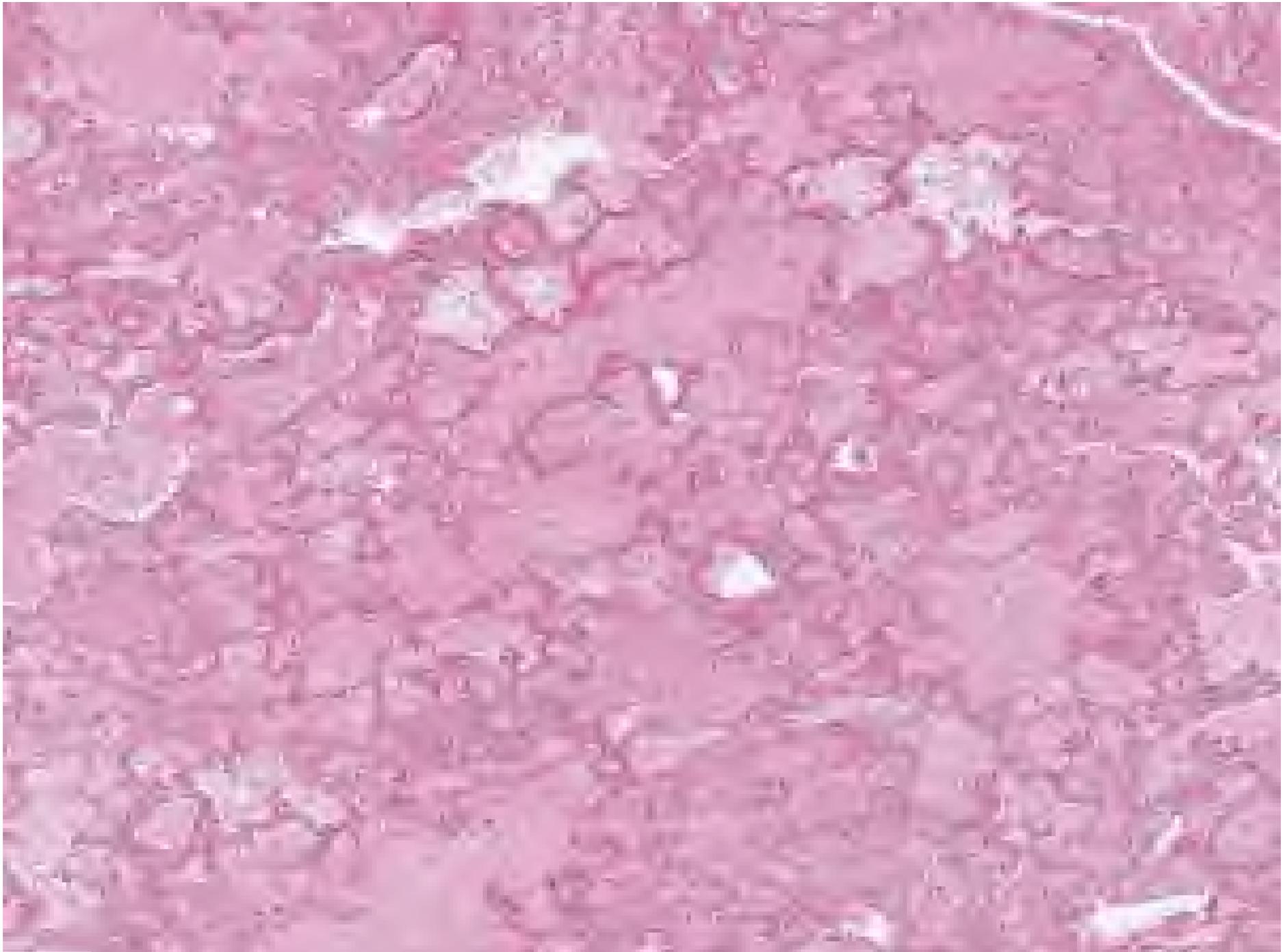
Pulmonary Infarct

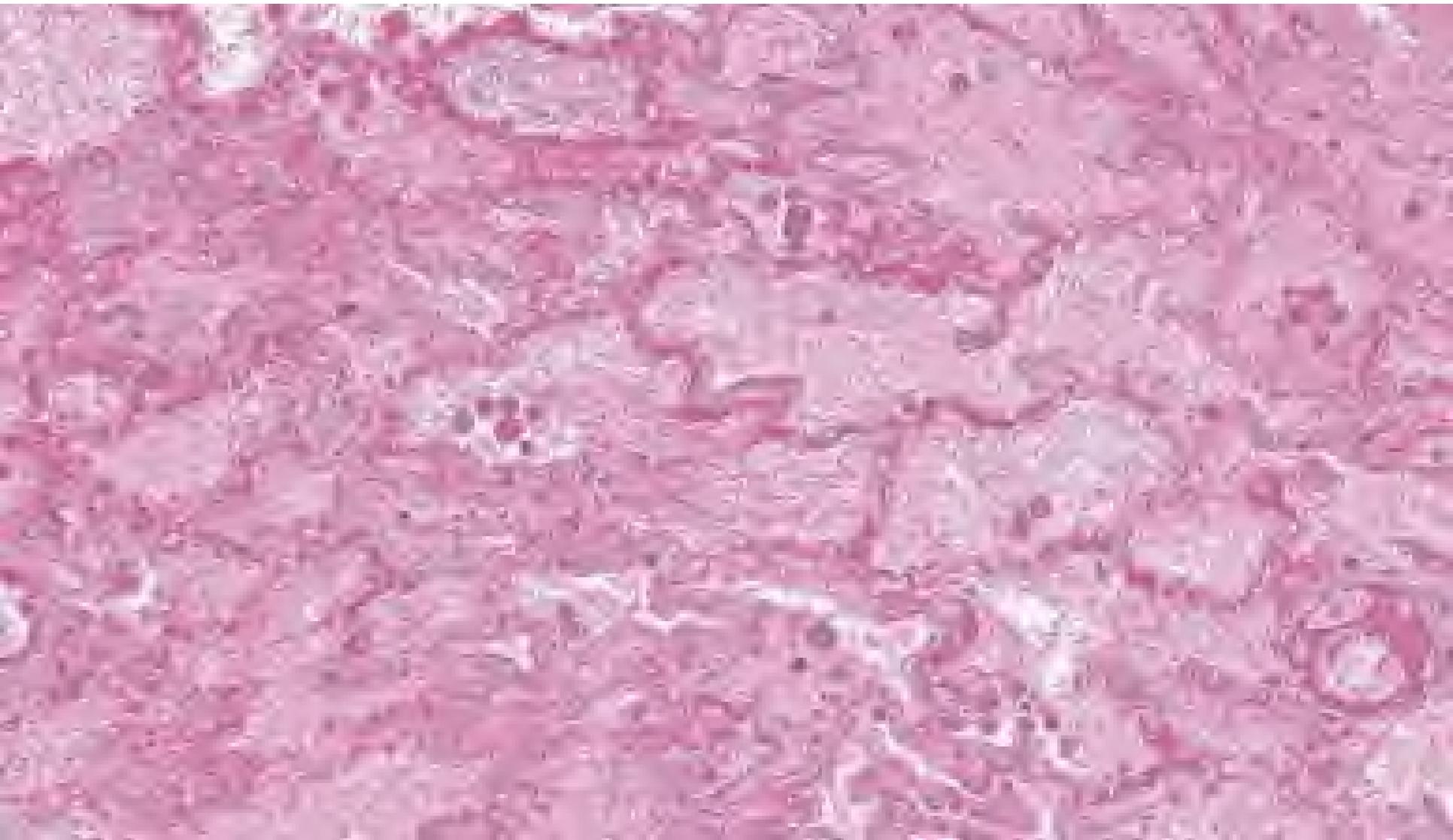


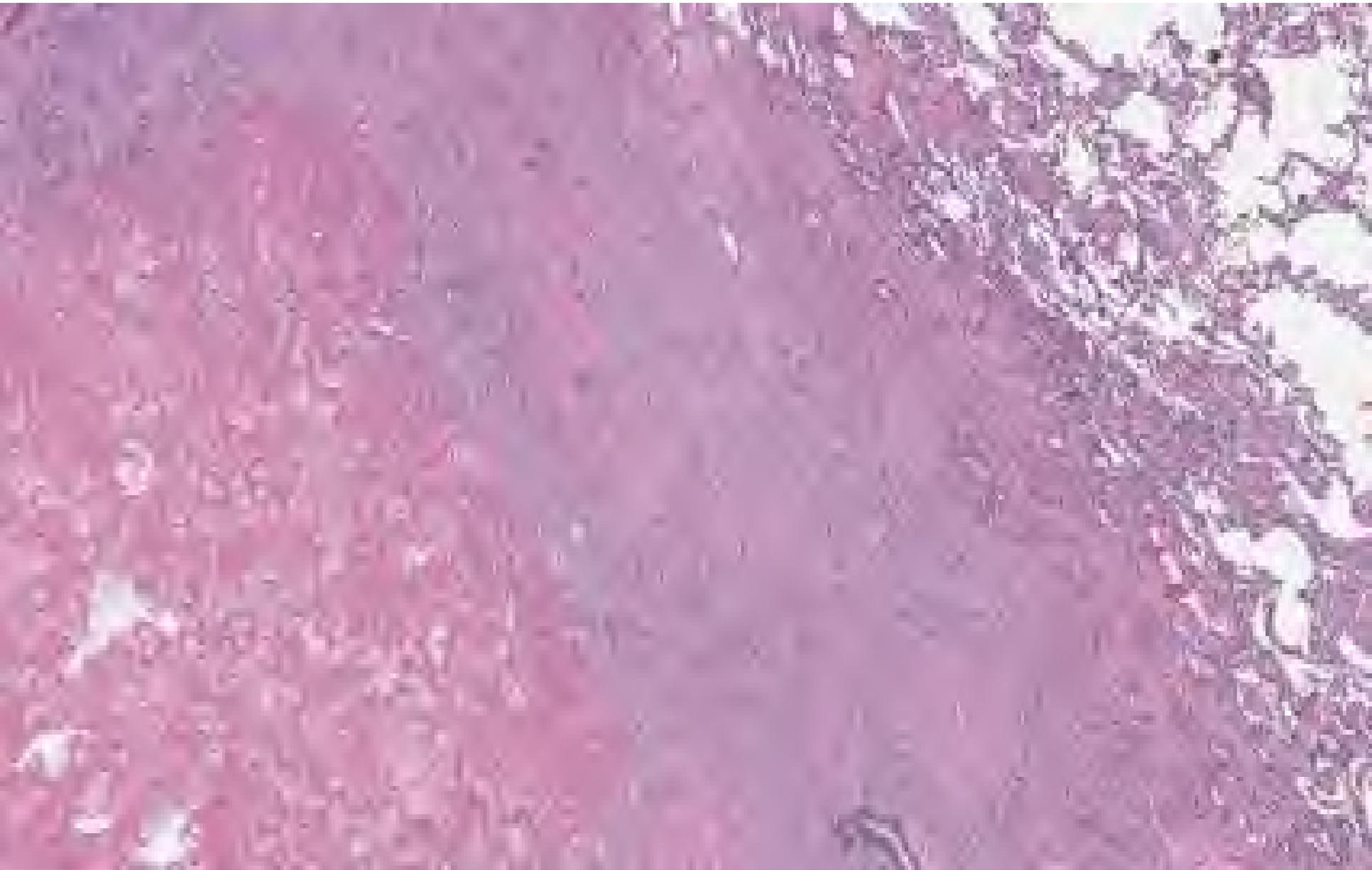


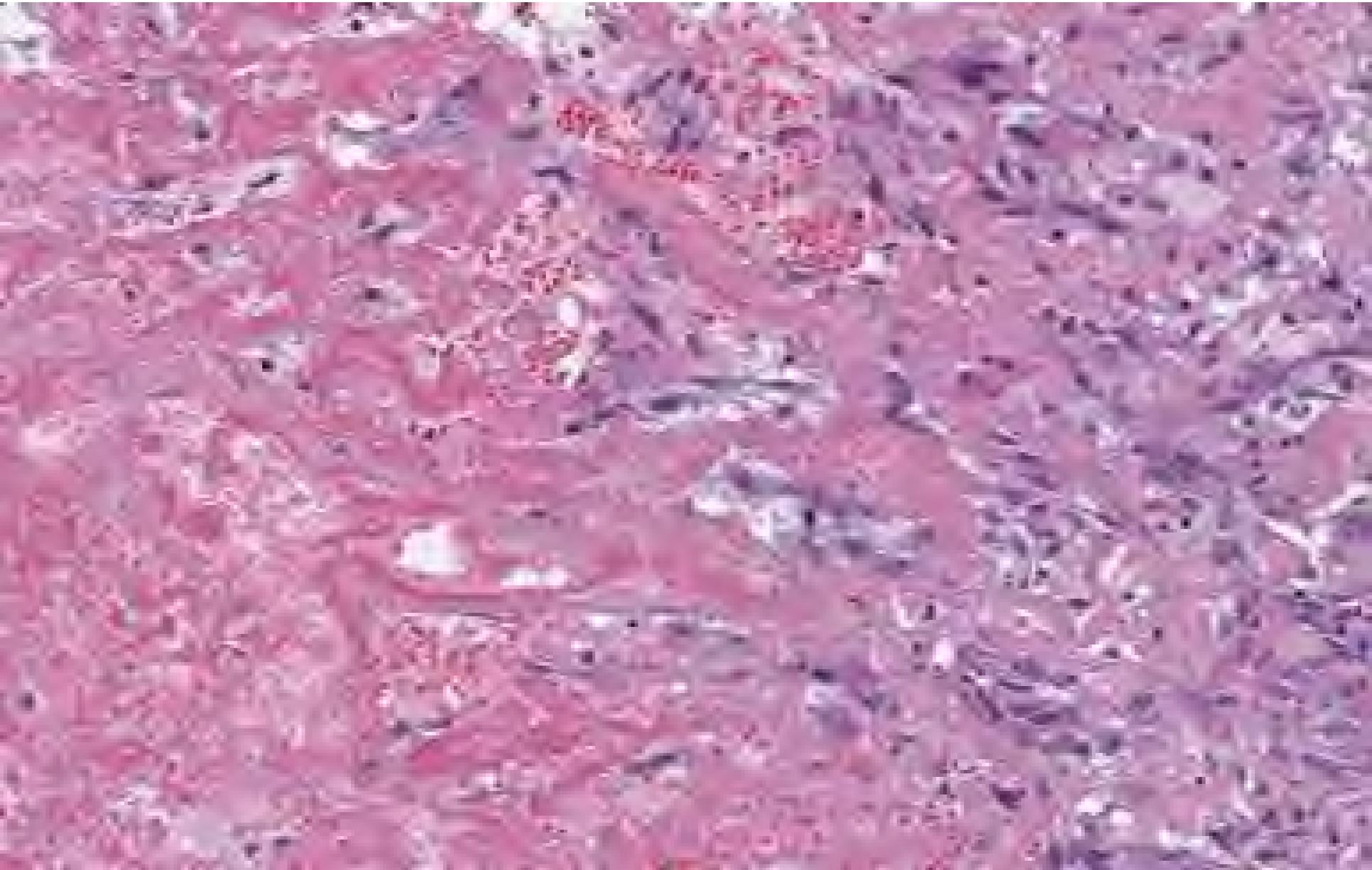
Pulmonary Infarct

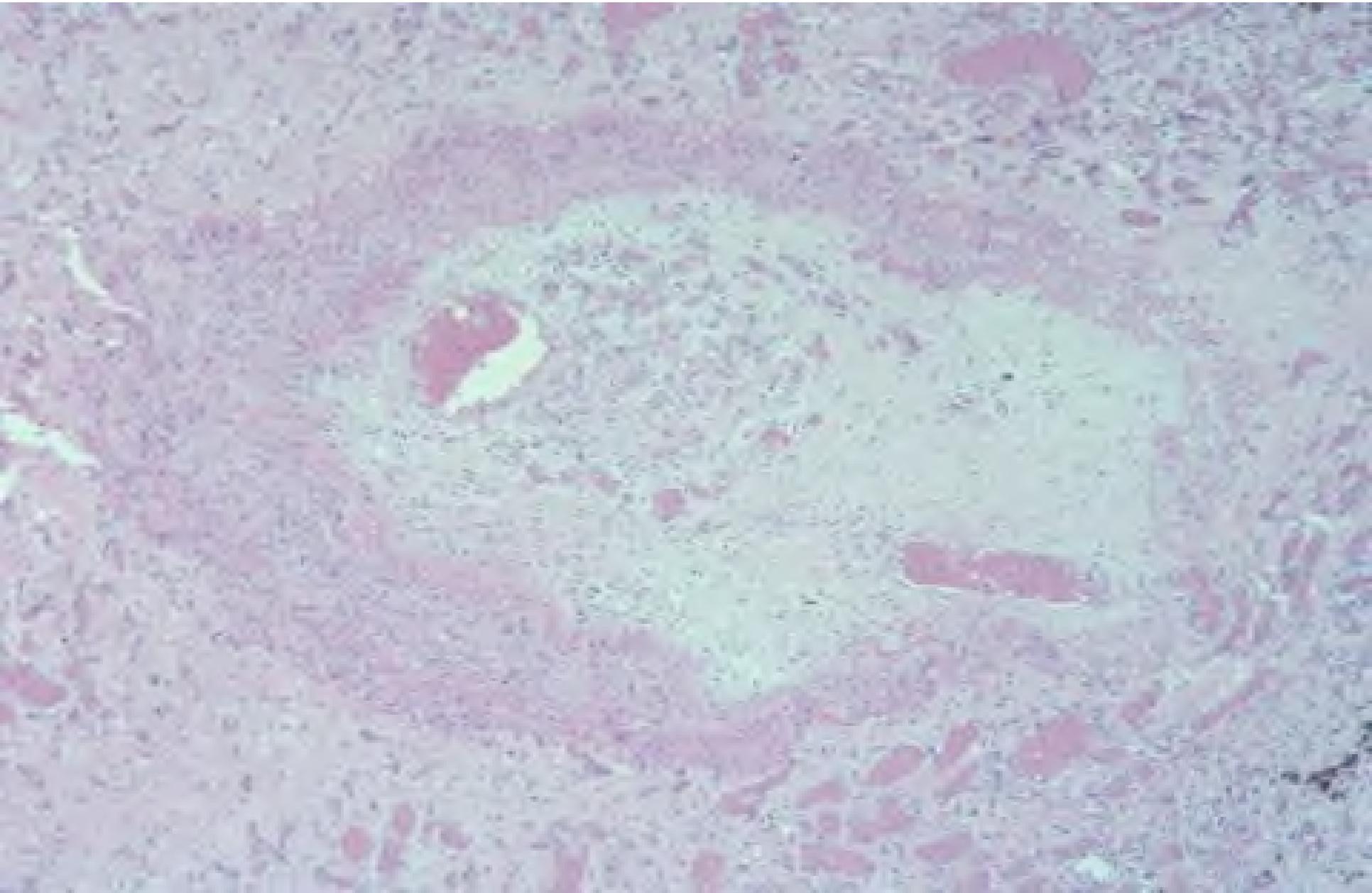




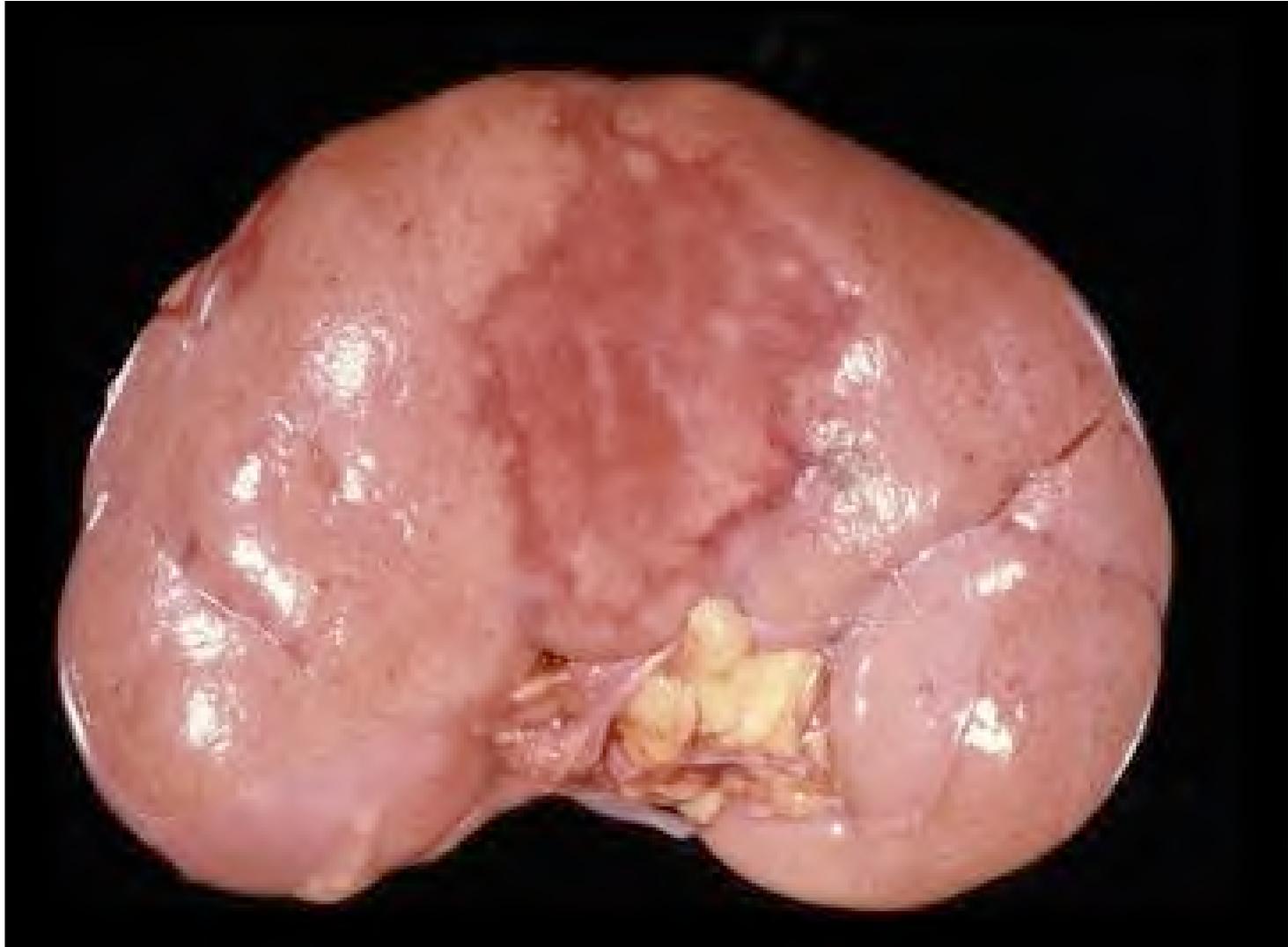






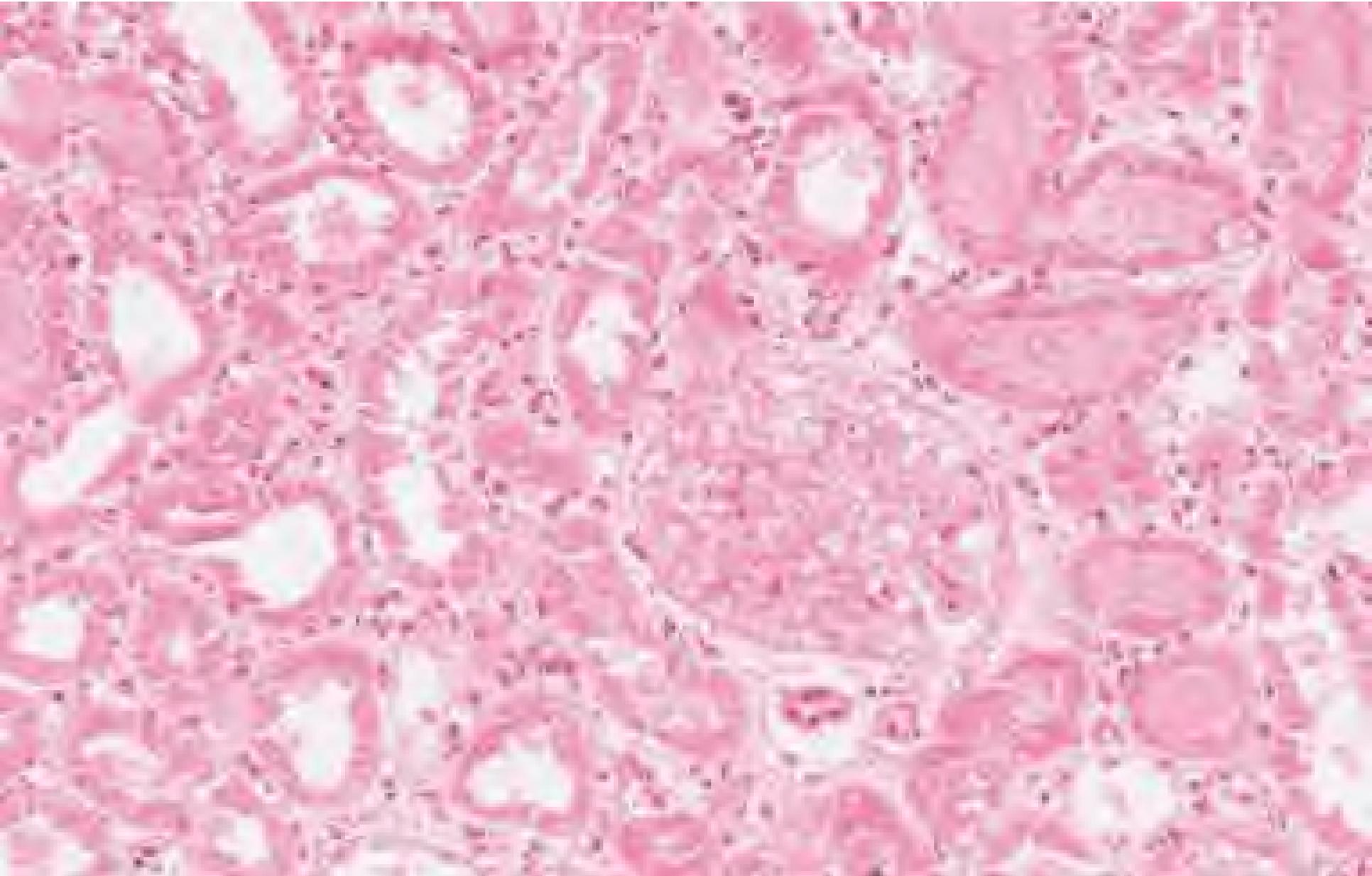


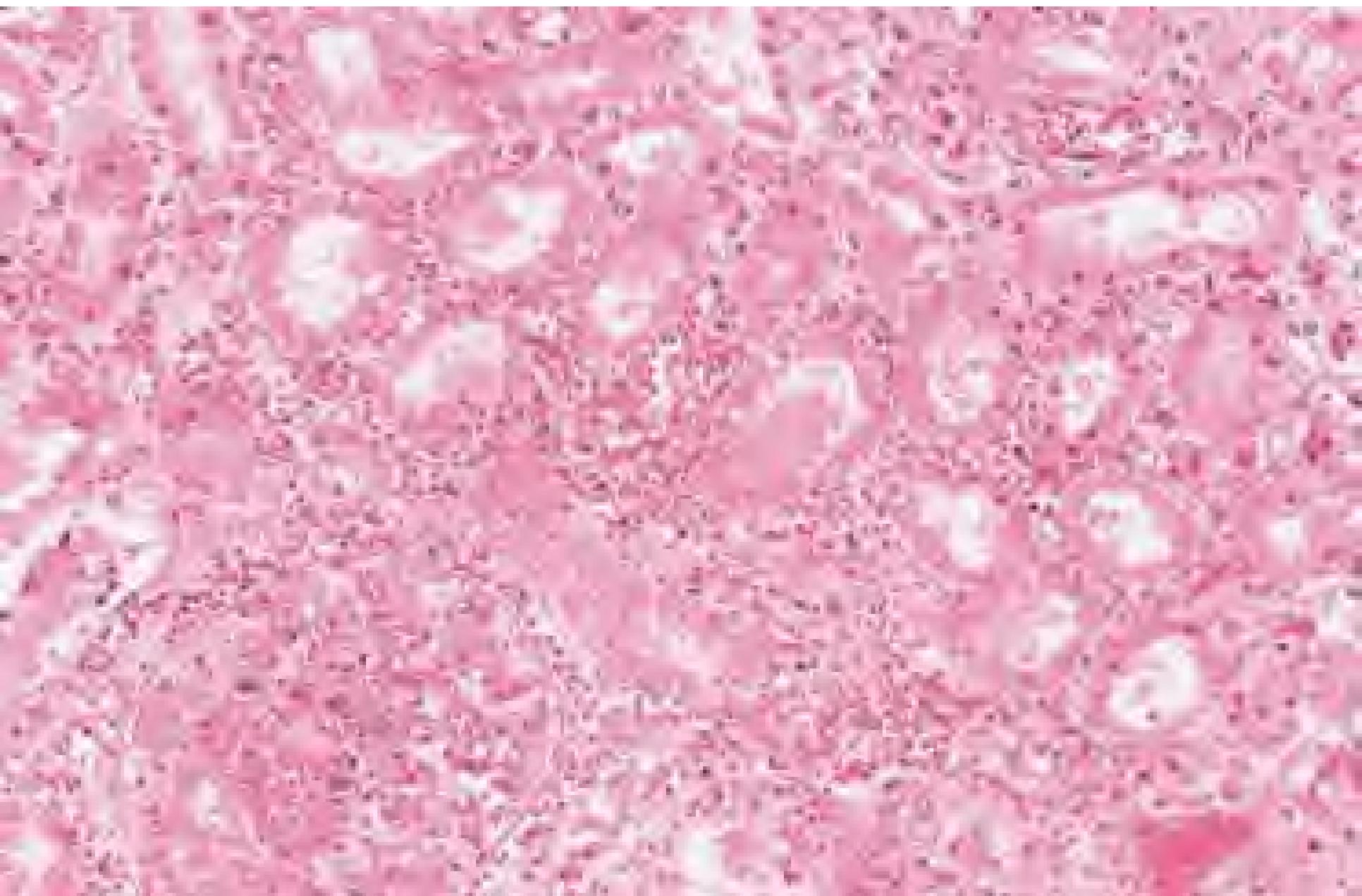
Renal Infarct

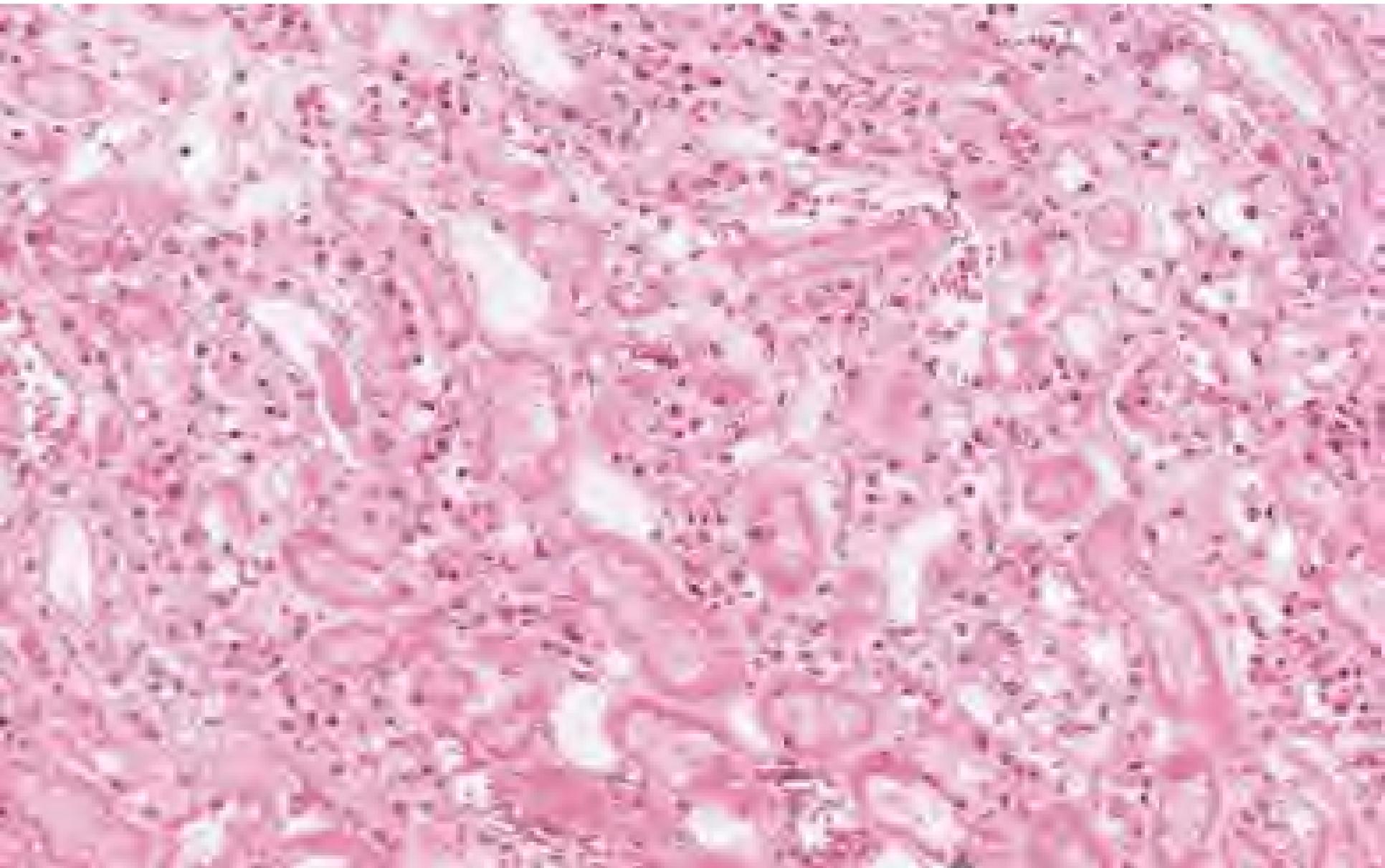


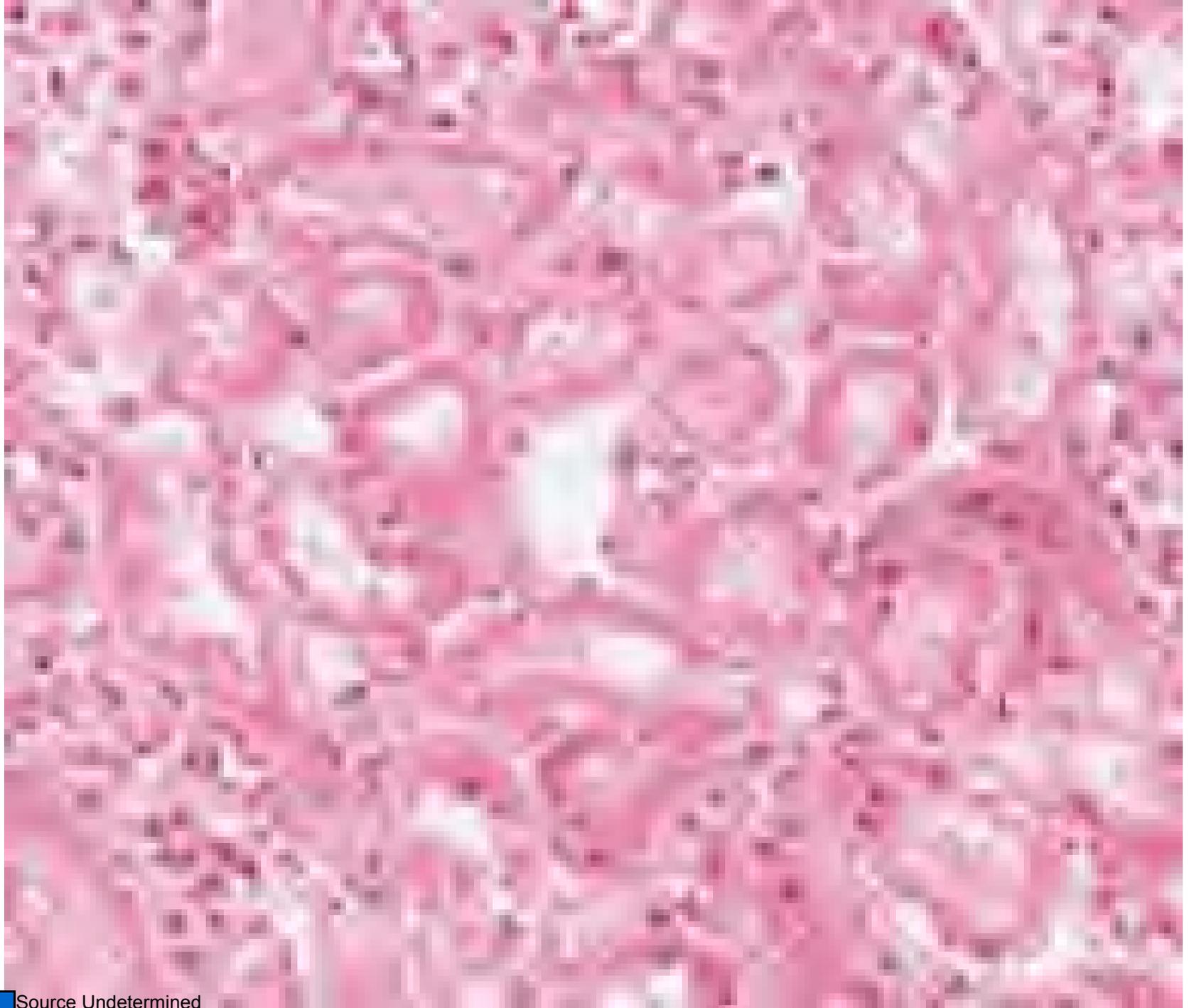
Renal Infarct

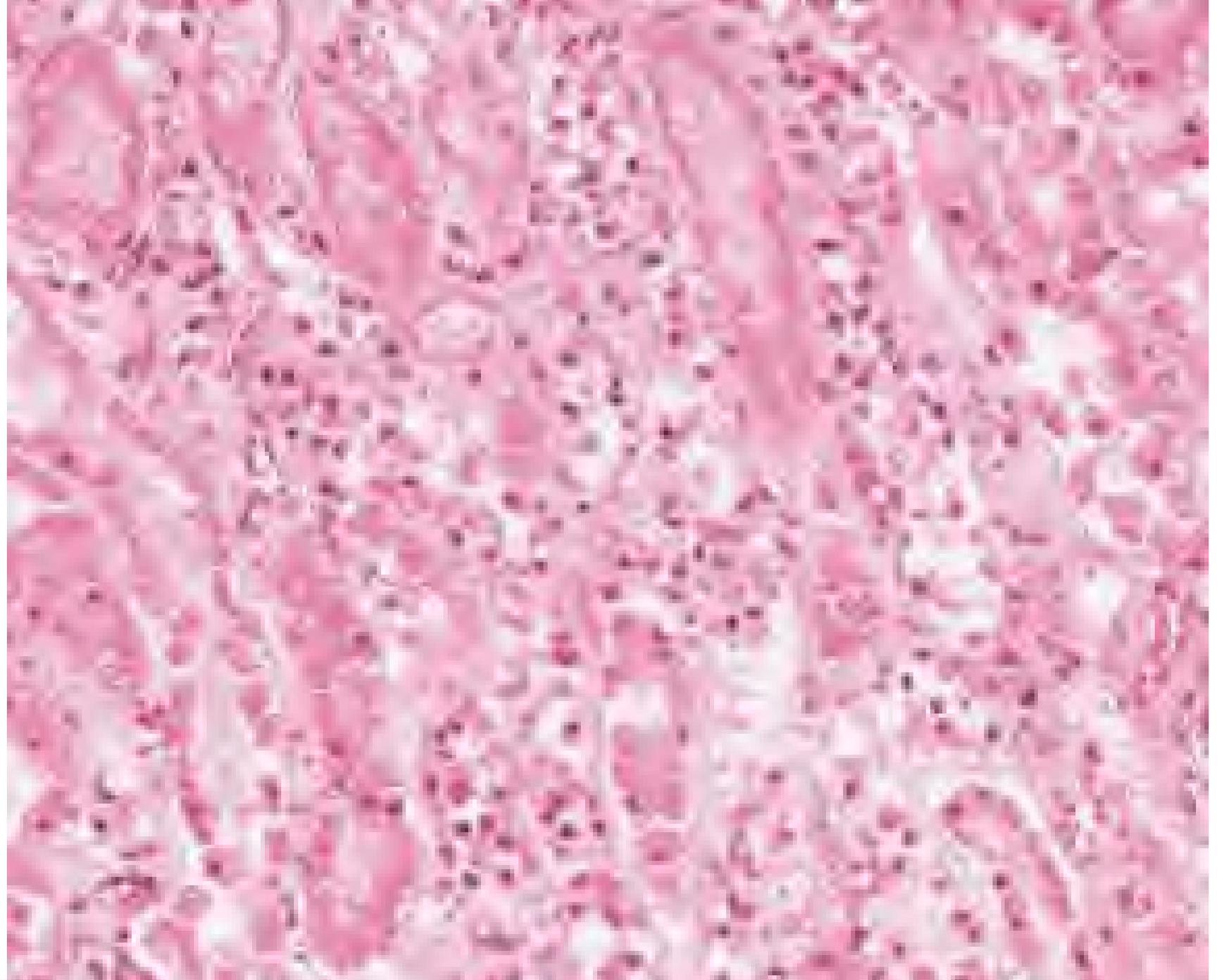


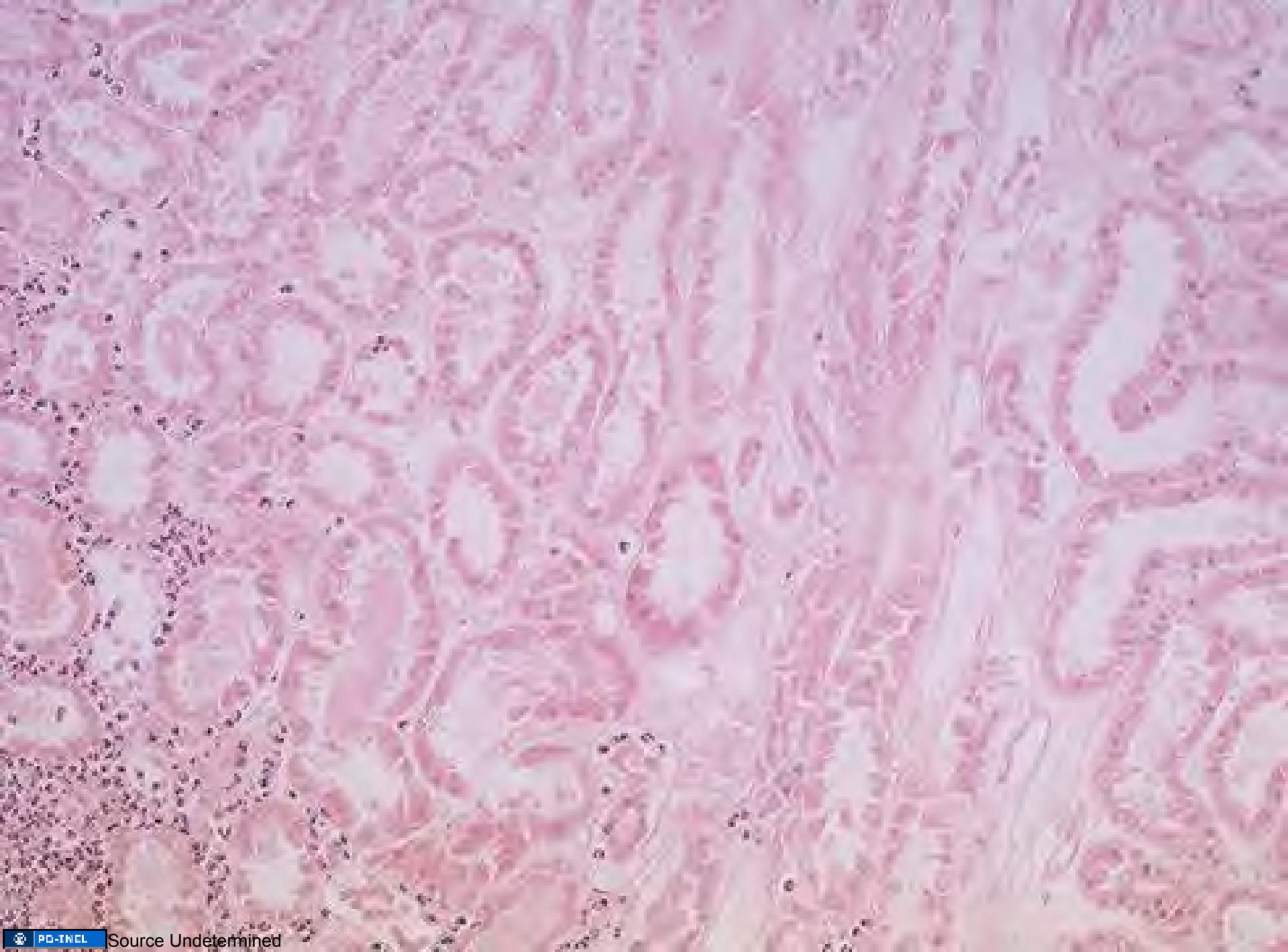


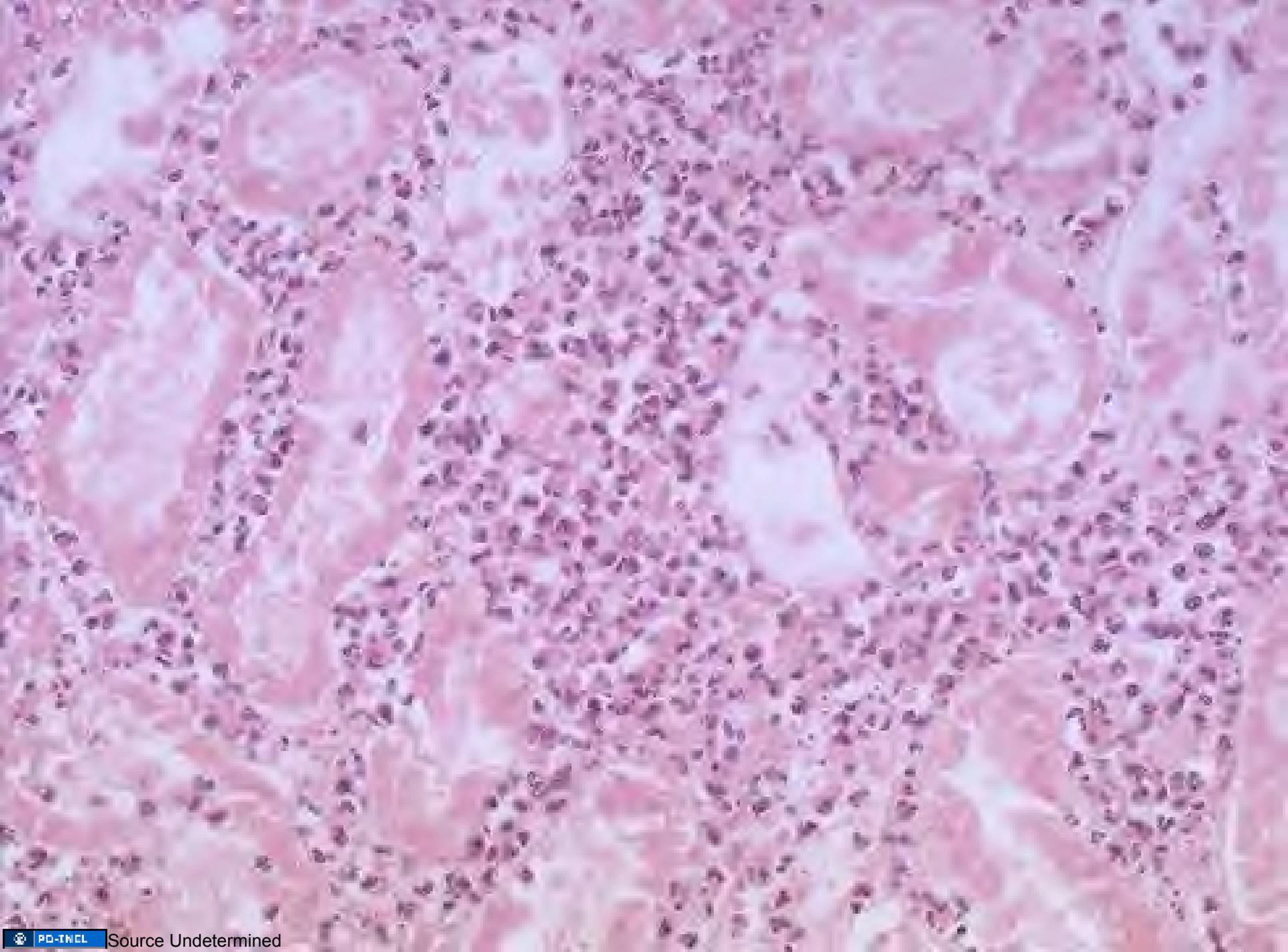








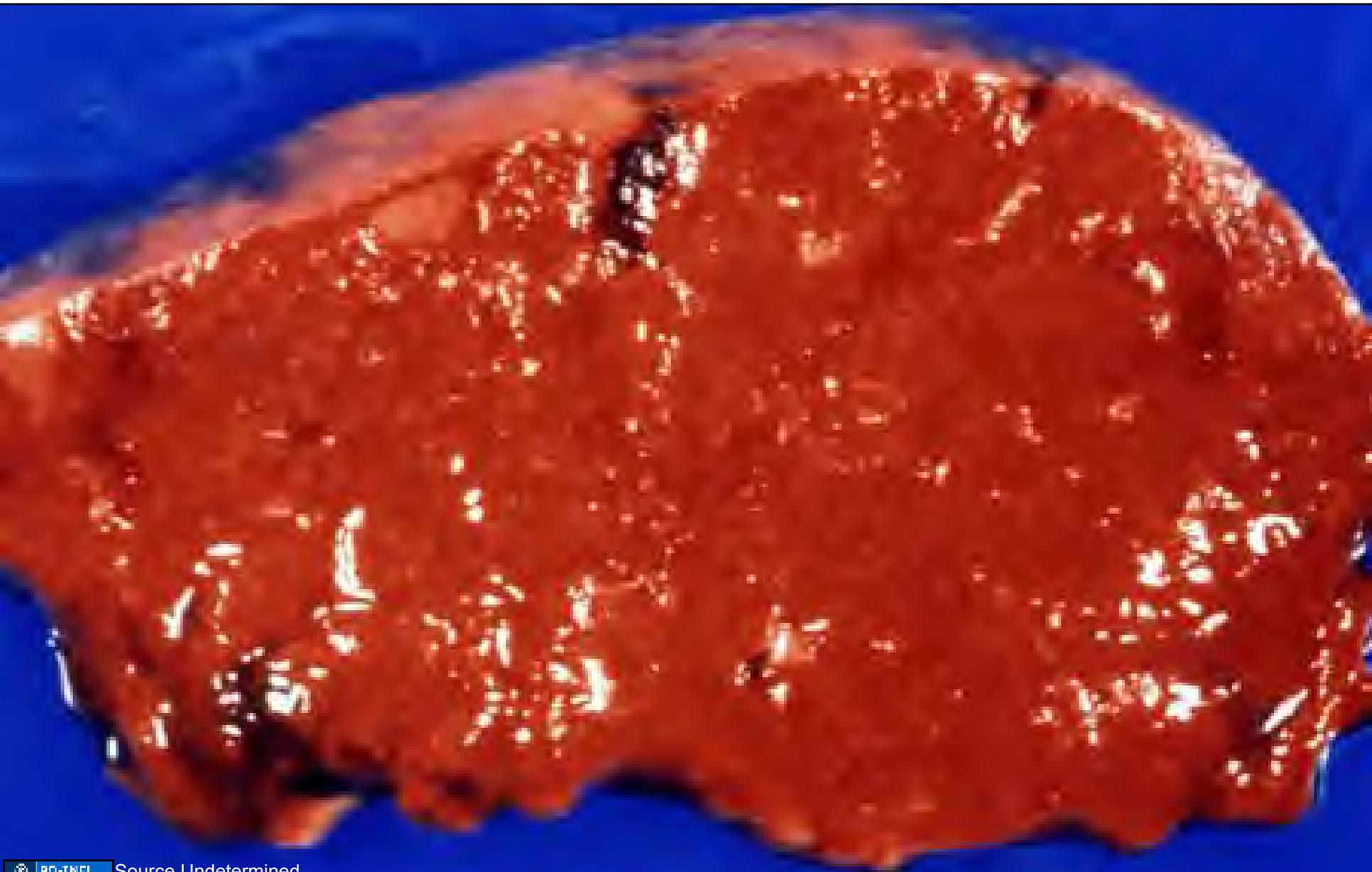




M-2 Cardiovascular Laboratory - 3

- 30** Acute pulmonary edema
- 32** Central hemorrhagic necrosis
- 31** Chronic pulmonary congestion
- 88** Colon ischemia
- 37** Myocardial hypertrophy
- 9** Gangrene

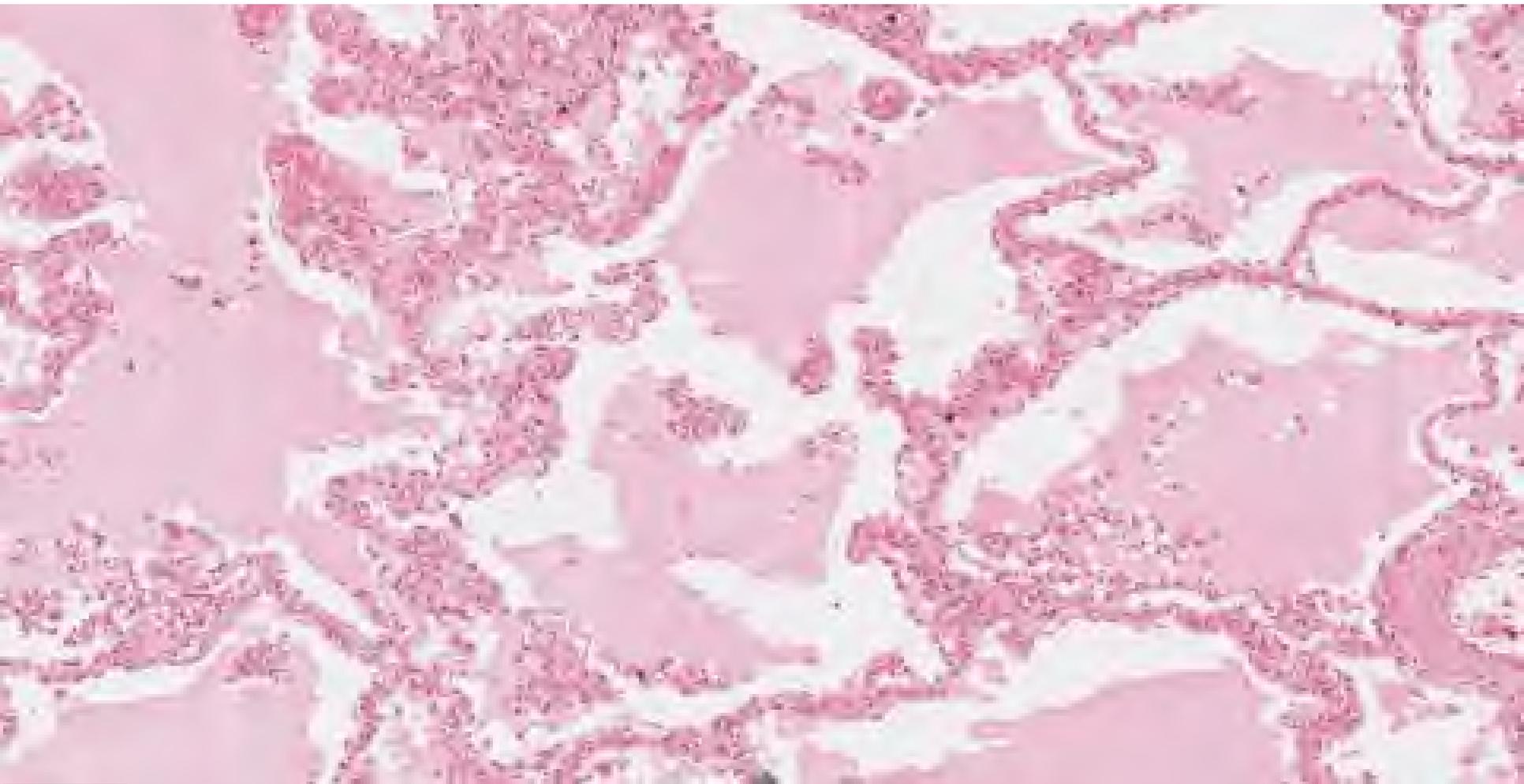
Acute Pulmonary Edema

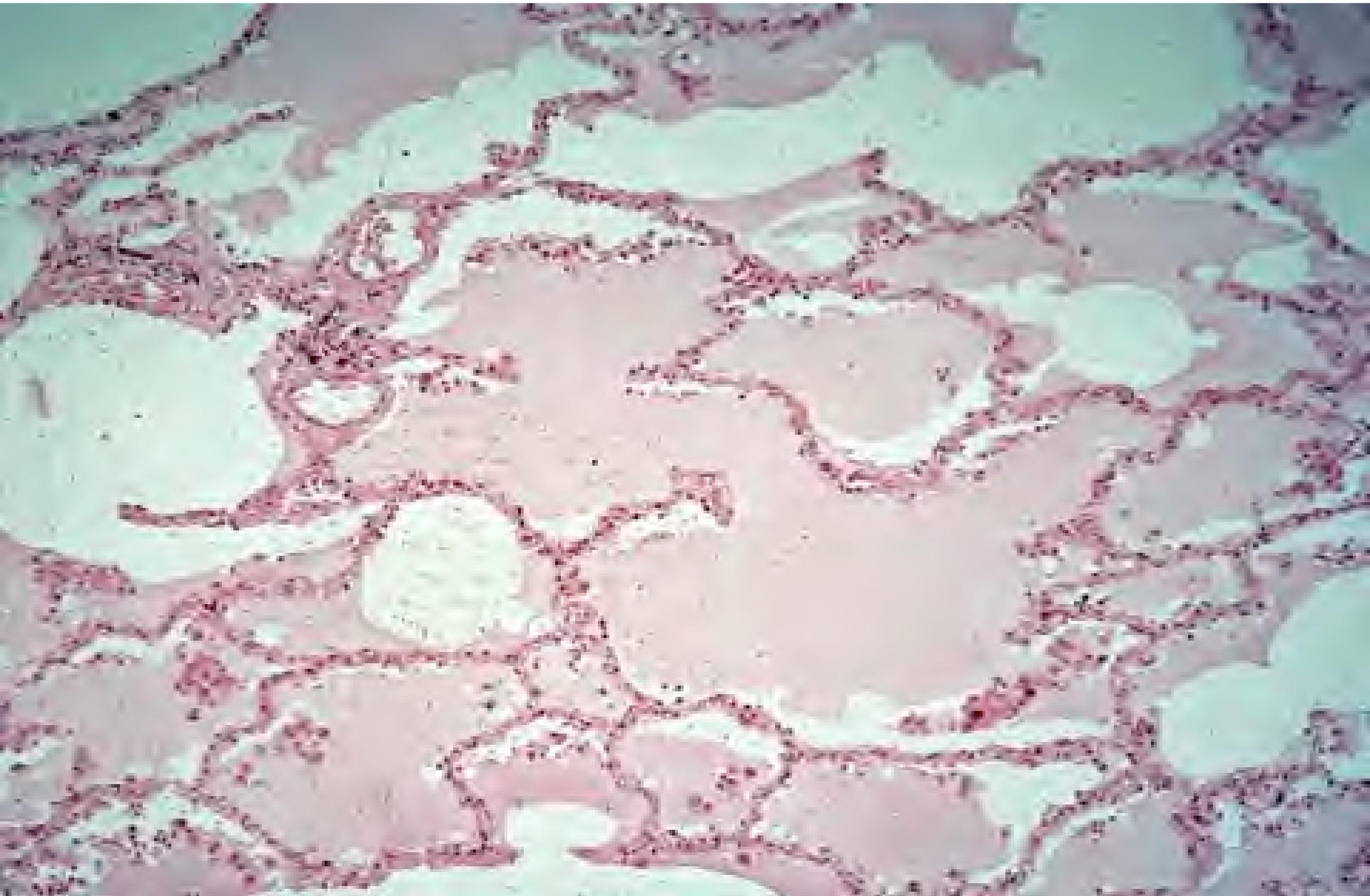


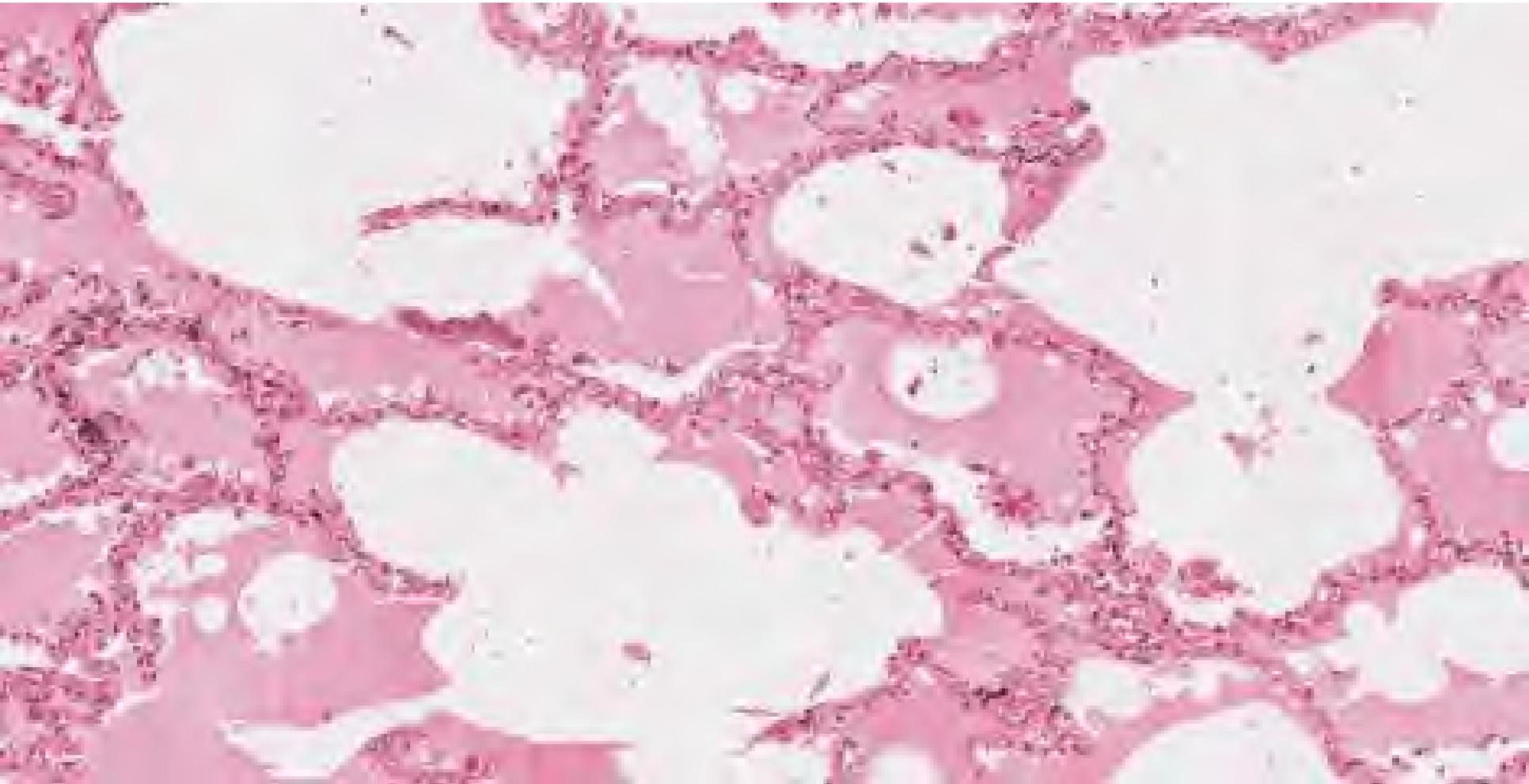


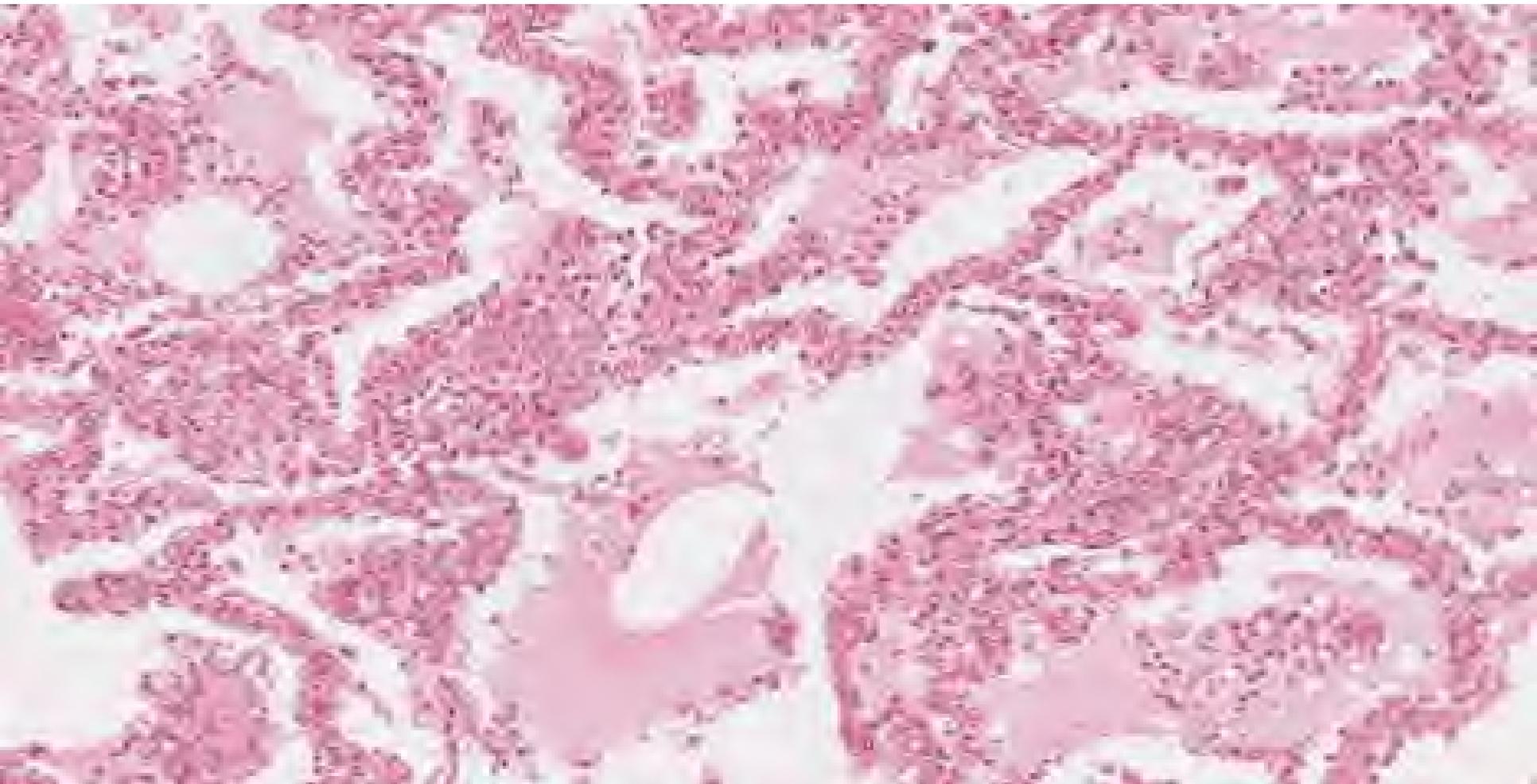
Acute Pulmonary Edema

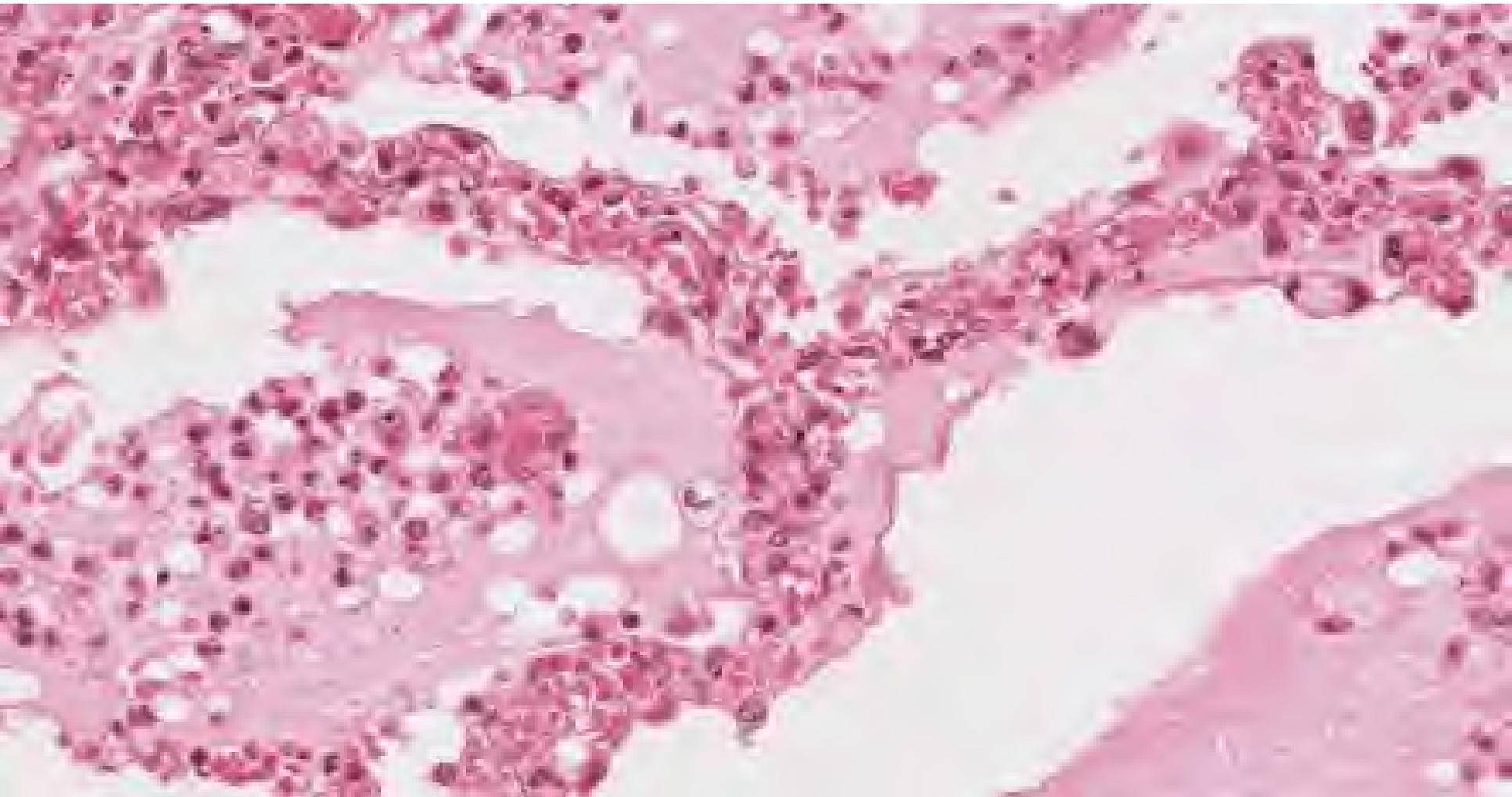




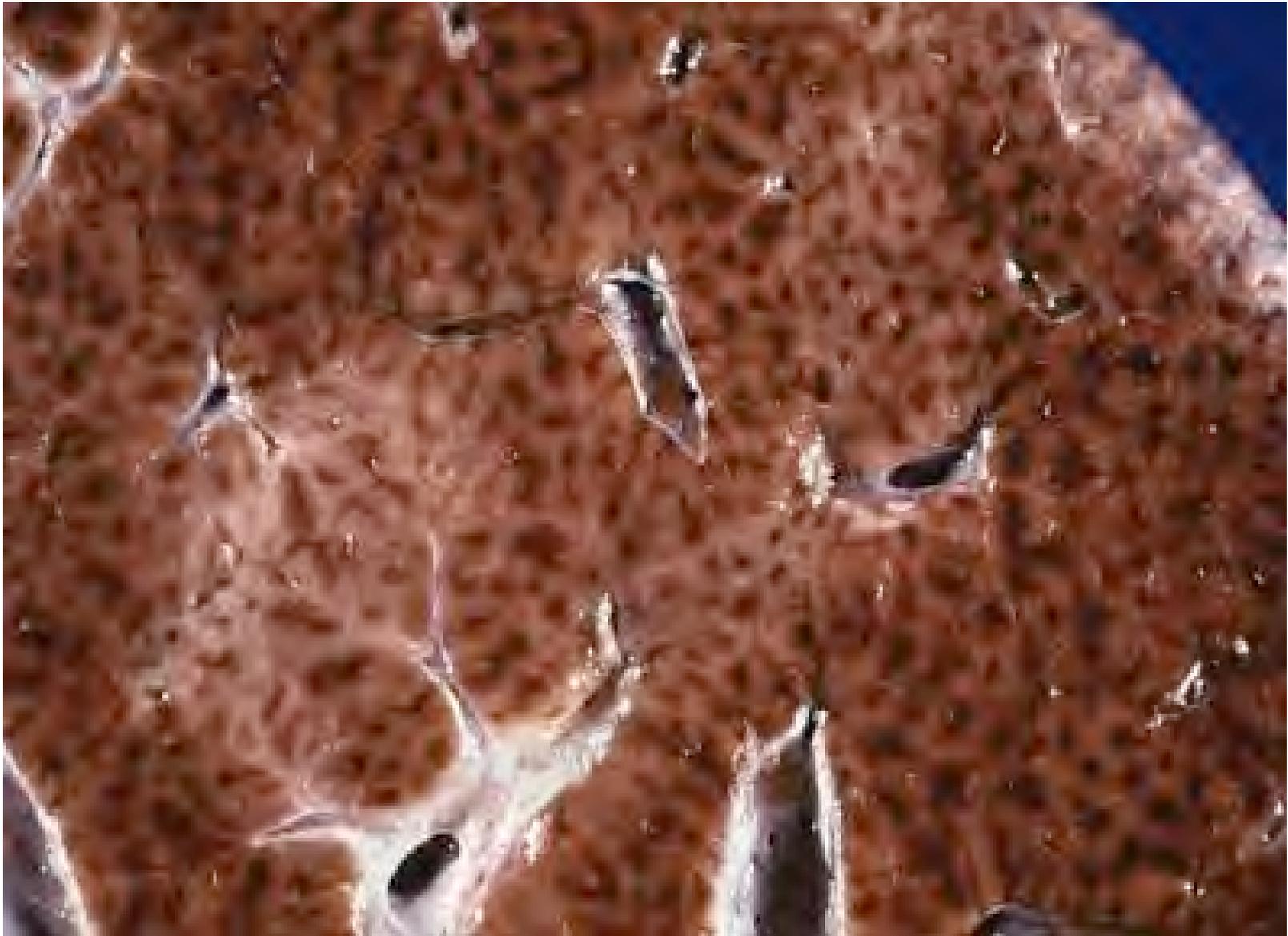




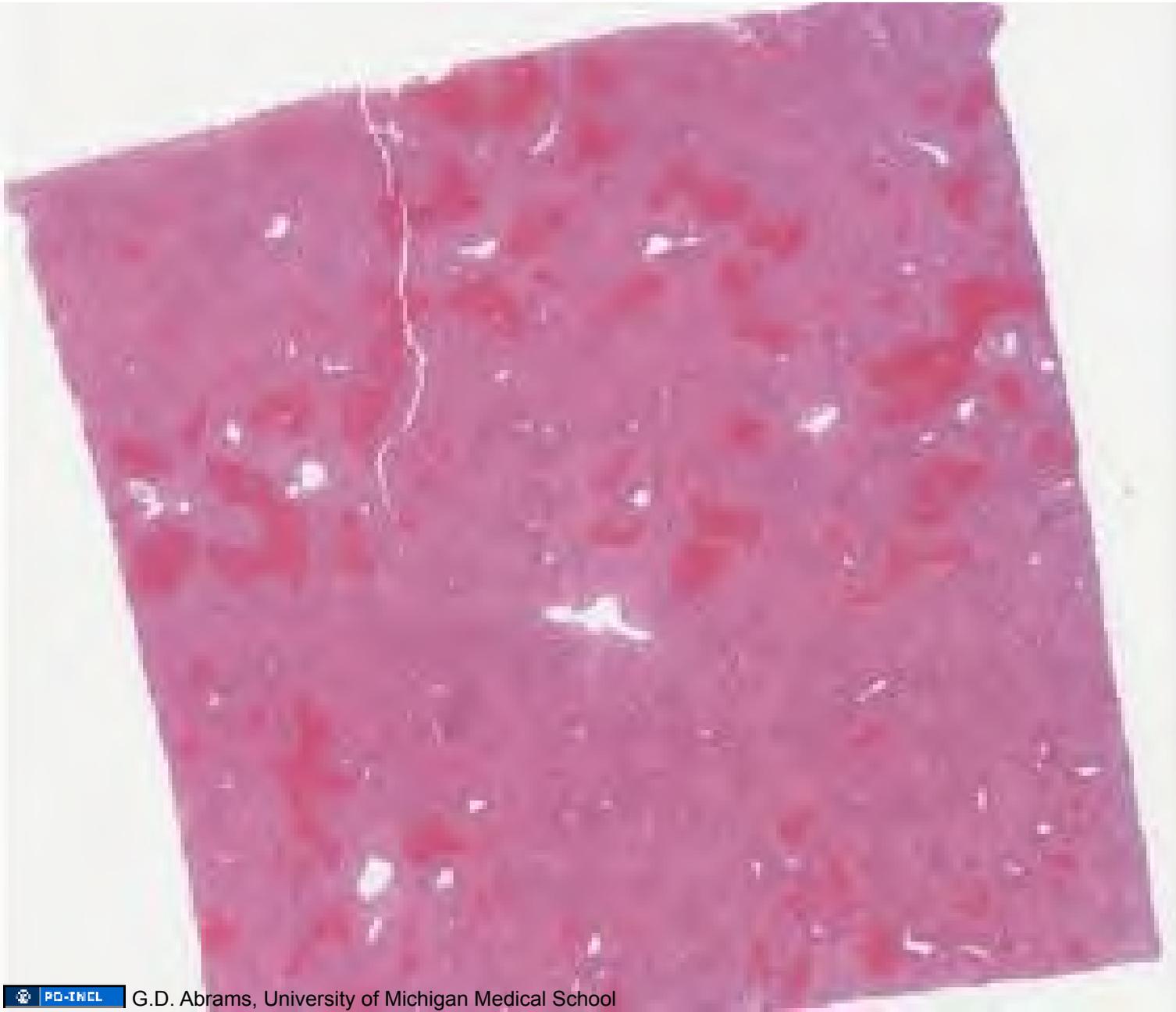




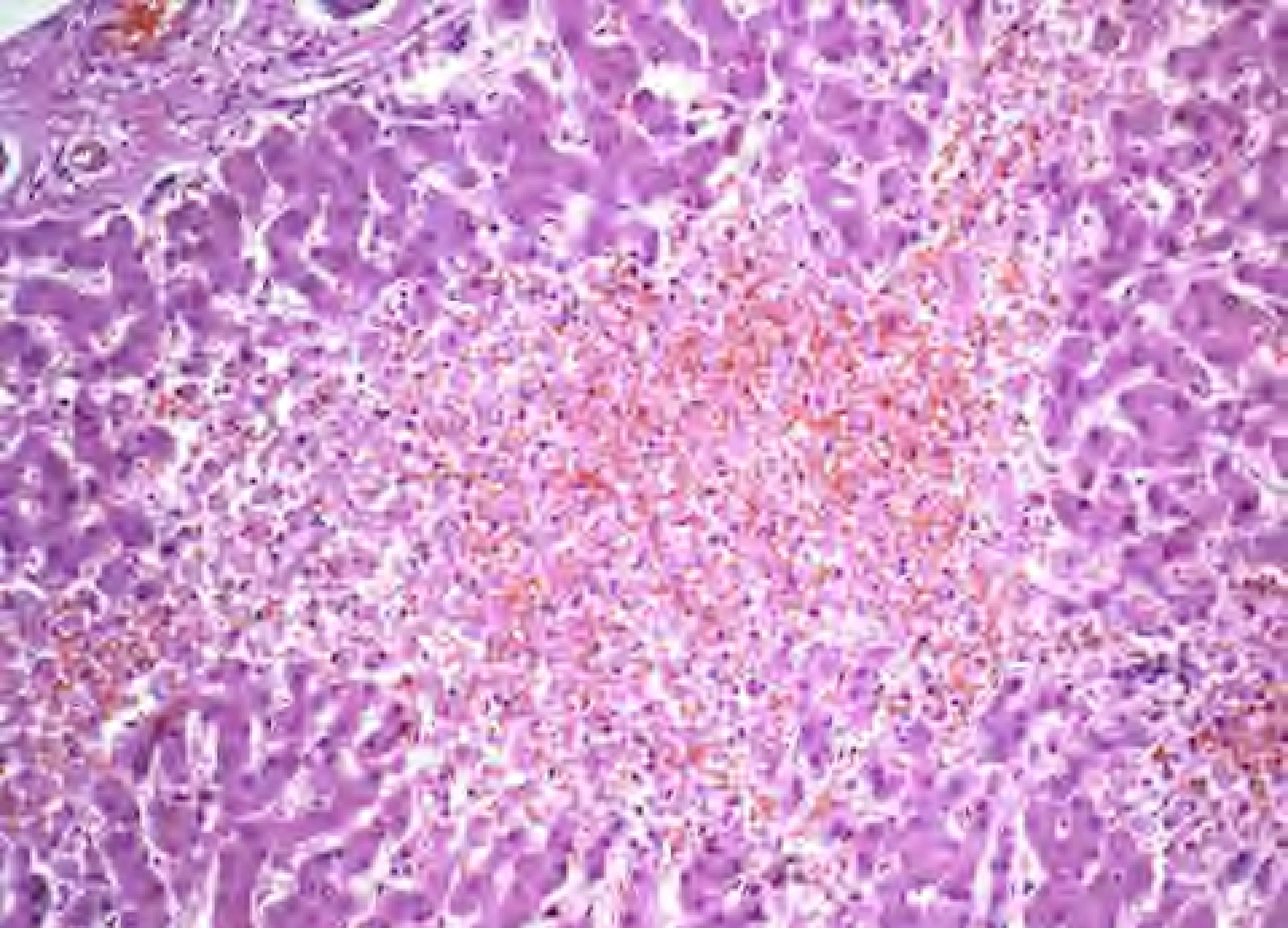
Central Hemorrhagic Necrosis

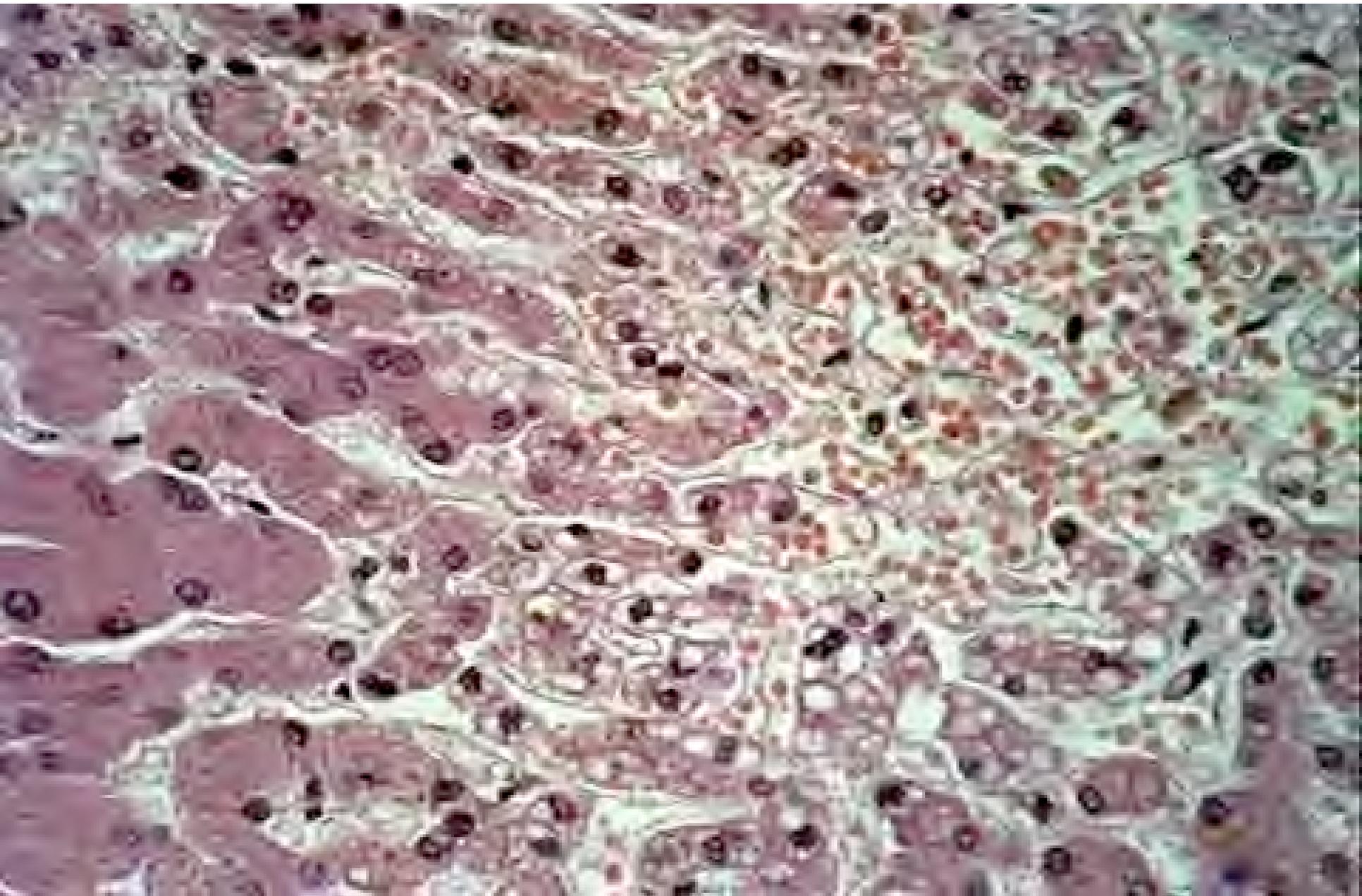


Central Hemorrhagic Necrosis







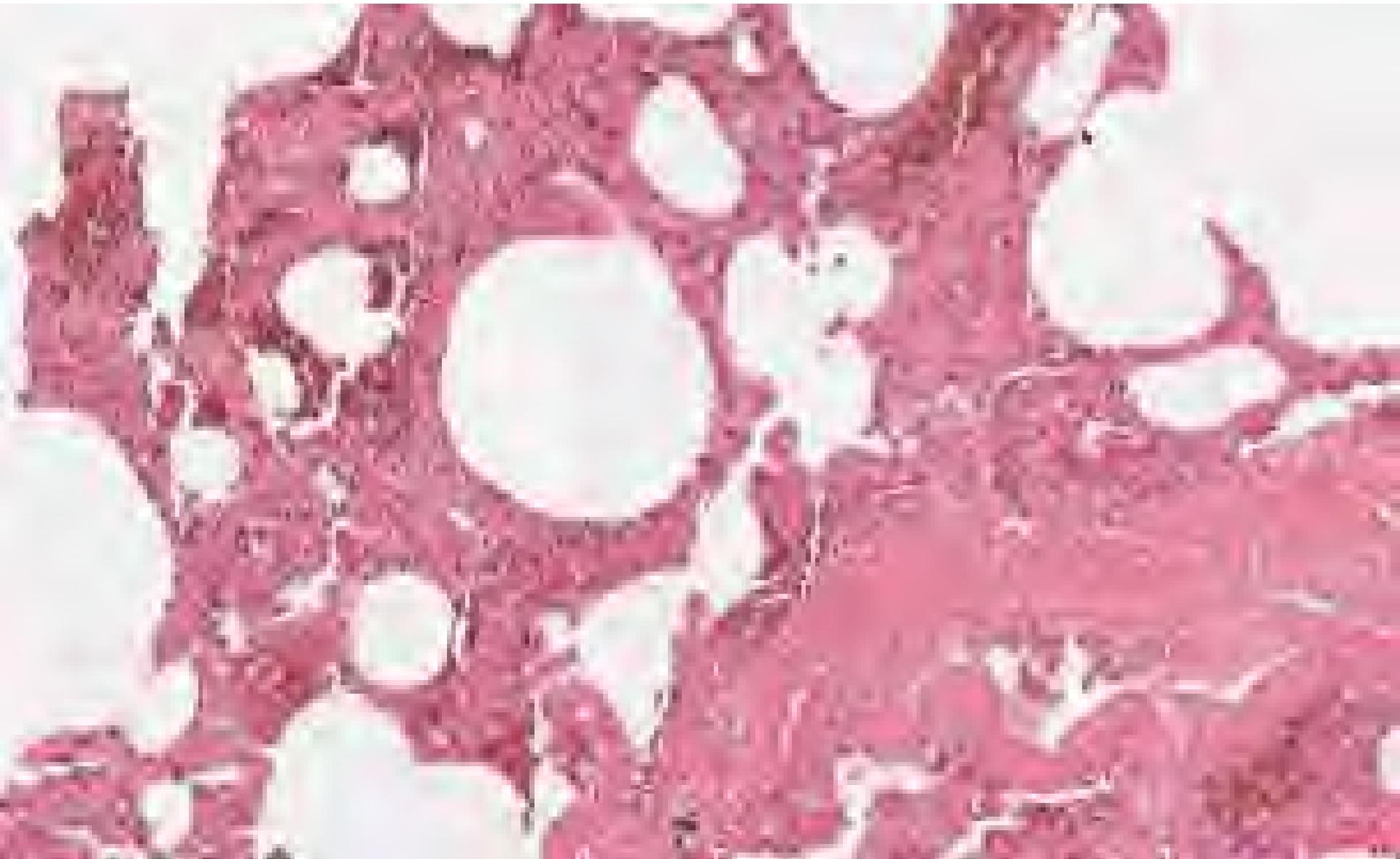


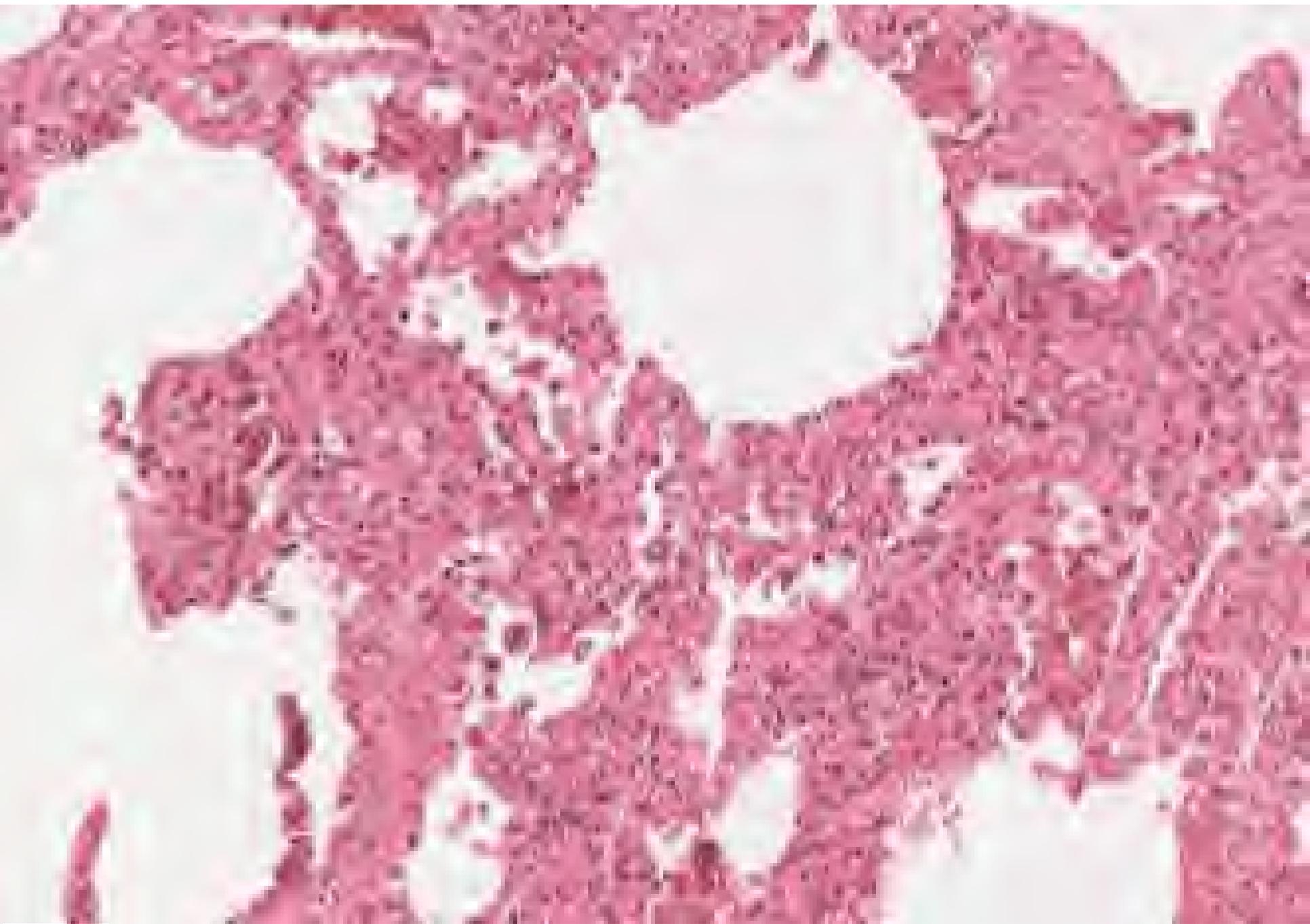
Congested Lung

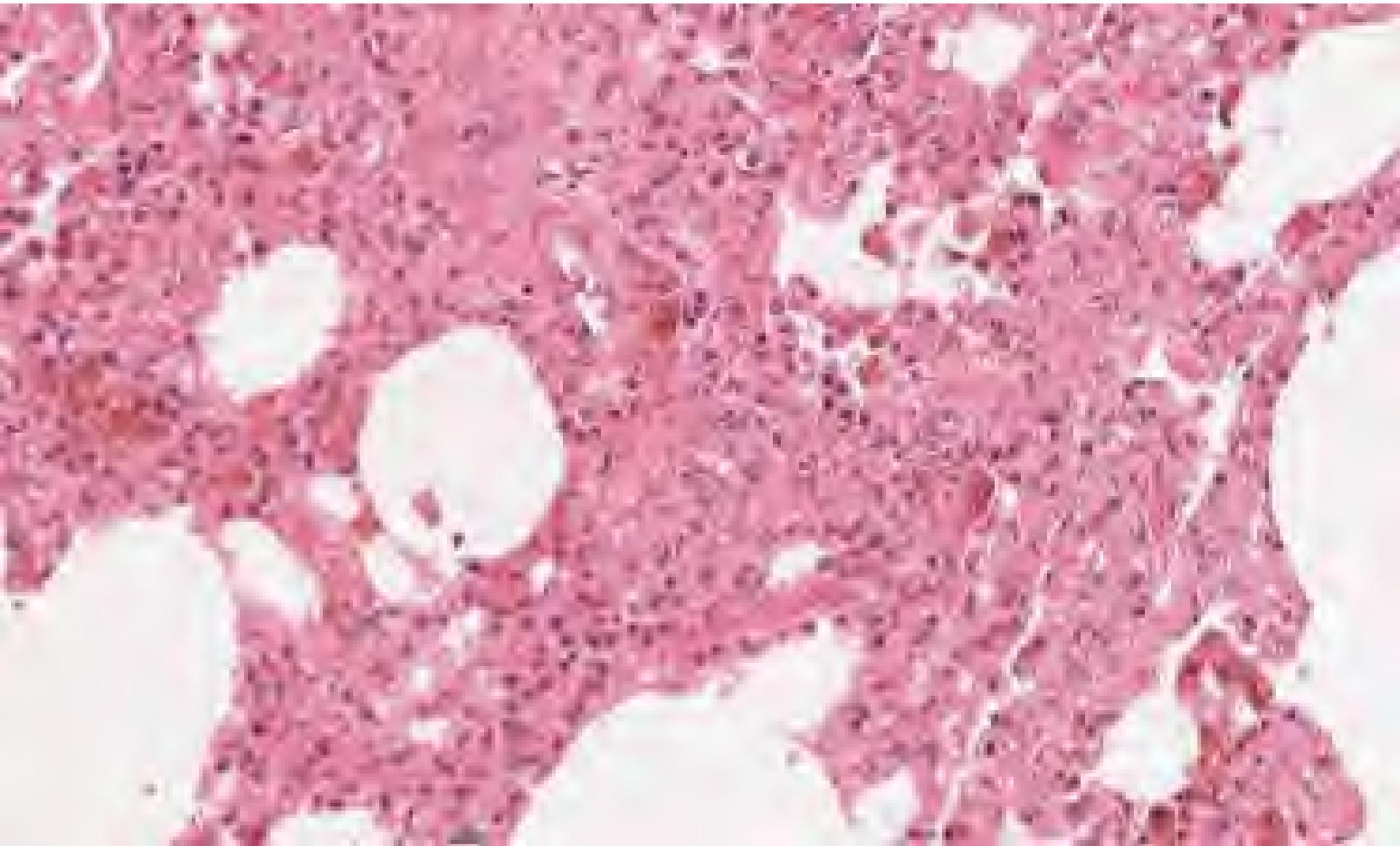


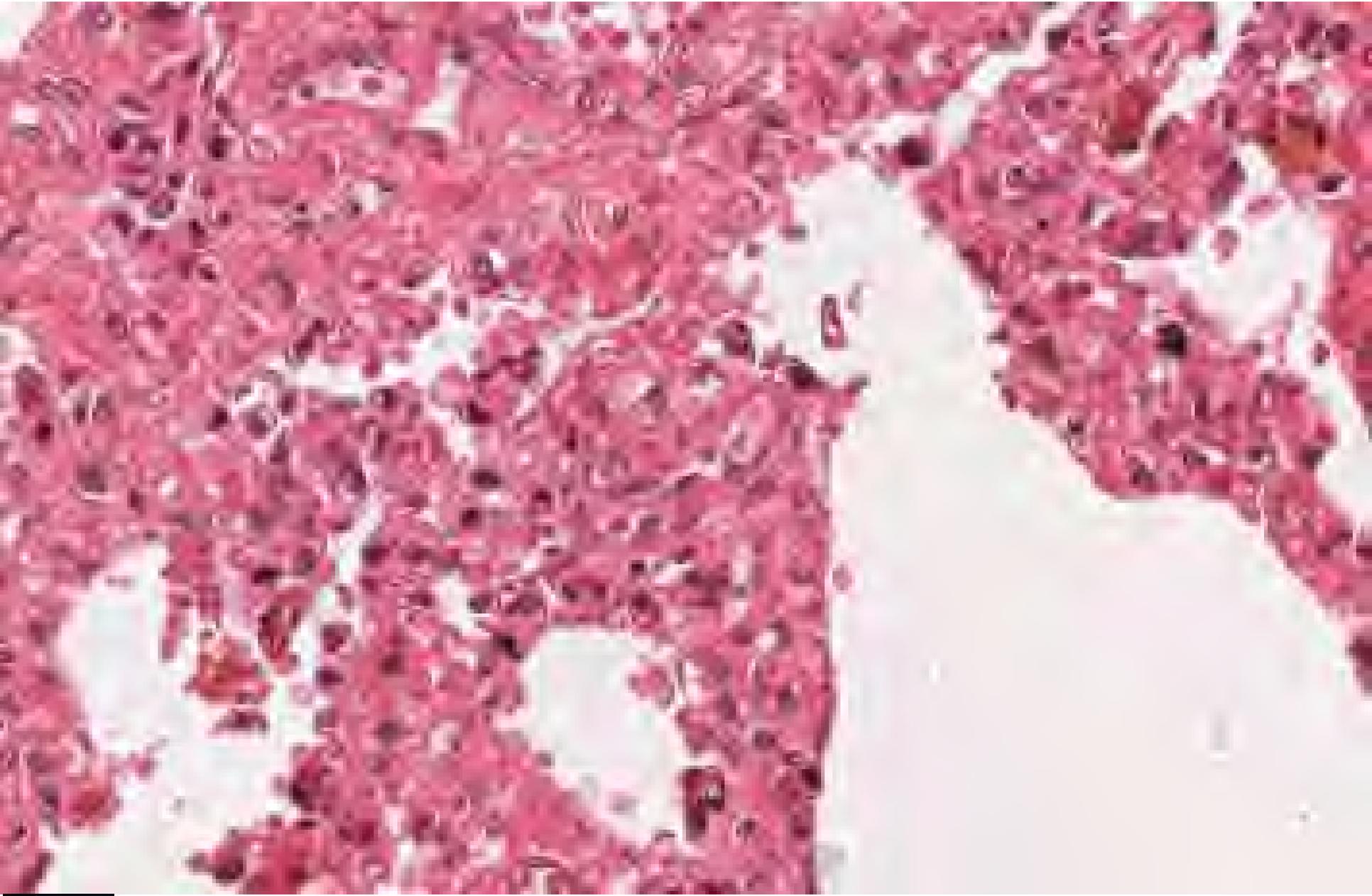
Chronic Pulmonary Congestion

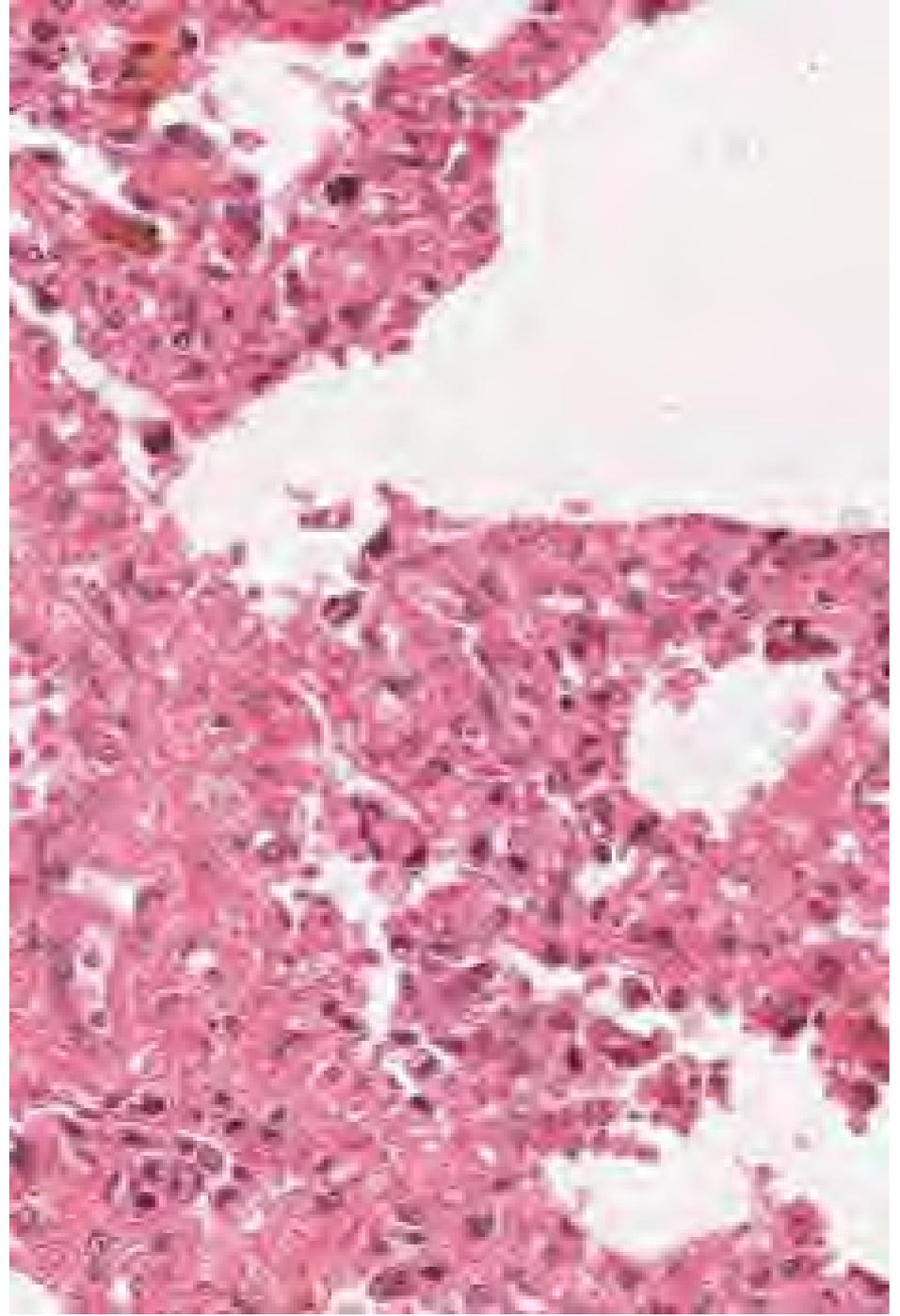
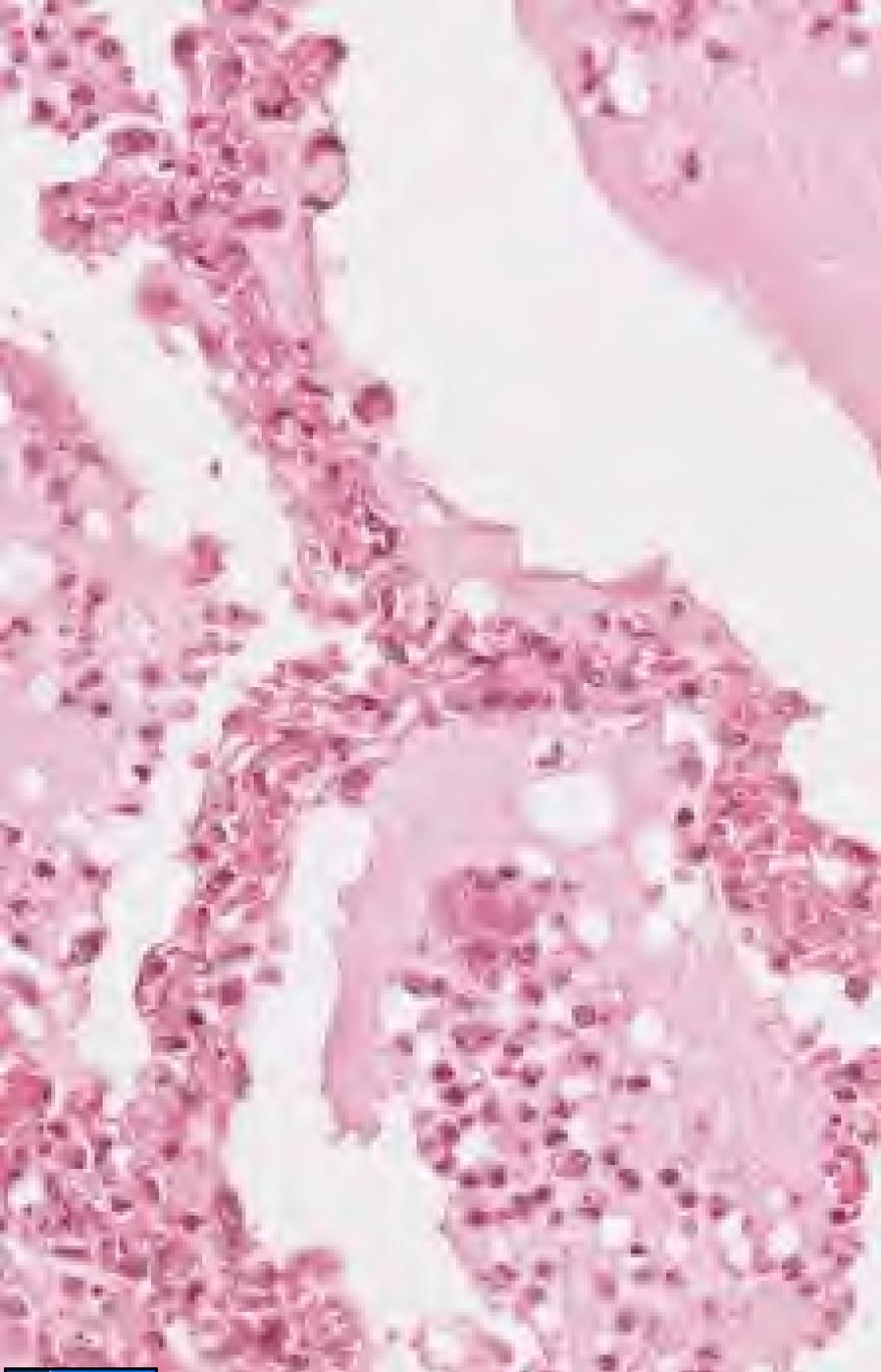












Ischemic Colitis

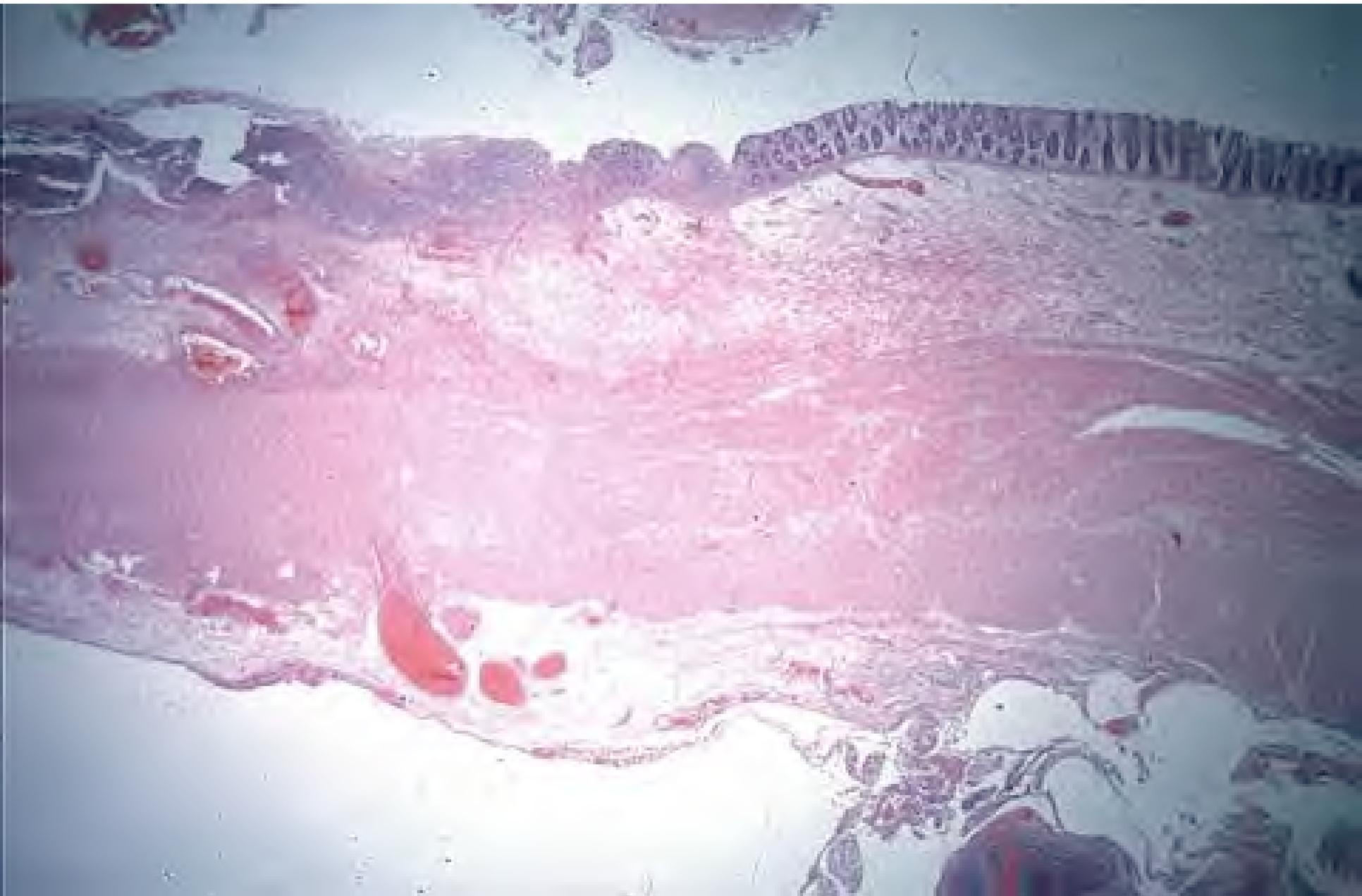


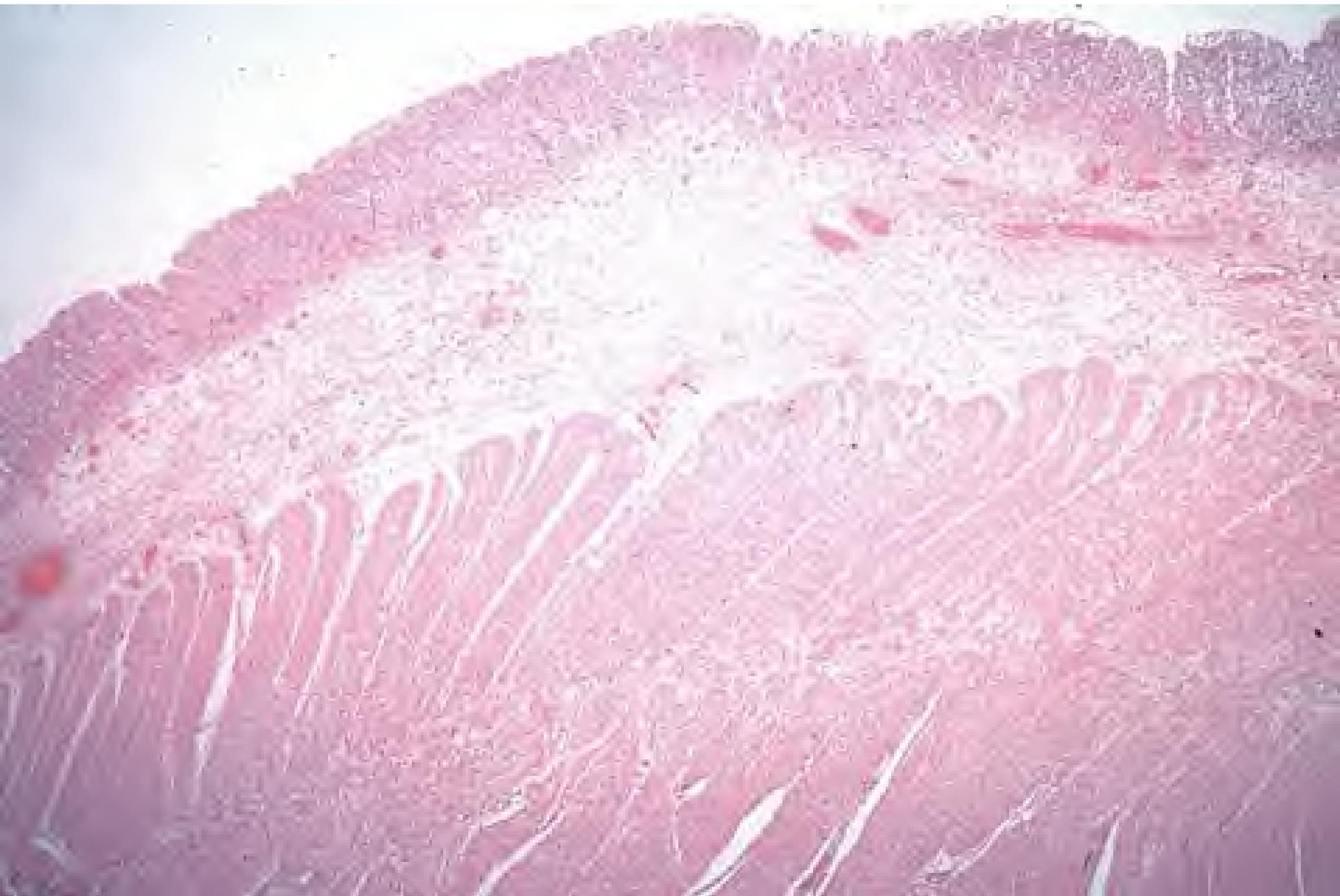
Ischemic Colitis

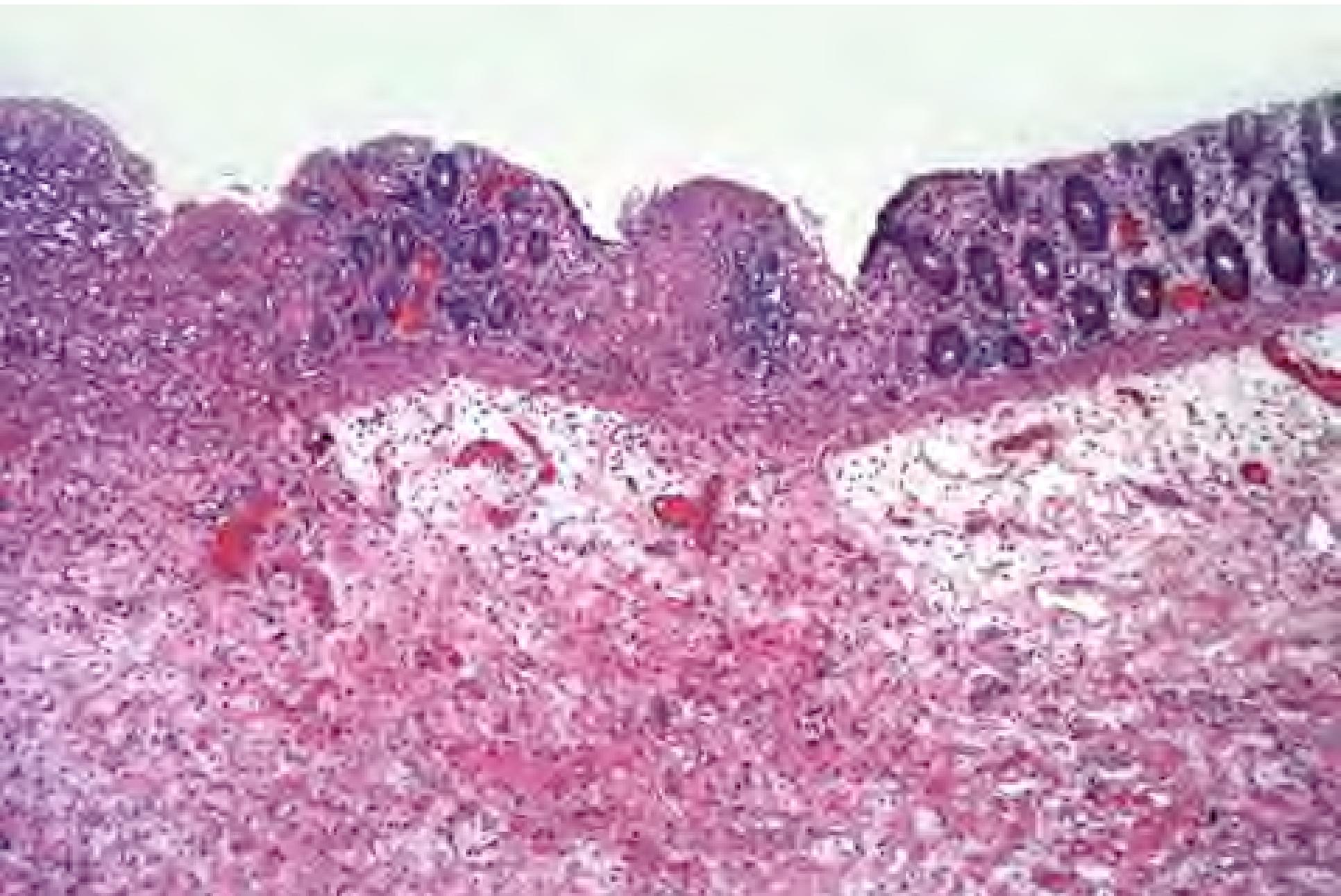


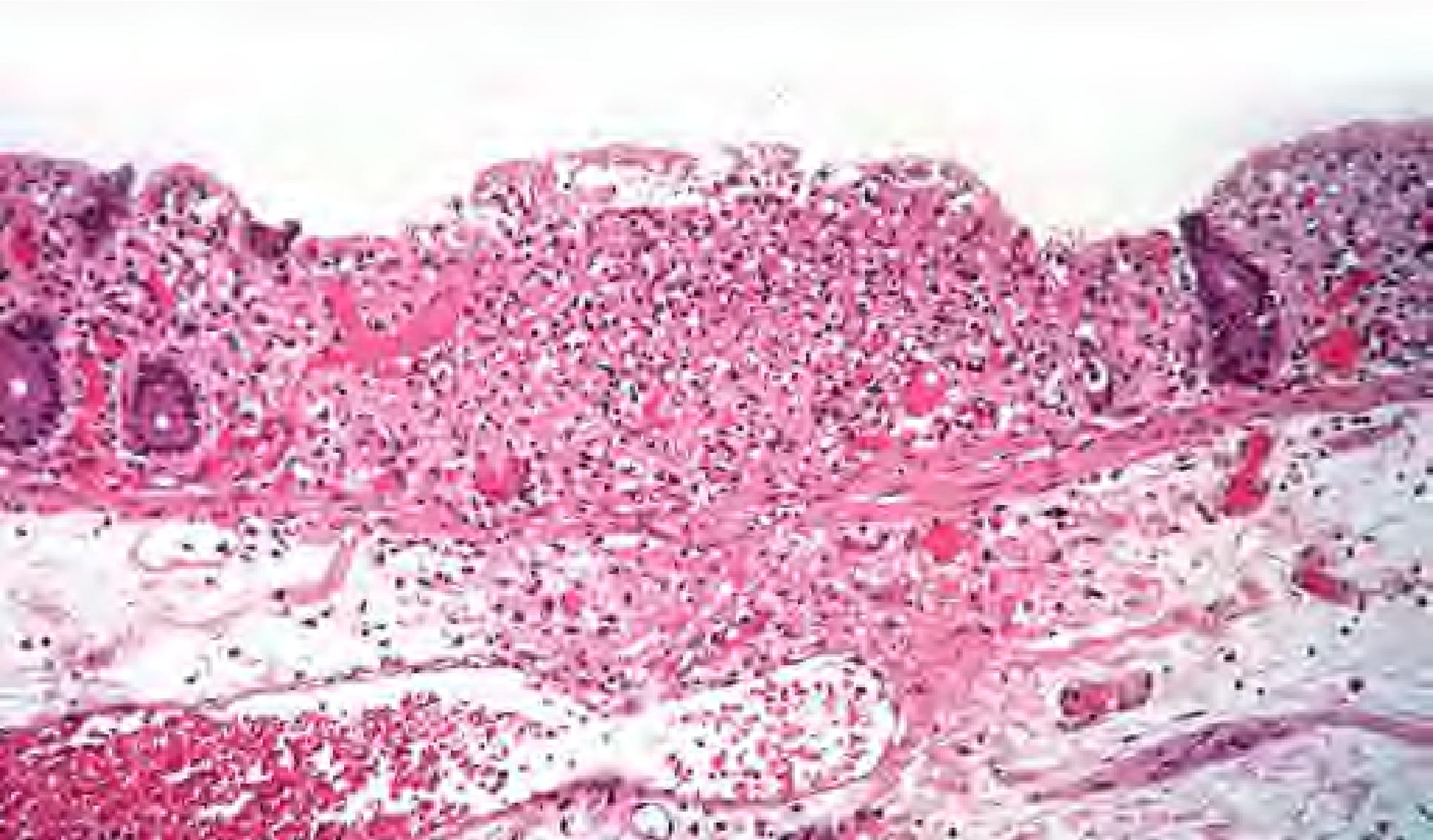
Colon Ischemia

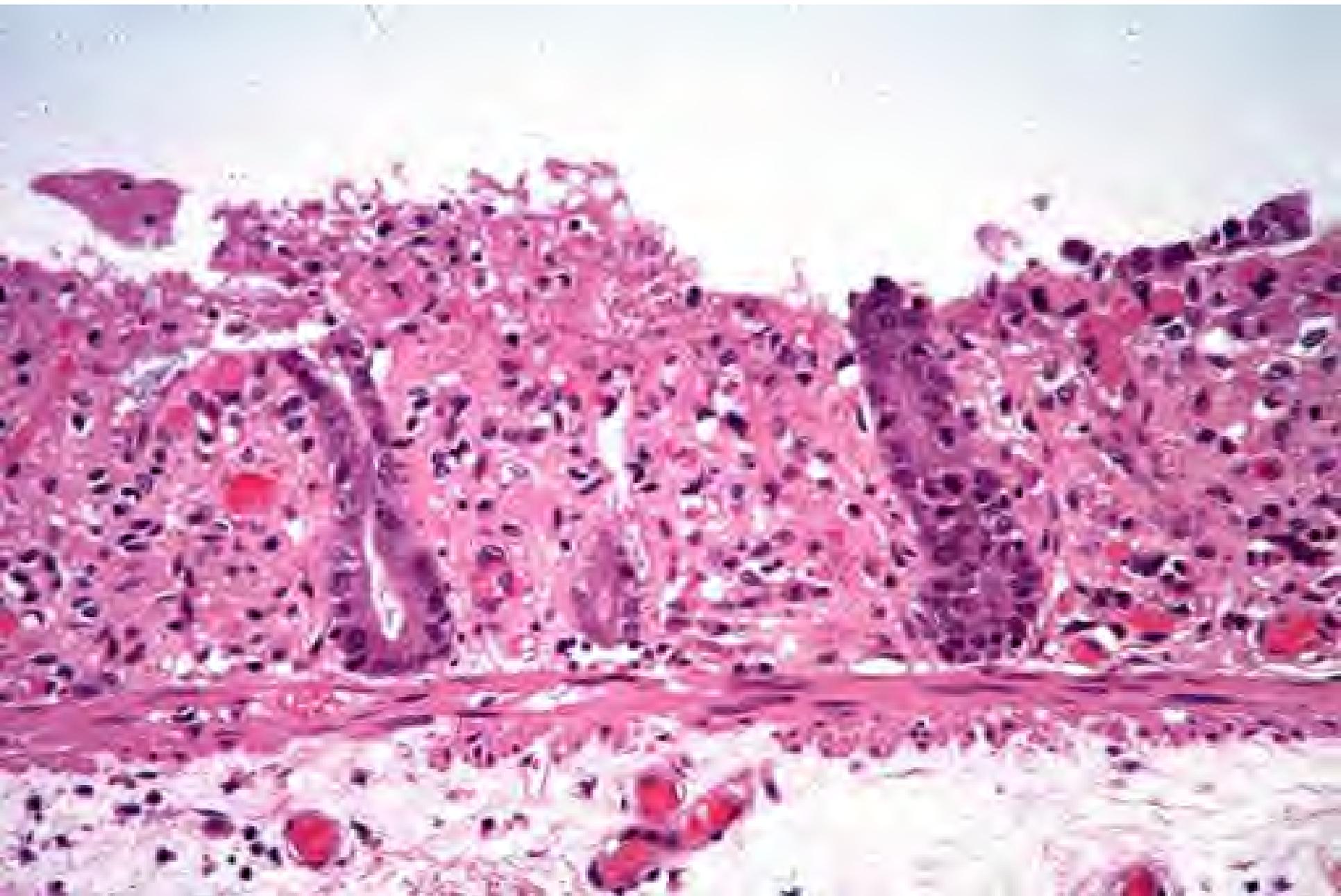


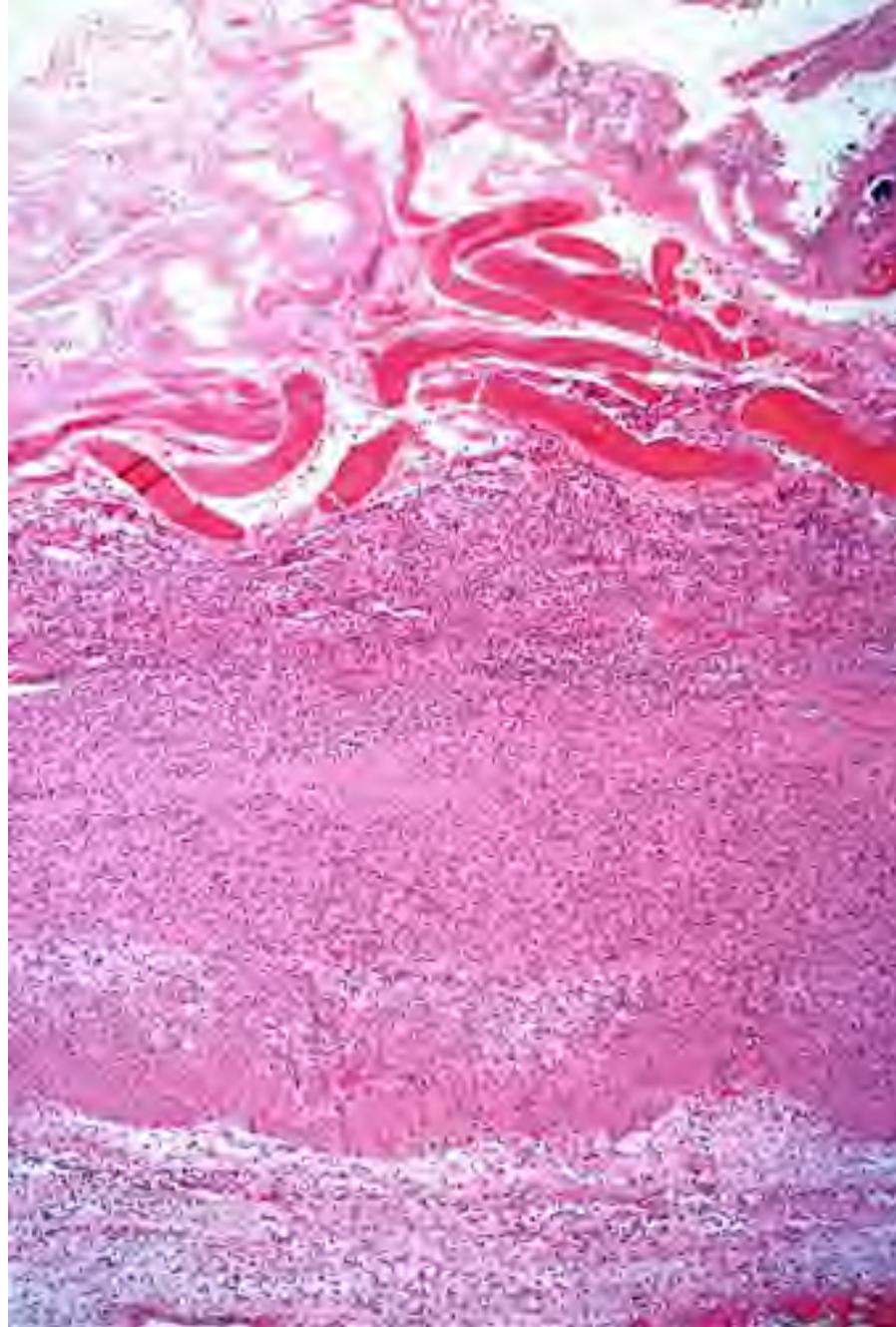














Normal Heart

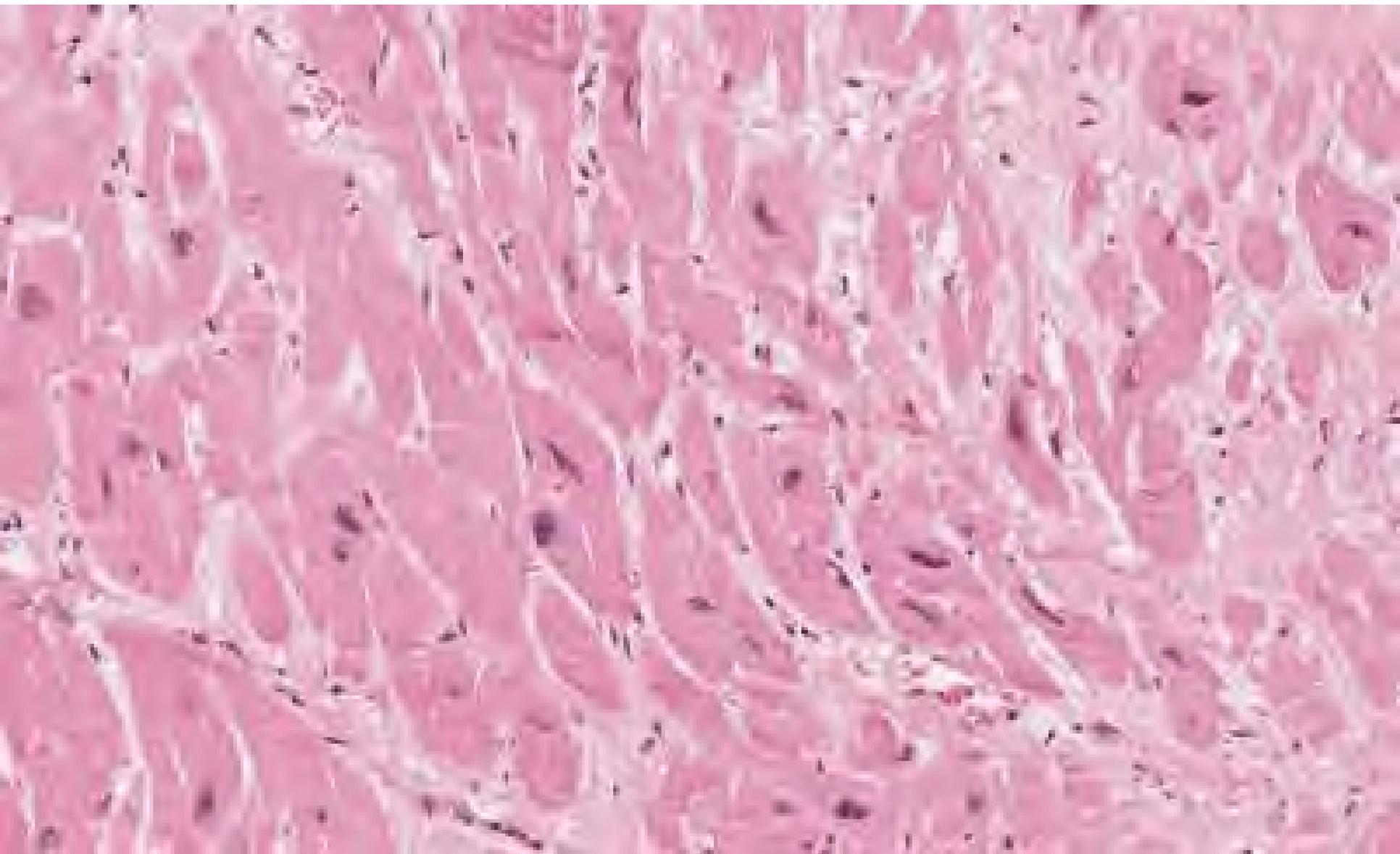
Hypertrophied Heart

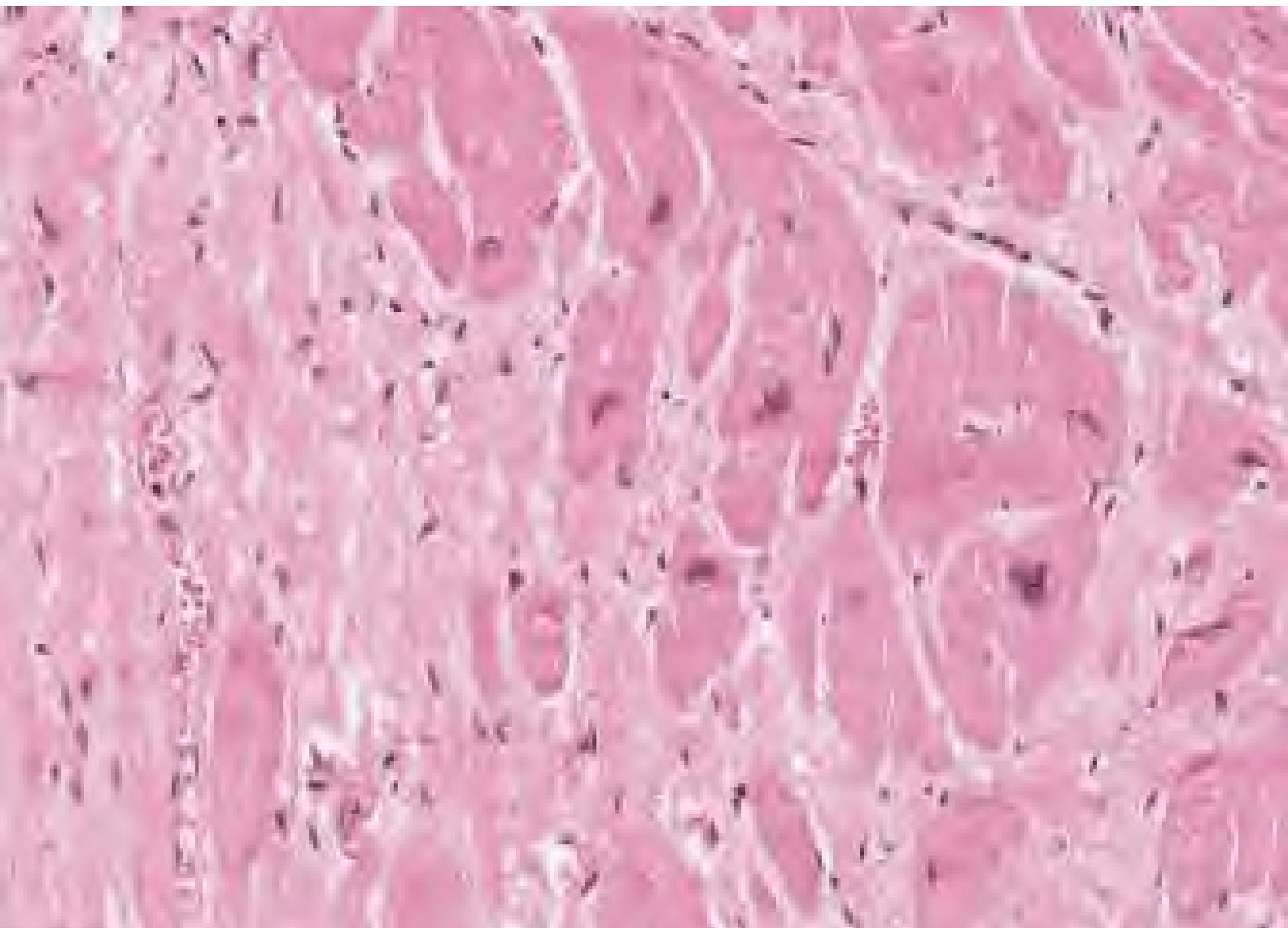


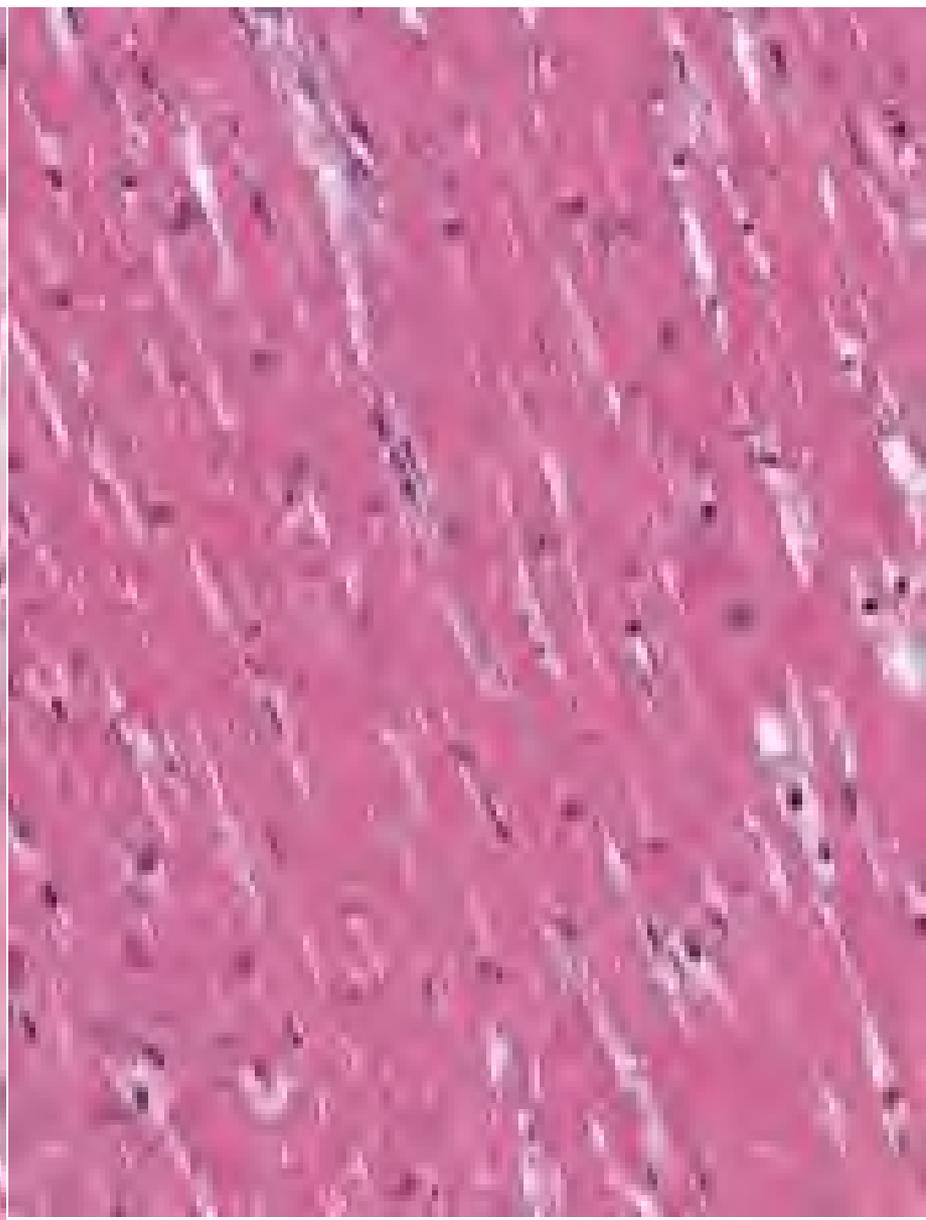
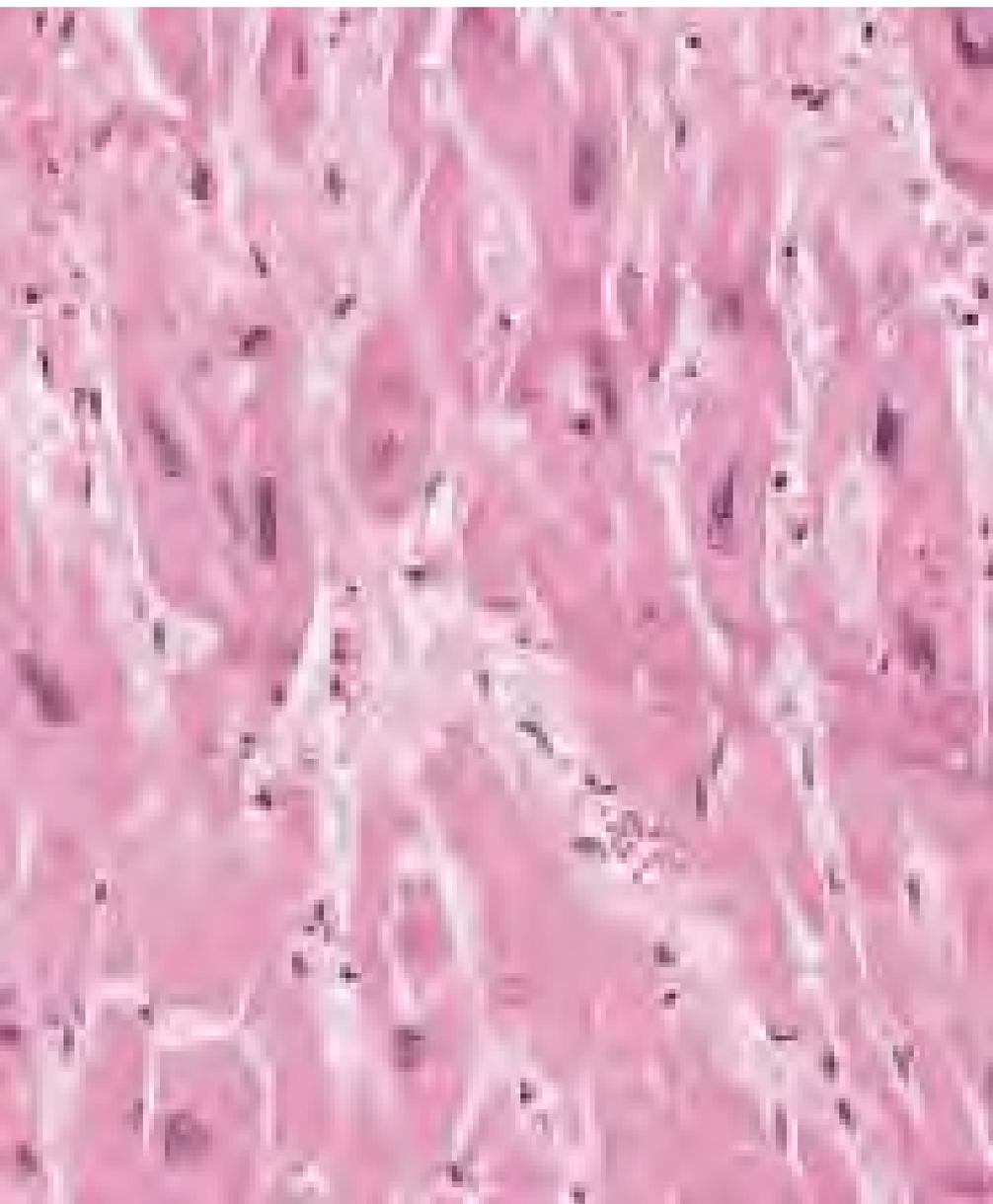
PD-INCL Department of Pathology, University of Michigan (both images)

Myocardial Hypertrophy





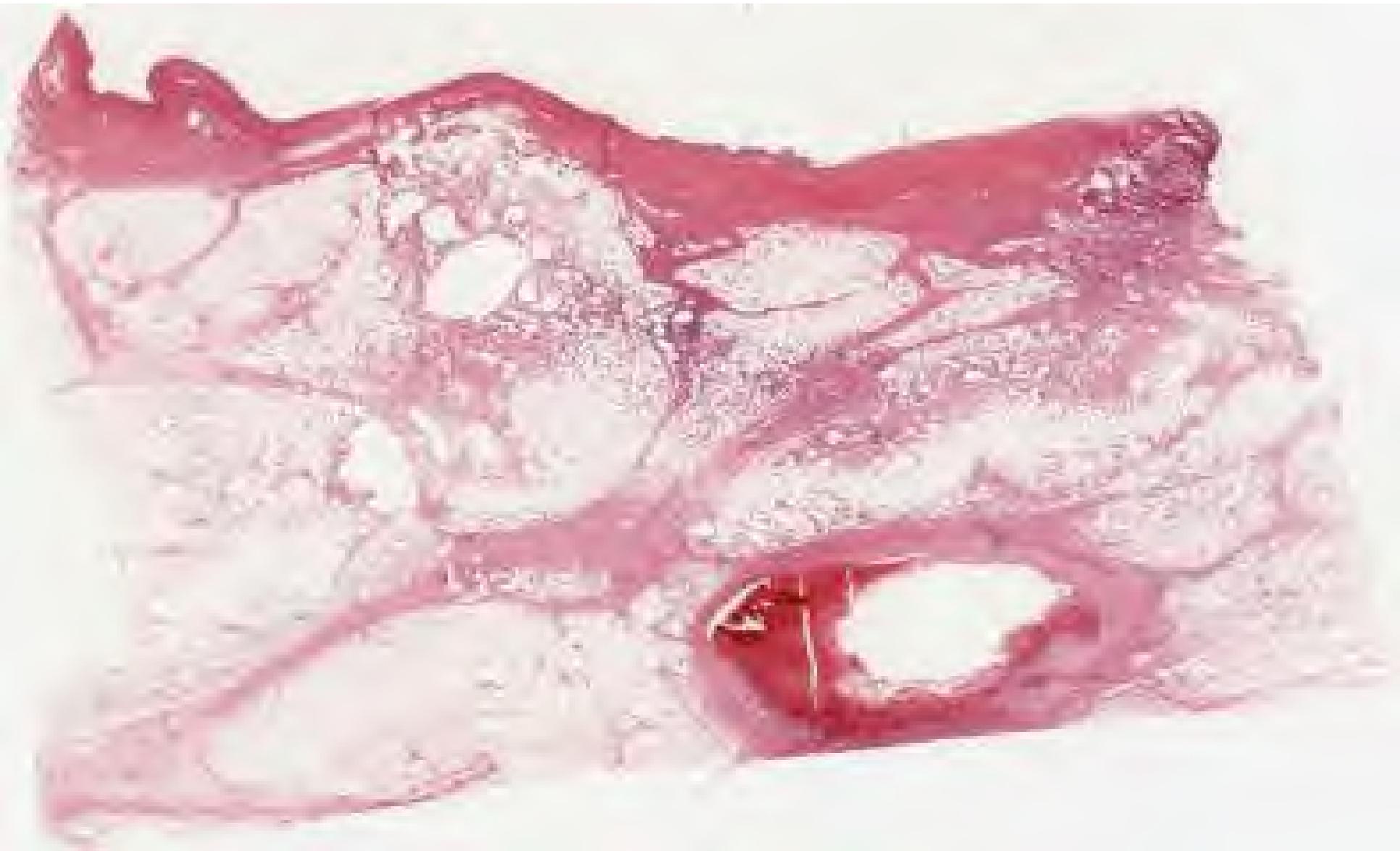




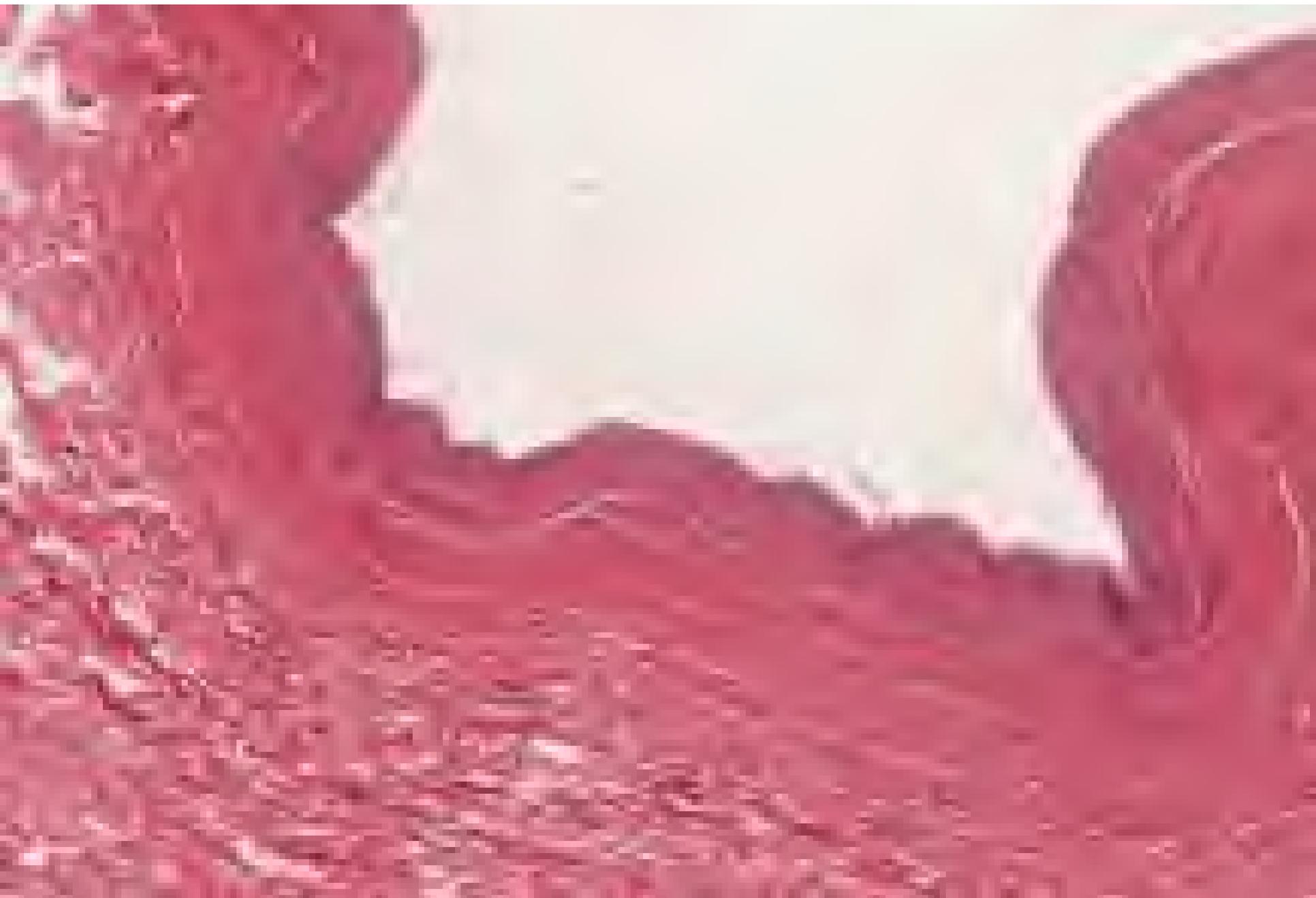
Gangrene

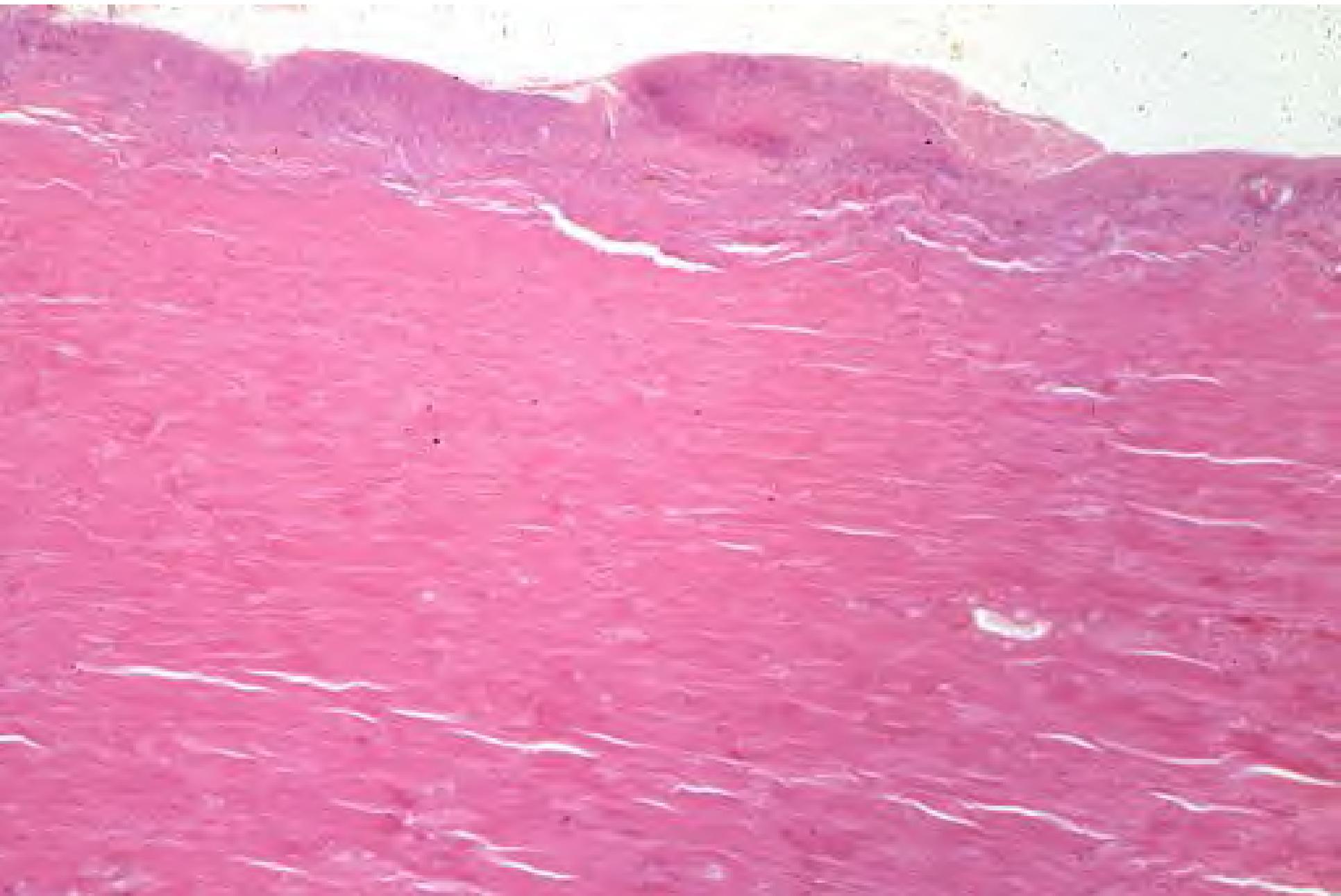


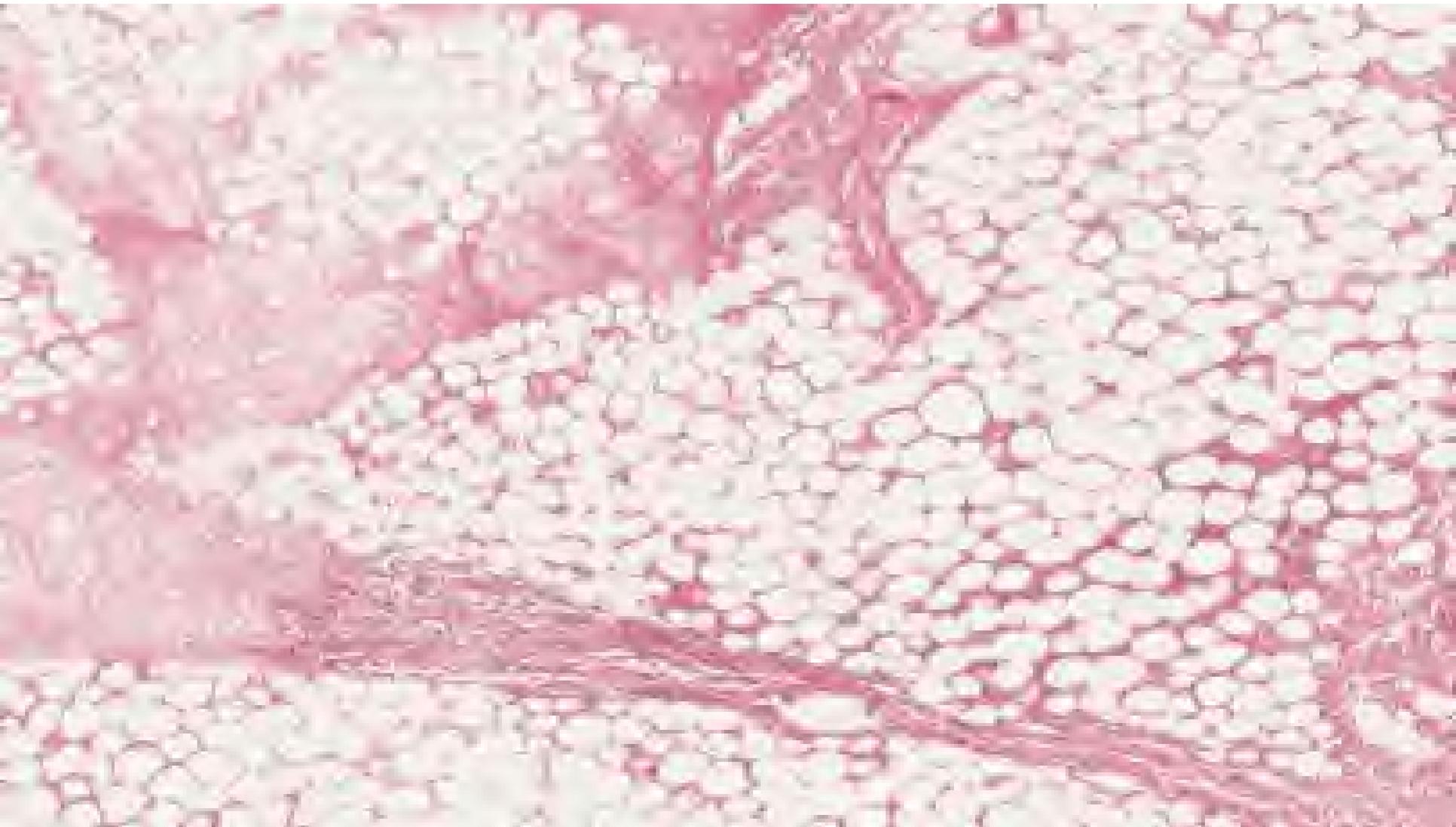
Gangrene

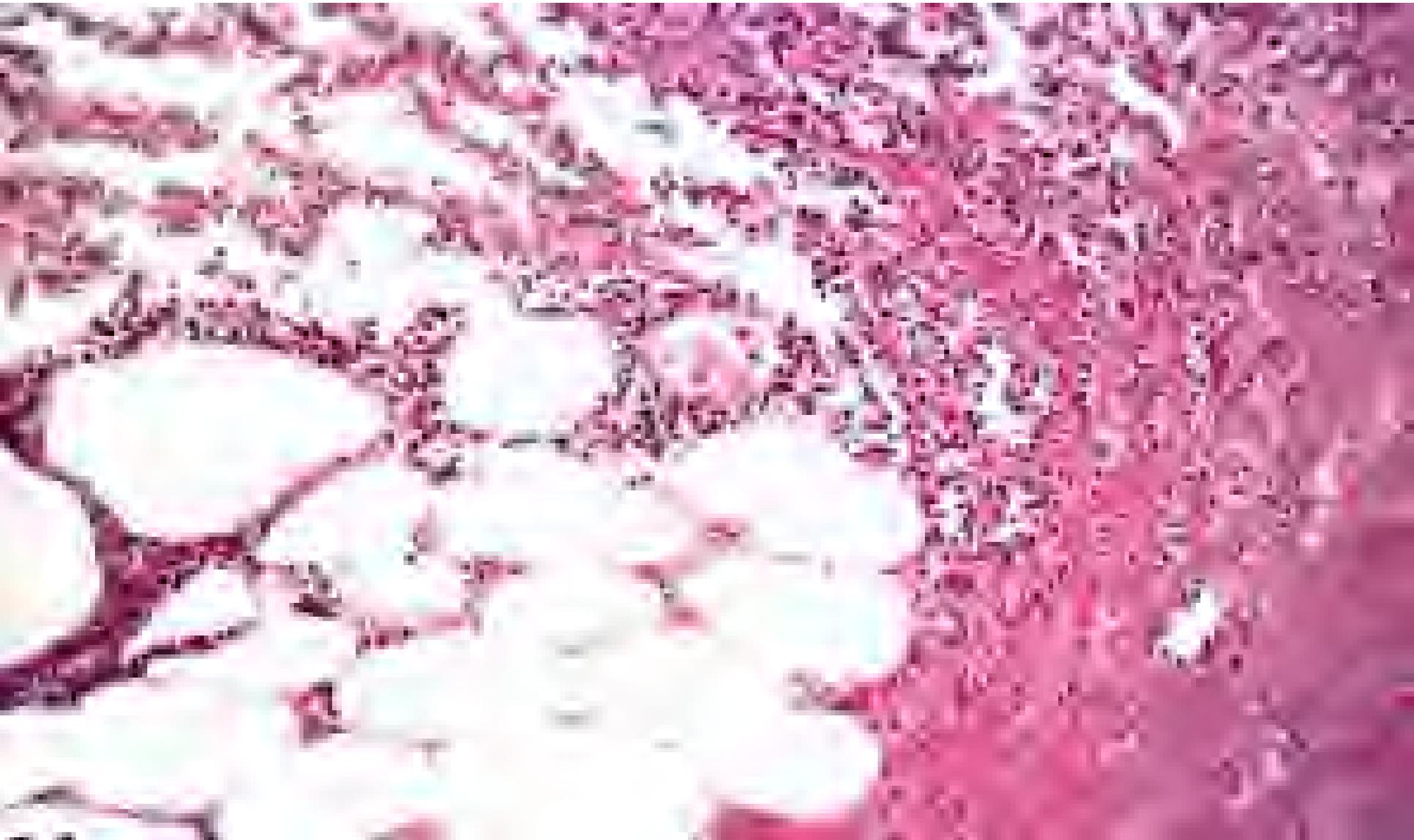


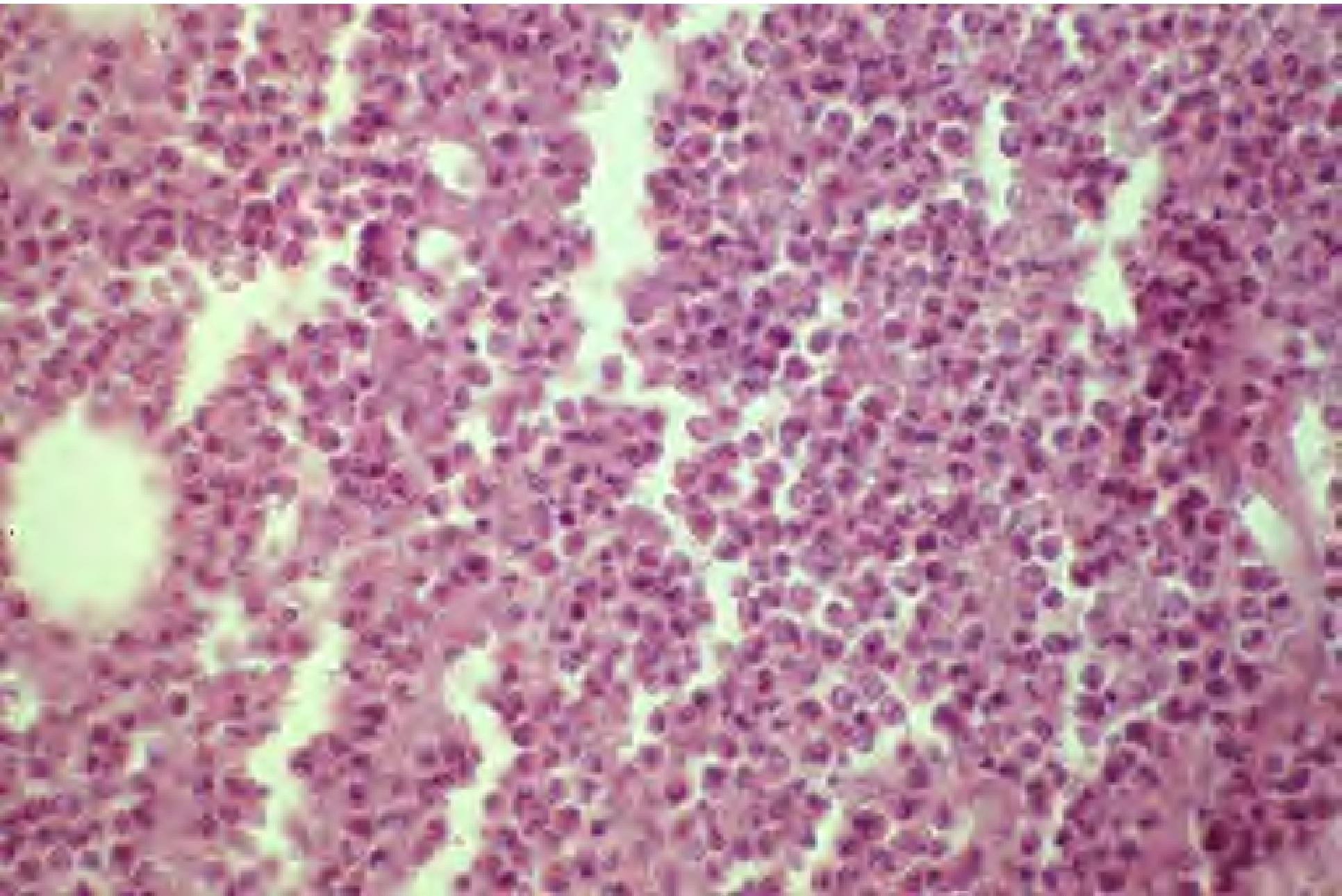












M-2 Cardiovascular Laboratory - 4

50 **Rheumatic heart disease**

Pericarditis

Myocarditis

Endocarditis

51 **Infective endocarditis**

58 **Myocarditis**

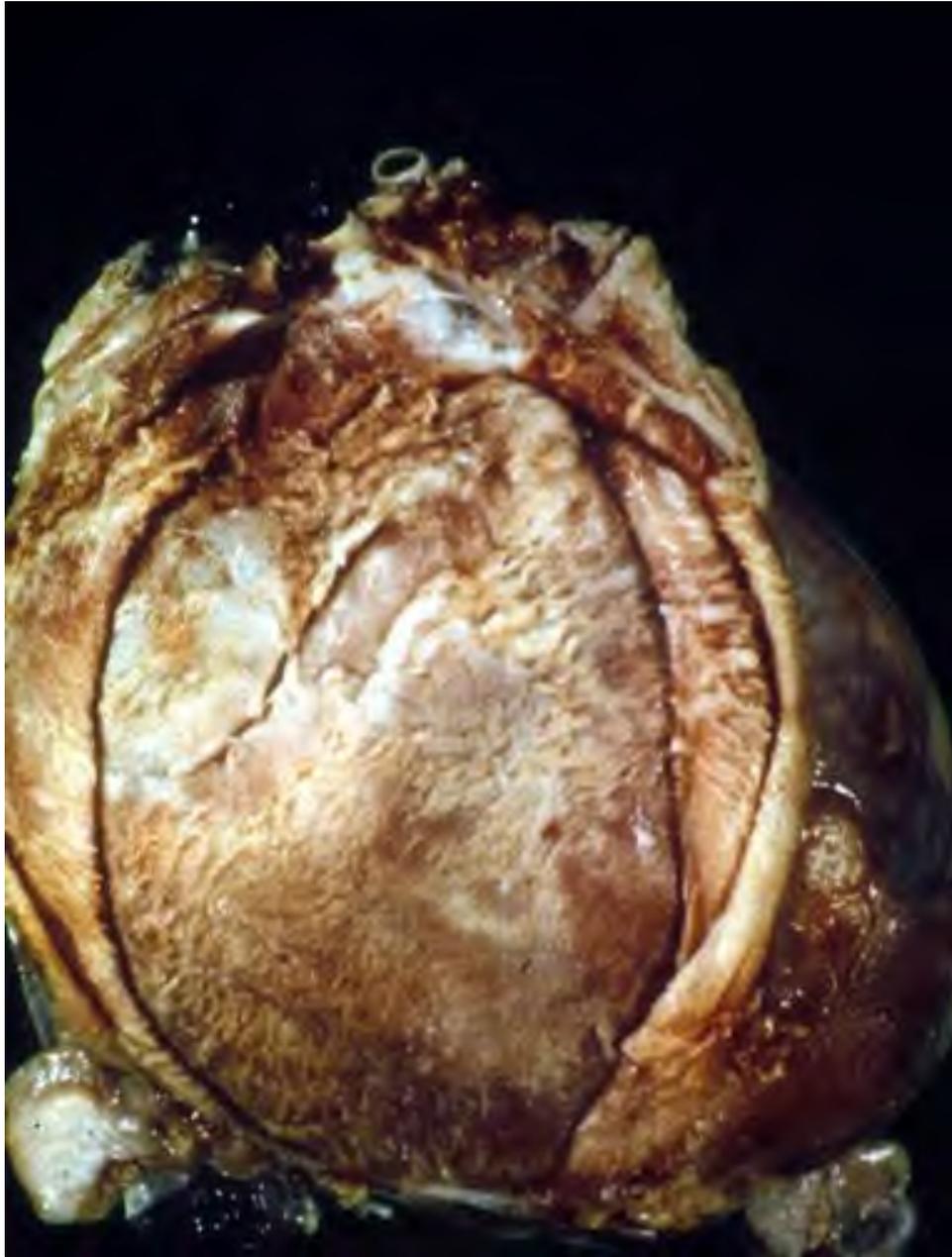
21 **Pericarditis**

Atrial Myxoma

Rheumatic Heart Disease

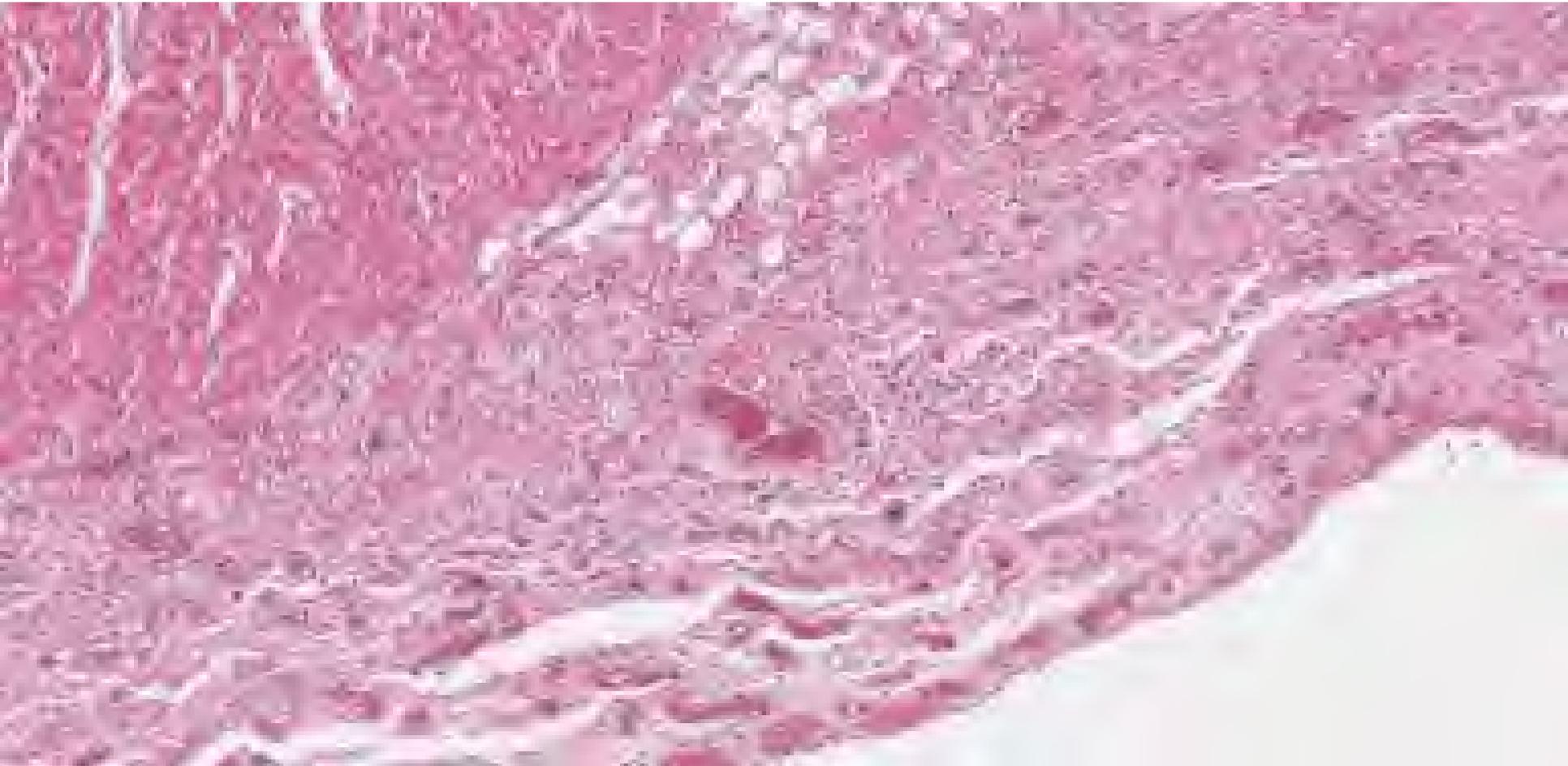


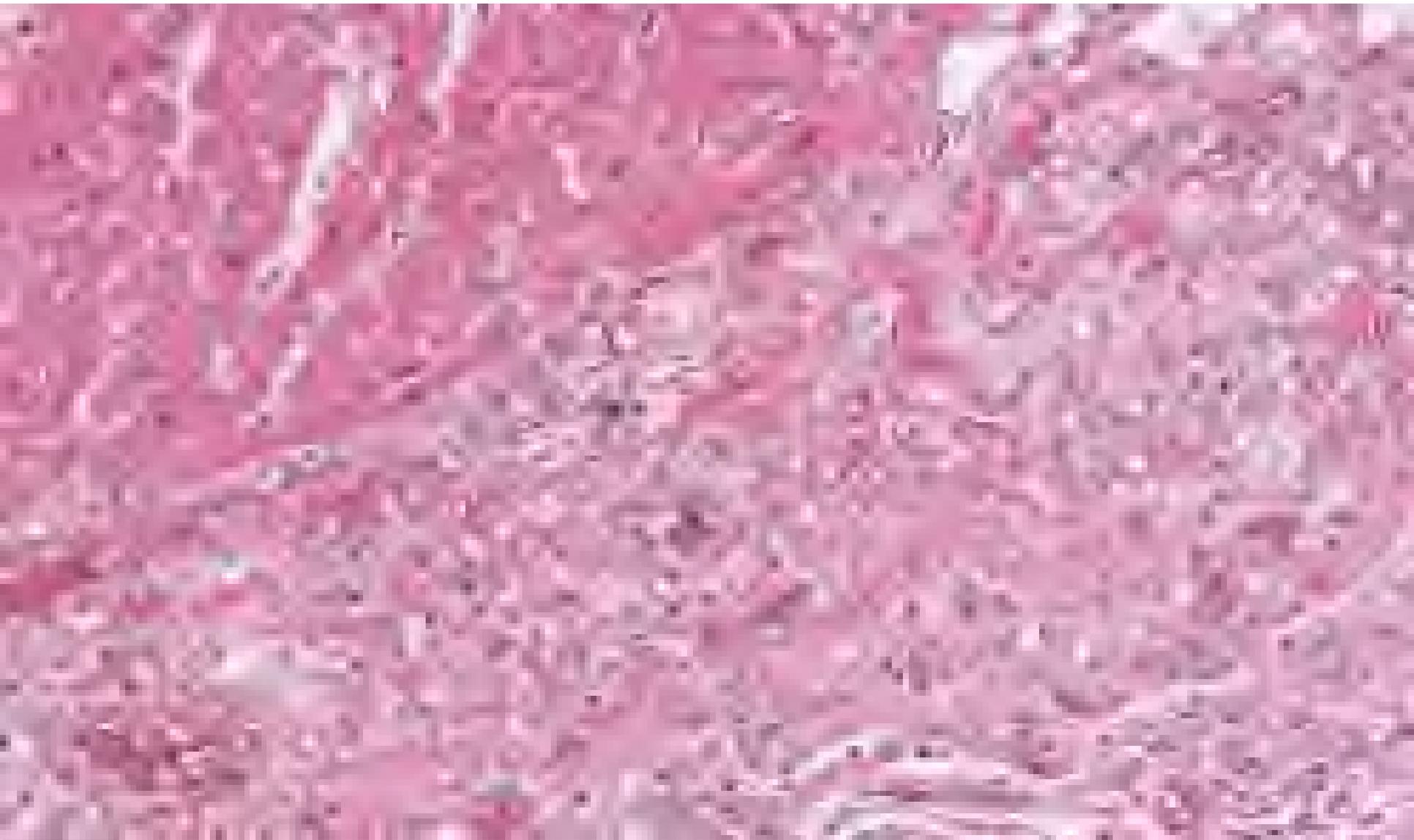
Rheumatic Pericarditis



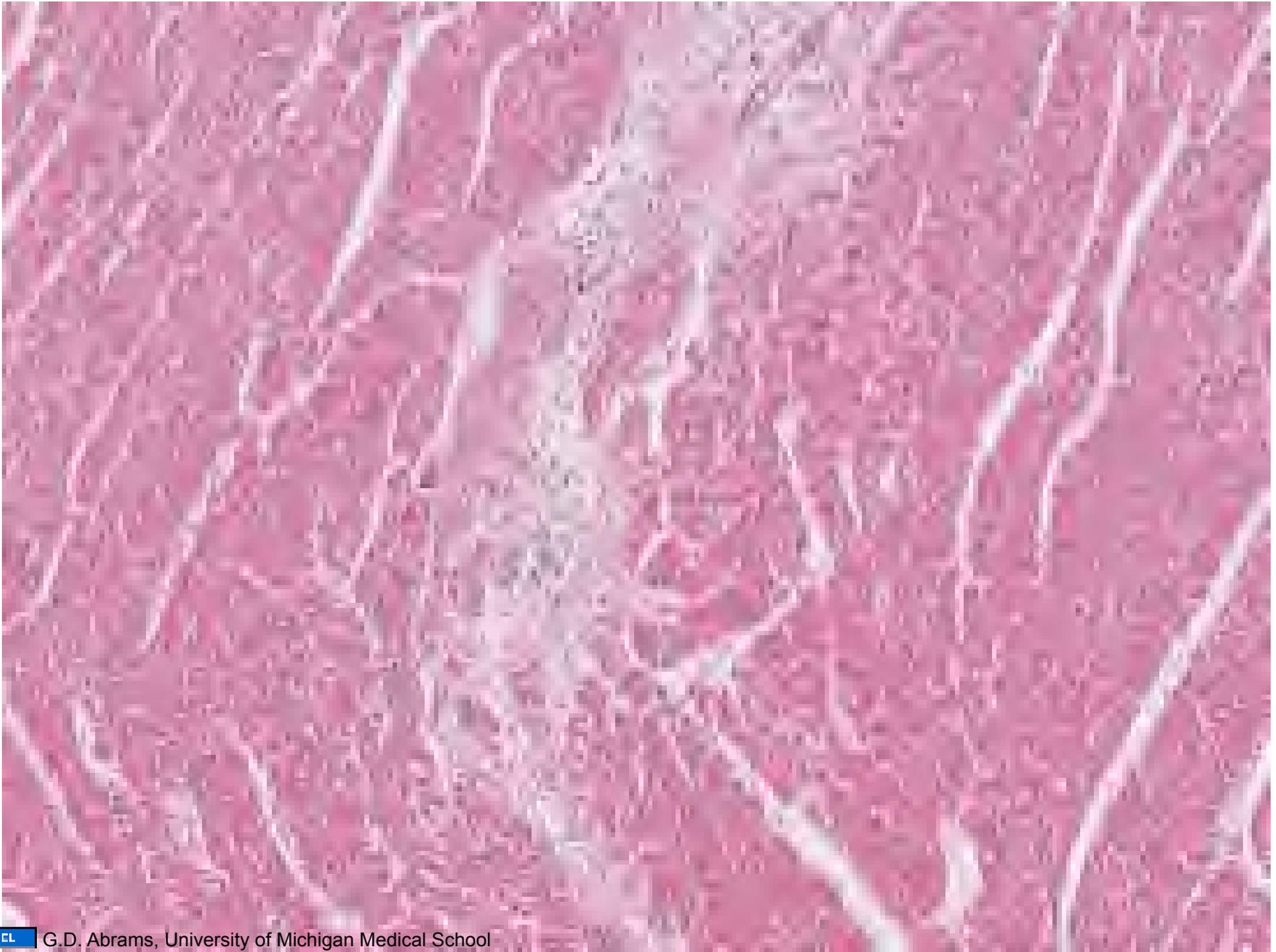


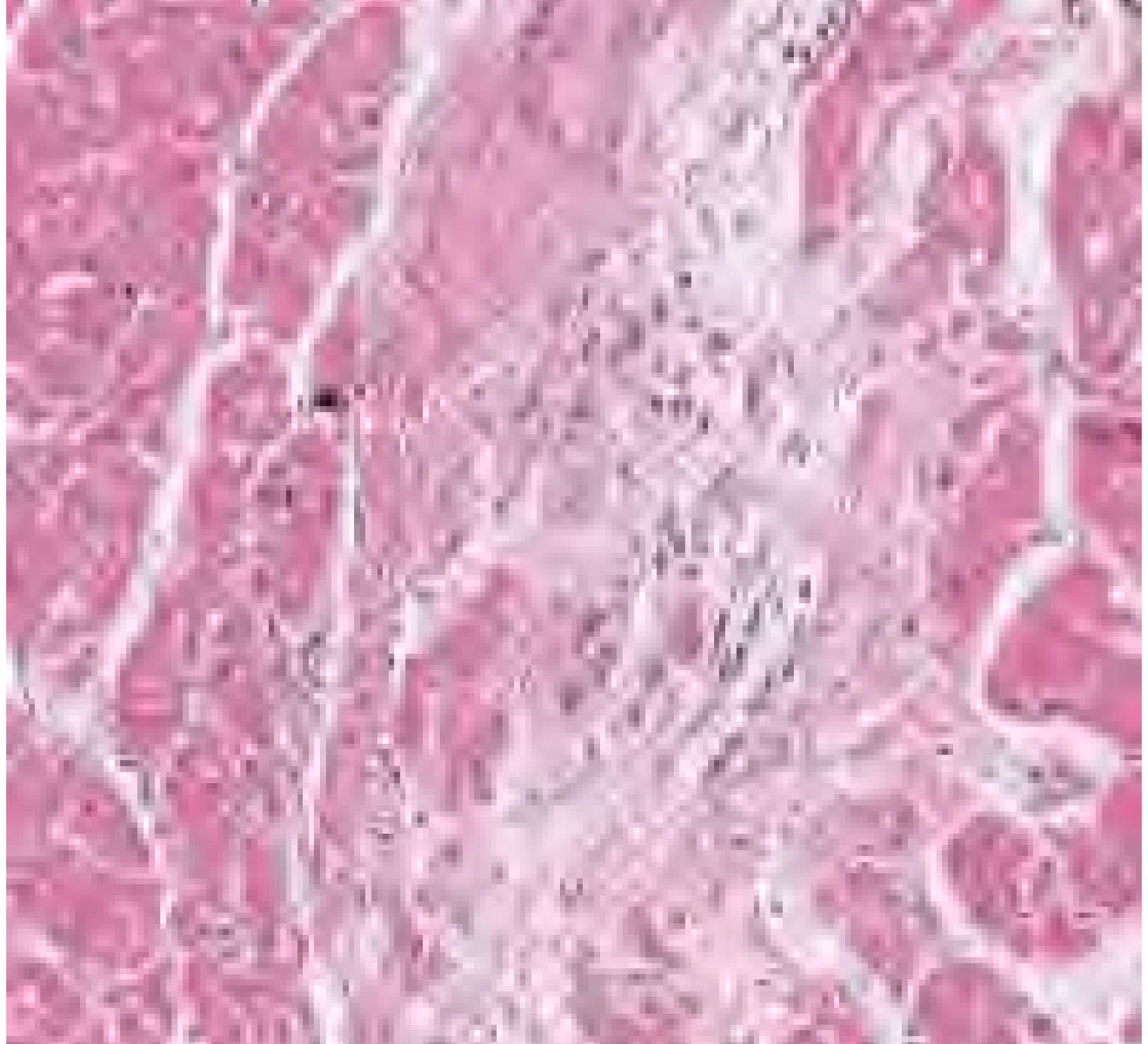
Rheumatic Pericarditis

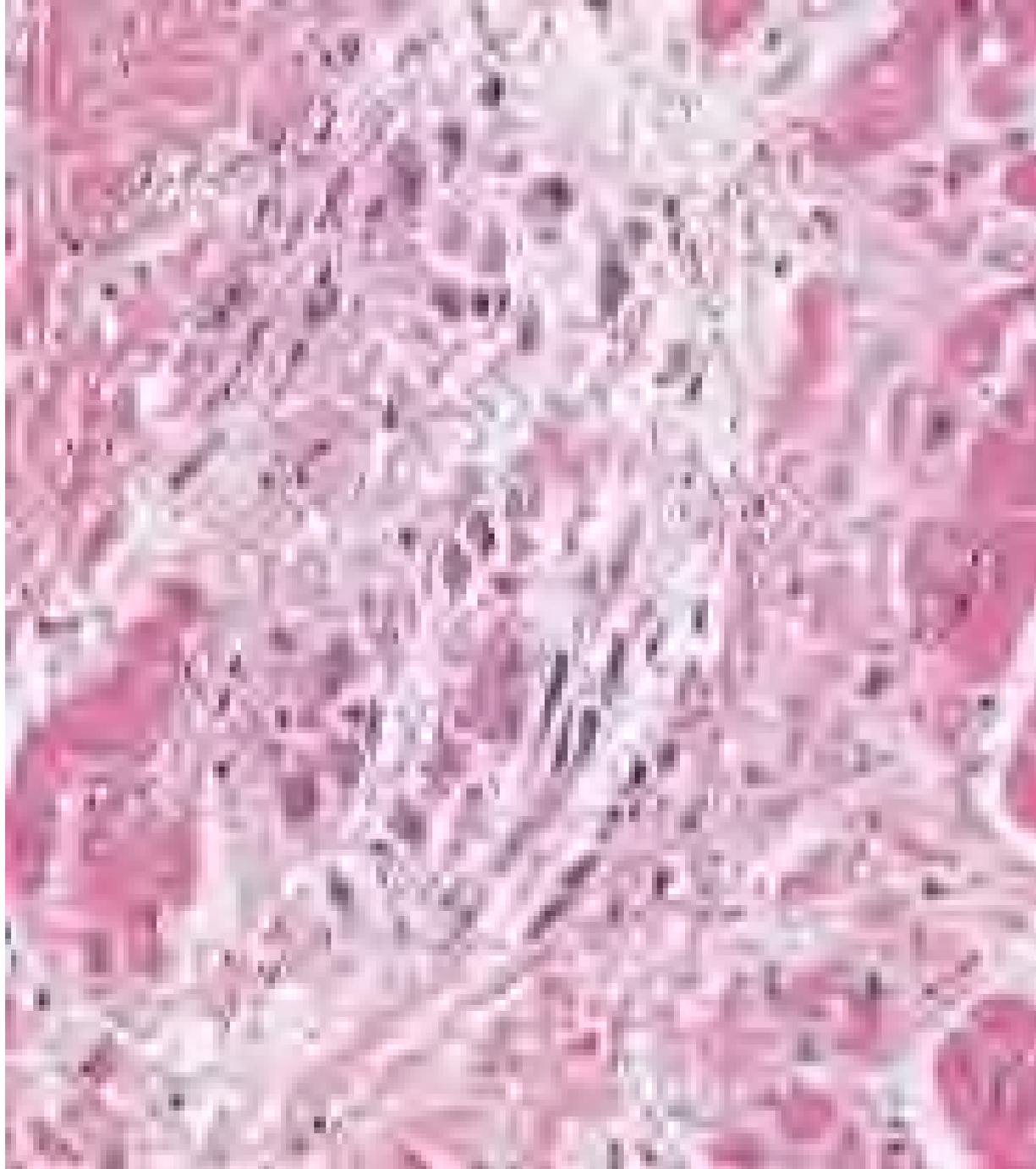


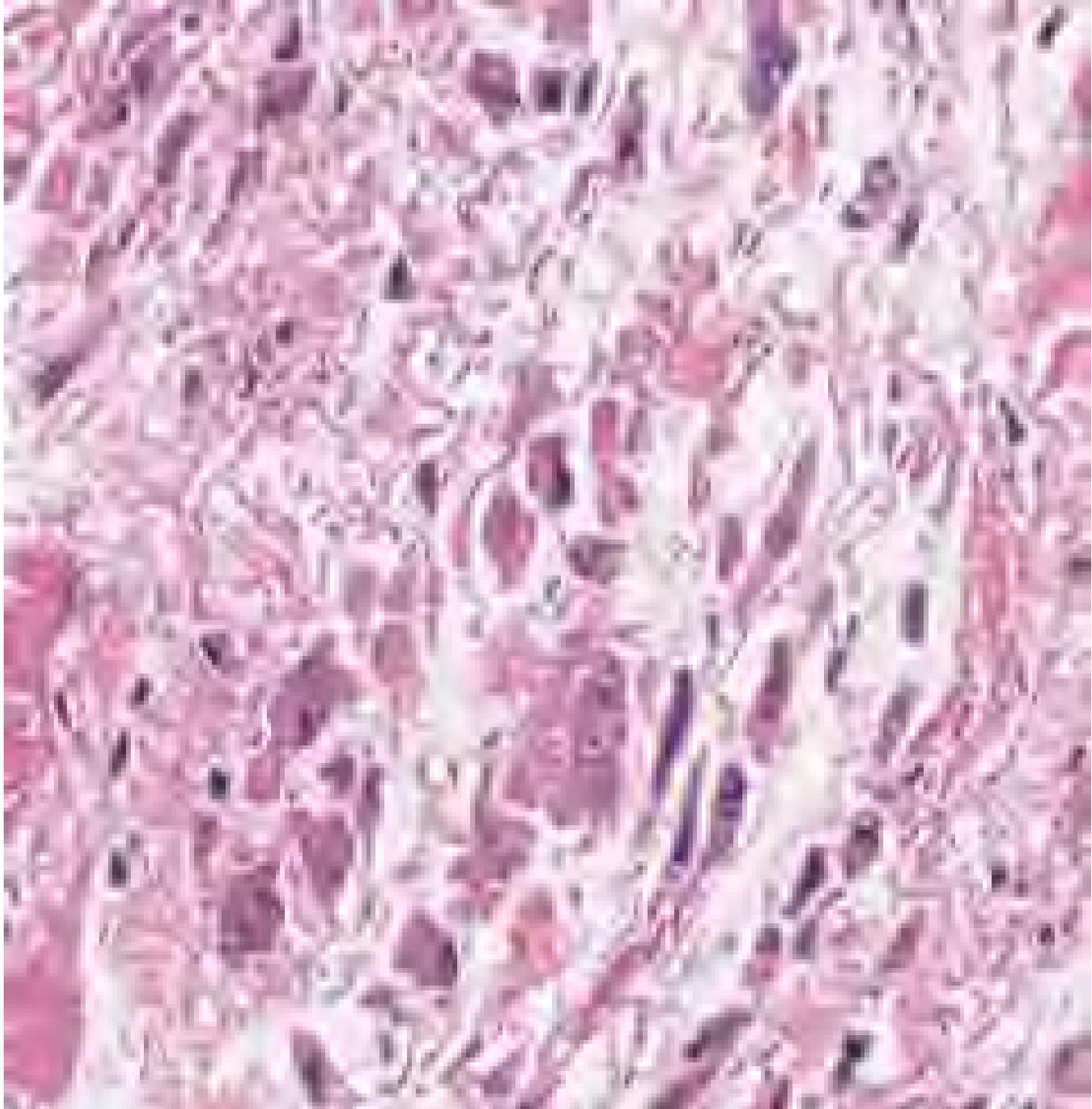


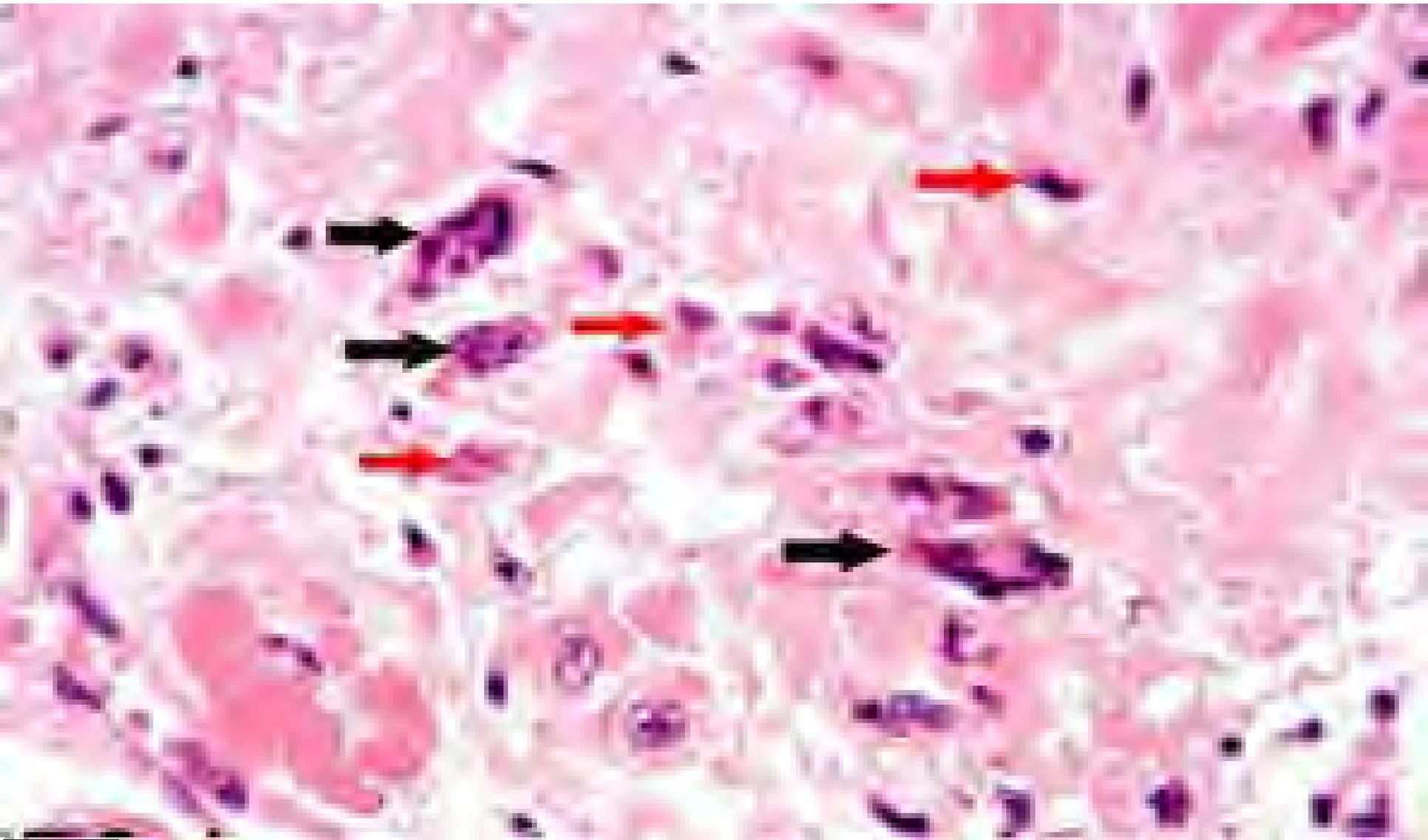
Rheumatic Myocarditis



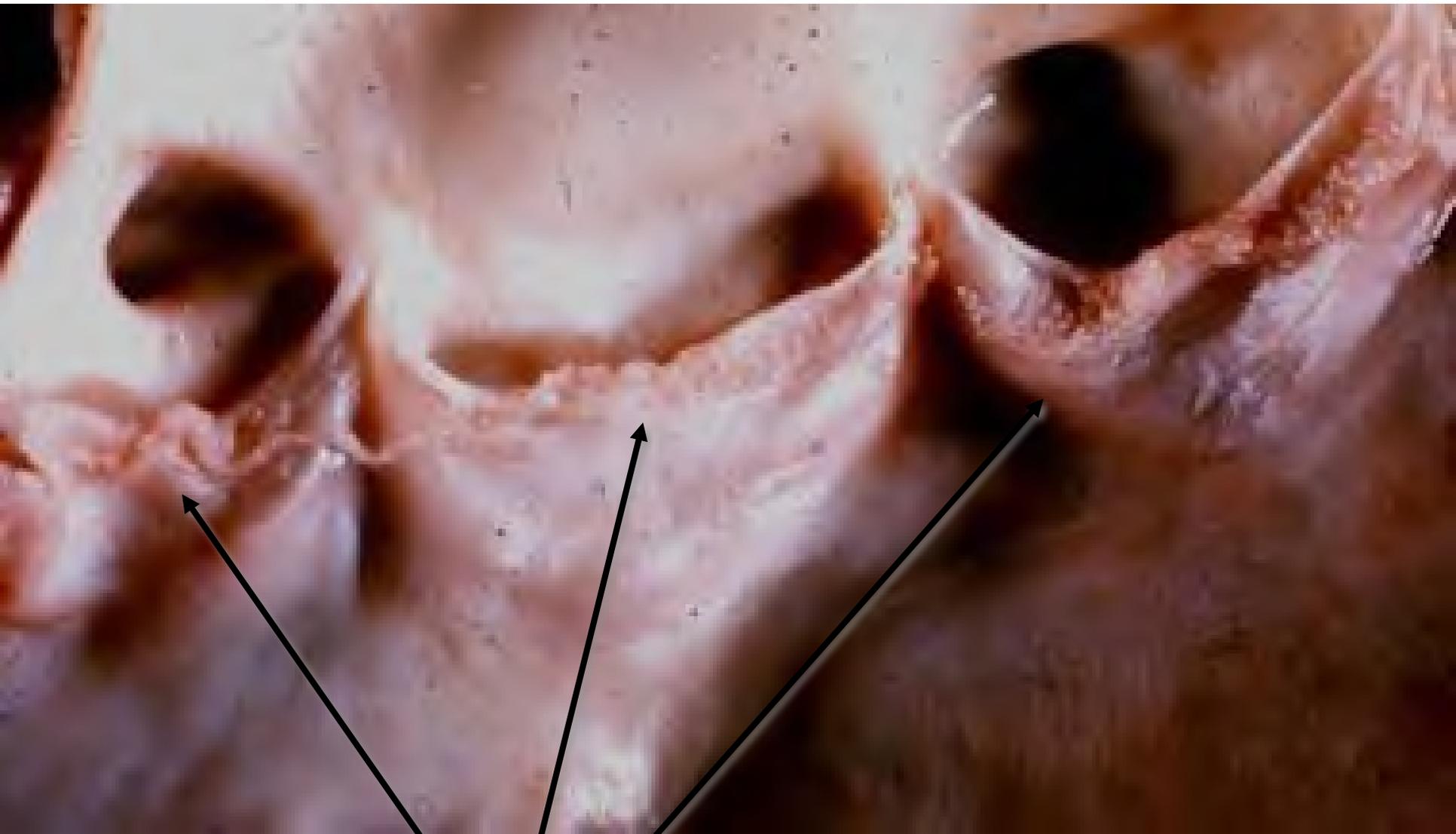




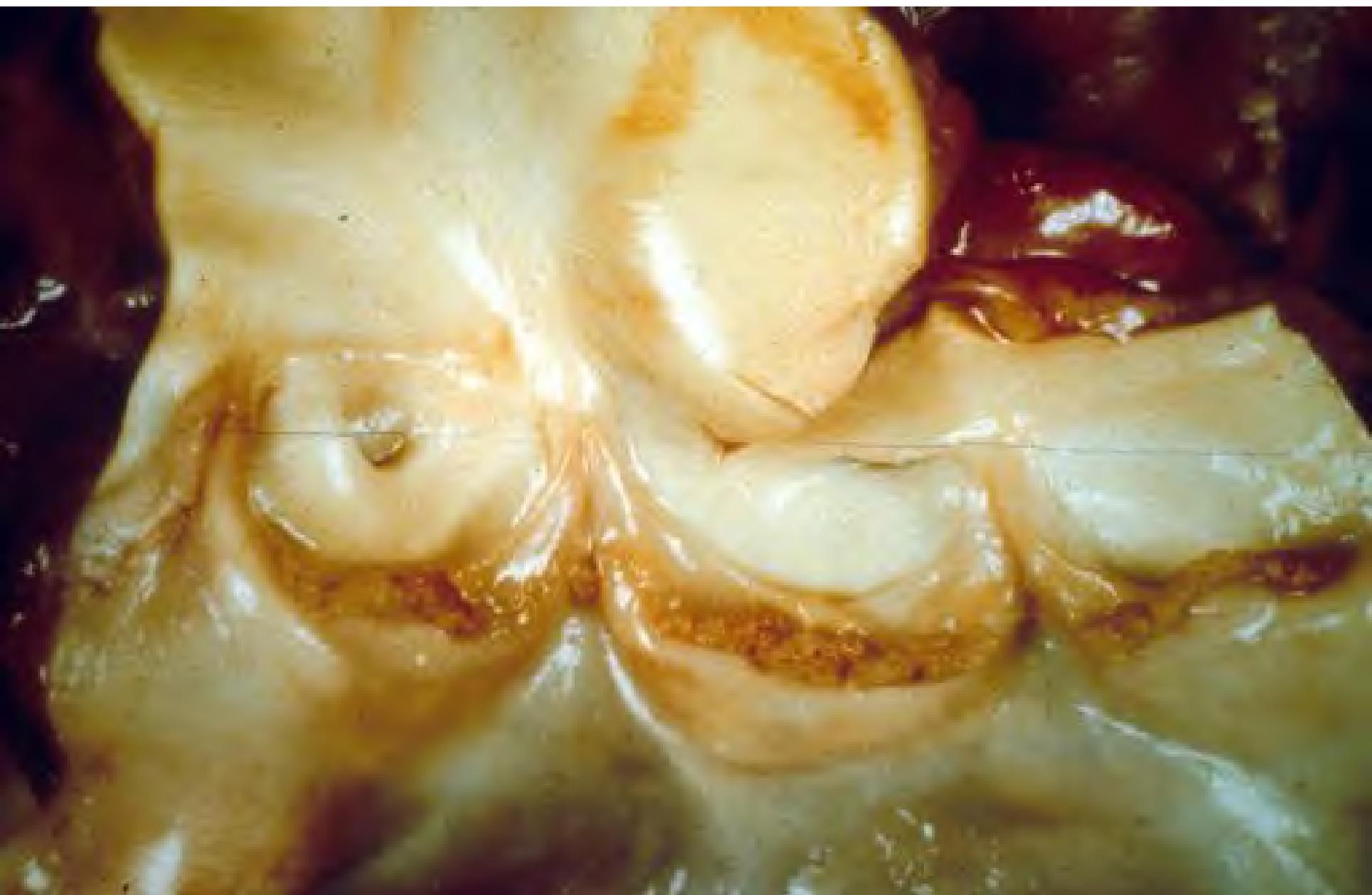




Rheumatic Endocarditis



Vegetations

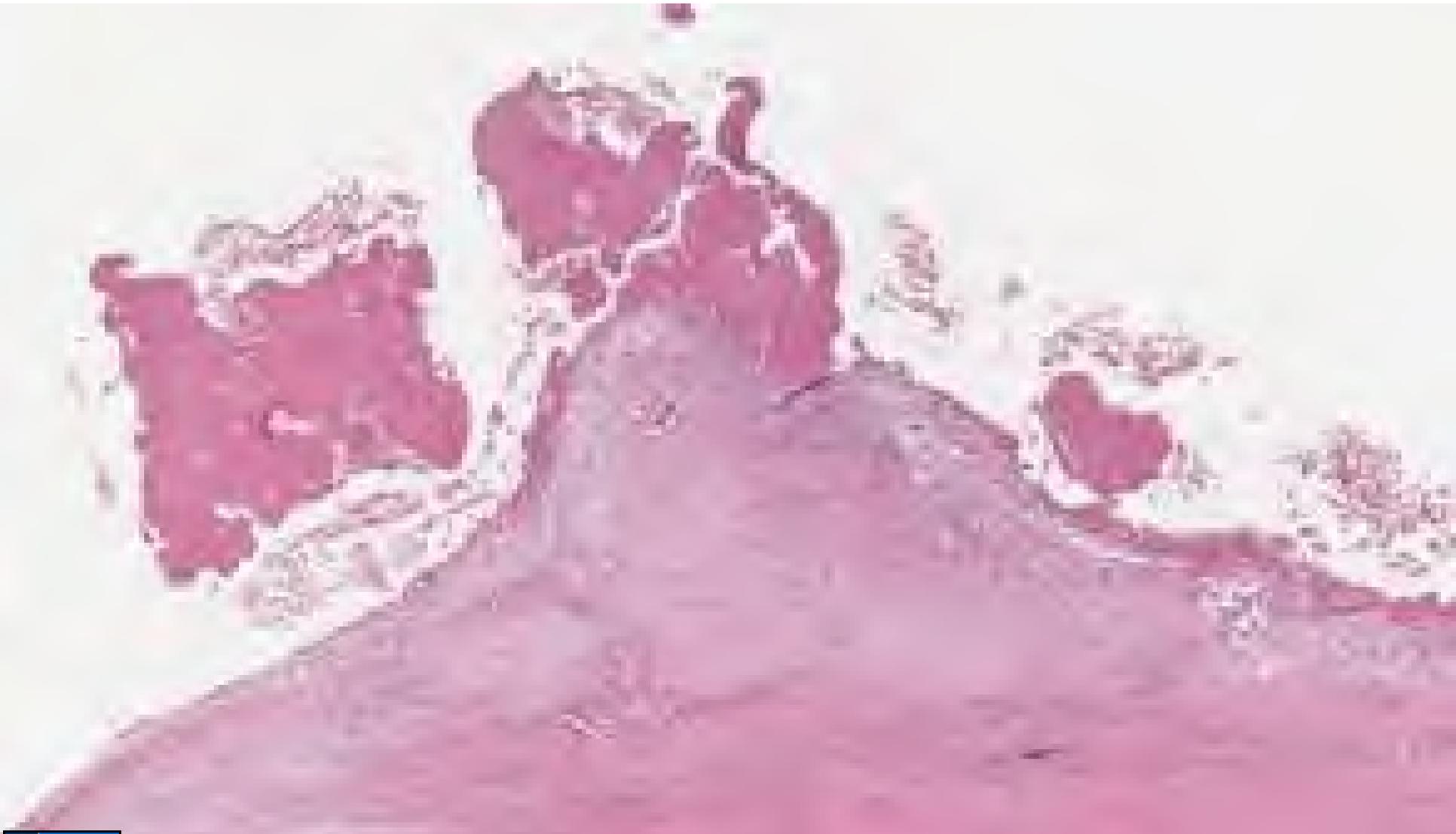


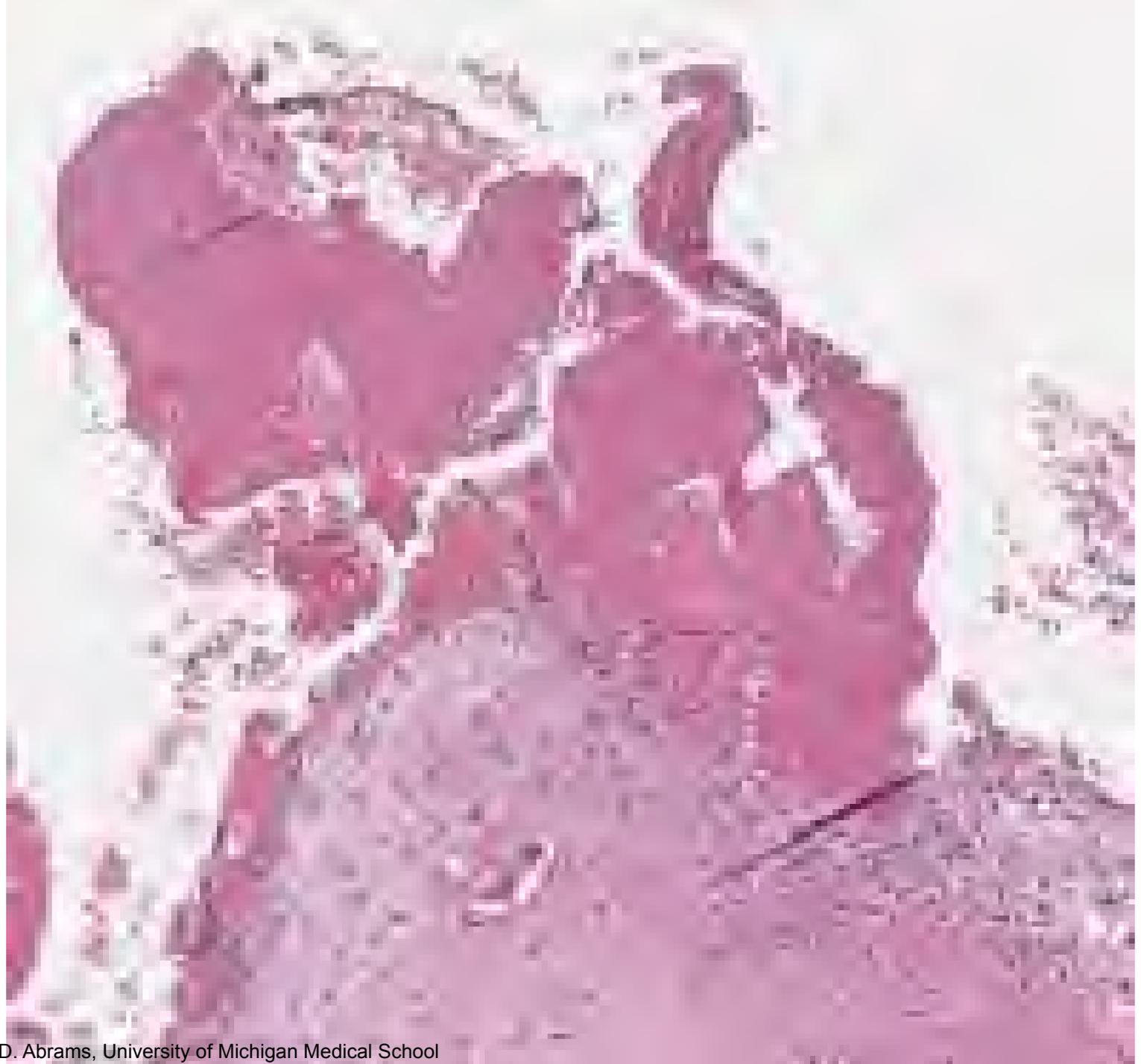
Rheumatic Endocarditis





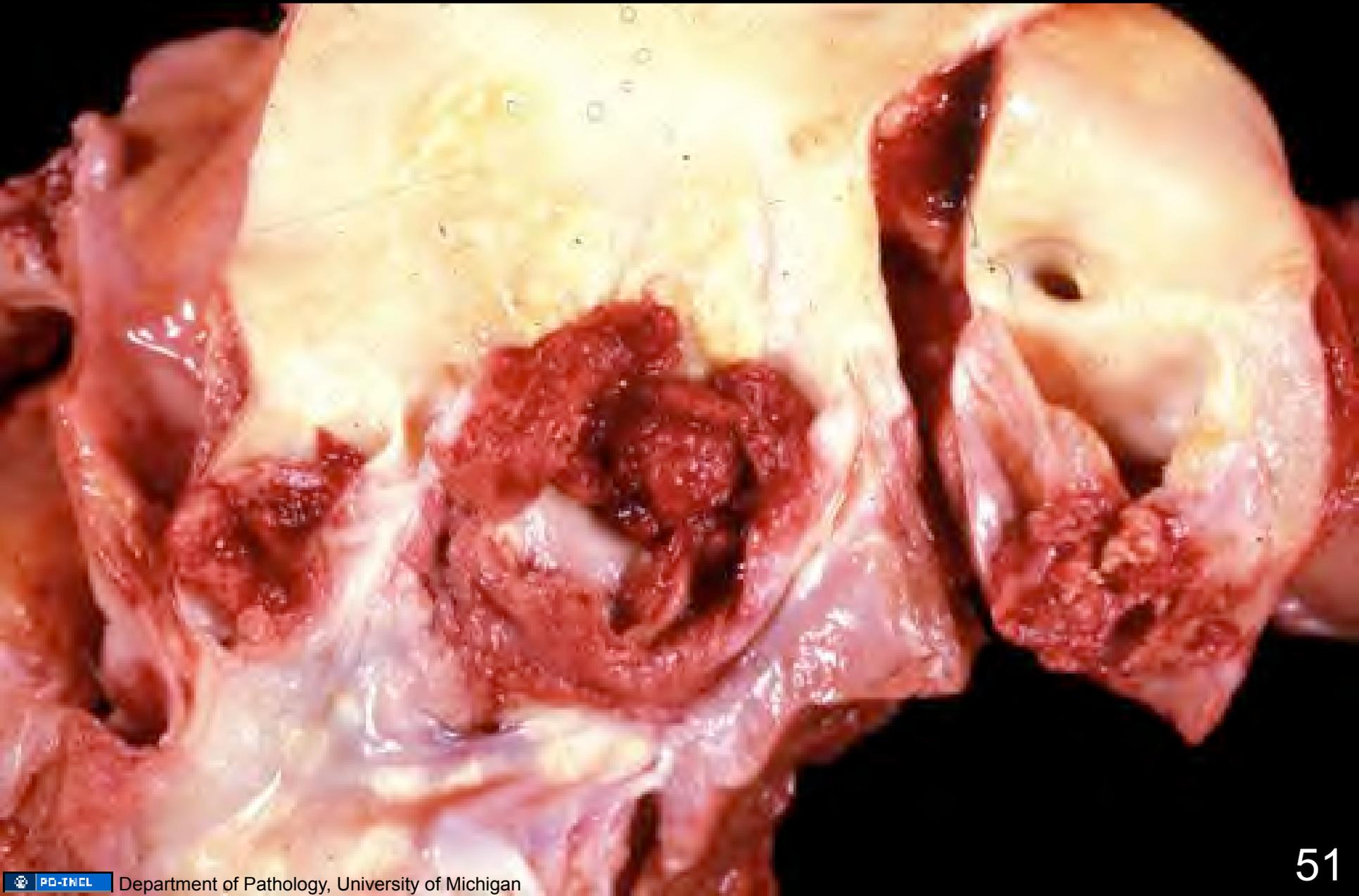
Rheumatic Endocarditis



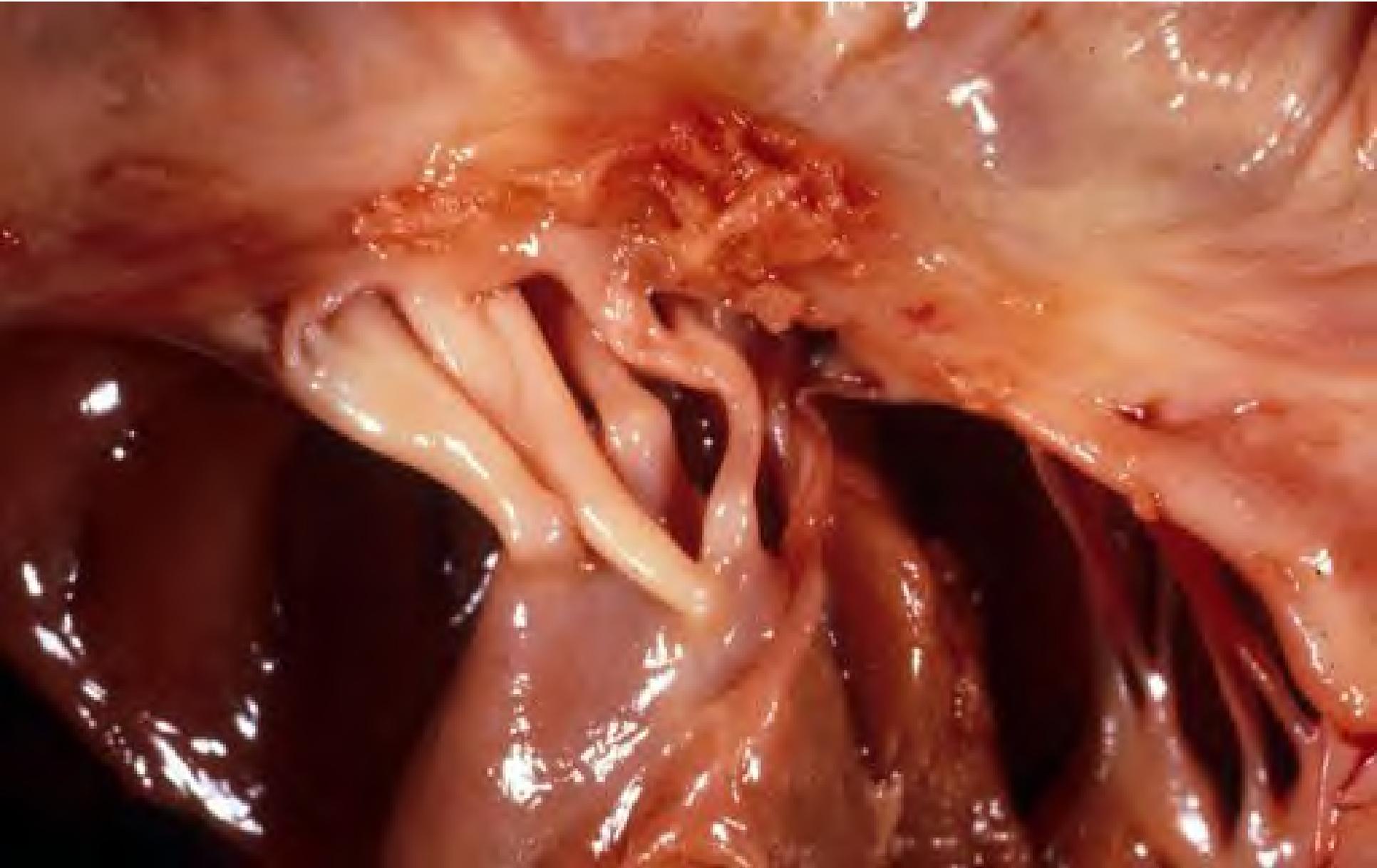




Bacterial Endocarditis - Aortic Valve



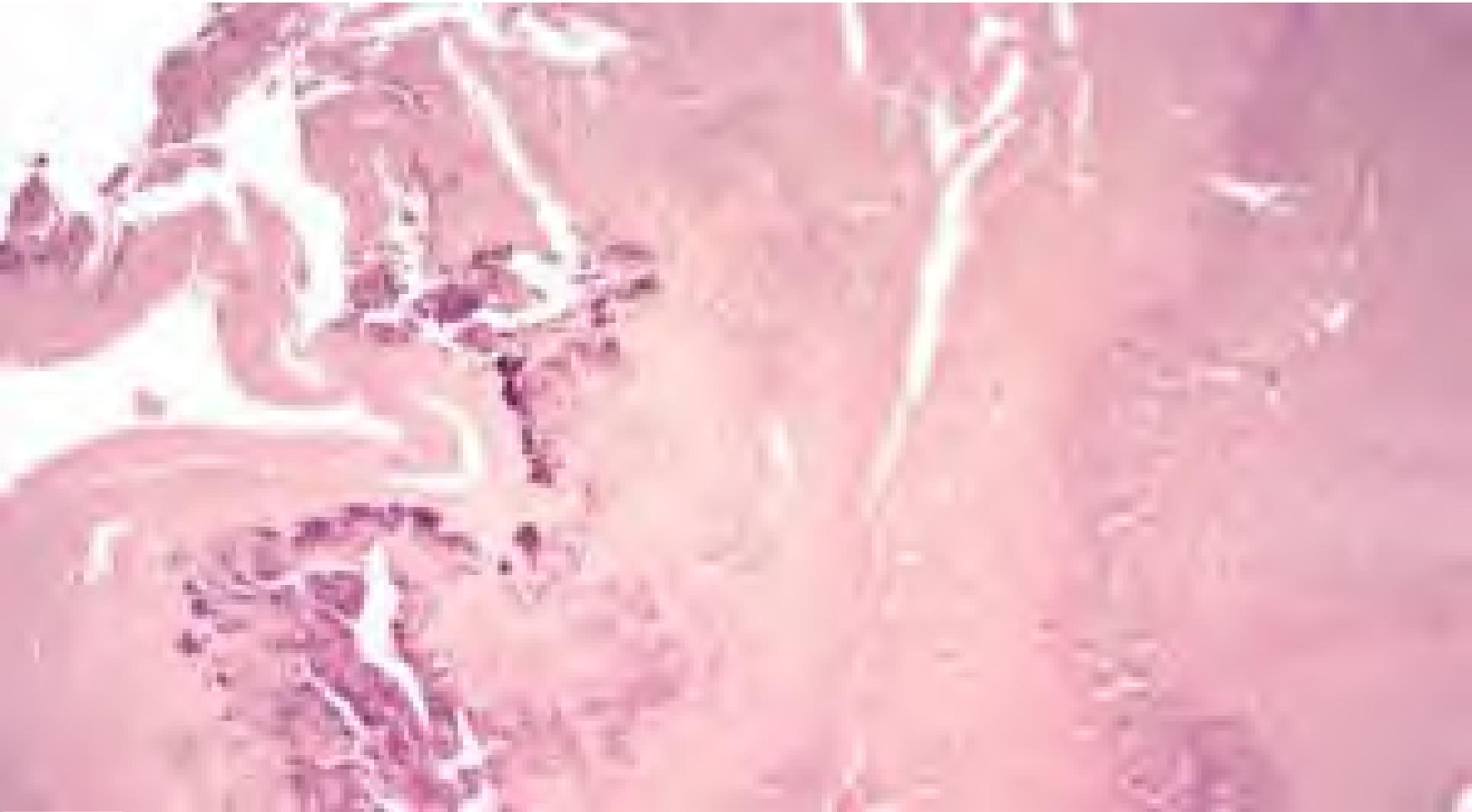


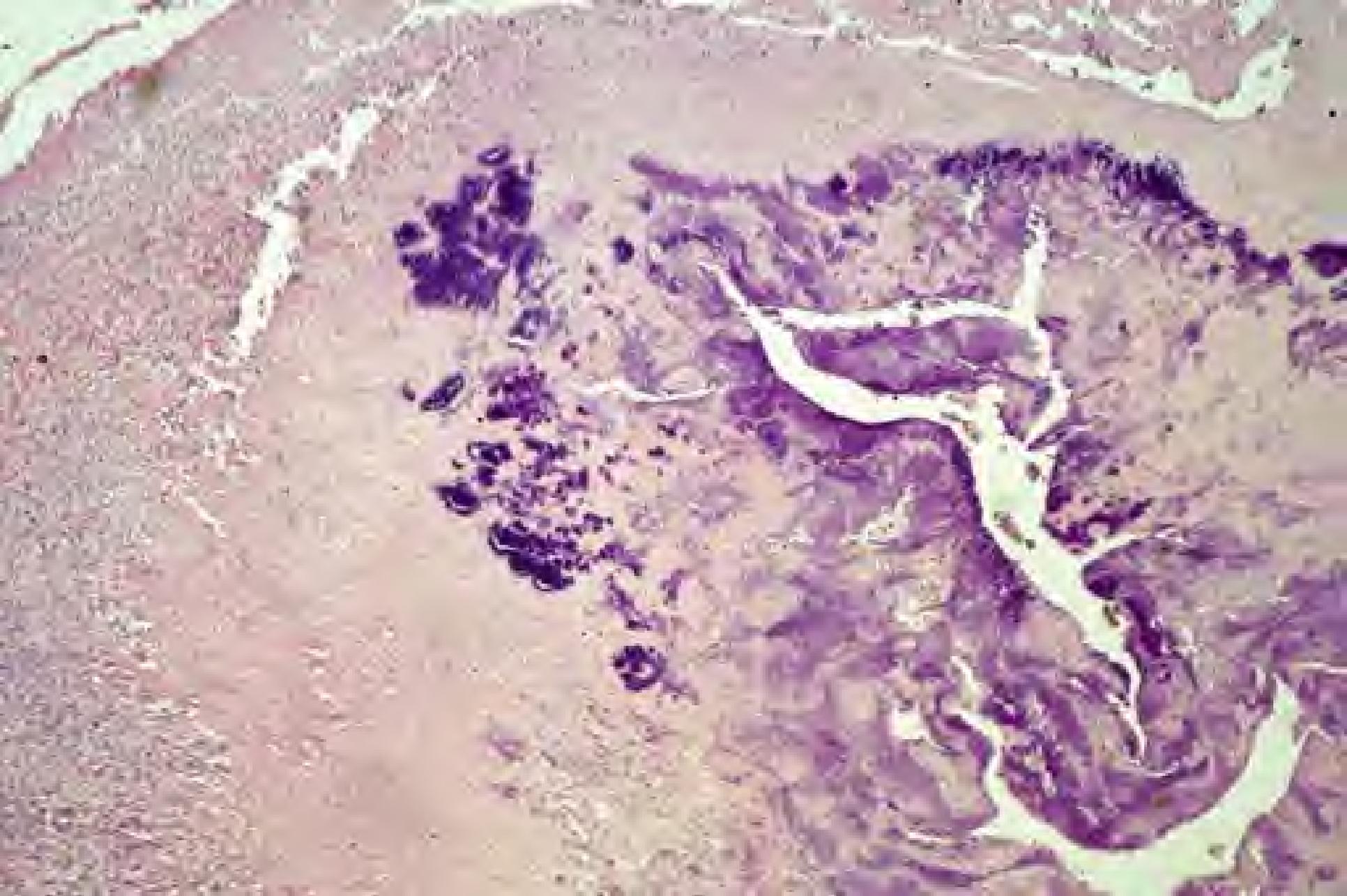


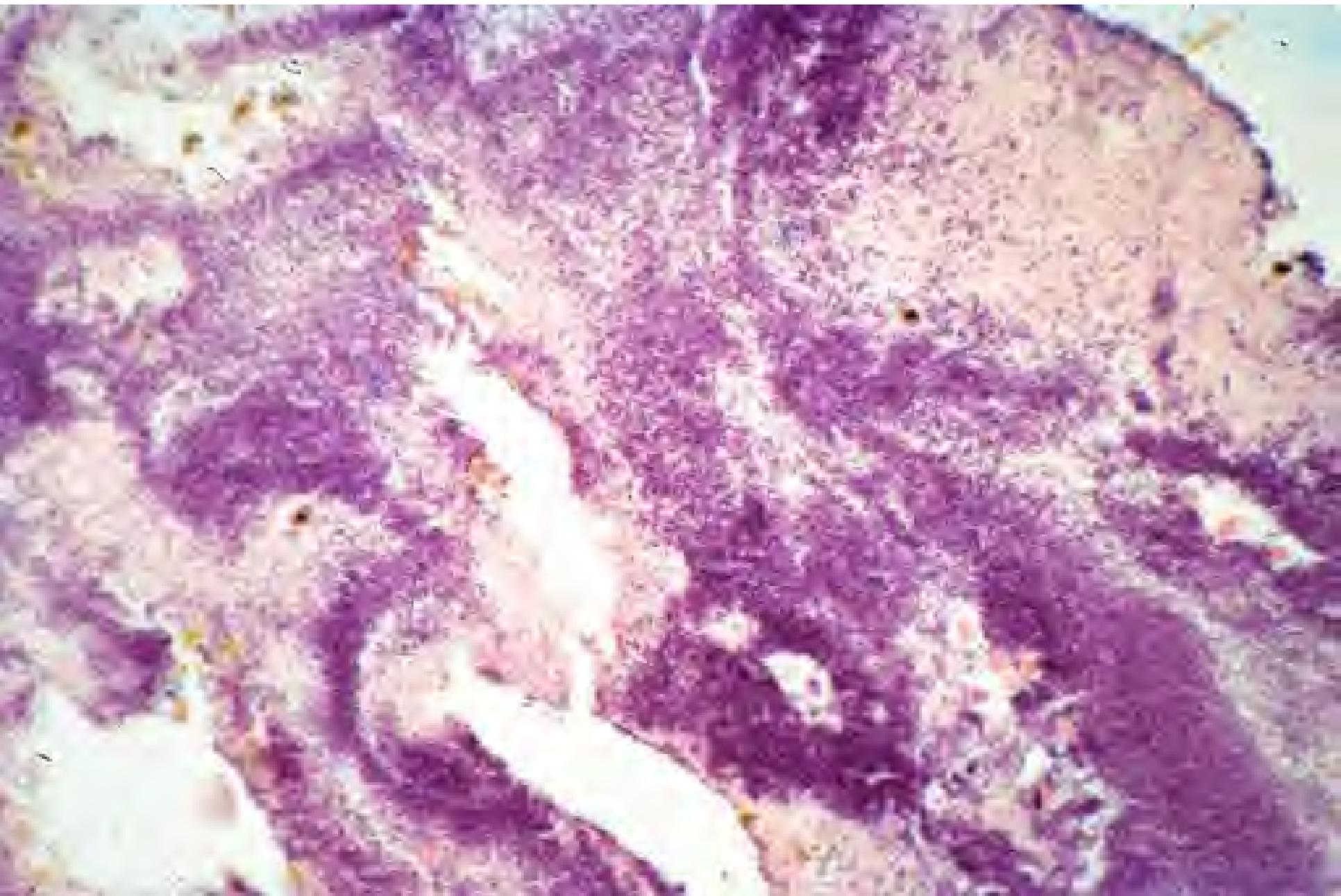
Bacterial Endocarditis - Aortic Valve



PO-IMCL G.D. Abrams, University of Michigan Medical School

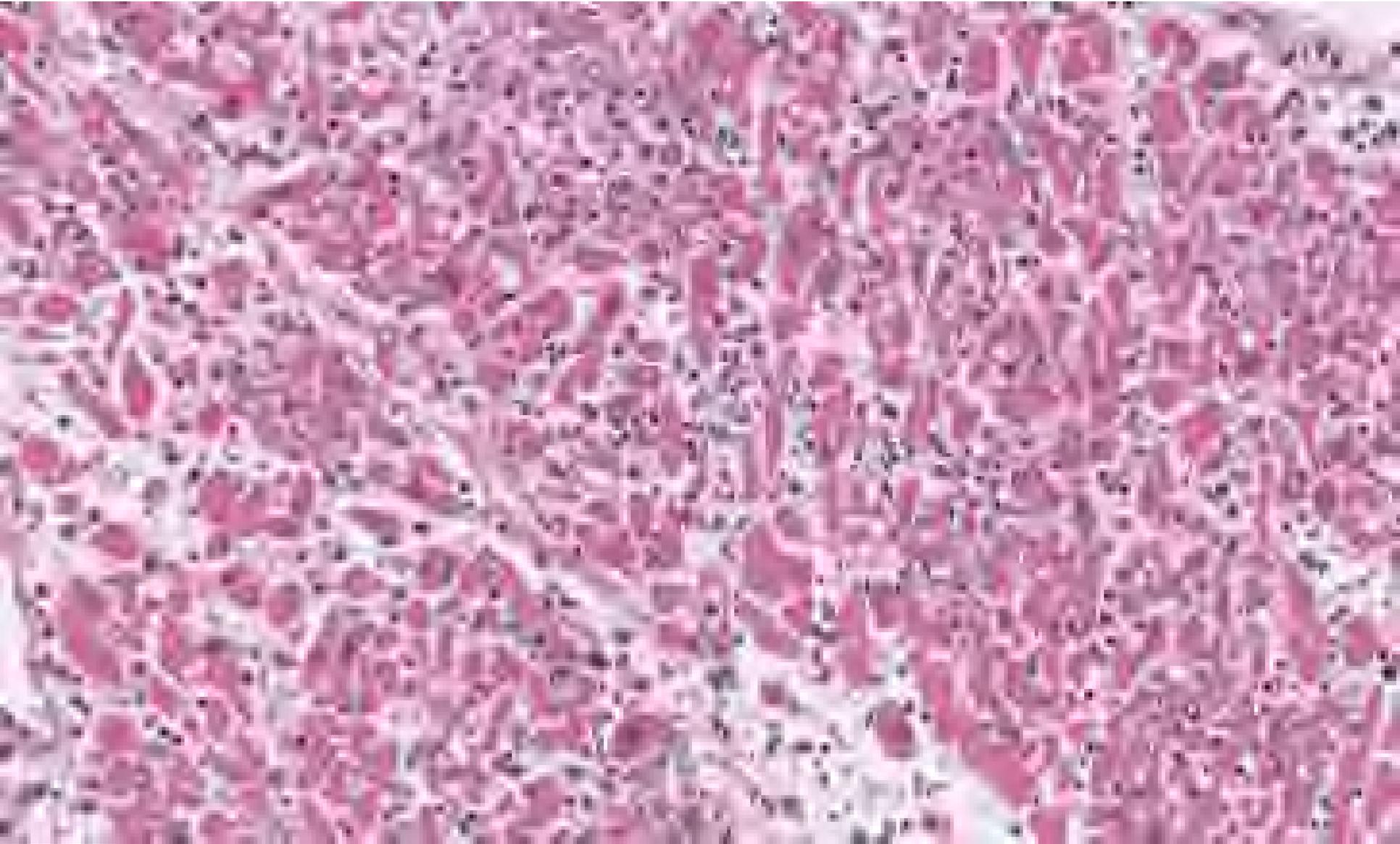


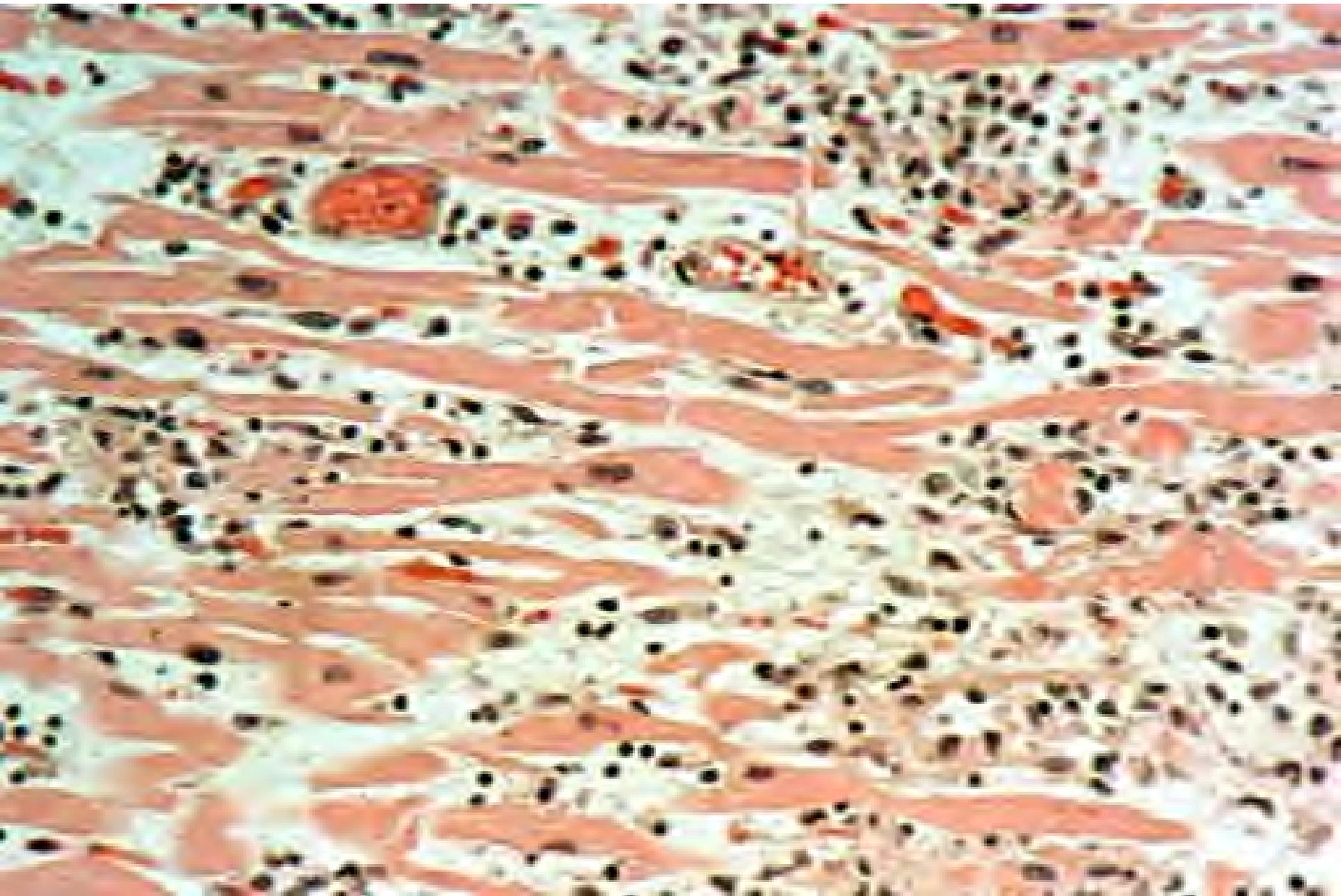


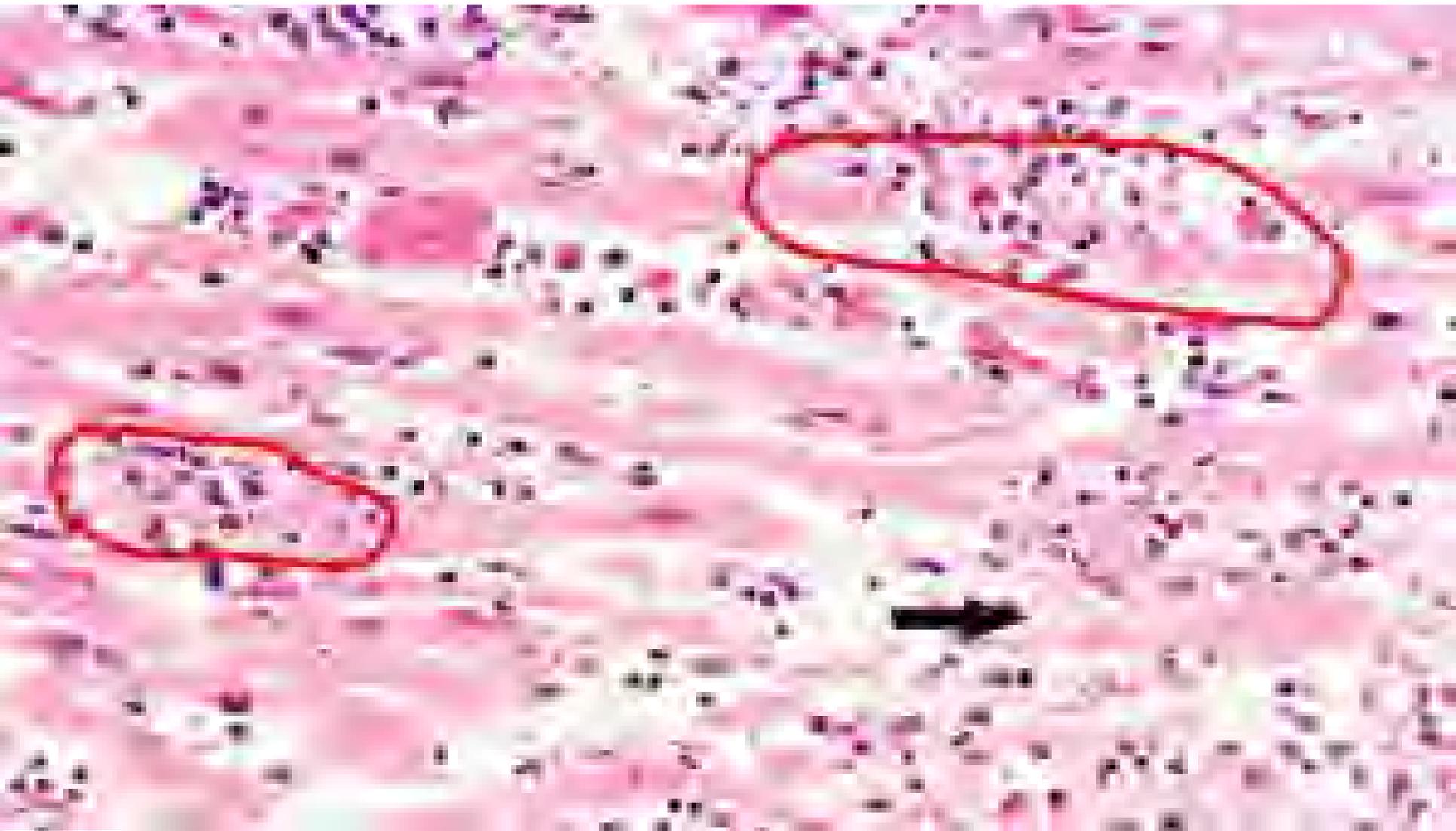


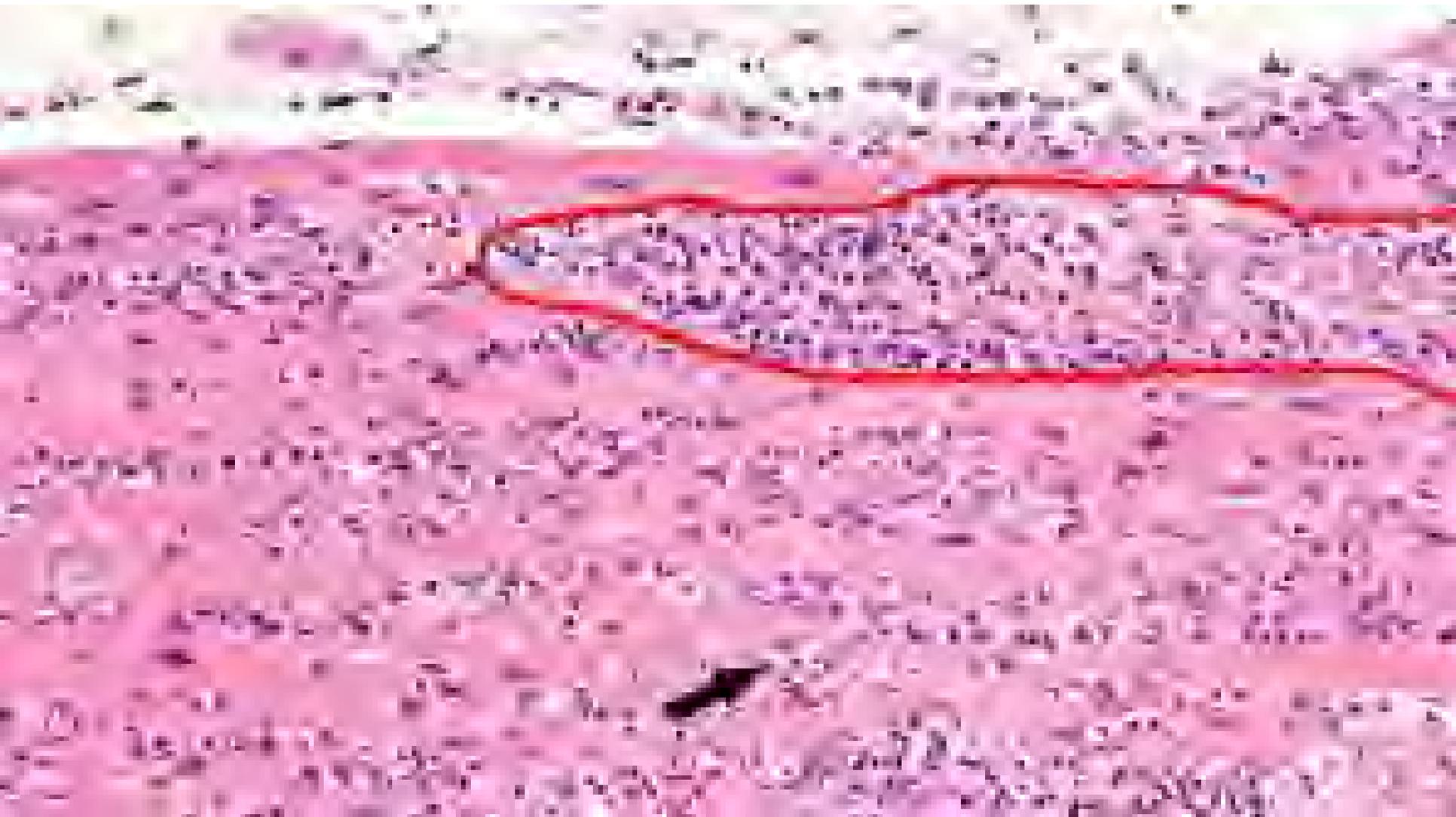
Myocarditis

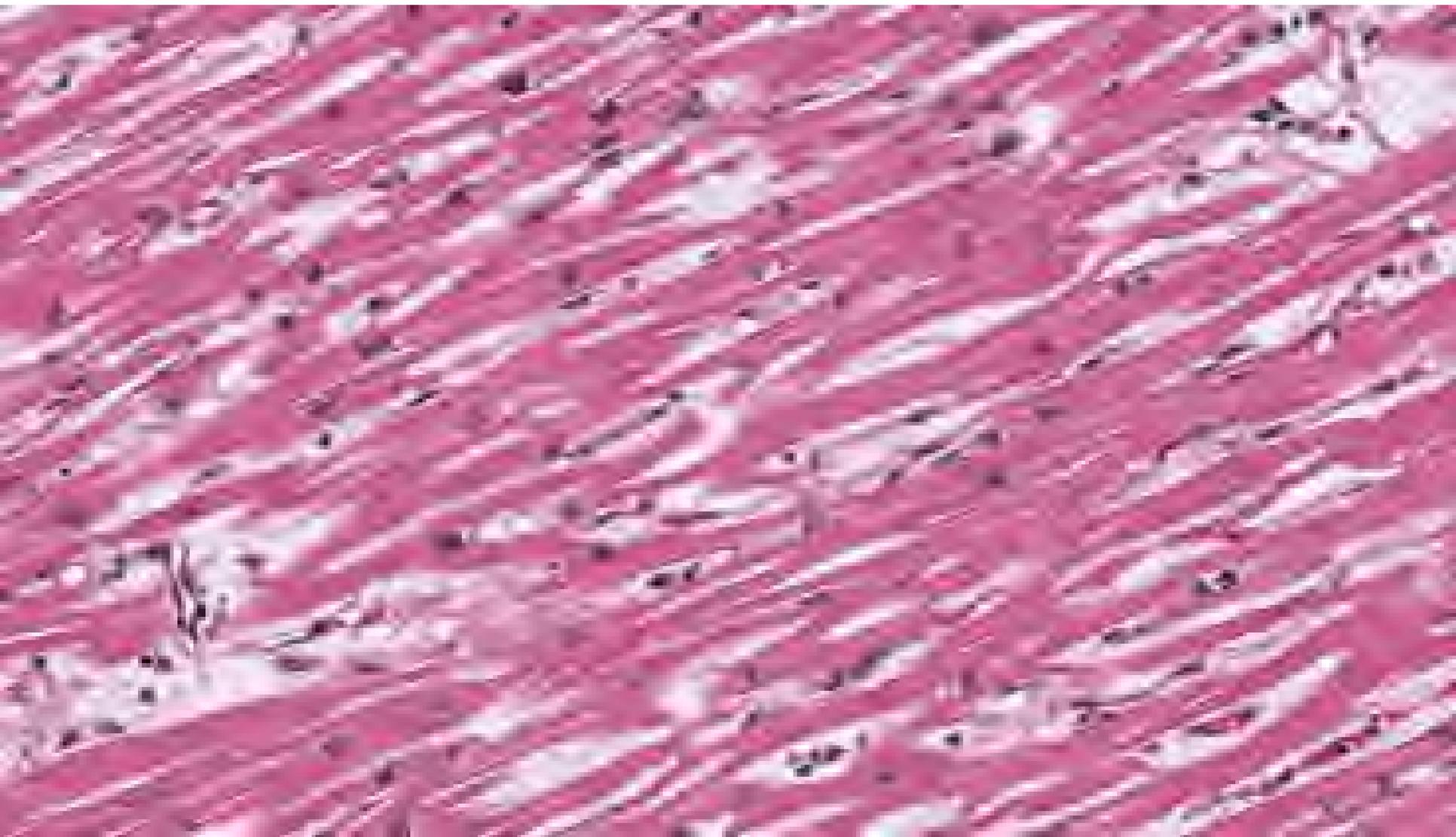


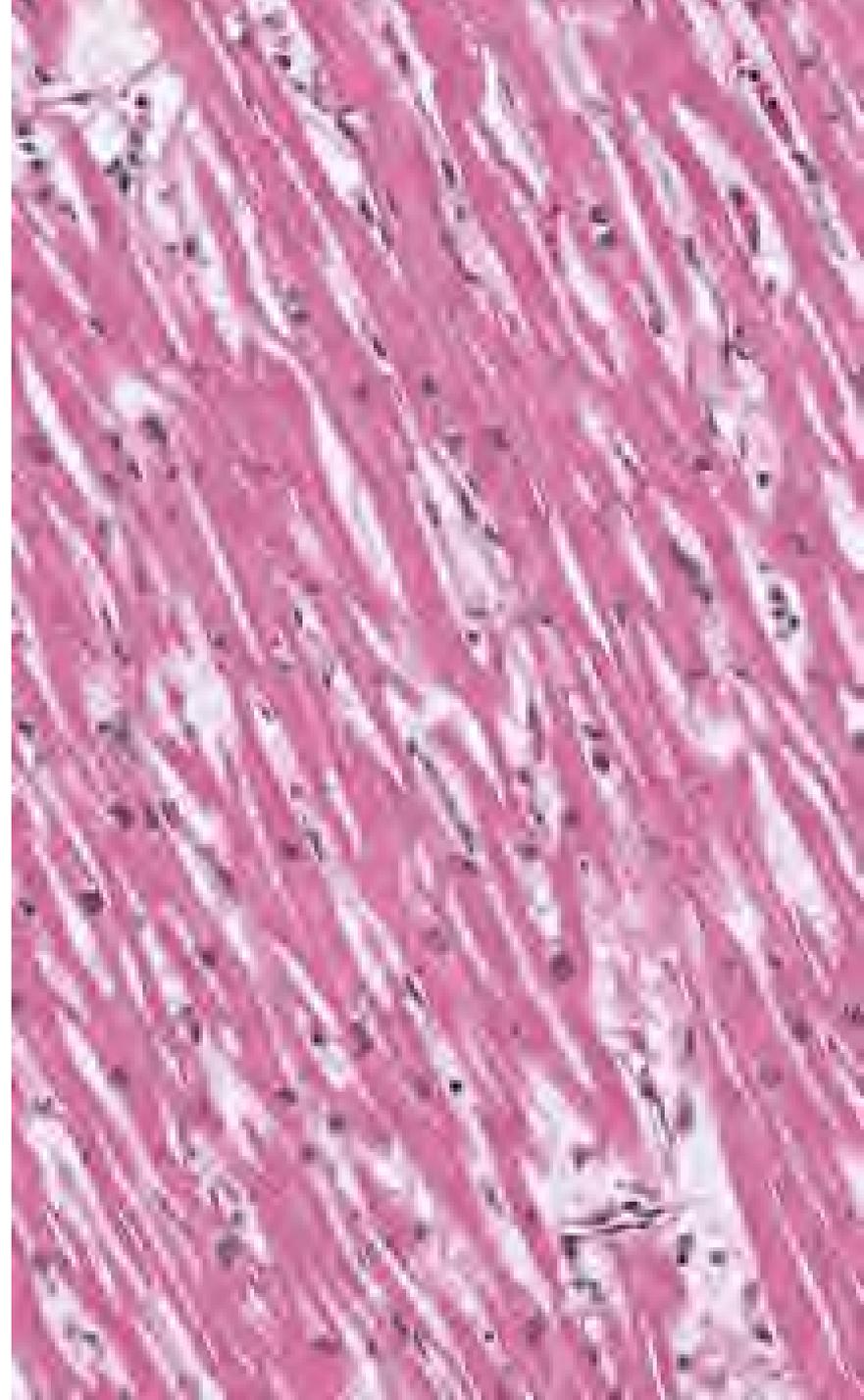
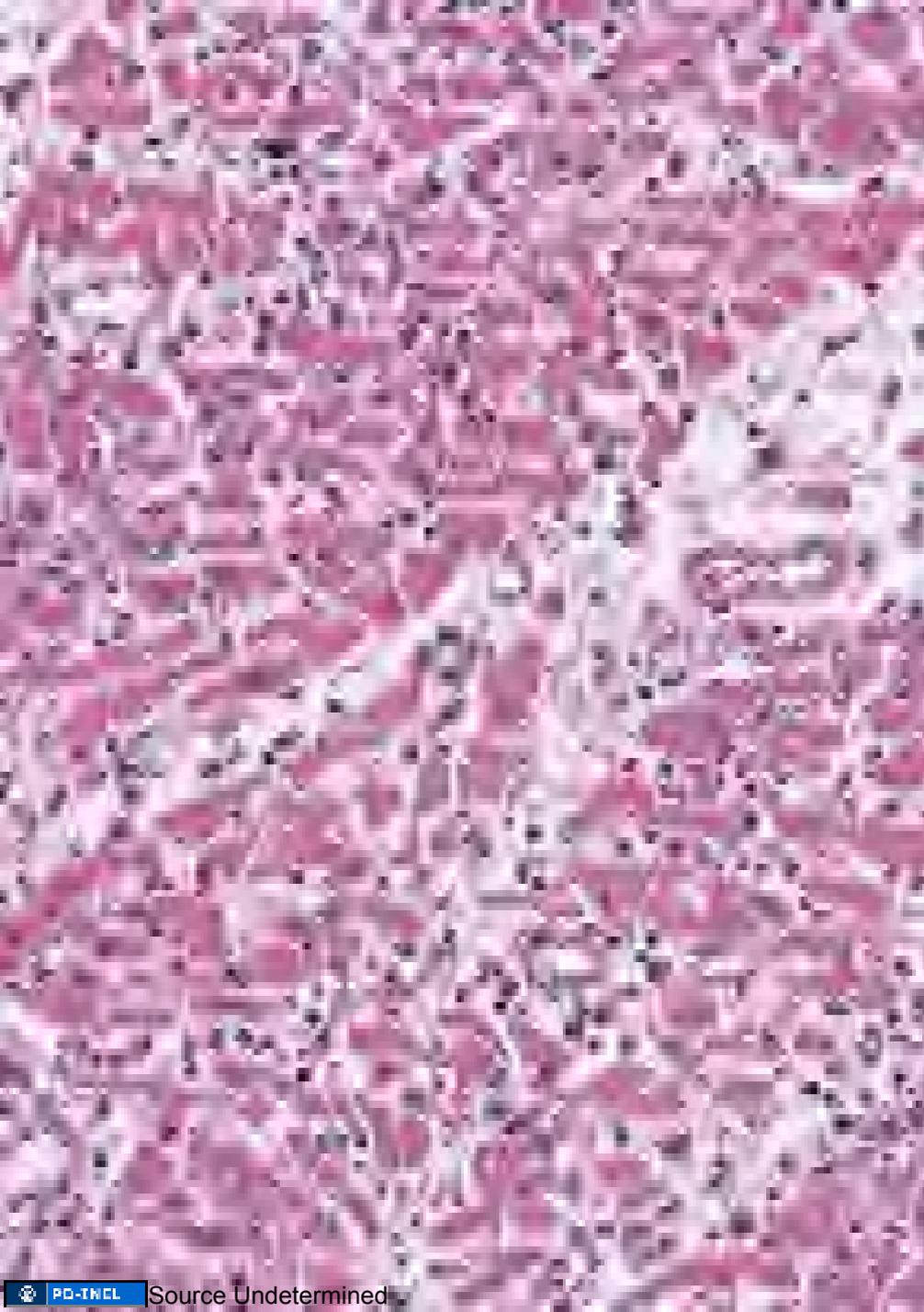








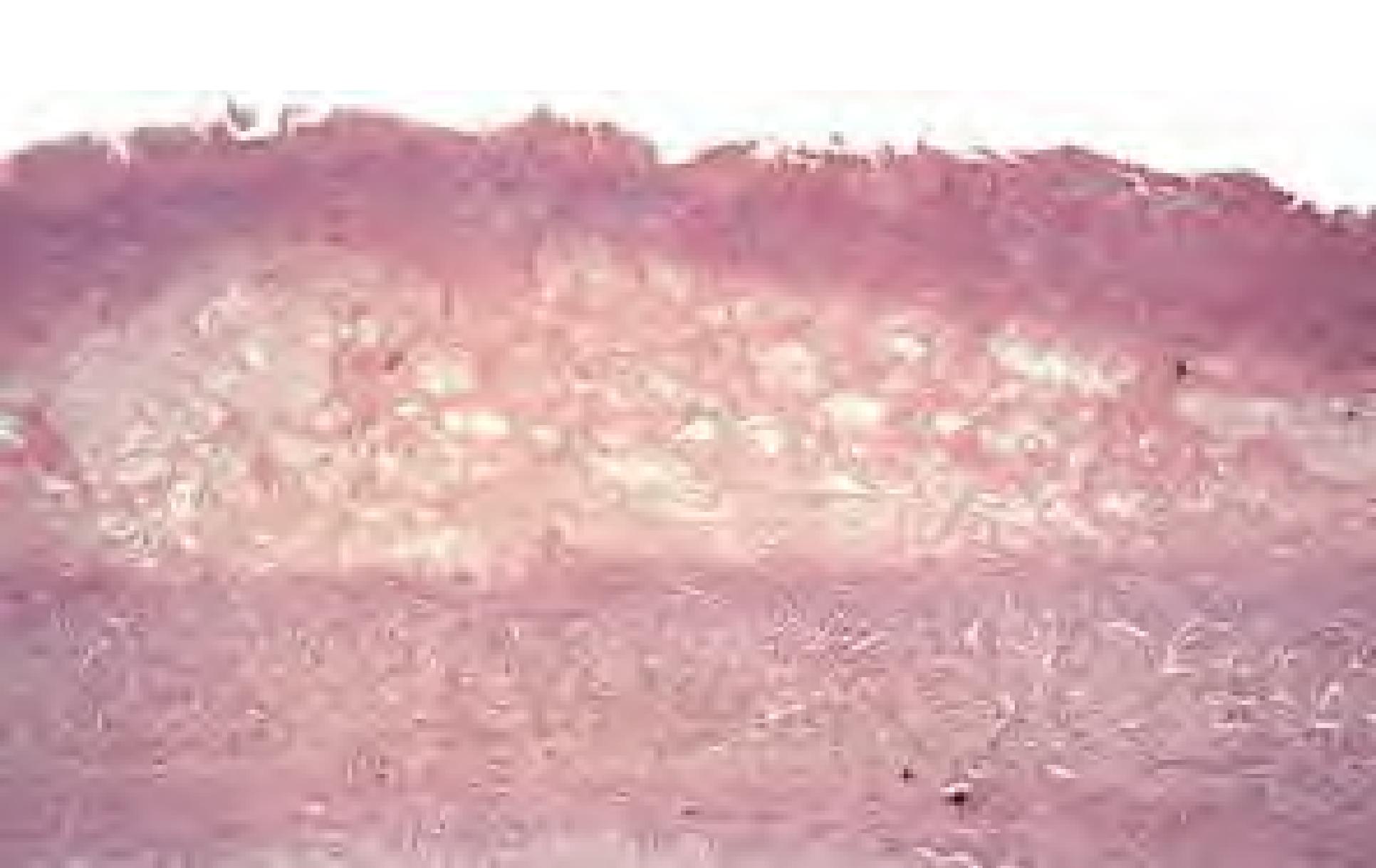




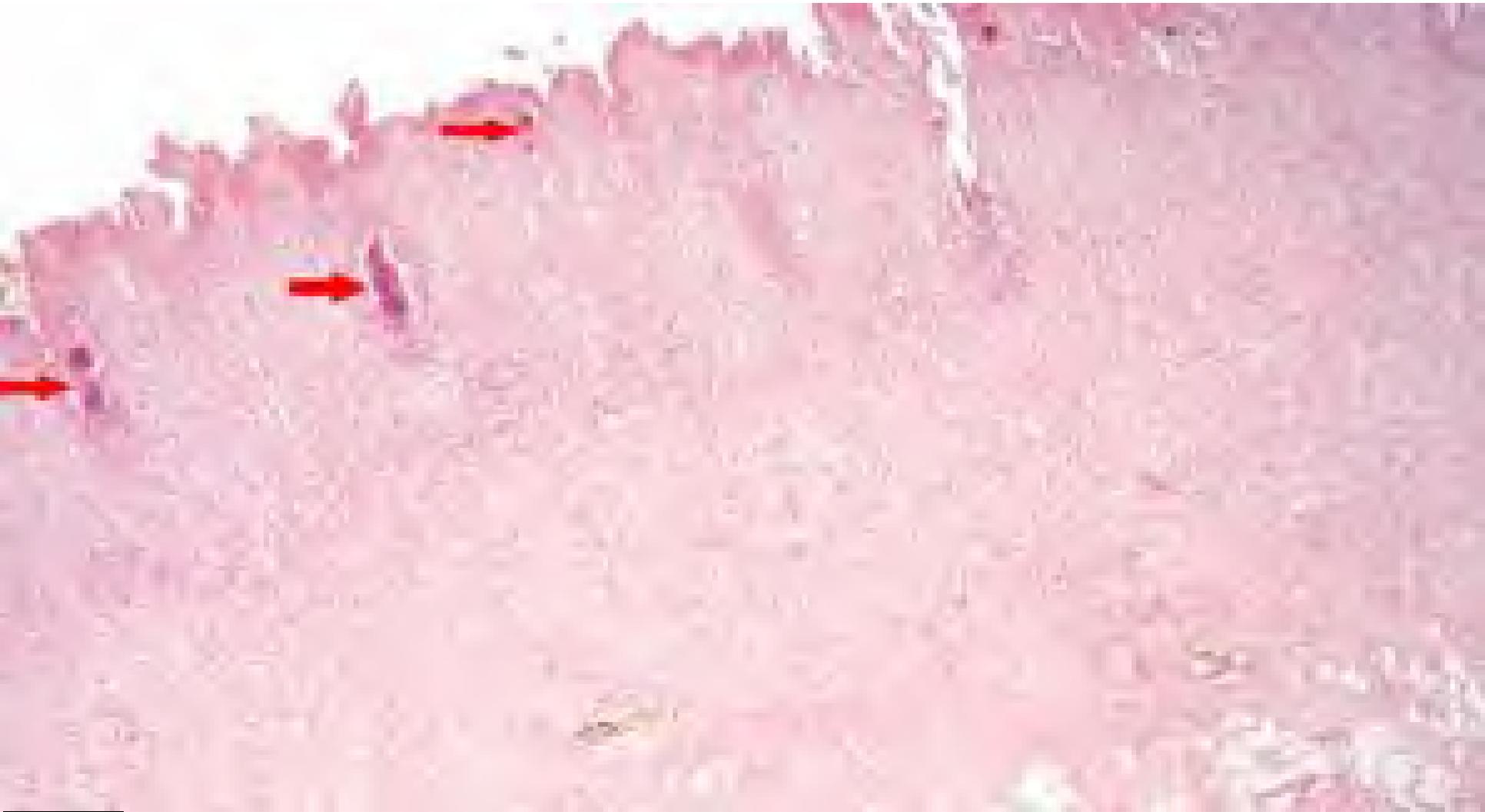
Pericarditis (epicarditis)

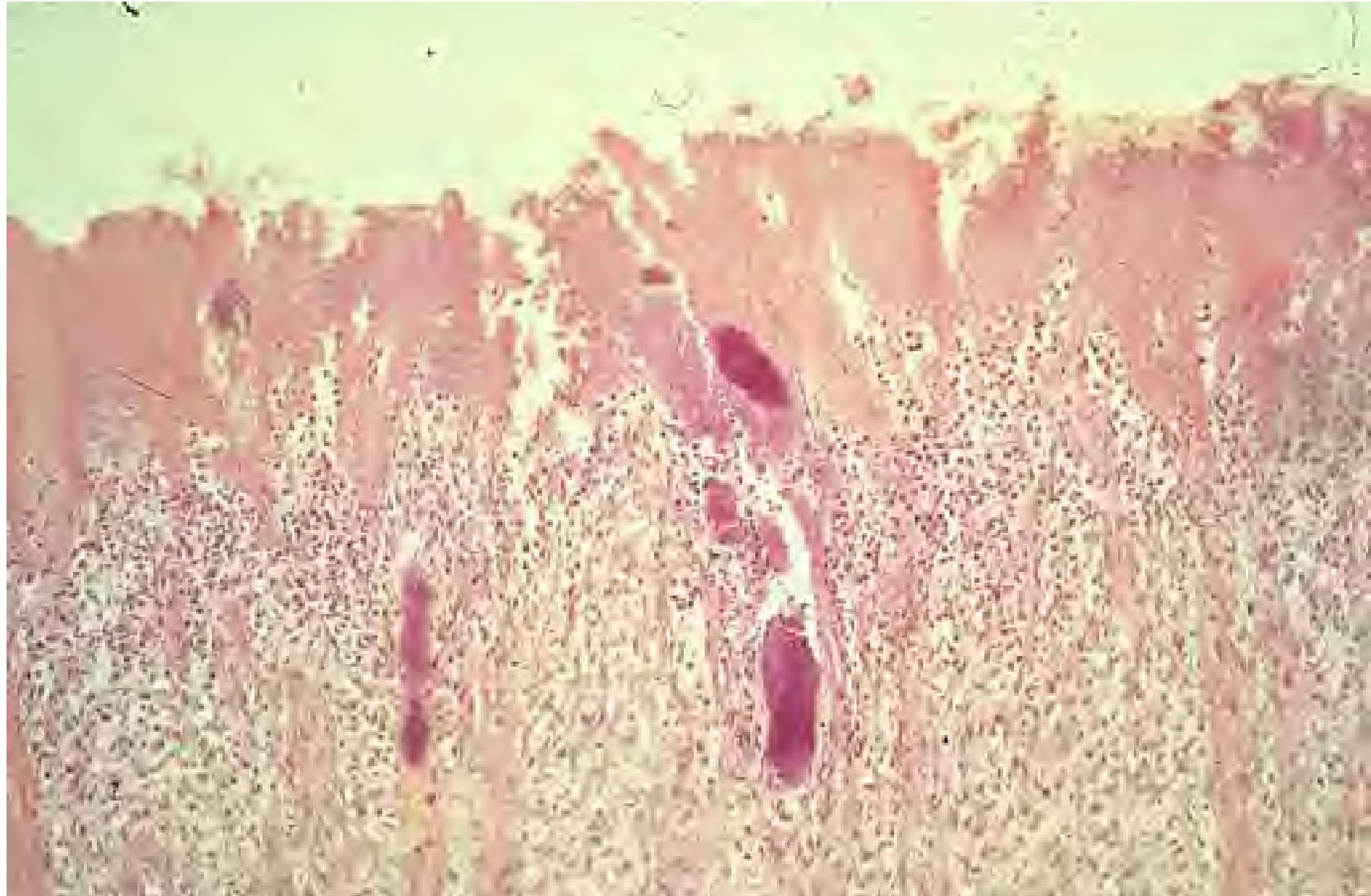


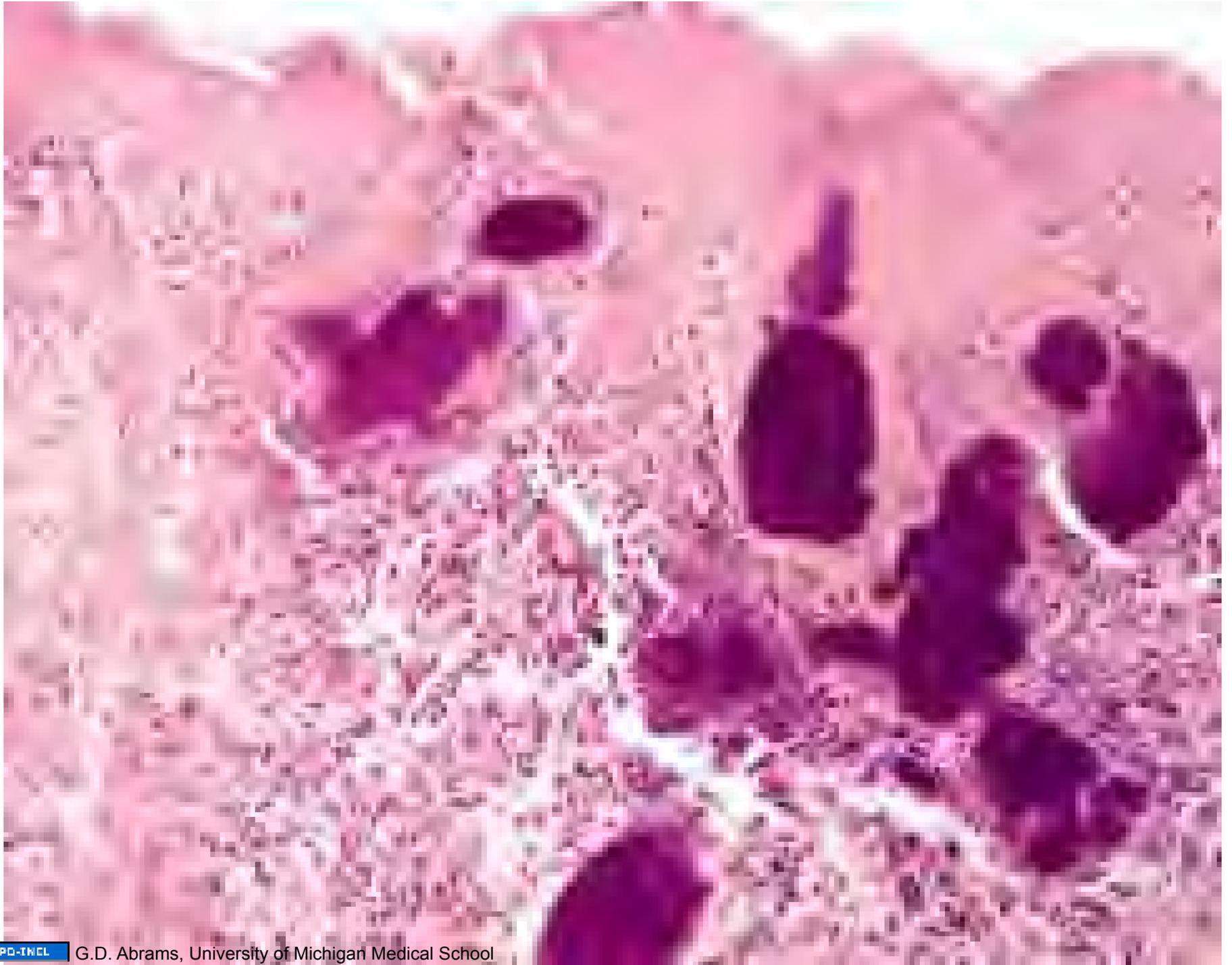


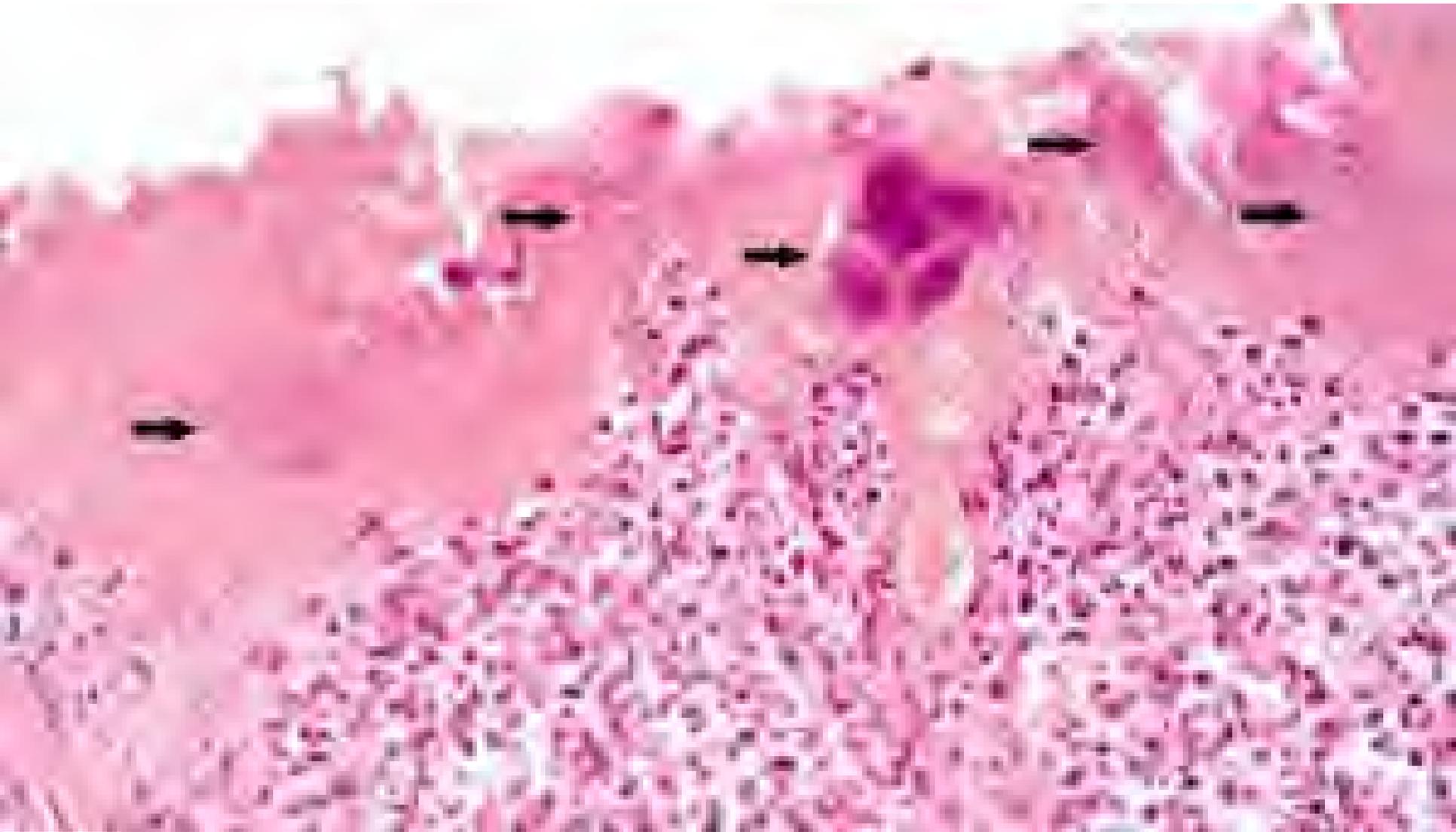


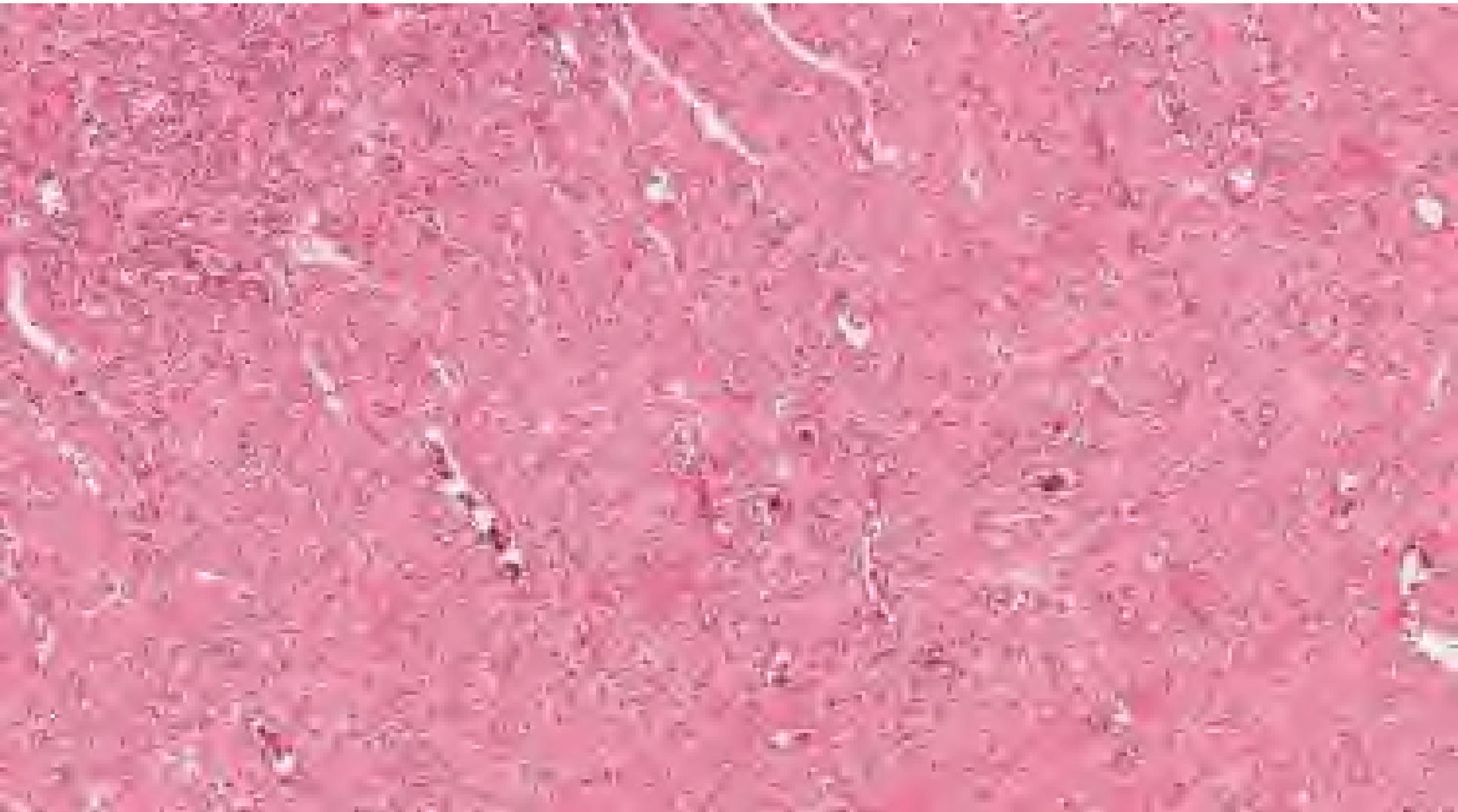


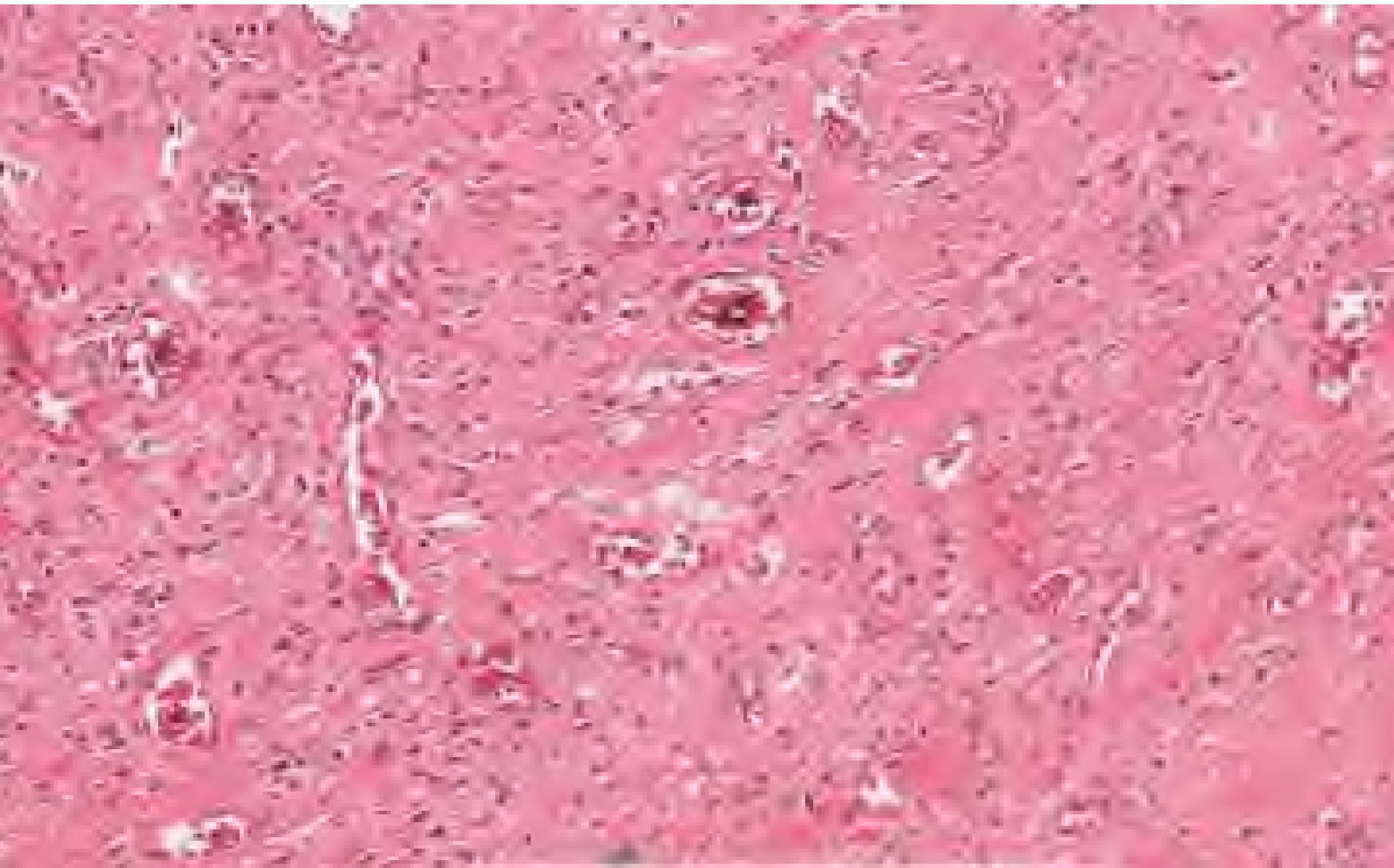




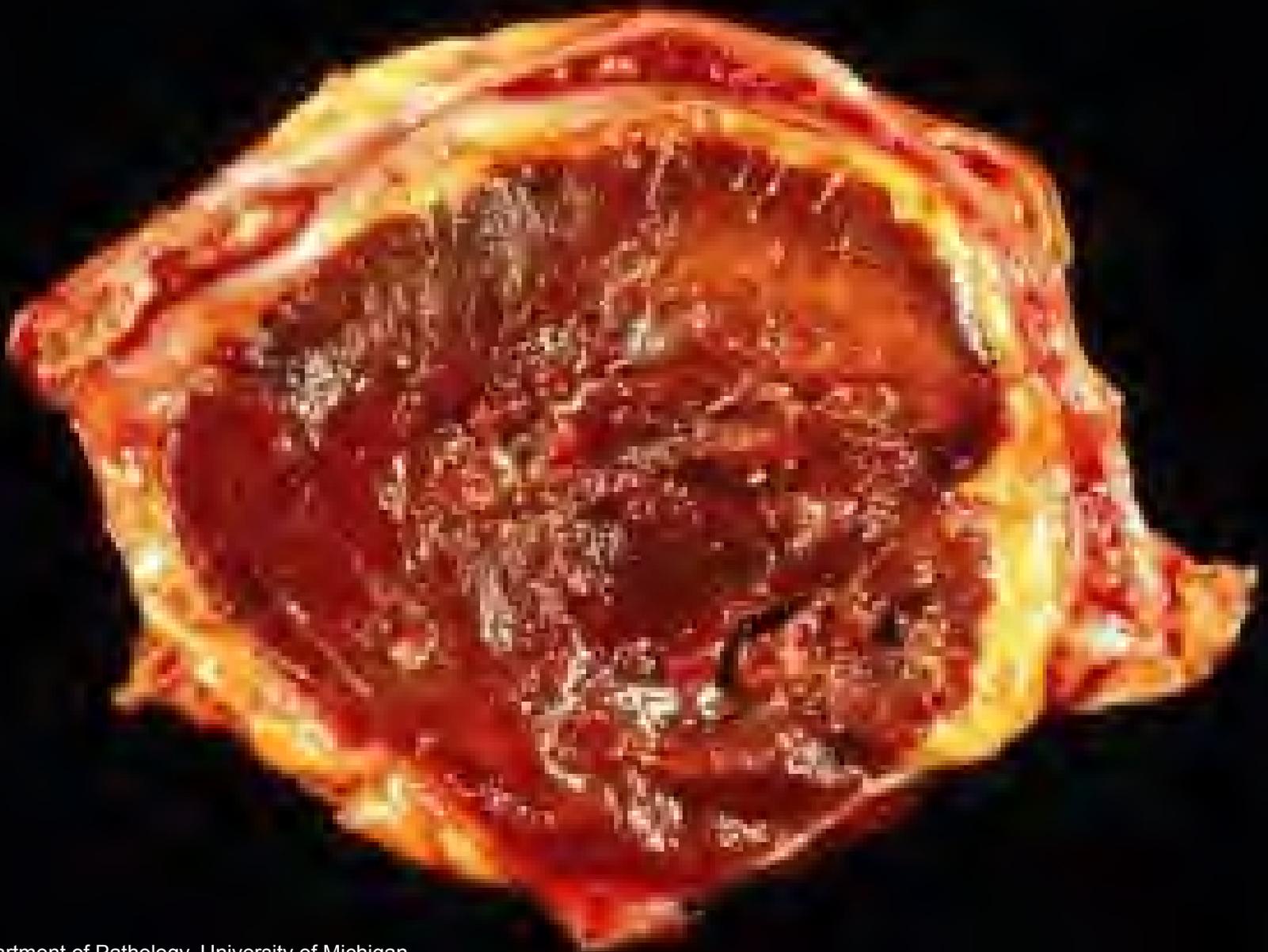








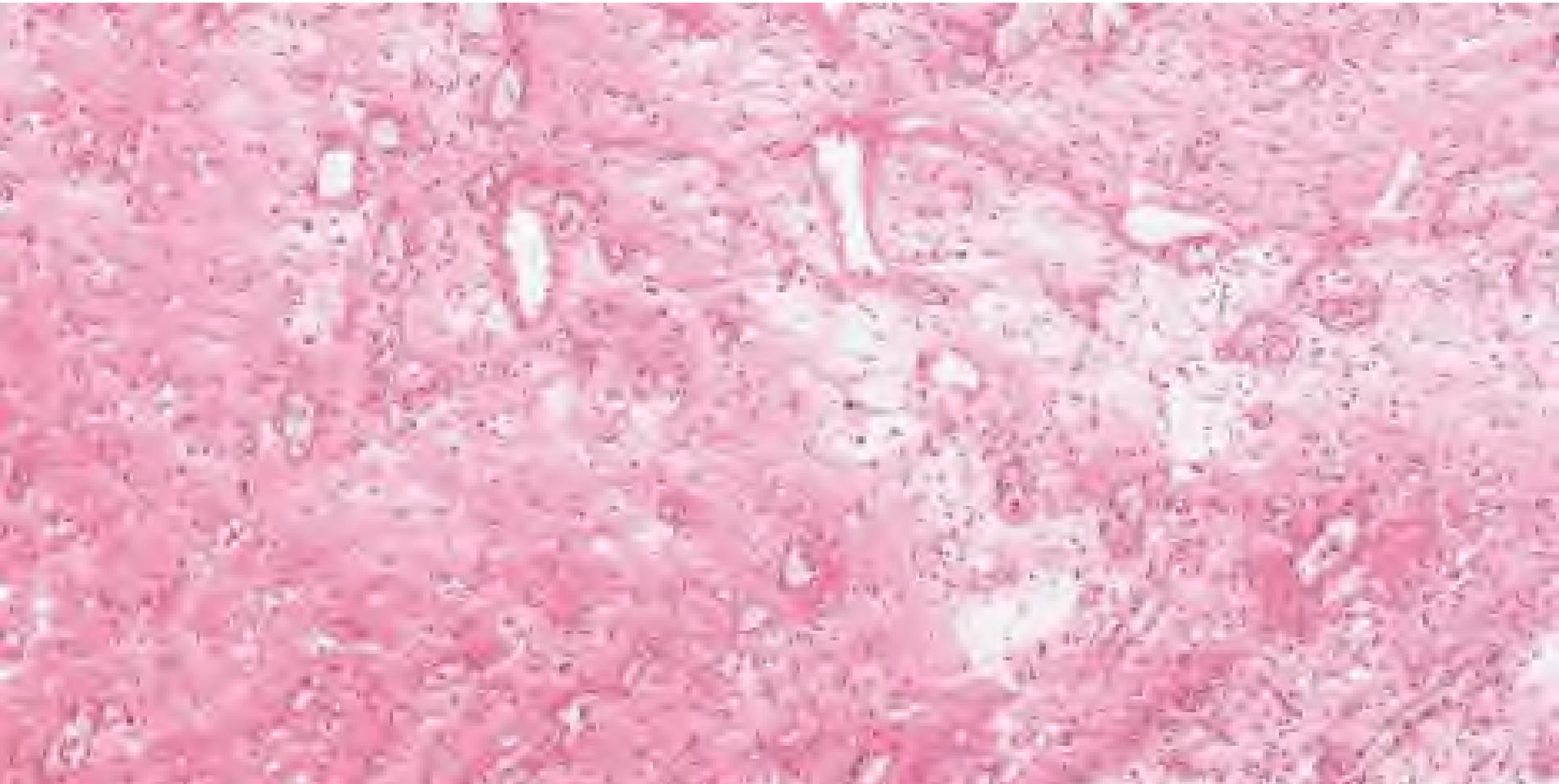
Constrictive Pericarditis



Pericarditis (epicarditis)



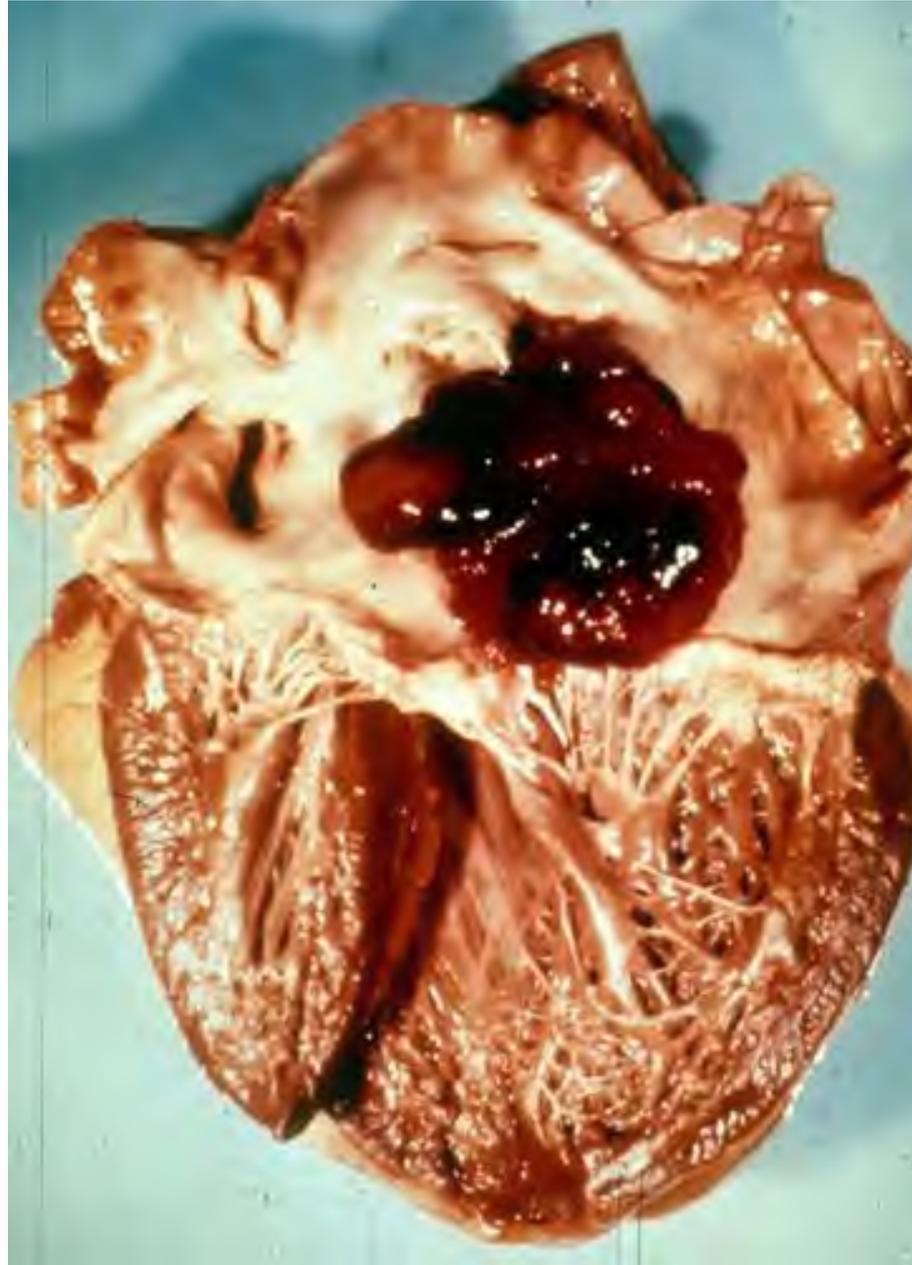


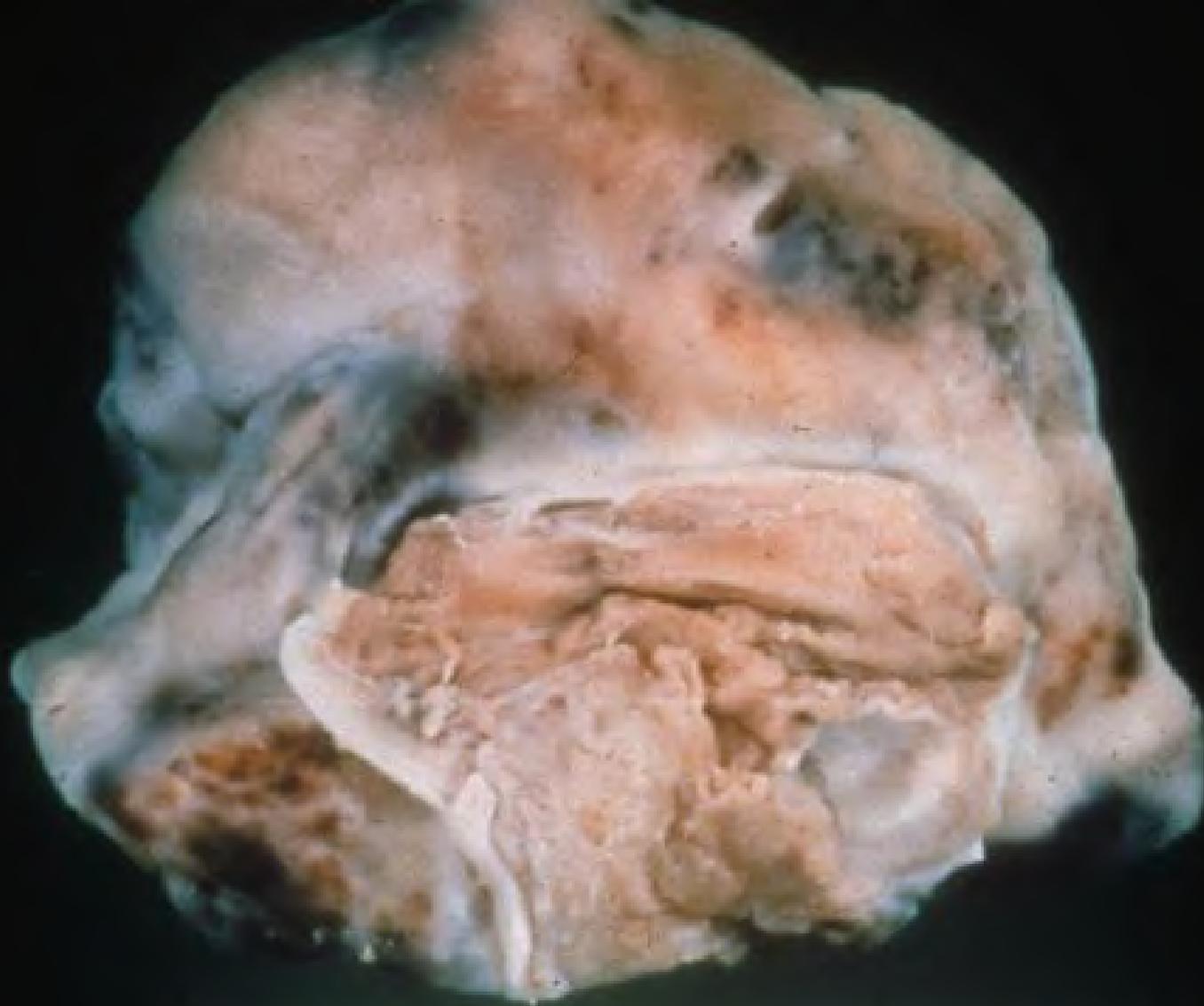


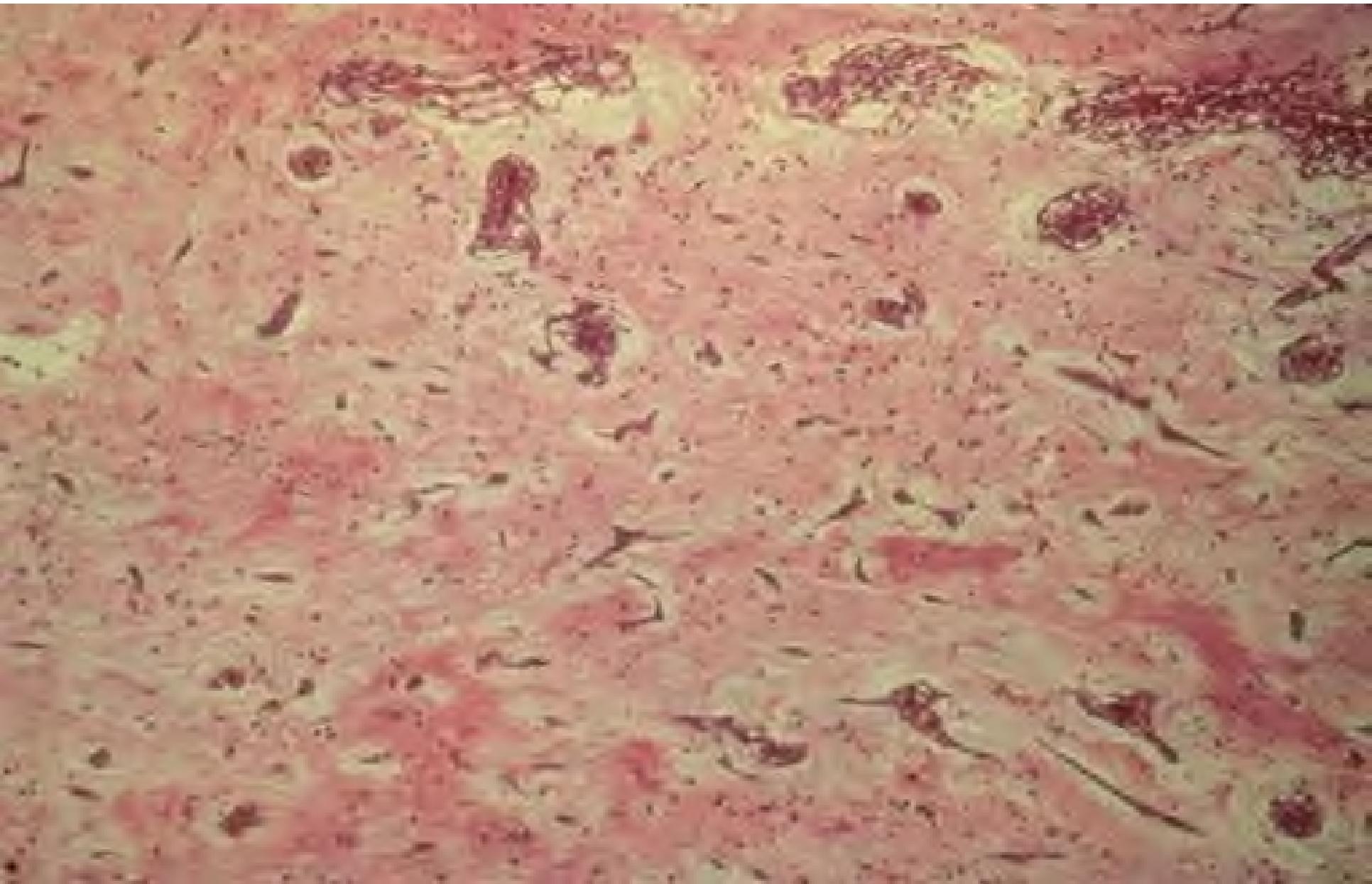
Case Presentation

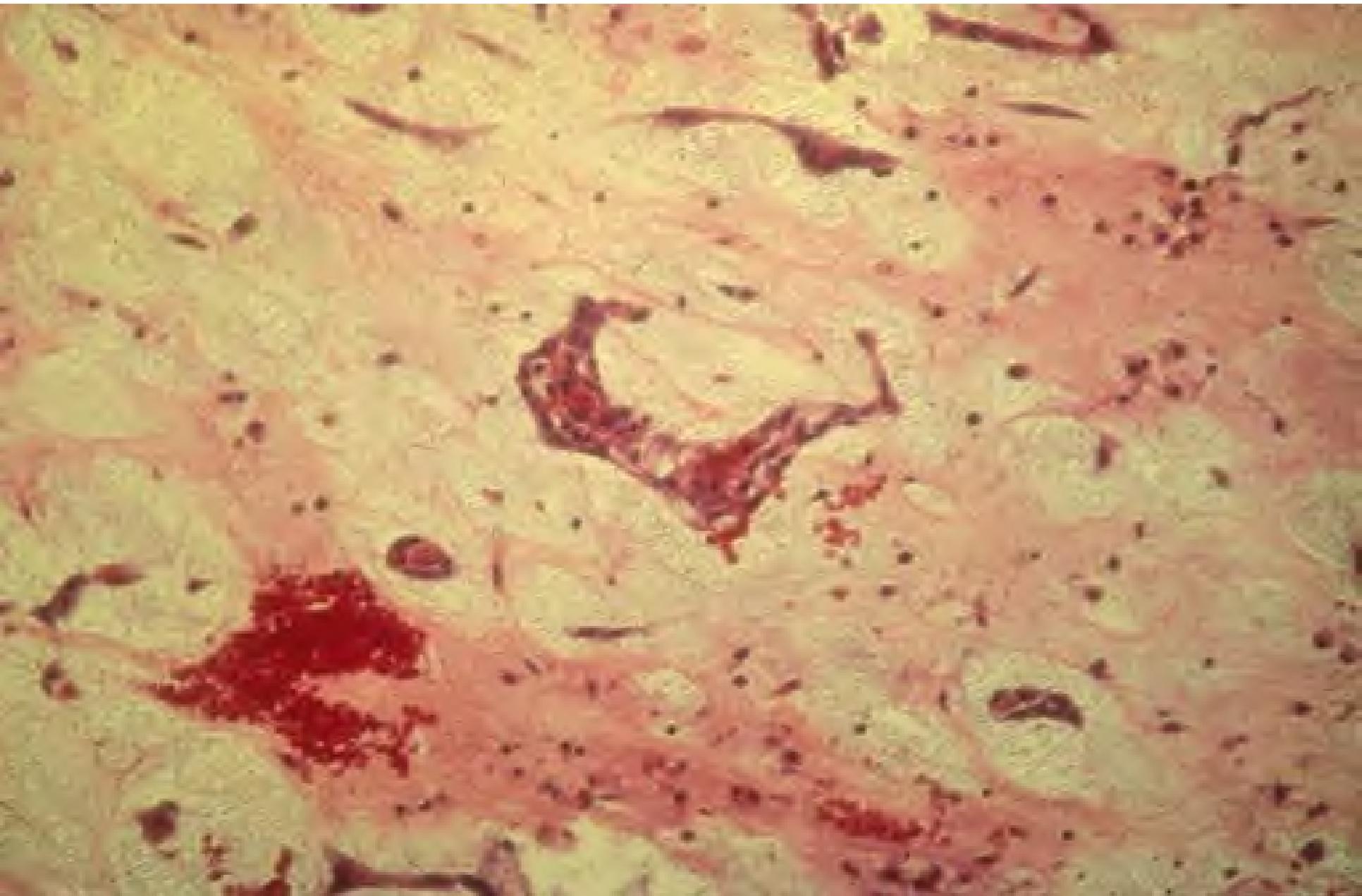
Atrial Myxoma

Case presentation - **Atrial Myxoma**









M-2 Cardiovascular Laboratory – 5



Following slides are intended for review

Cardio Lab 5

Case Presentation 1

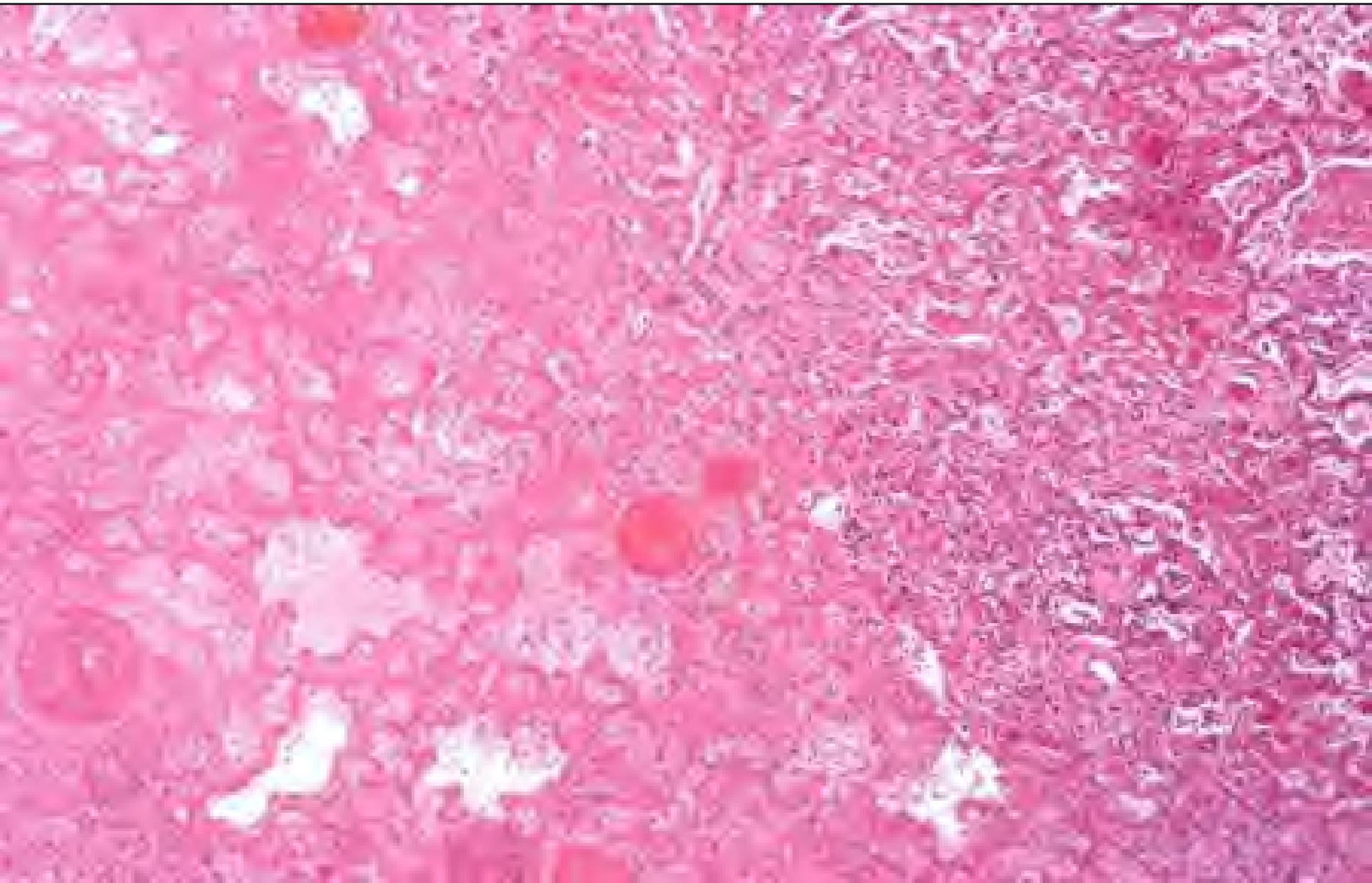
(Refer to lab syllabus for the clinical information)

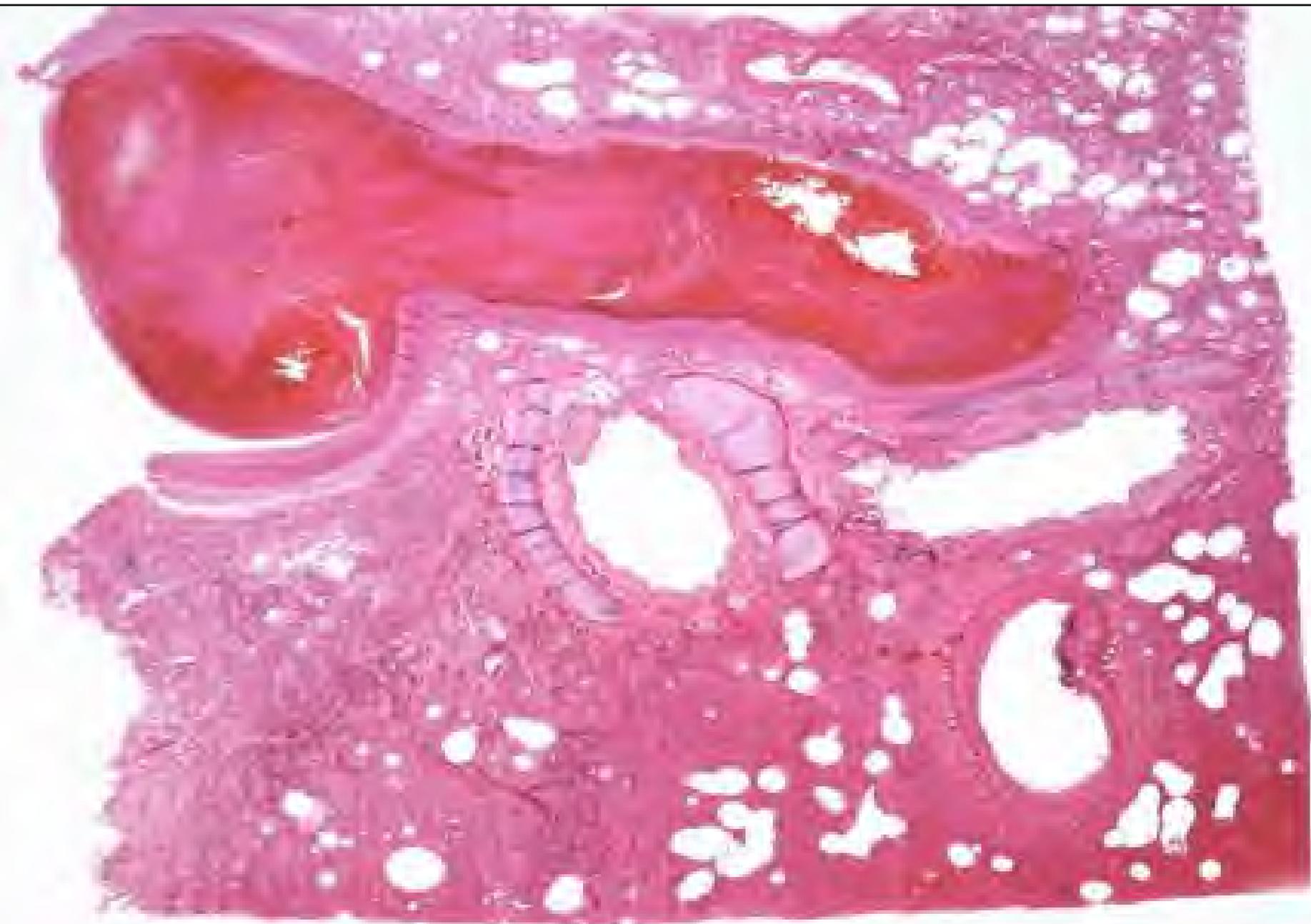
1. Discuss the pathologic findings and offer a diagnosis
2. Why did circulatory collapse occur?
3. What blood test may have aided in the diagnosis of this disorder?
4. What risk factors are associated with this disorder?











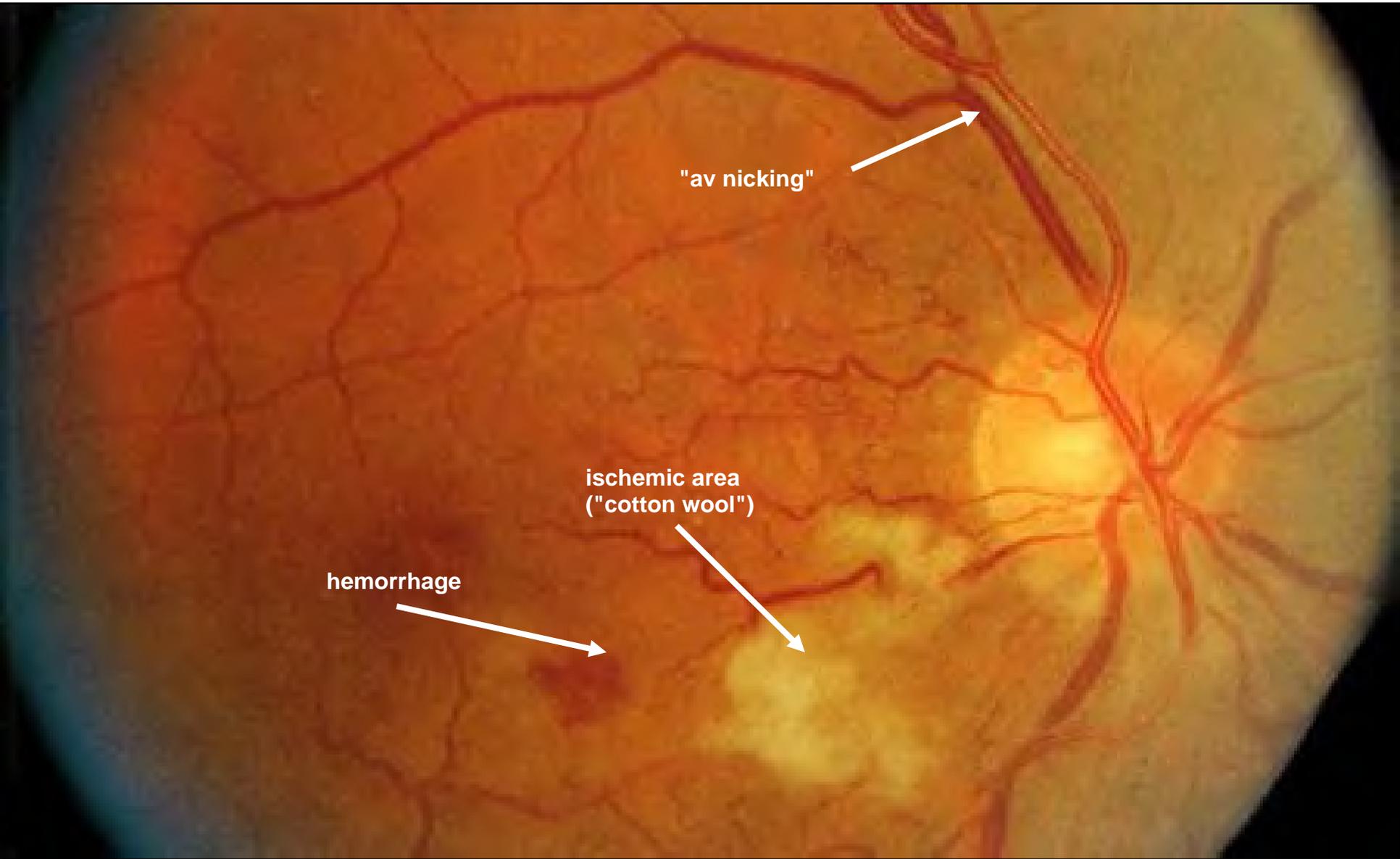
Pulmonary embolus secondary to DVT

Cardio Lab 5

Case Presentation 2

(Refer to lab syllabus for the clinical information)

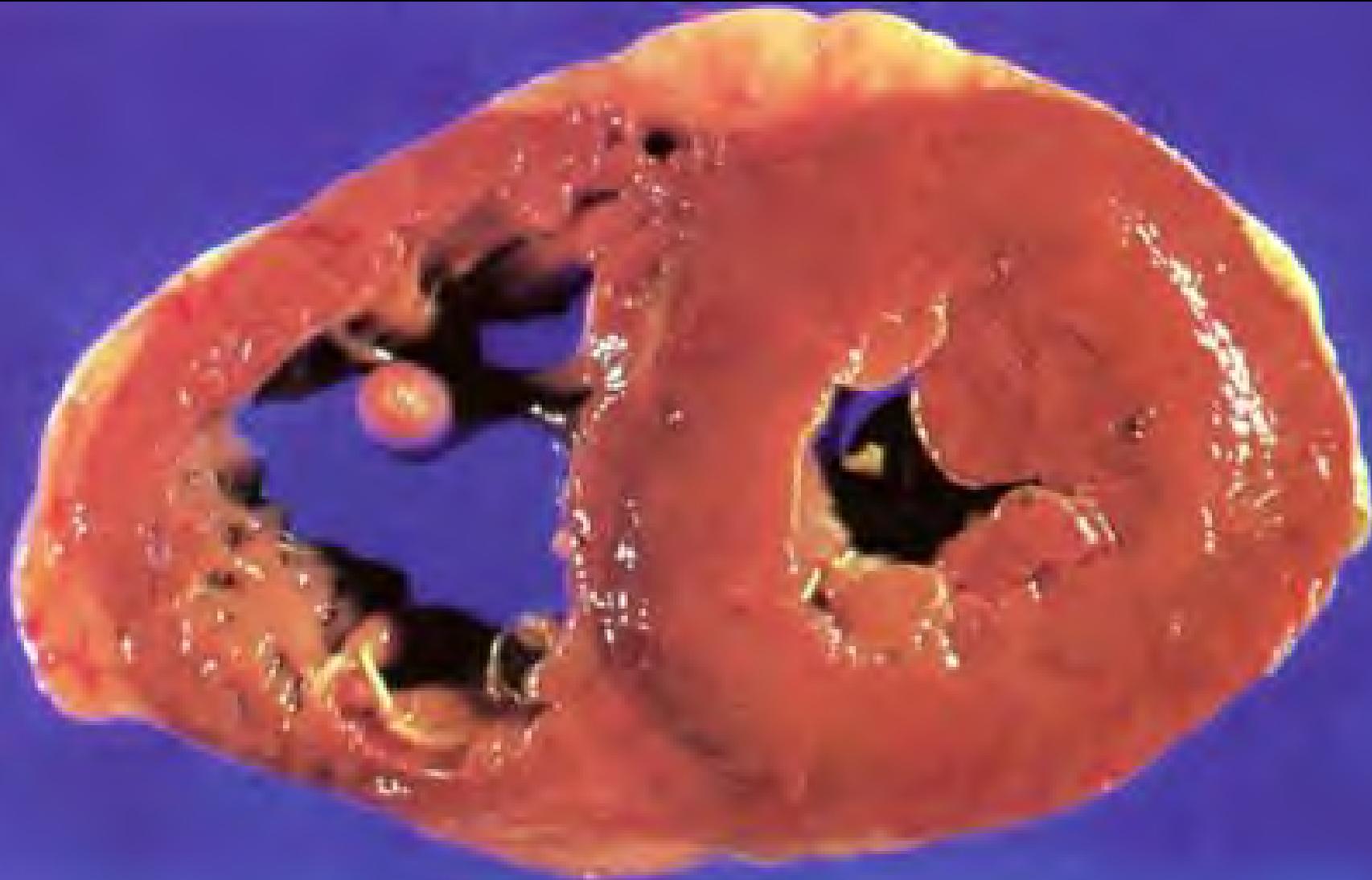
1. Describe the pathologic findings and form a diagnosis.
2. What other pathologic abnormalities might have been observed, with regard to the arterial system?
3. What pathologic finding was most likely found in his cerebrum?
4. What abnormal physical findings might have been present?

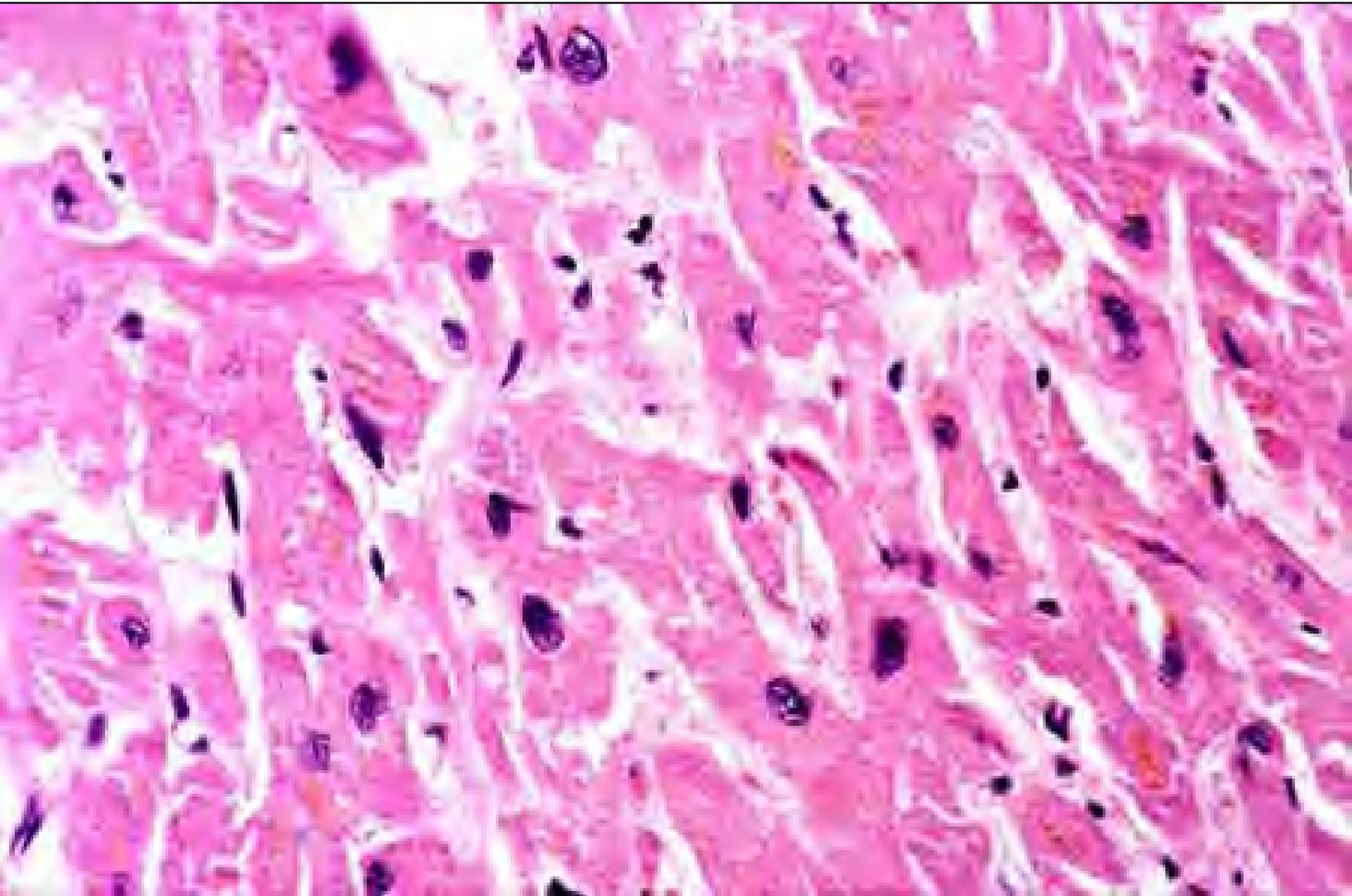


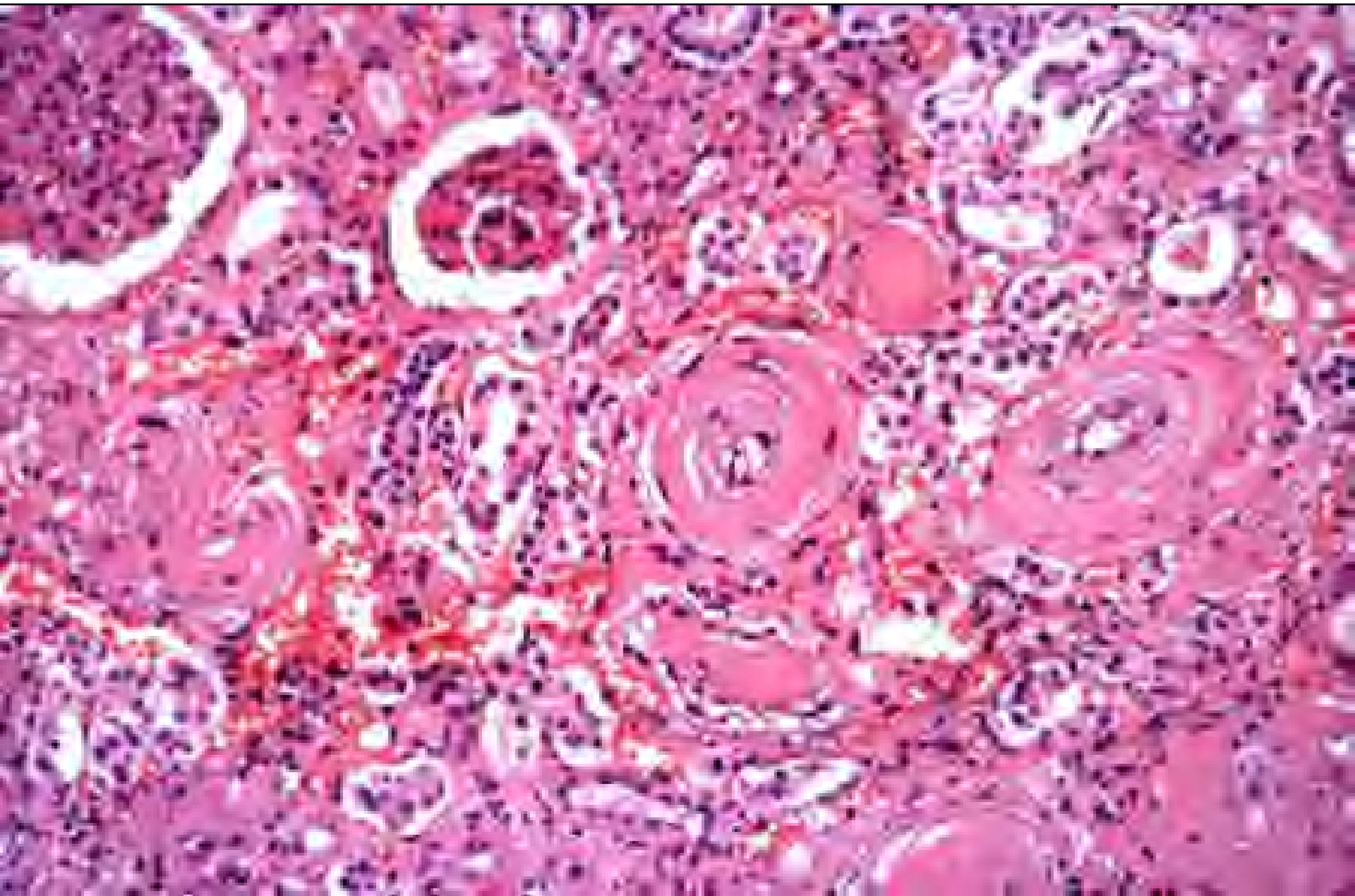
"av nicking"

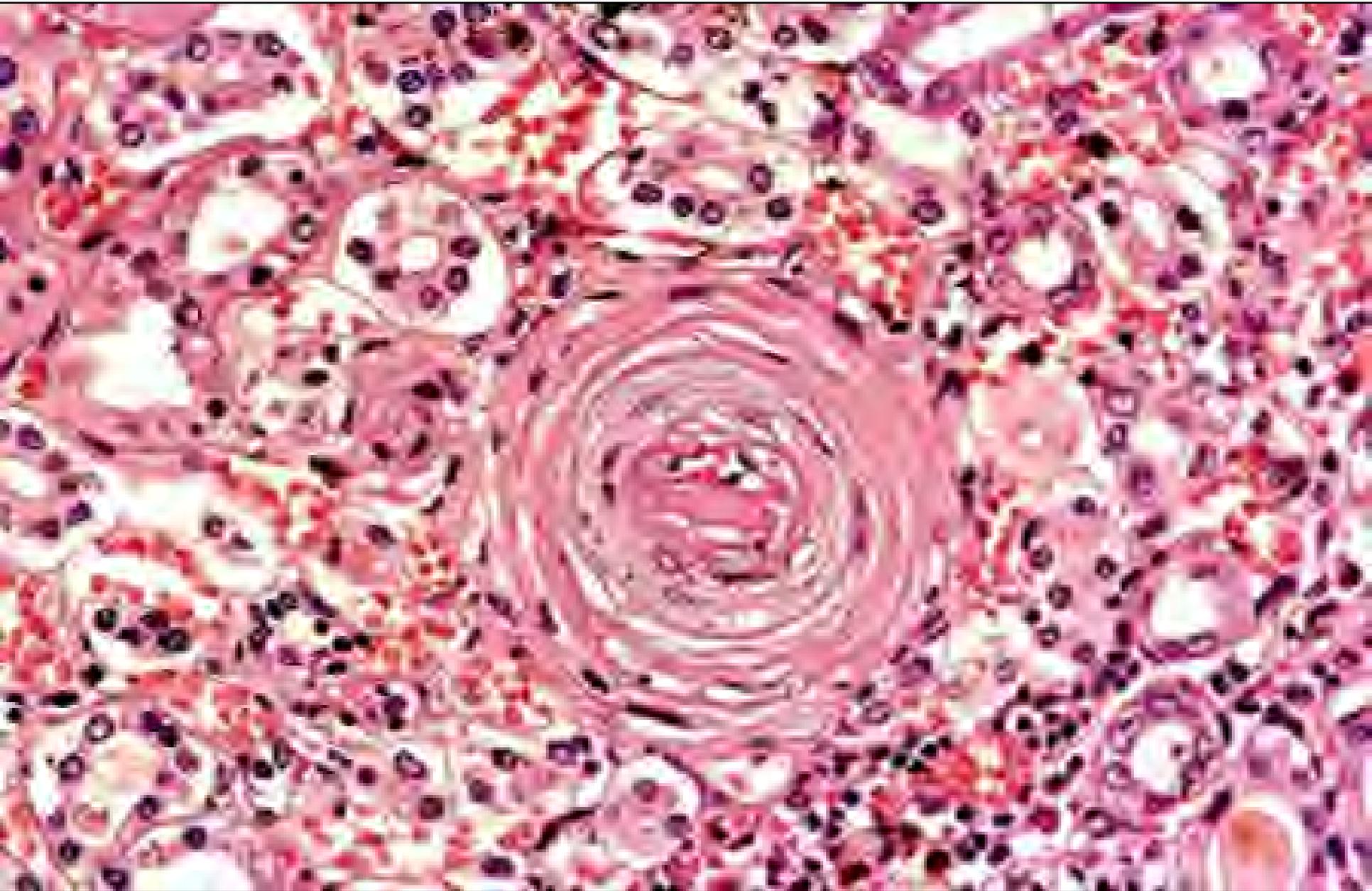
ischemic area
("cotton wool")

hemorrhage









Malignant hypertension

Cardio Lab 5

Case Presentation 3

(Refer to lab syllabus for the clinical information)

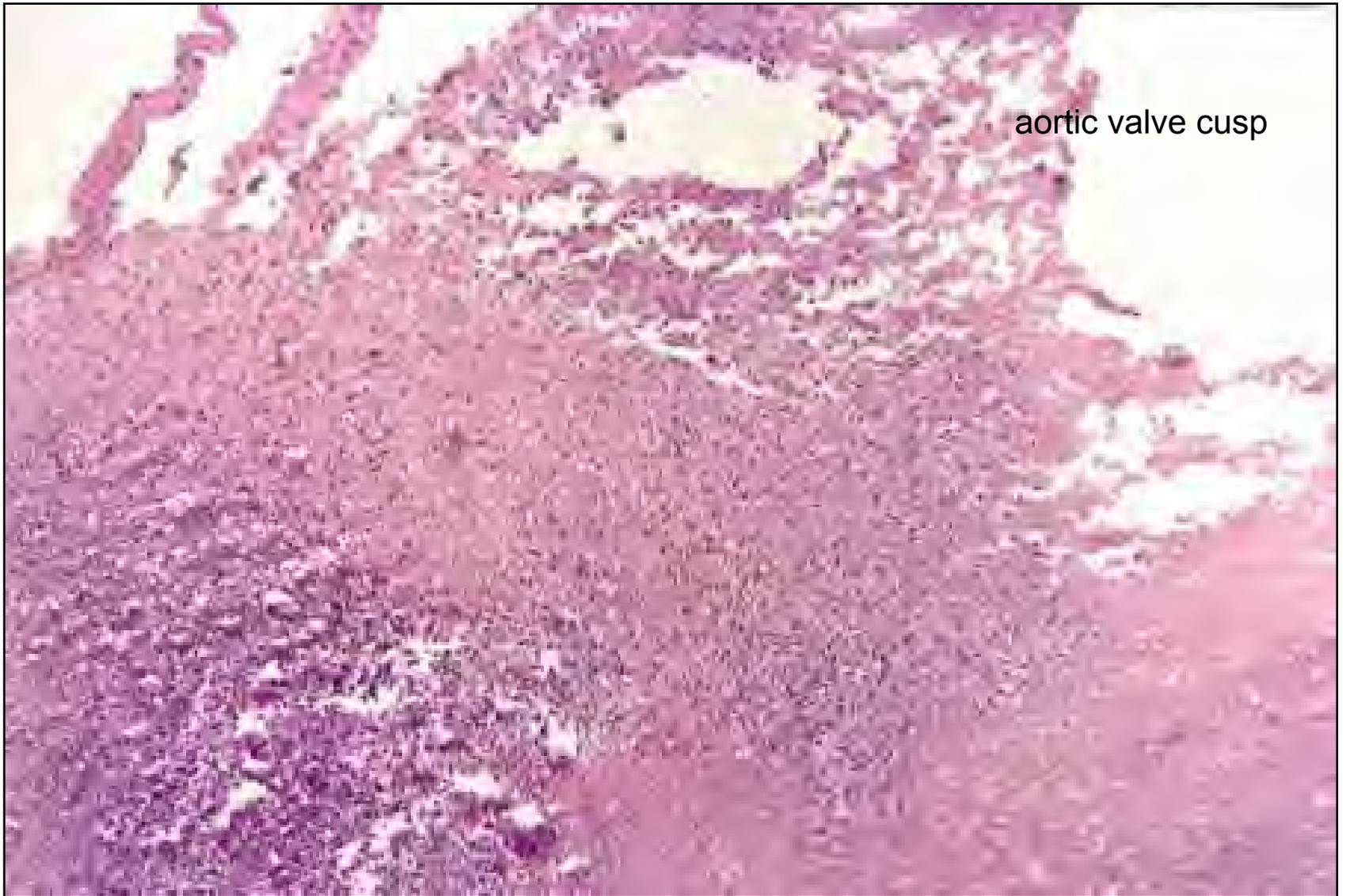
1. Describe the pathologic findings and form a pathologic diagnosis.
2. Discuss or explain the clinical course and physical findings, in light of the pathologic findings



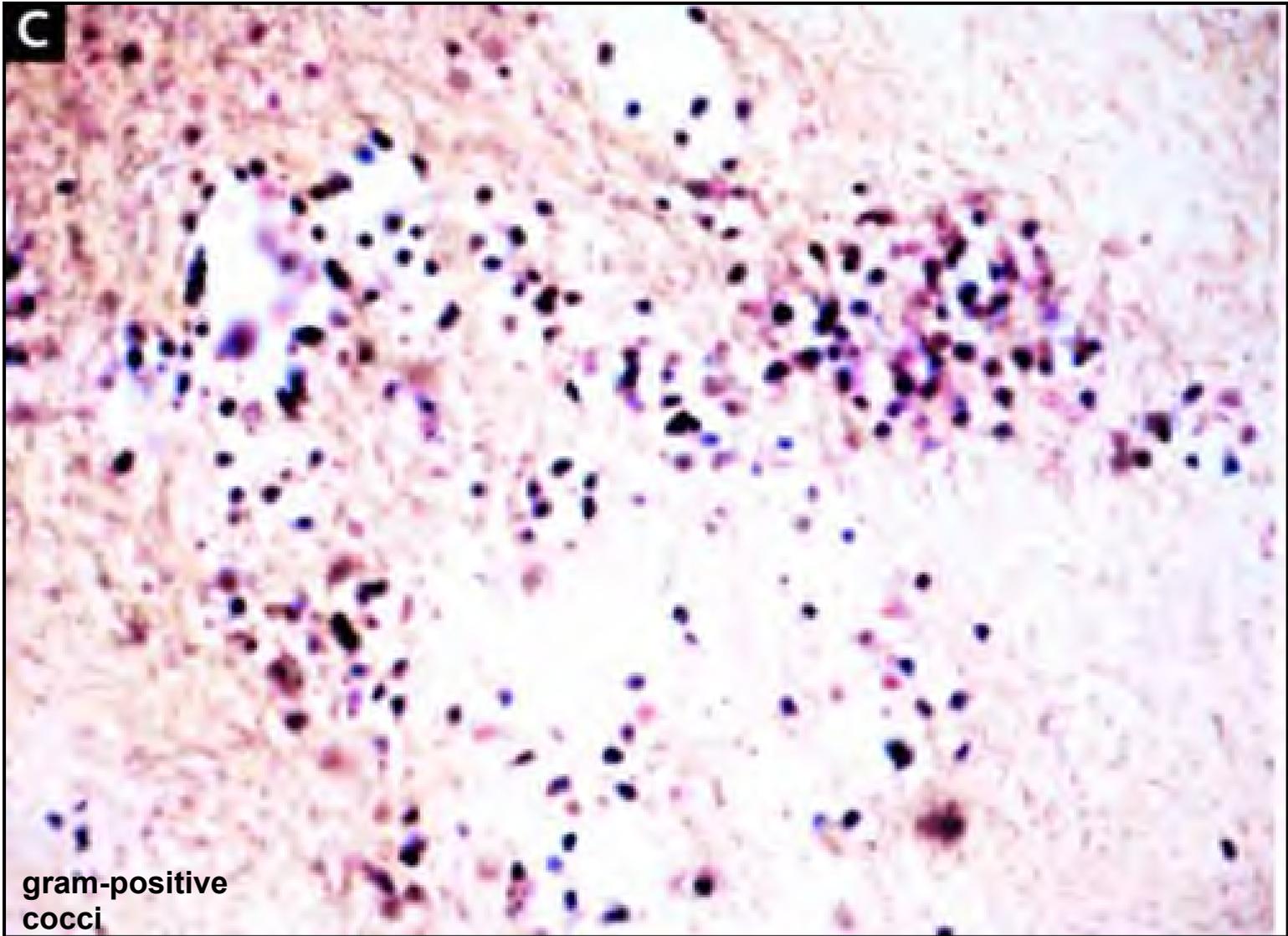


hypopyon





aortic valve cusp



gram-positive
cocci

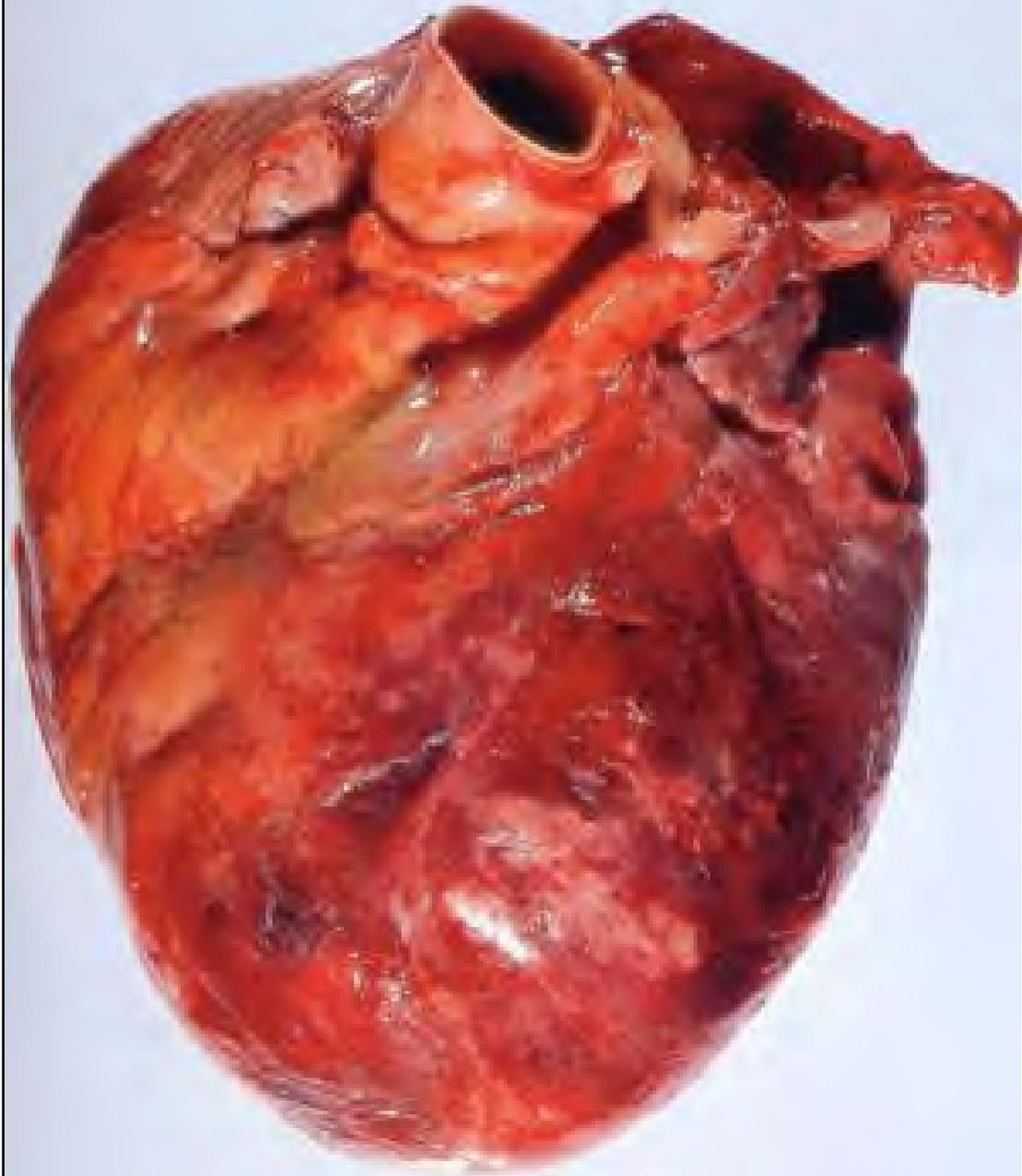
Bacterial endocarditis

Cardio Lab 5

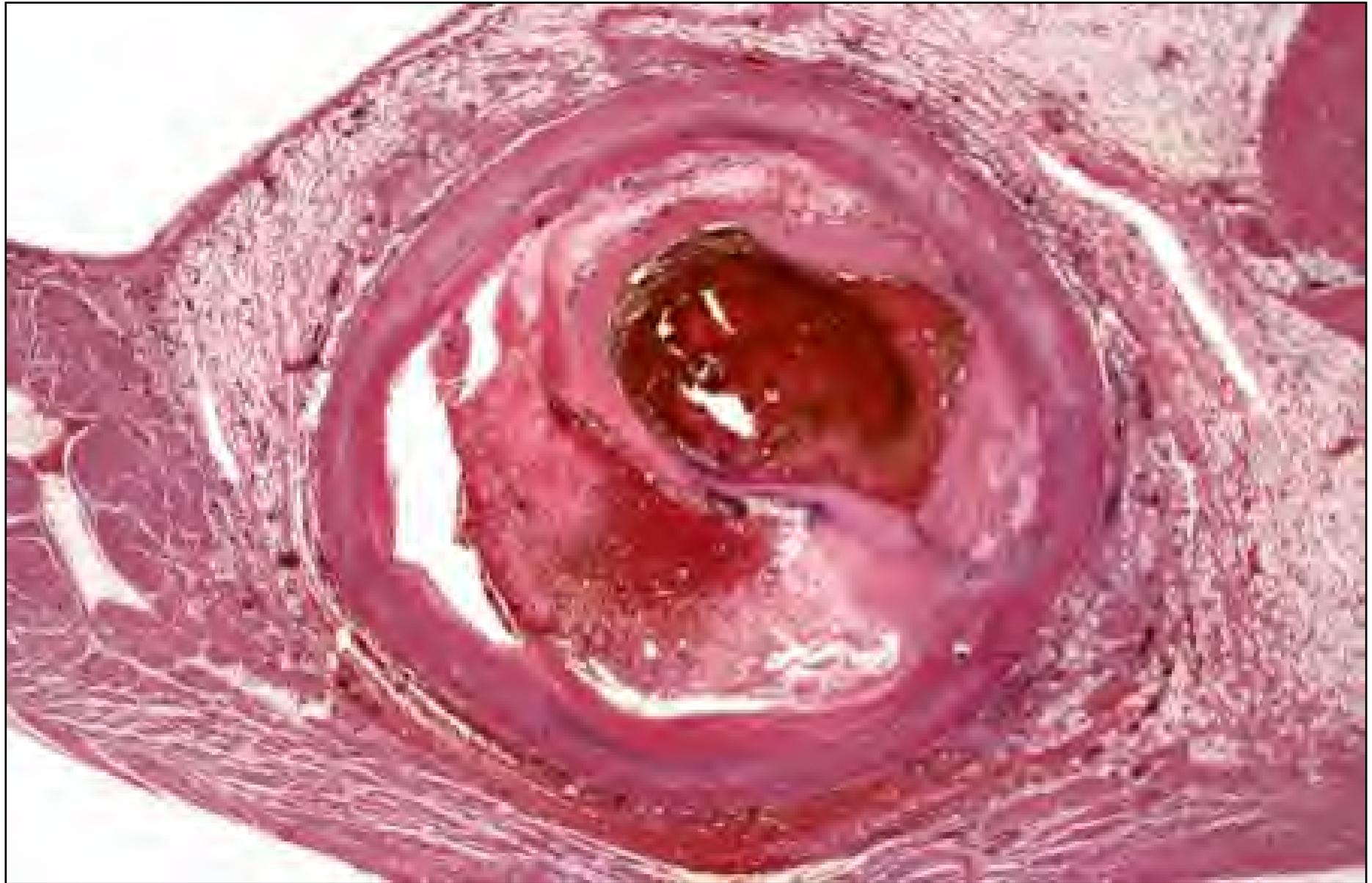
Case Presentation 4

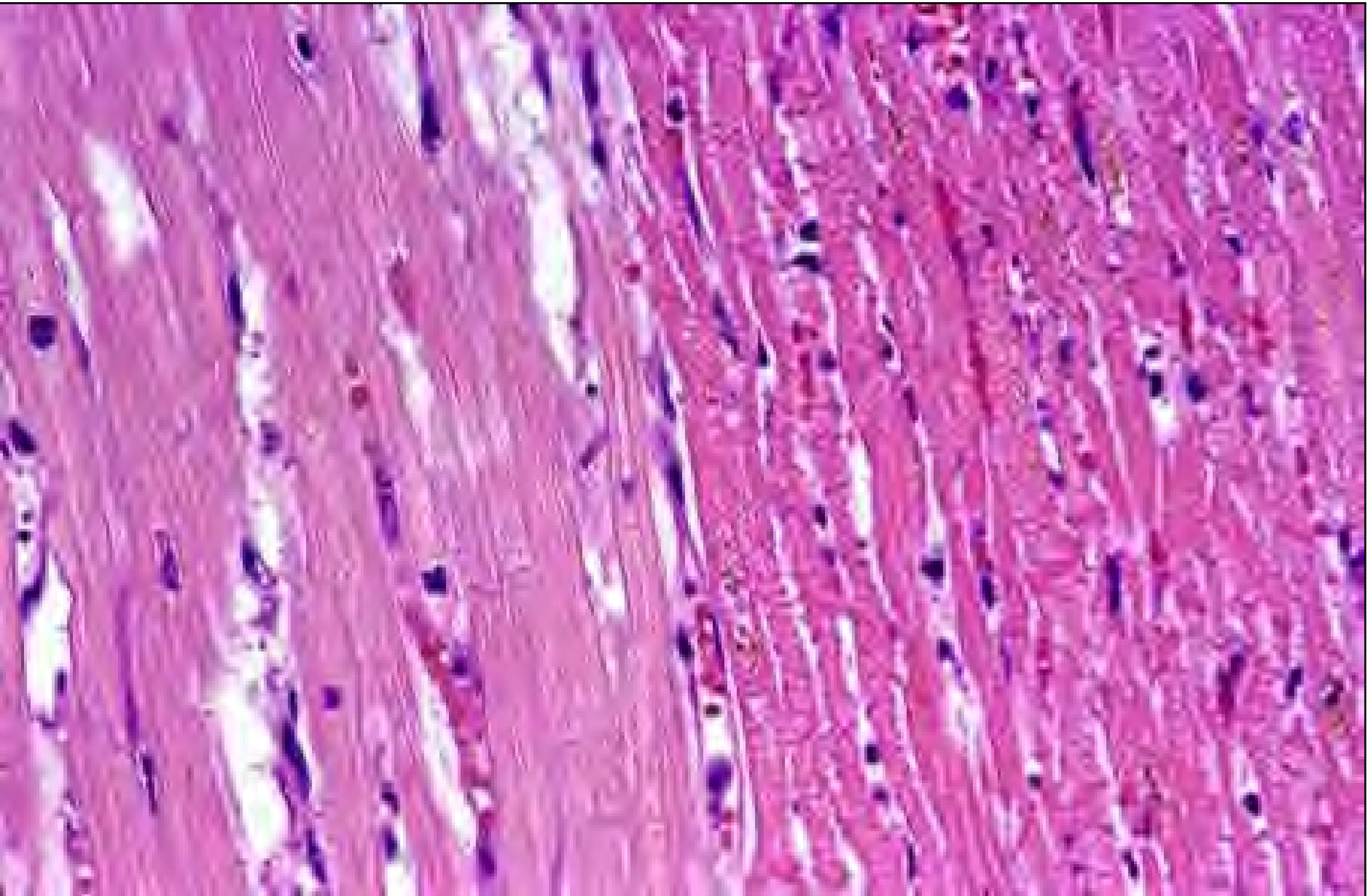
(Refer to lab syllabus for the clinical information)

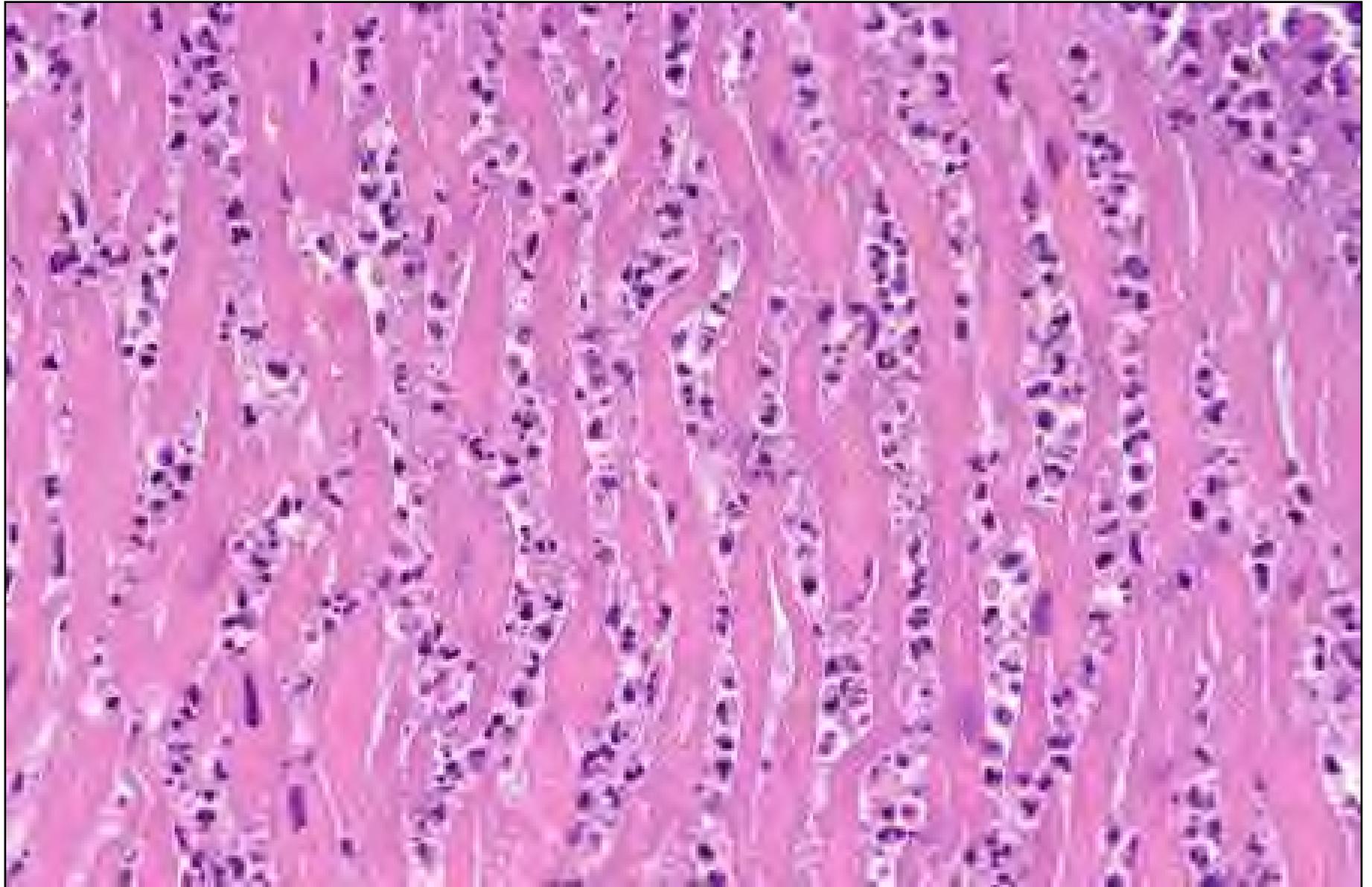
1. Describe the pathologic findings.
2. How do the pathologic findings explain the clinical course, and the clinical and laboratory findings?
3. What additional pathologic feature(s) might have been found in the heart if the patient had died on the 12th hospital day?

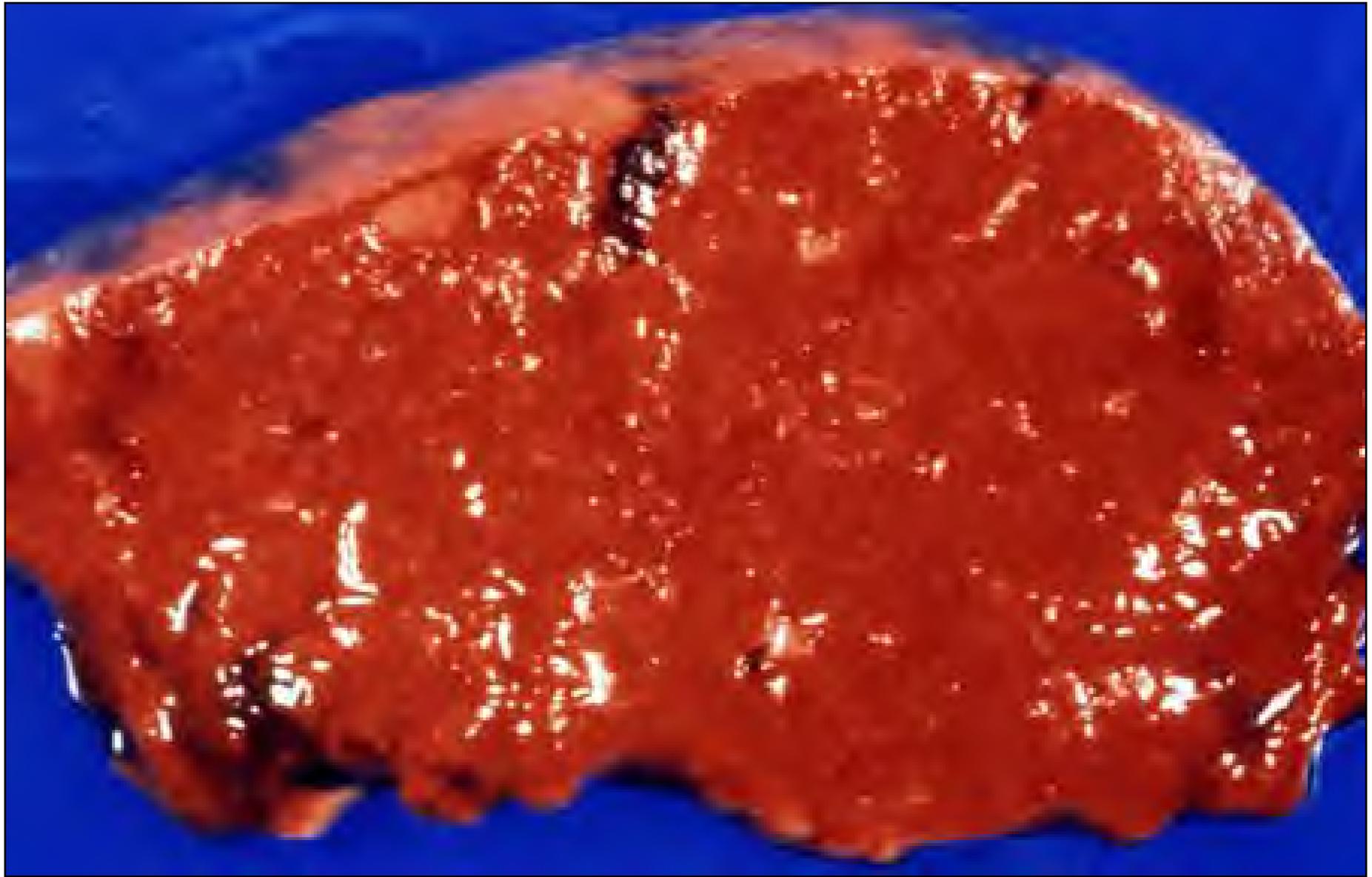


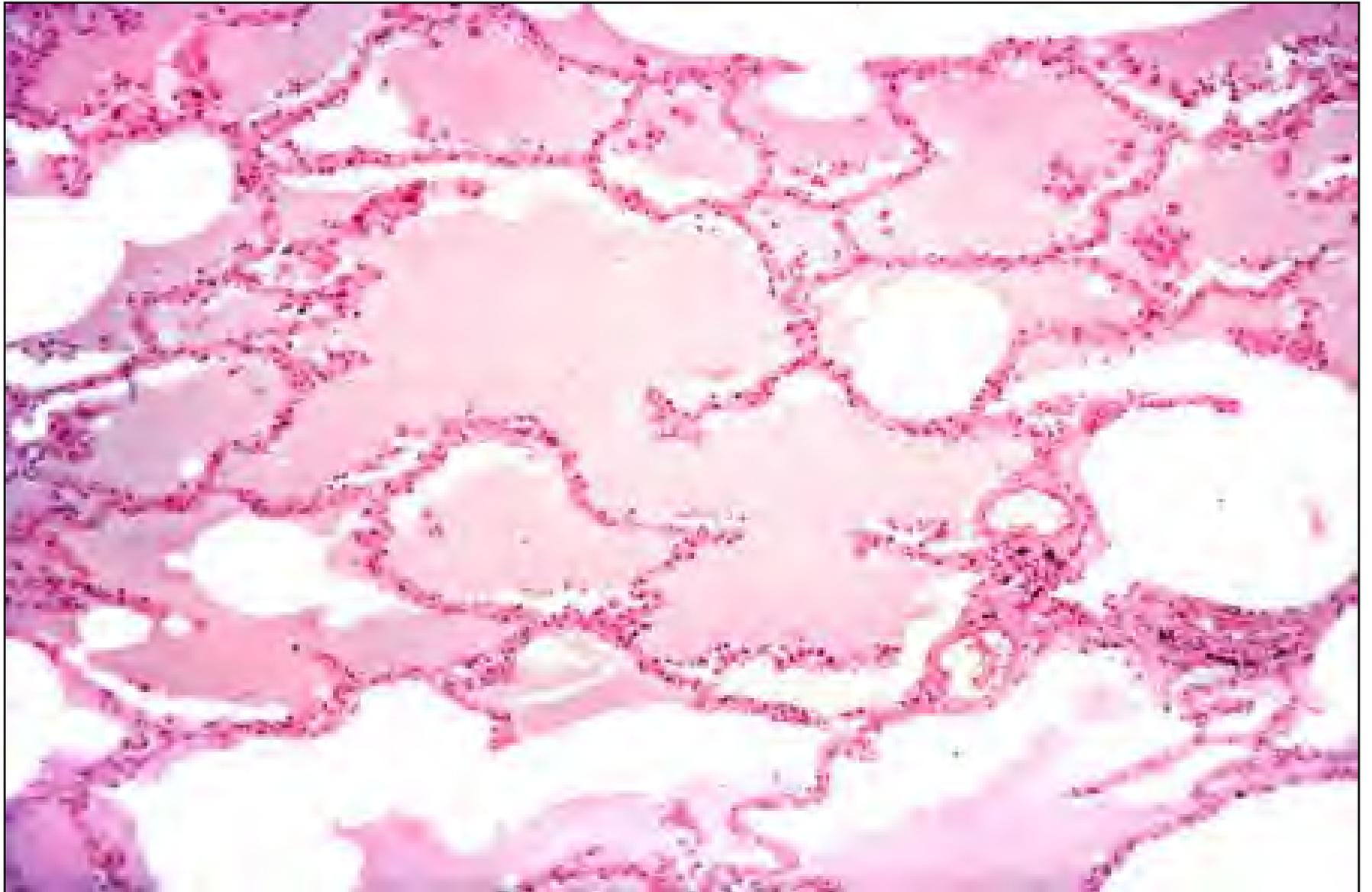


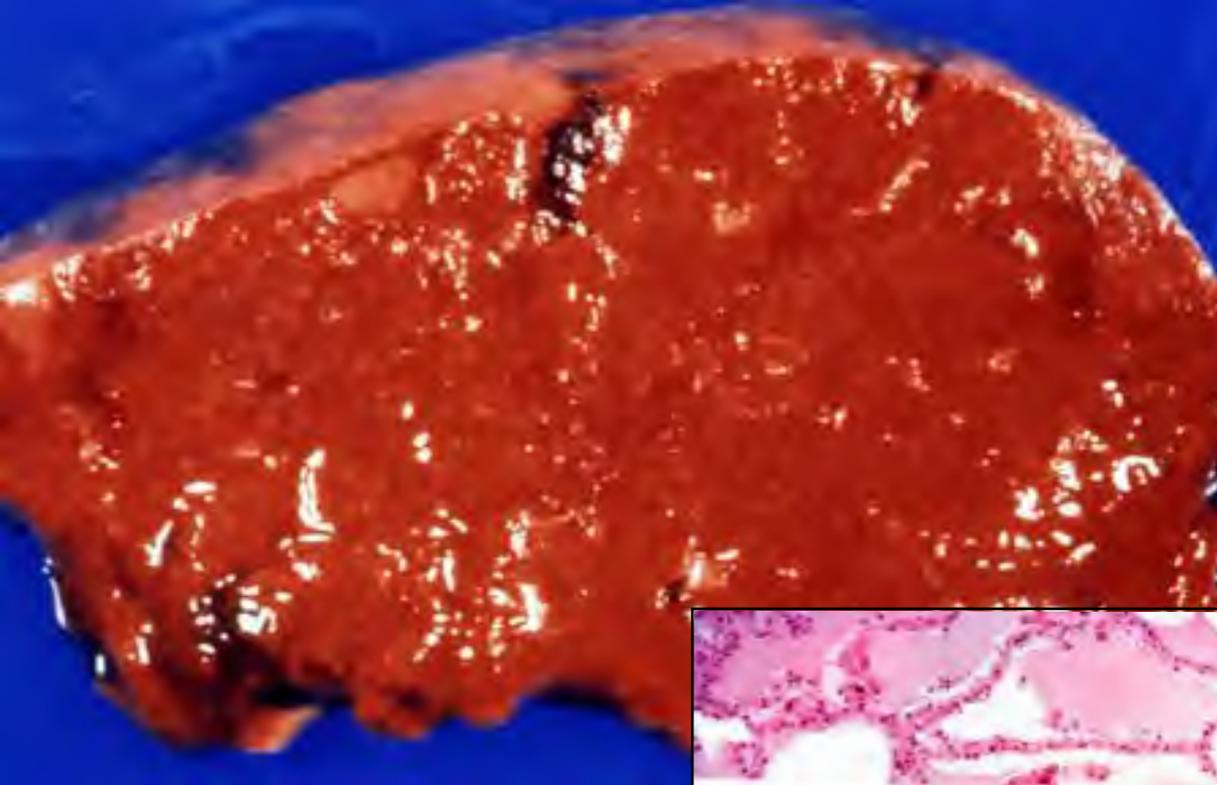




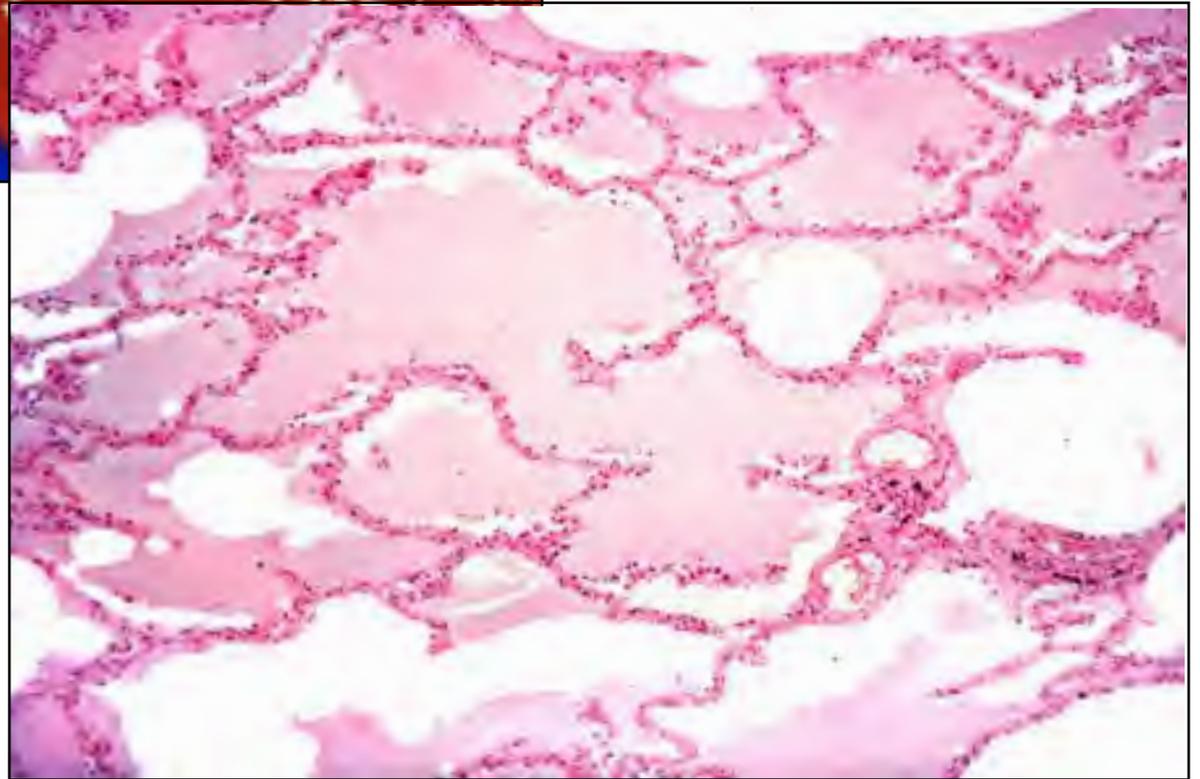




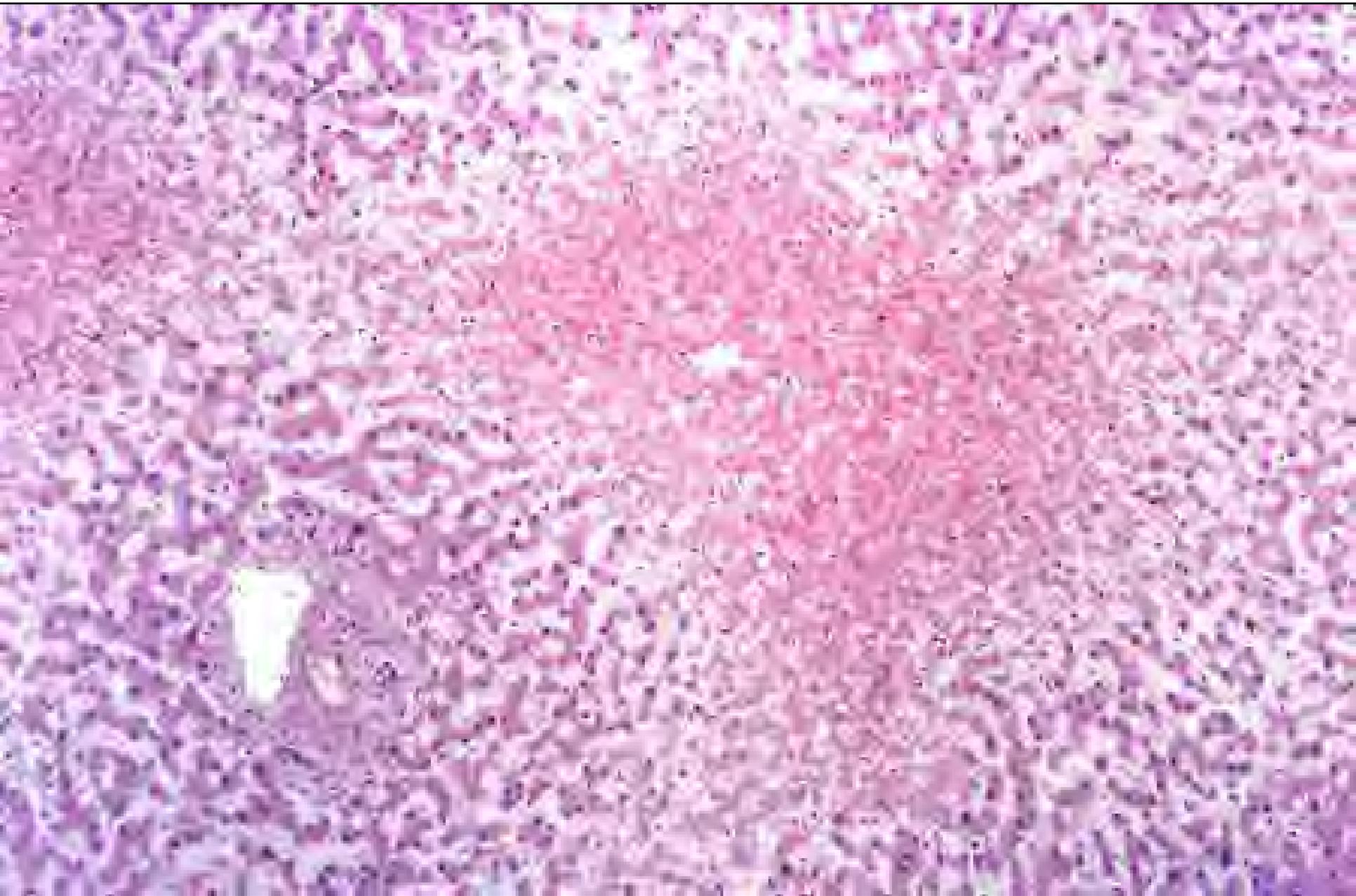


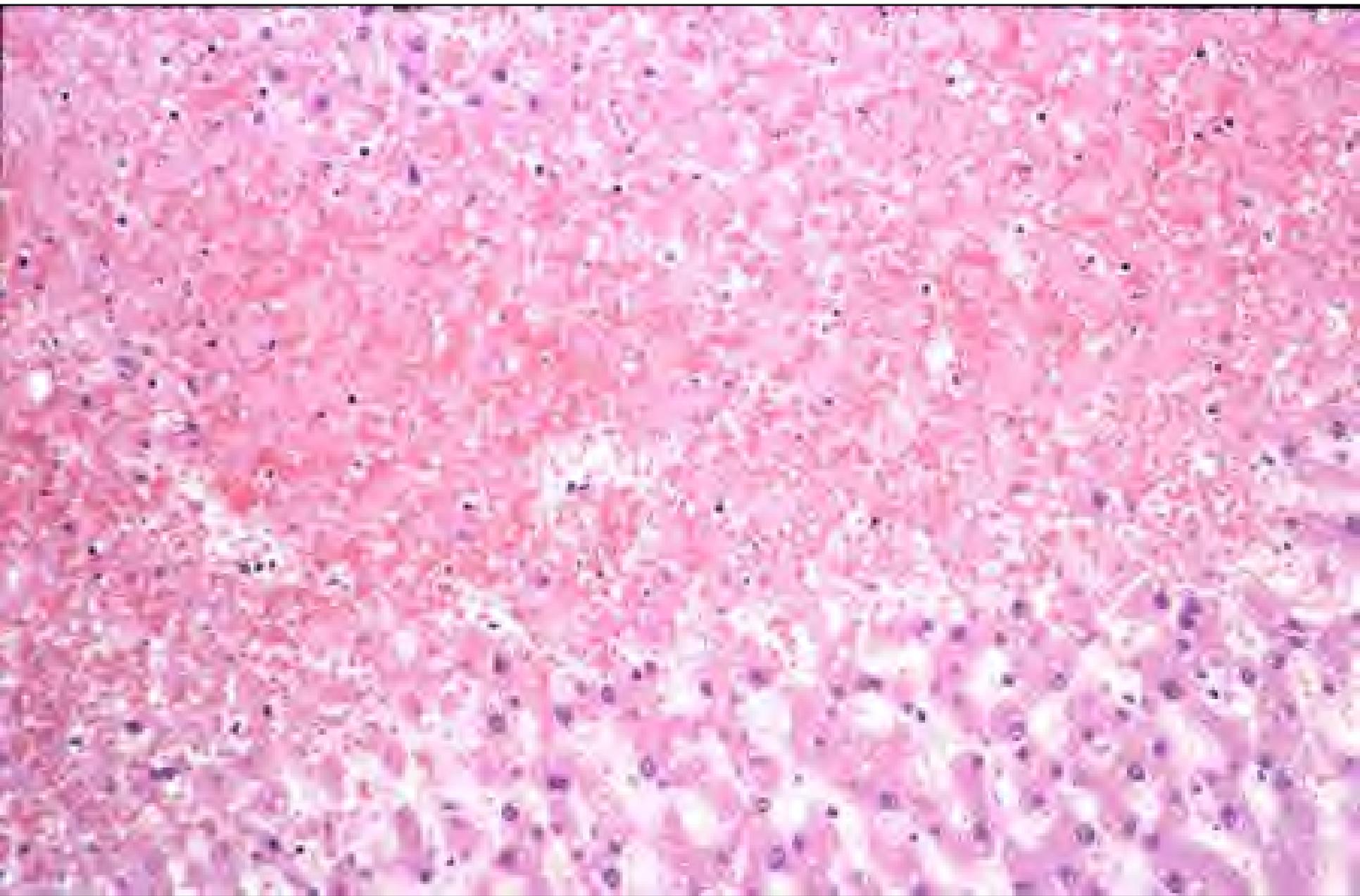


PD-TNCL Source Undetermined



PD-TNCL G.D. Abrams, University of Michigan Medical School





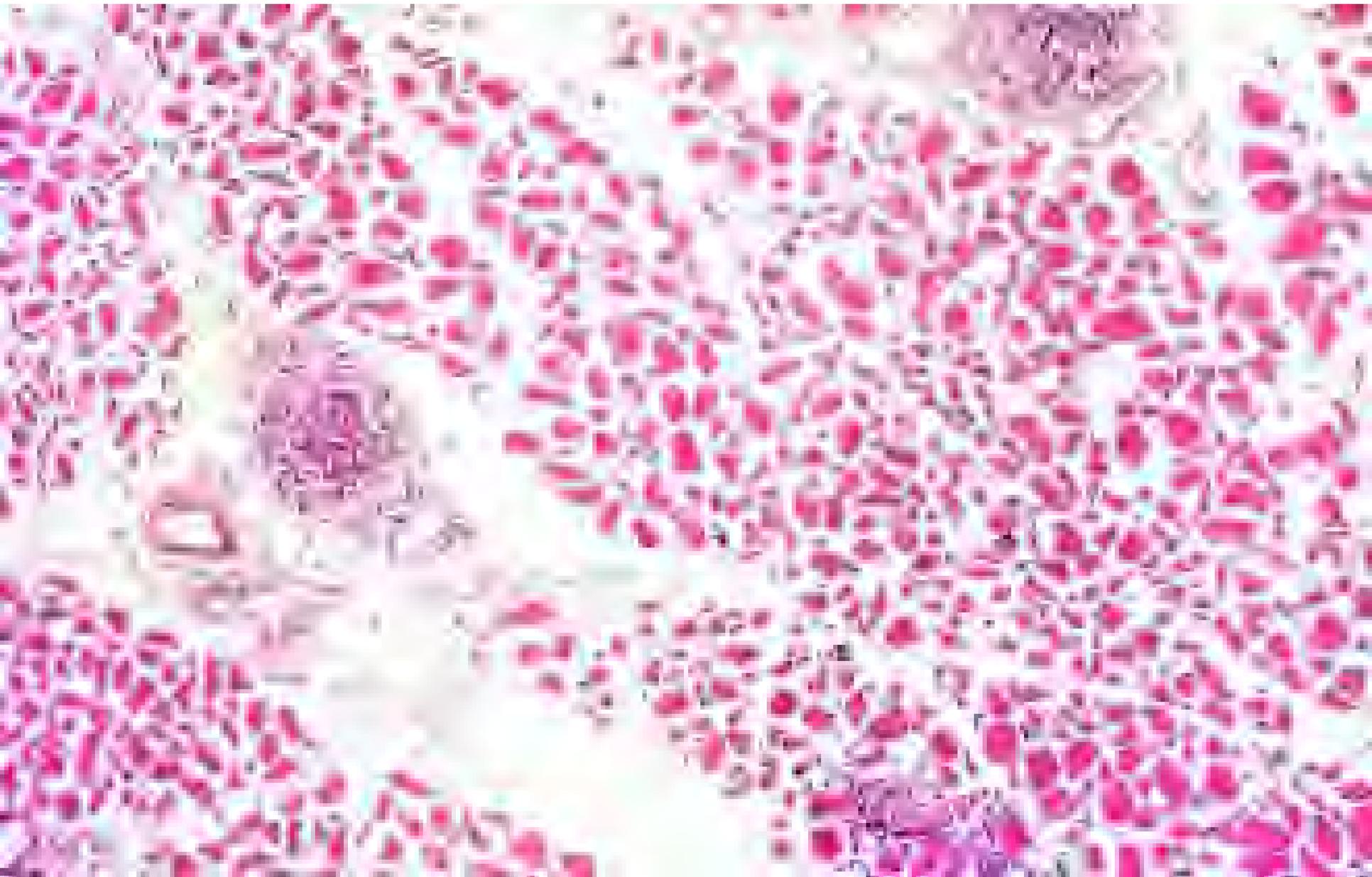
Myocardial infarction

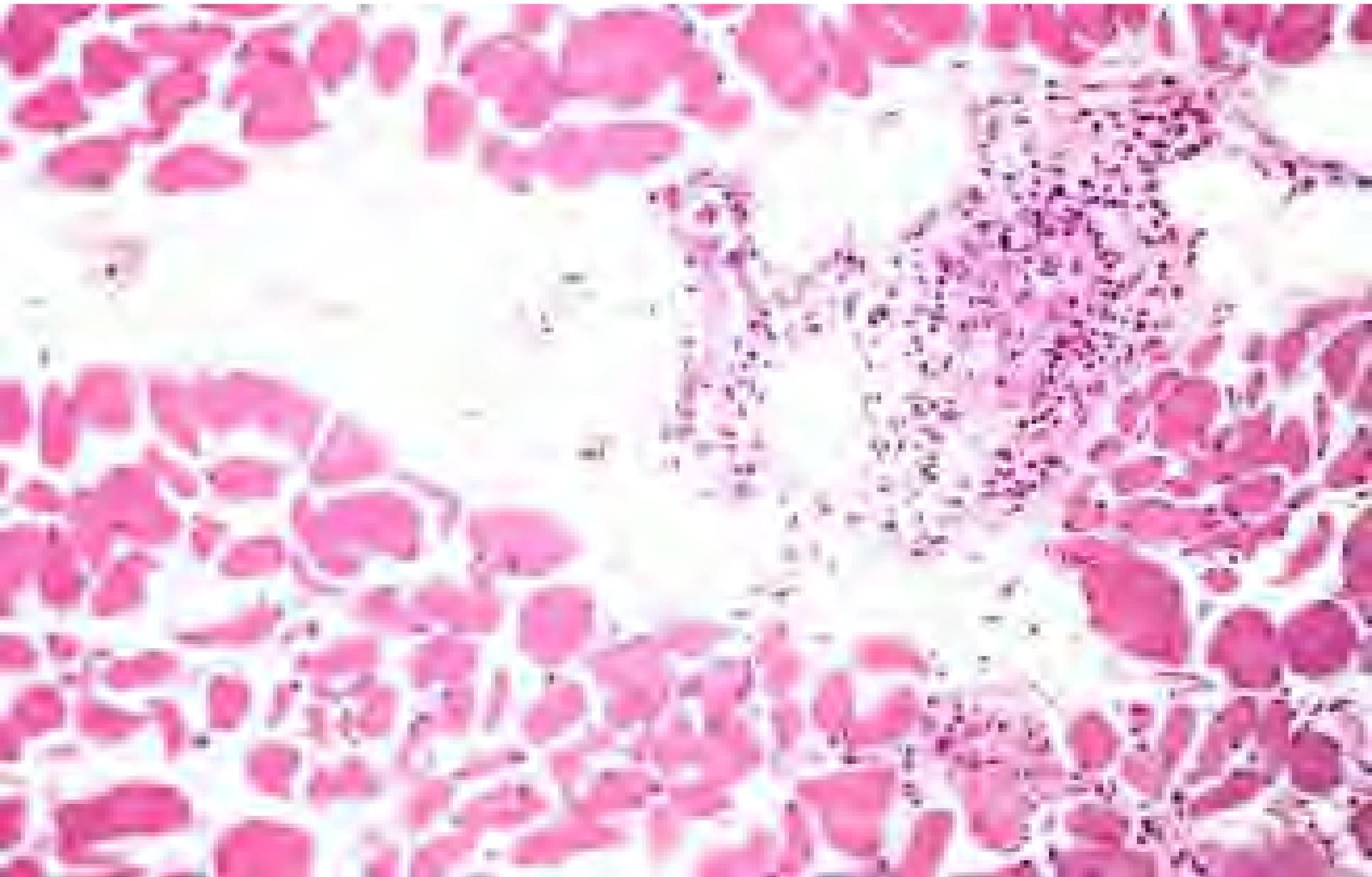
Cardio Lab 5

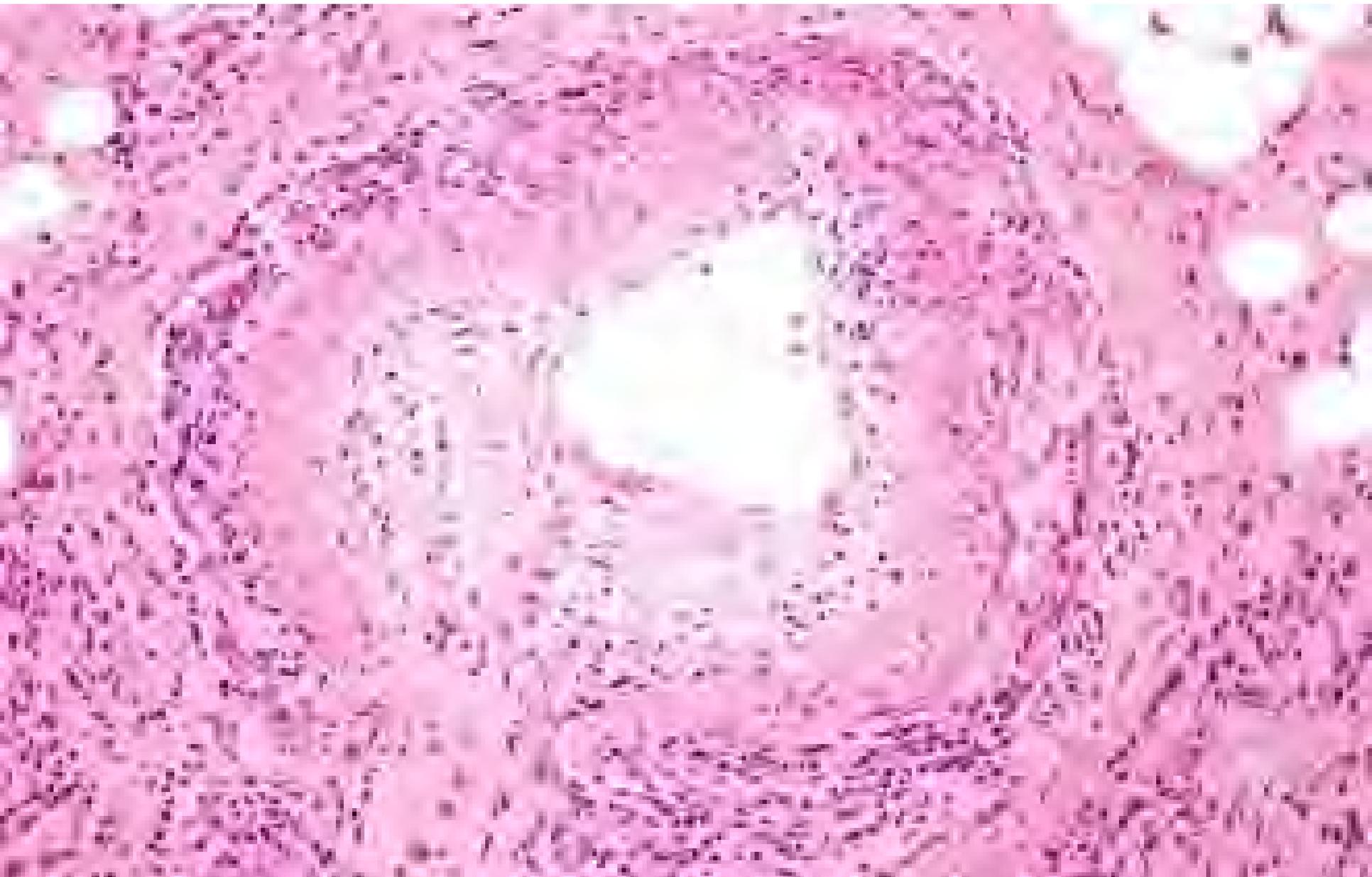
Case Presentation 5

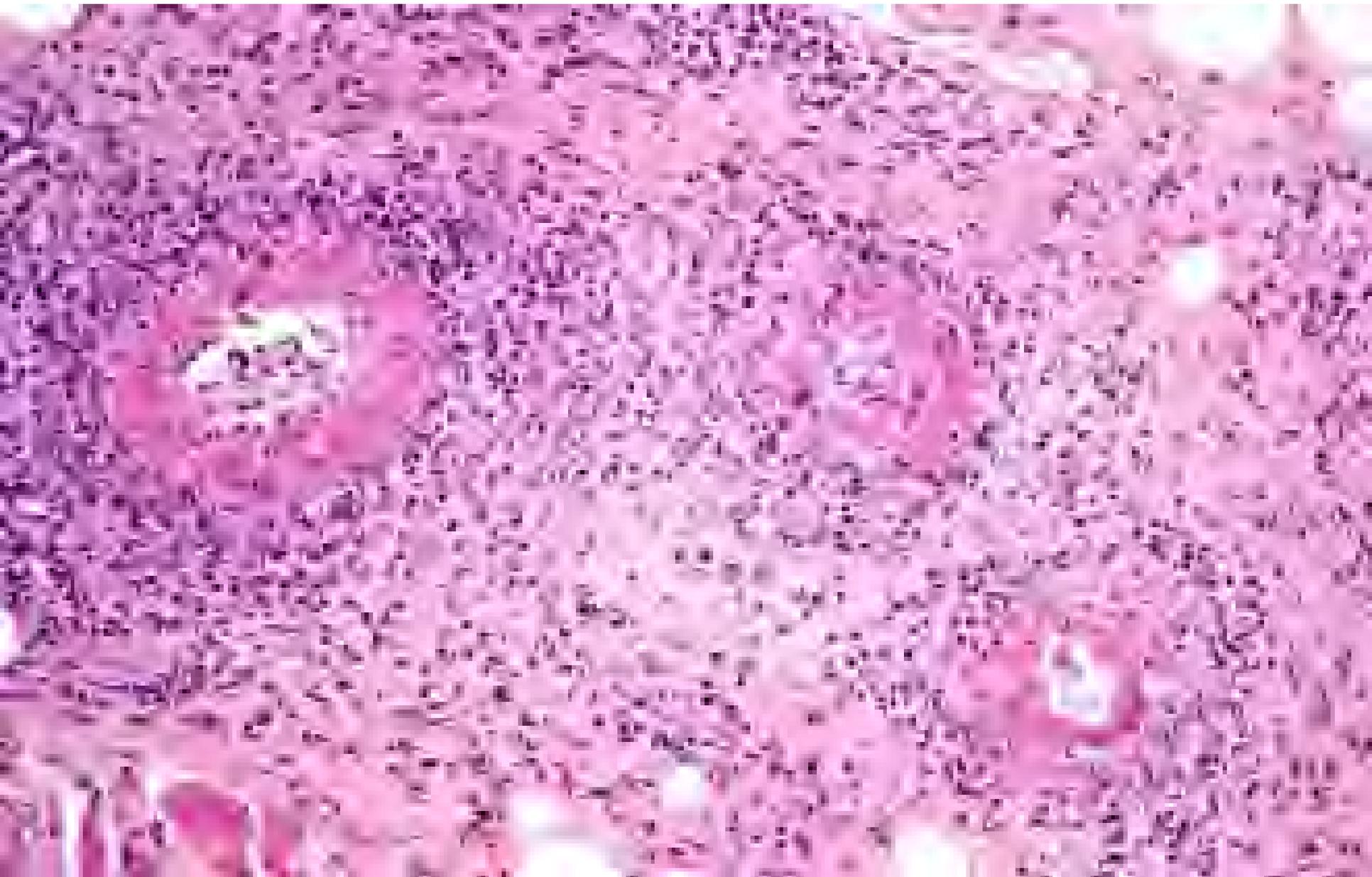
(Refer to the lab syllabus for the clinical information))

- 1) Based on the pathologic features manifested in the sample, please offer a differential diagnosis.
- 2) Based on the pathologic and clinical features, please offer a diagnosis.
- 3) What is the relationship between this patient's disorder and hepatitis B infection?
- 4) What other clinical signs and symptoms have been associated with the patient's disorder?





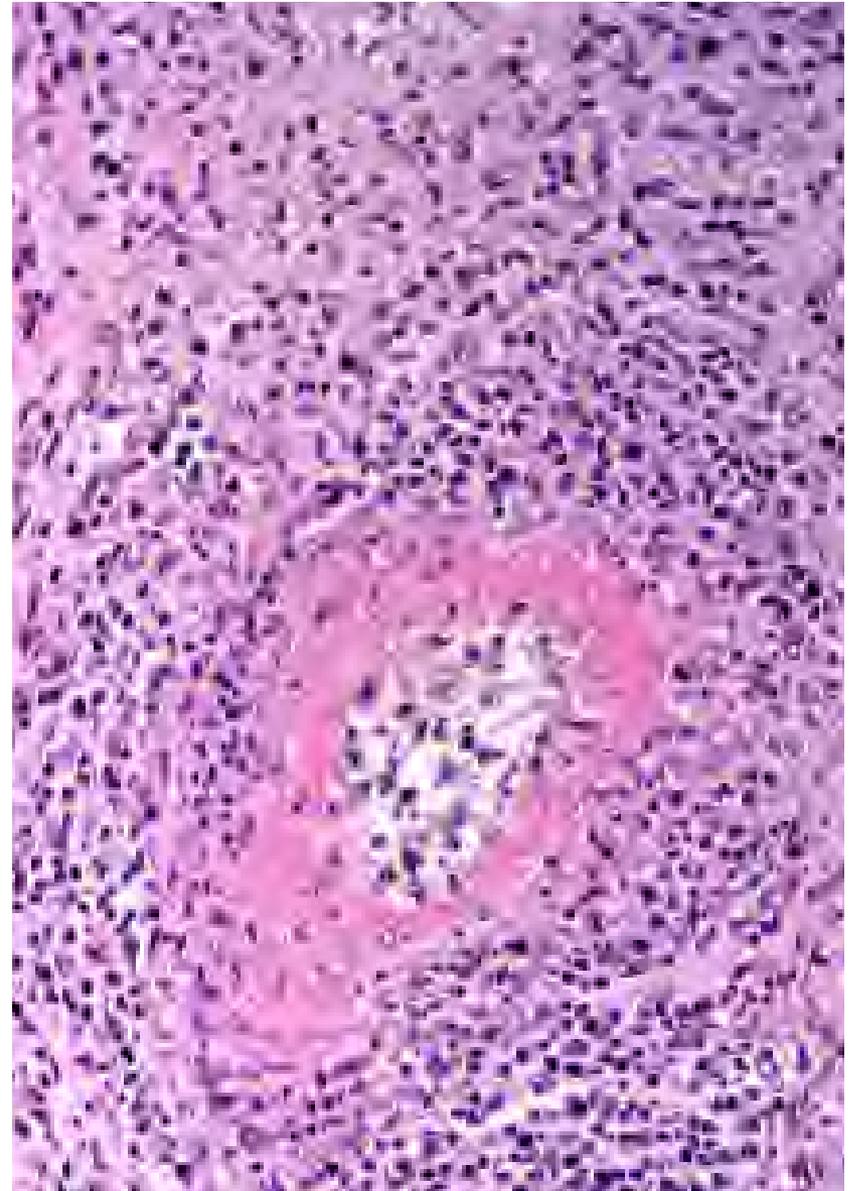
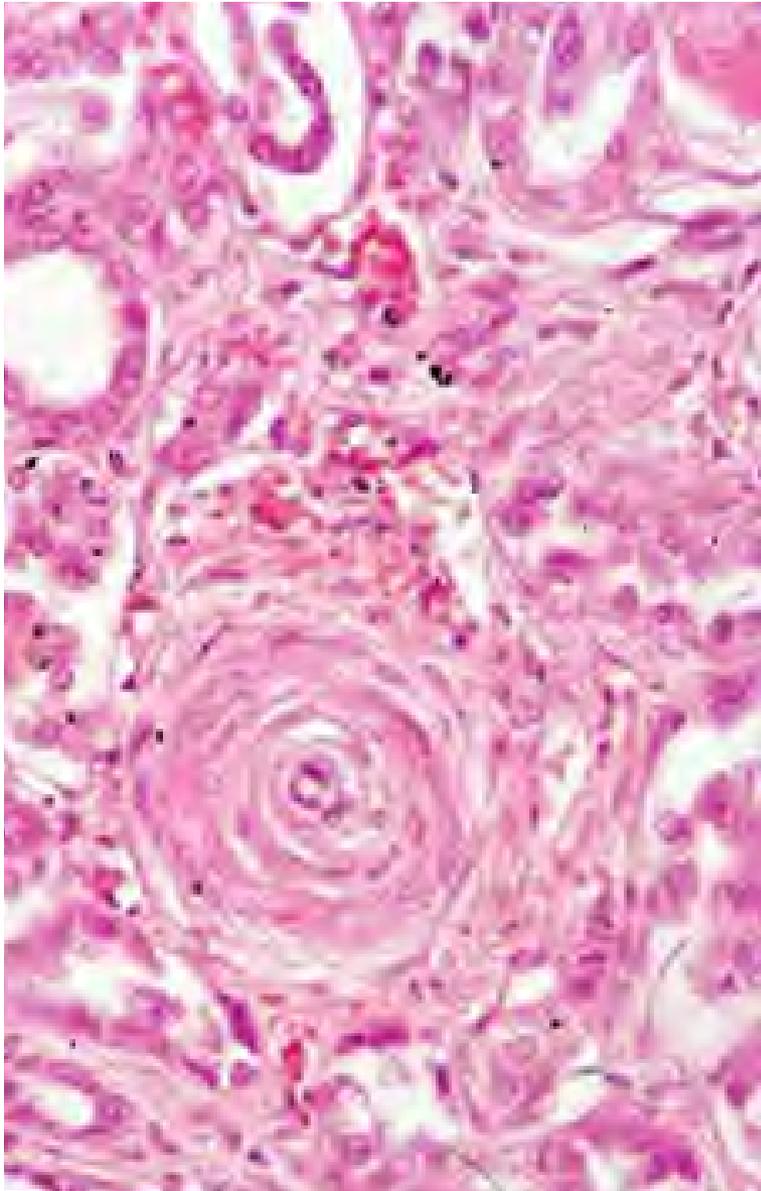


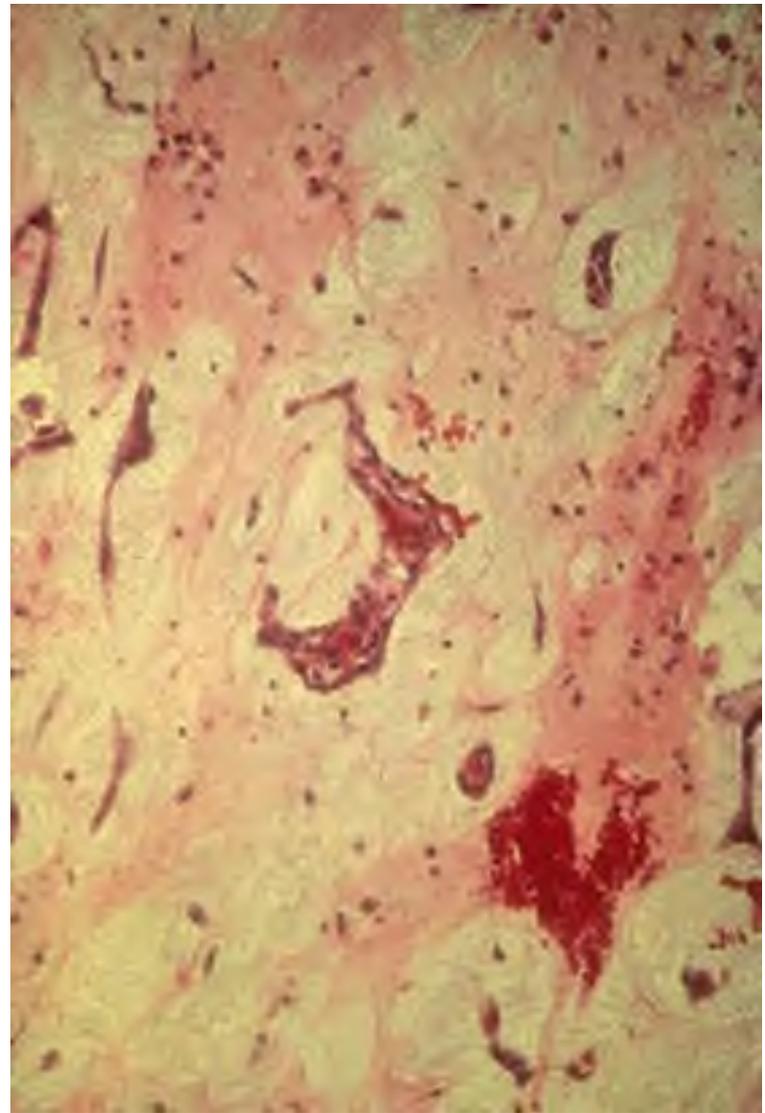
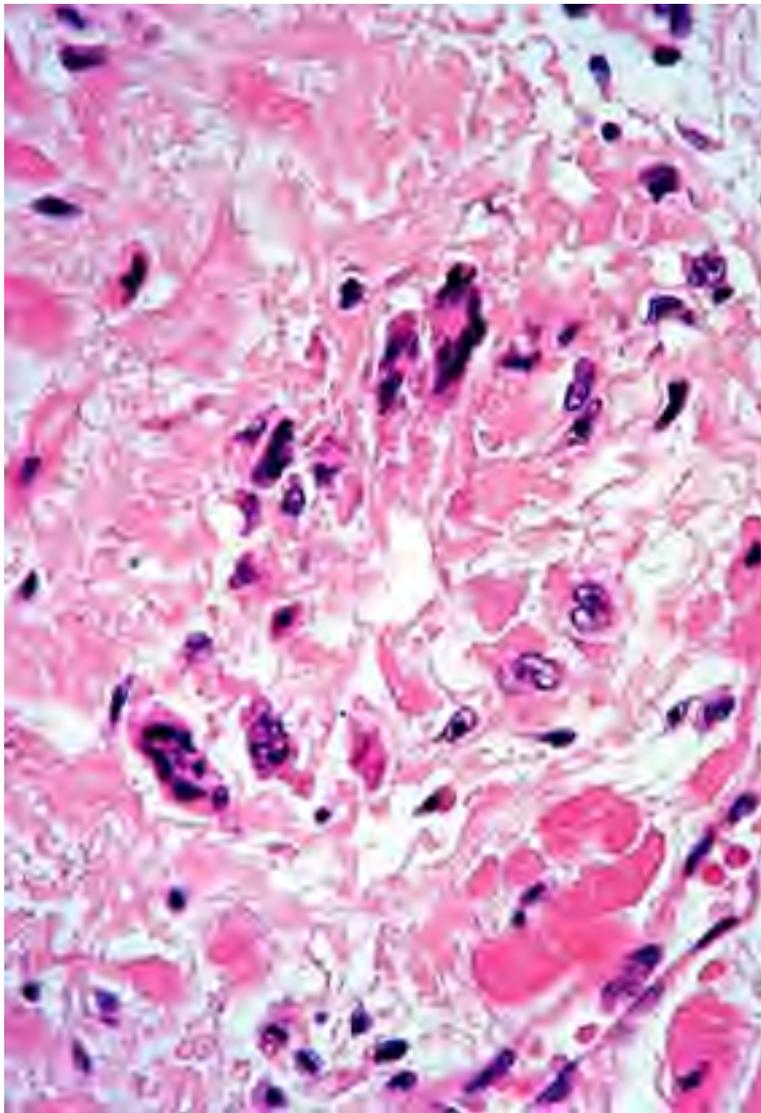


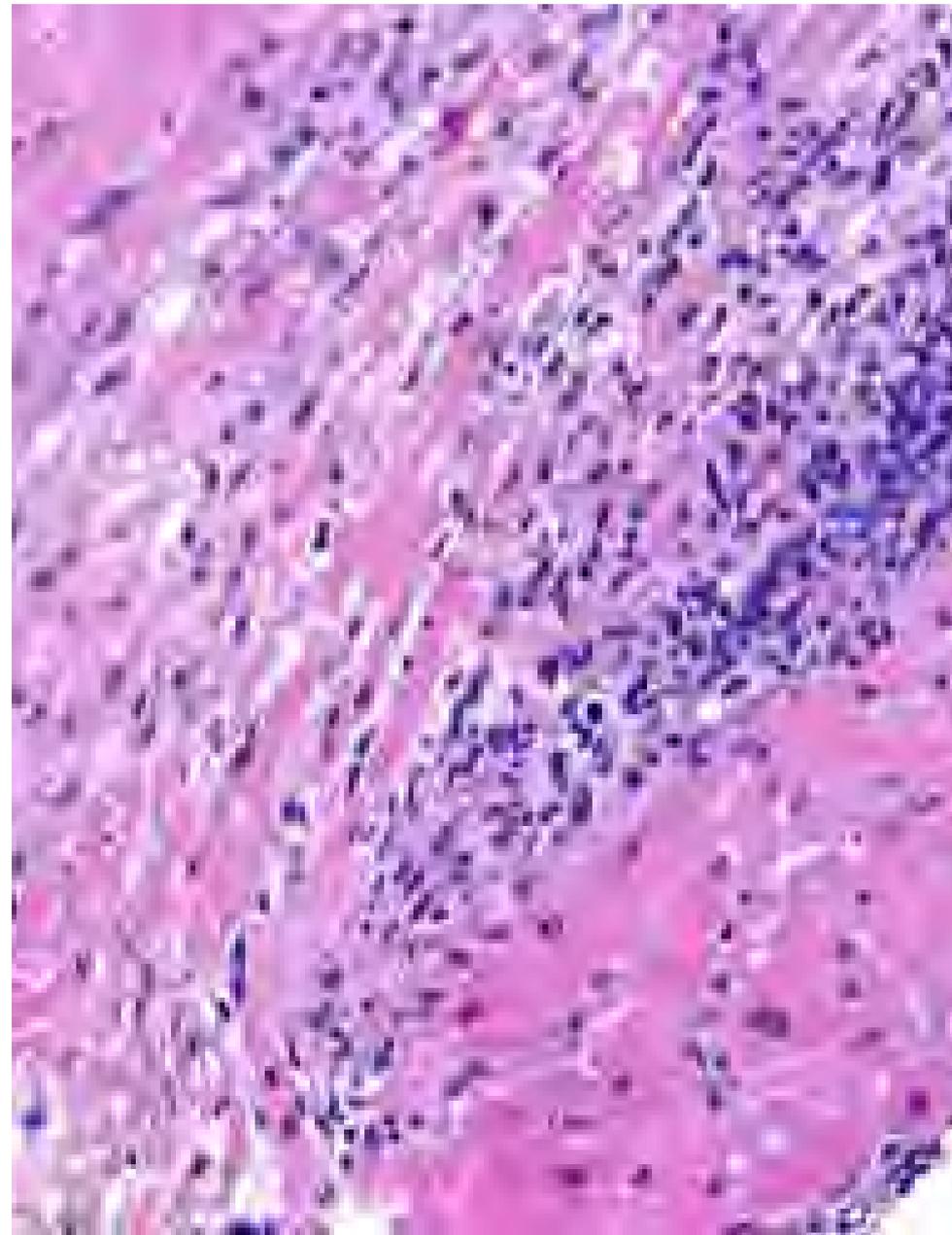
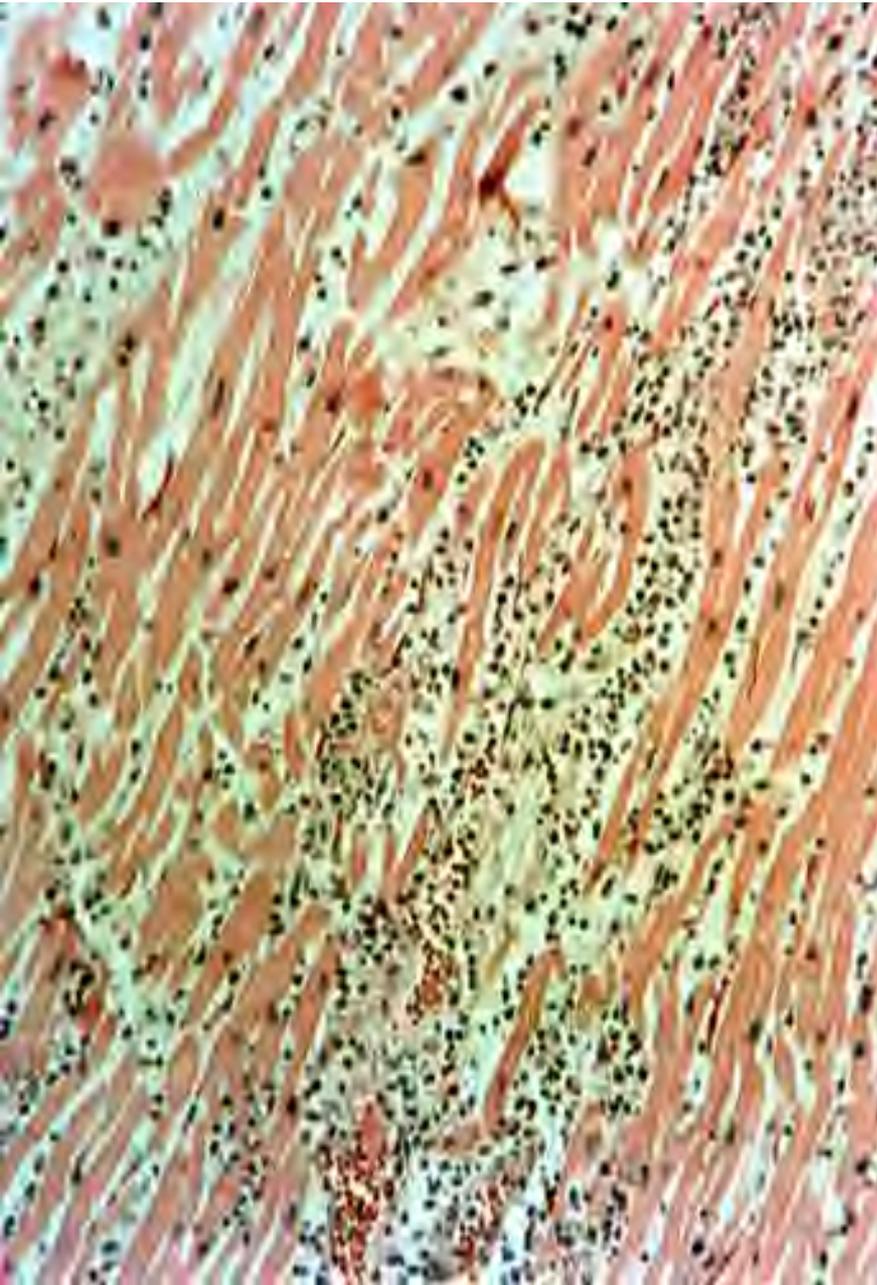
Polyarteritis Nodosa



1908







Additional Source Information

for more information see: <http://open.umich.edu/wiki/CitationPolicy>

Slide 6: Department of Pathology, University of Michigan
Slide 7: Department of Pathology, University of Michigan
Slide 8: G.D. Abrams, University of Michigan Medical School
Slide 9: Source Undetermined
Slide 10: Source Undetermined
Slide 11: G.D. Abrams, University of Michigan Medical School
Slide 12: Source Undetermined
Slide 13: G.D. Abrams, University of Michigan Medical School
Slide 14: G.D. Abrams, University of Michigan Medical School
Slide 15: Source Undetermined
Slide 16: Department of Pathology, University of Michigan
Slide 17: Department of Pathology, University of Michigan
Slide 18: Department of Pathology, University of Michigan
Slide 19: G.D. Abrams, University of Michigan Medical School
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