

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

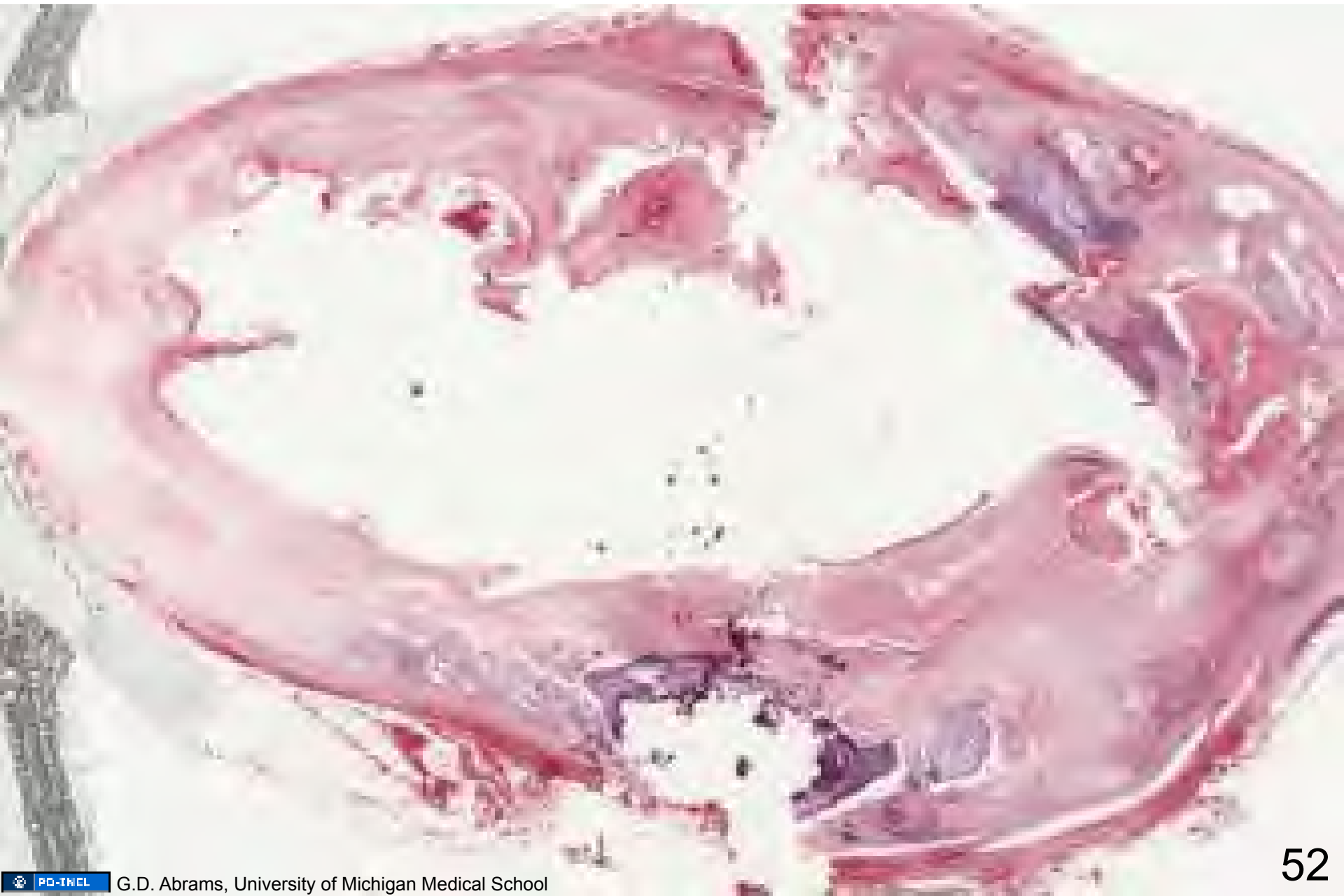
- 52** **Aortic atherosclerosis**
- 53** **Coronary atherosclerosis**
- 57** **Hyperplastic arteriolosclerosis**
- 14** **Hyaline arteriolosclerosis**
- 56** **Polyarteritis nodosa**
- 55** **Aortic dissection**

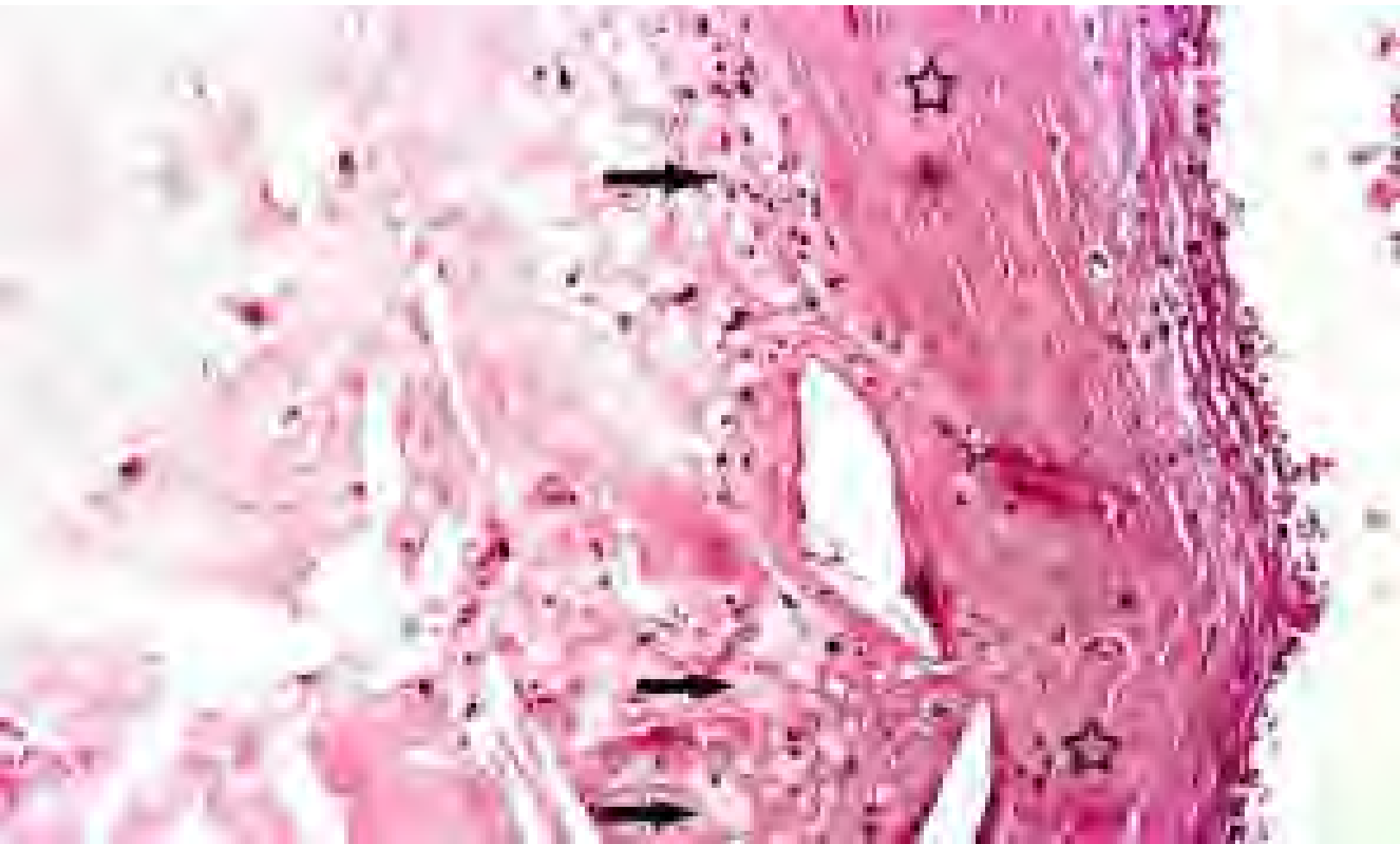
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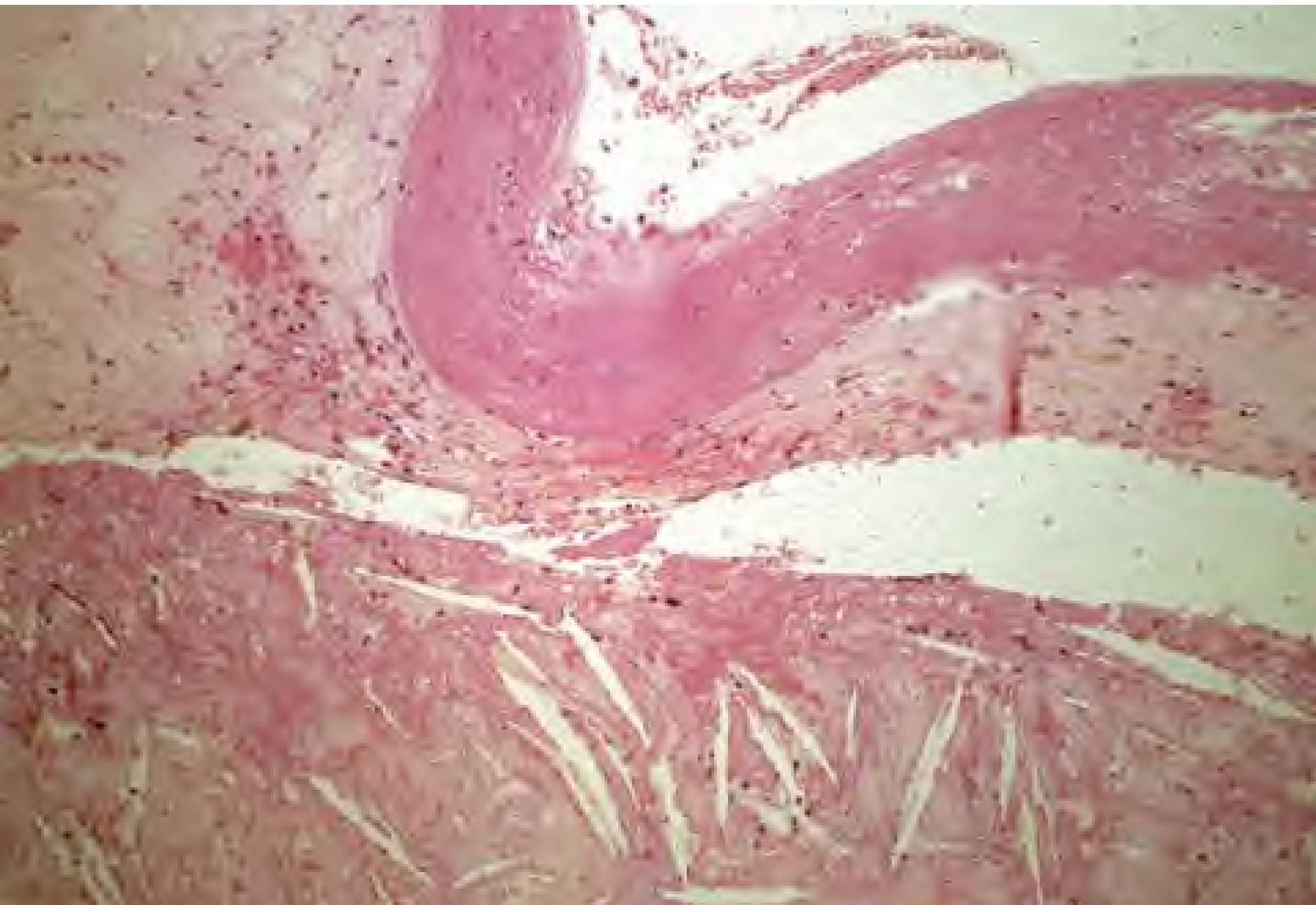


Aortic Atherosclerosis

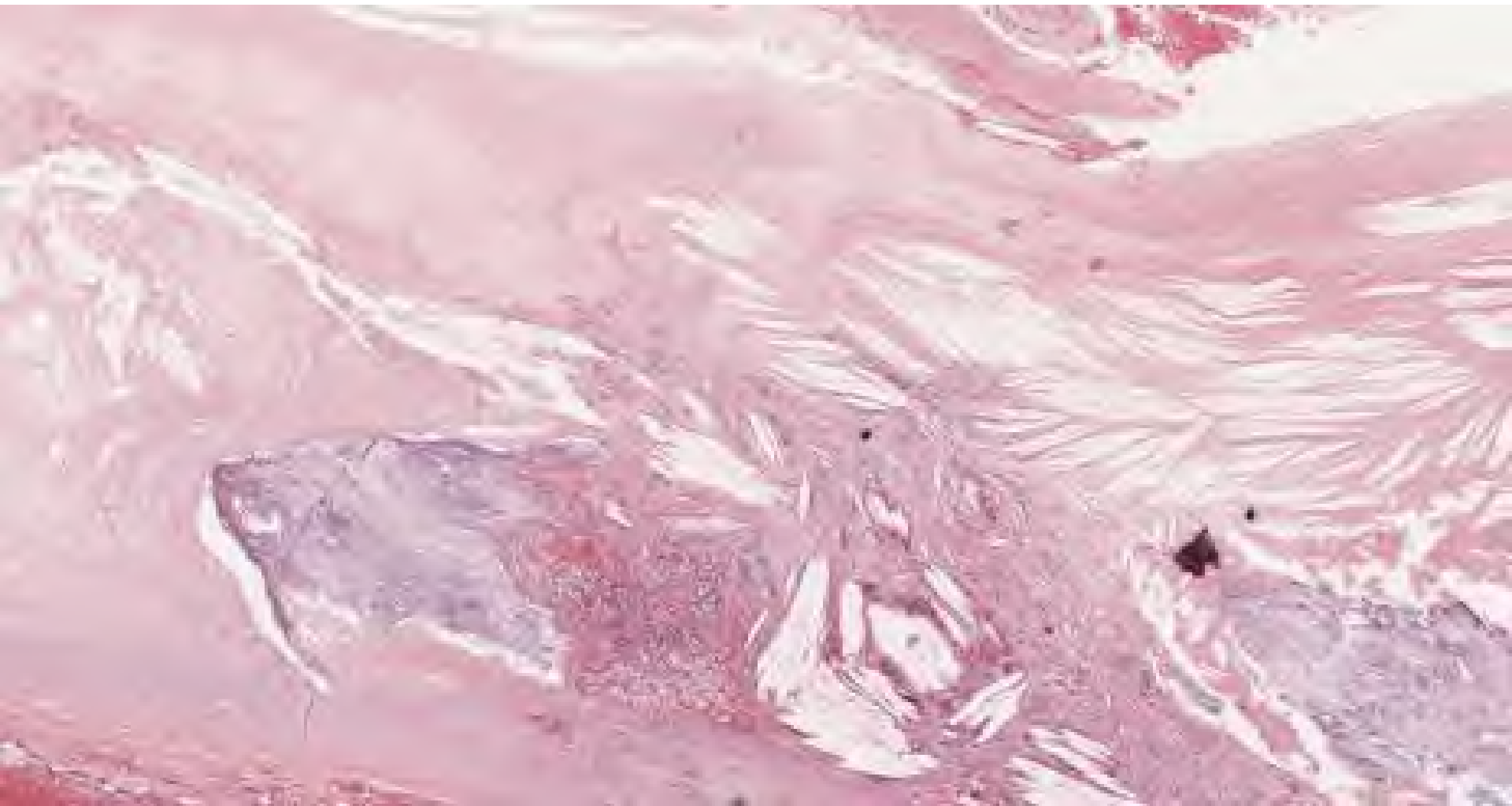


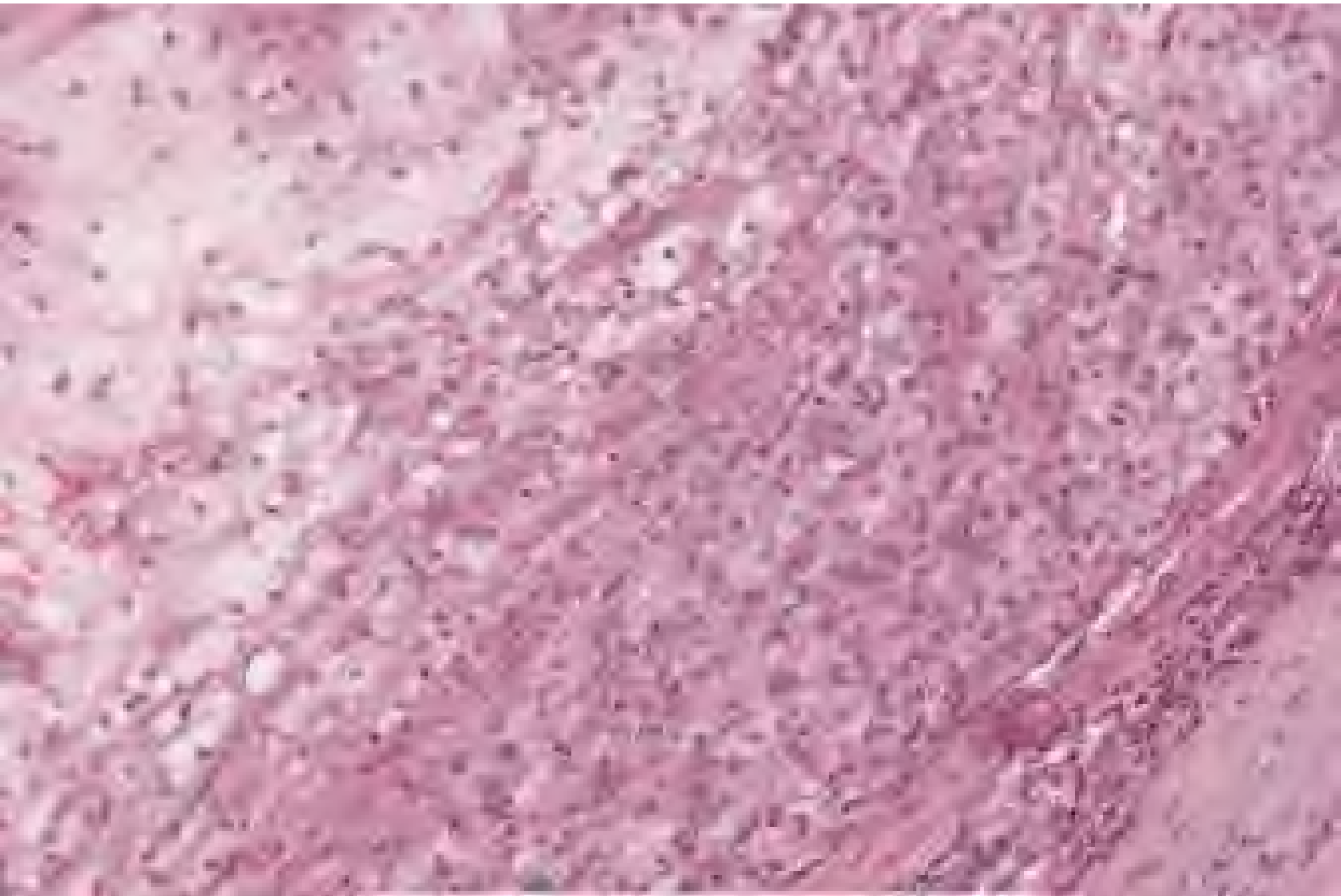


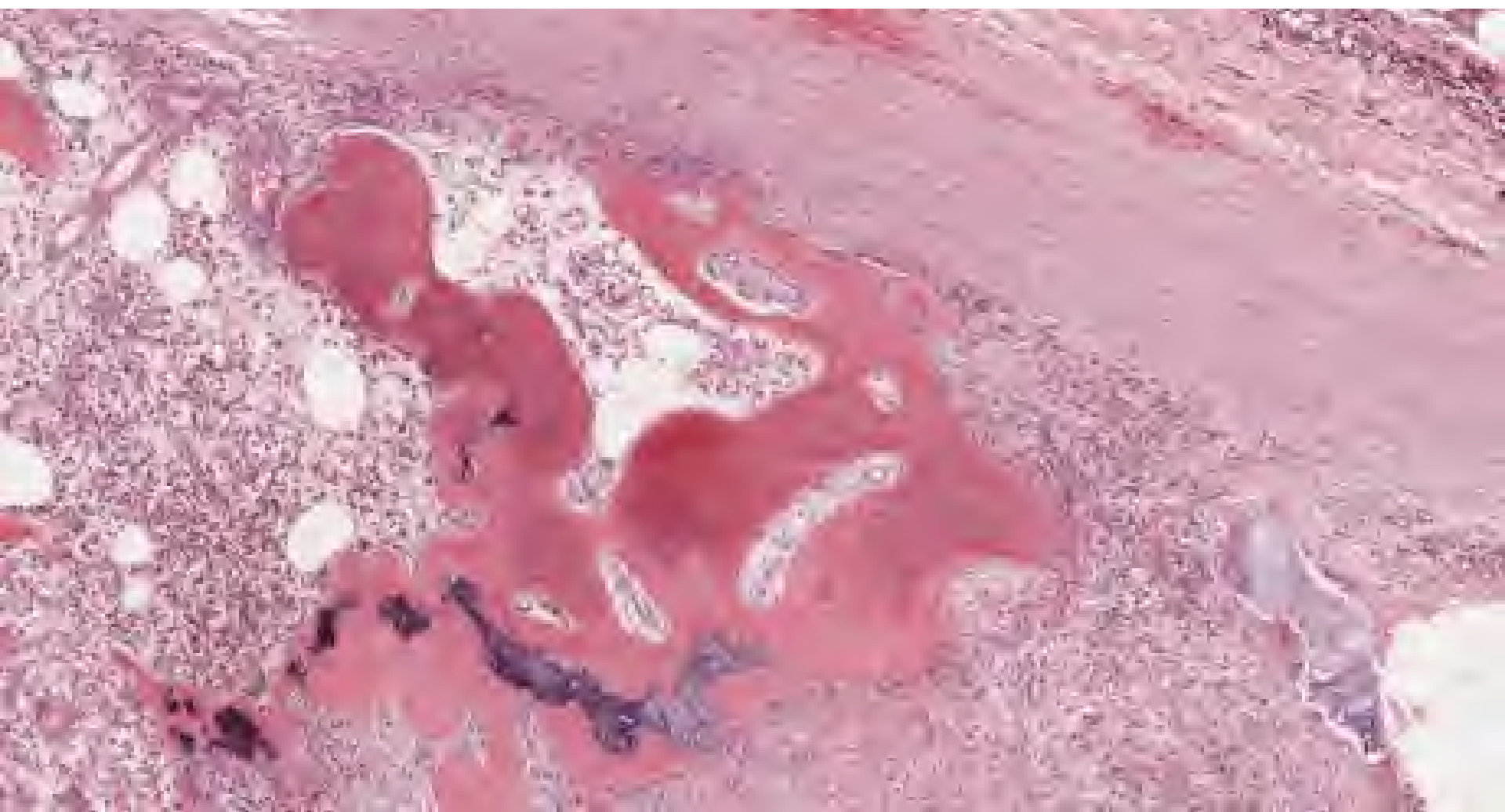






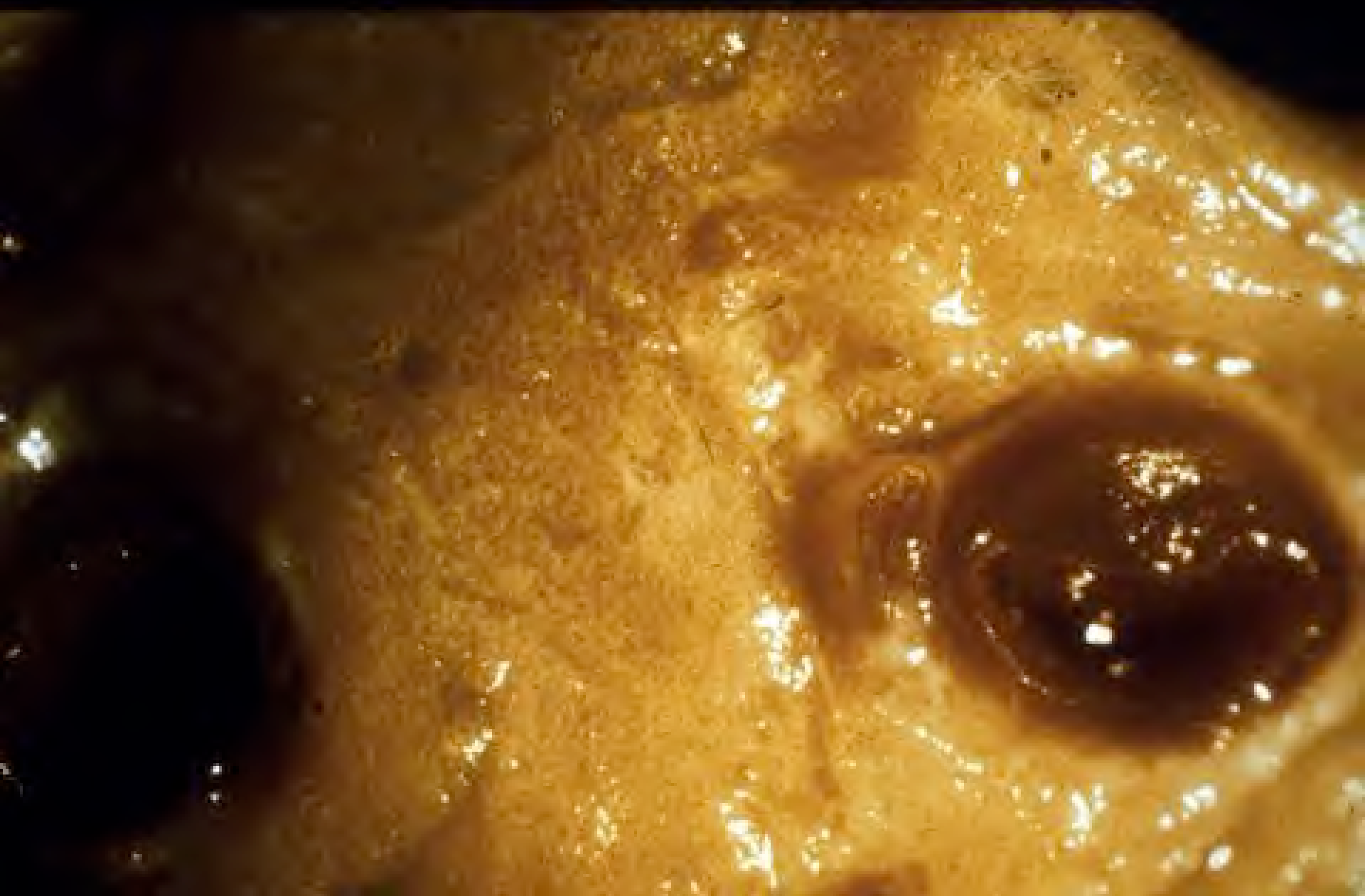






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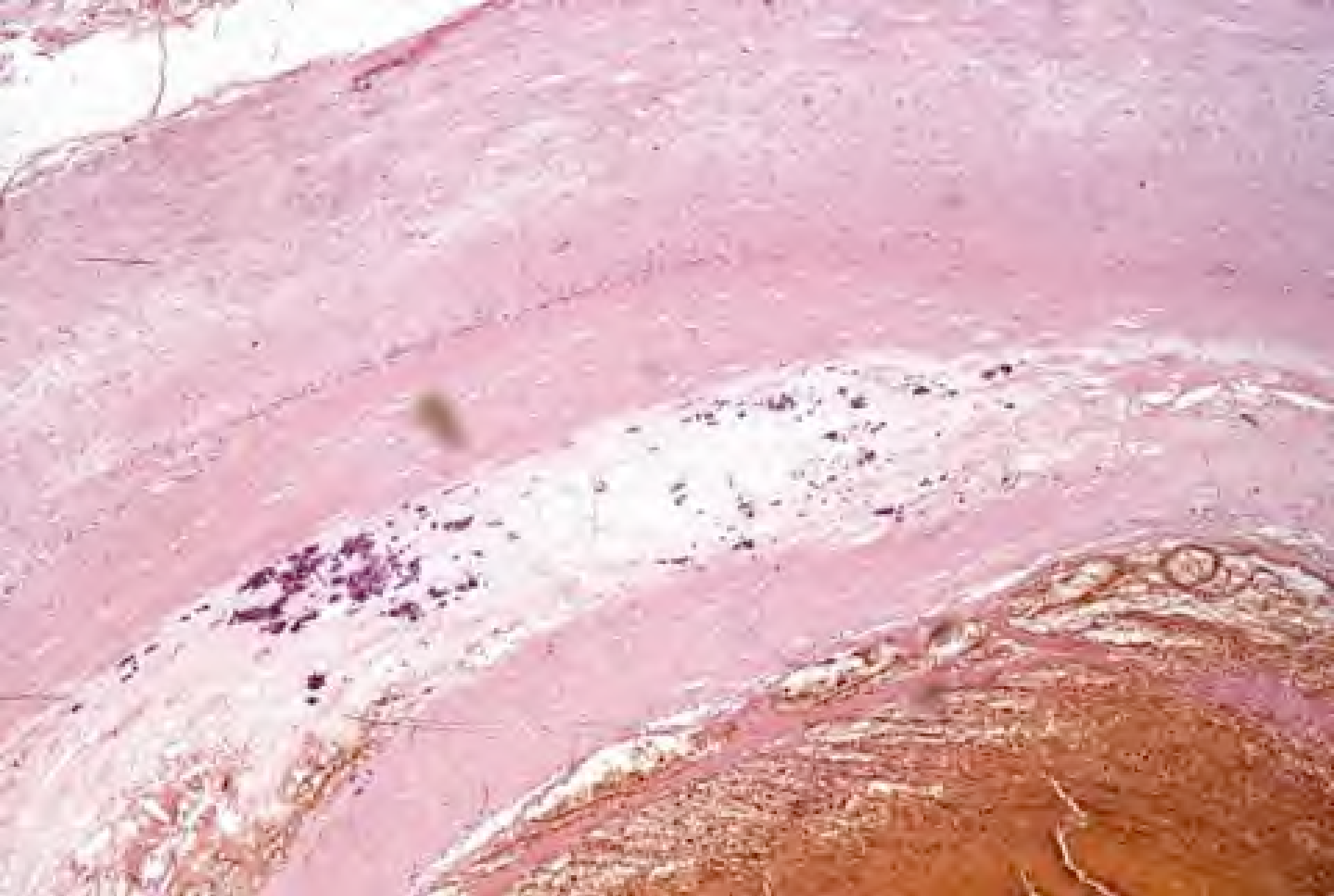




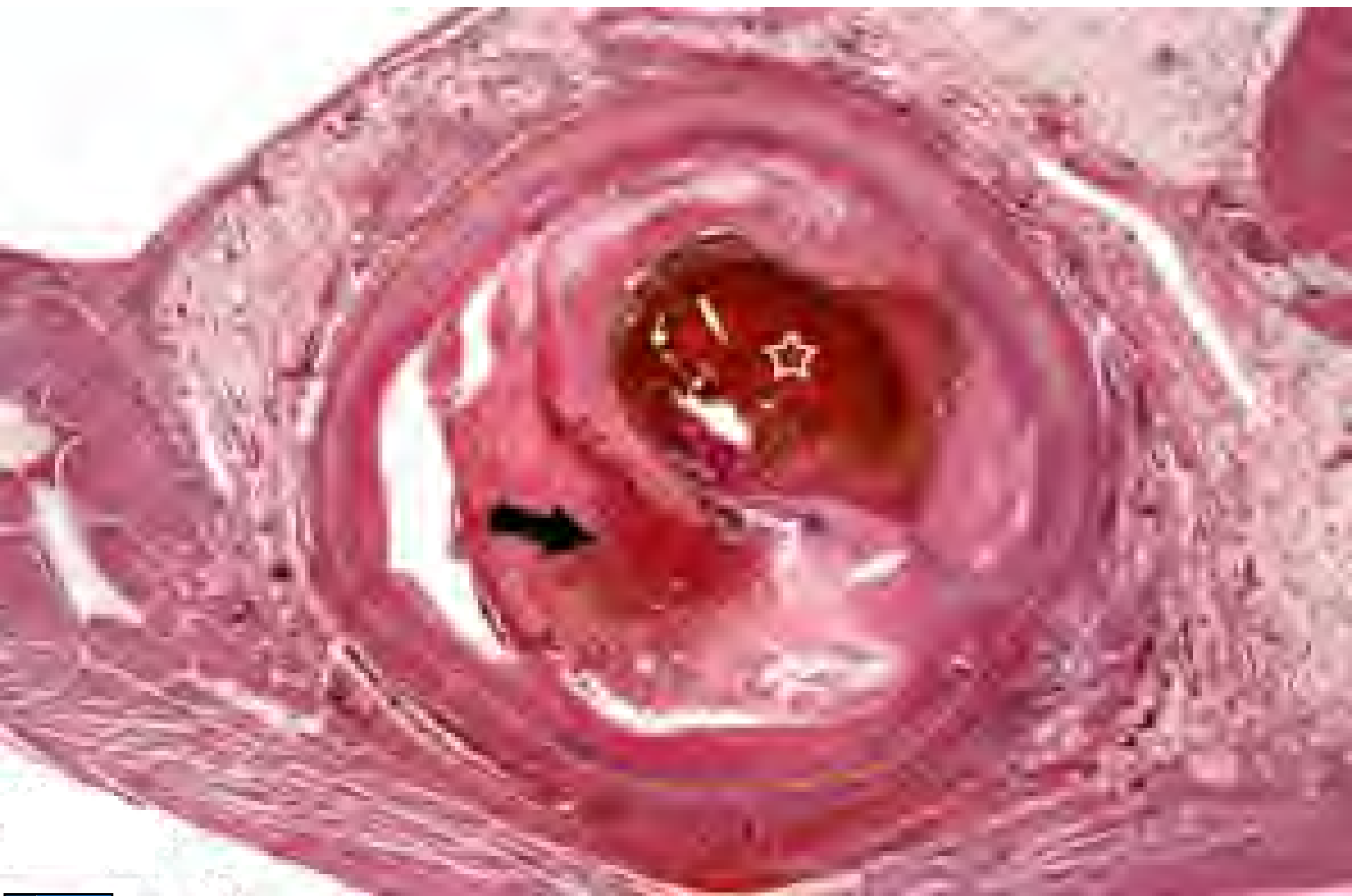


Coronary Atherosclerosis



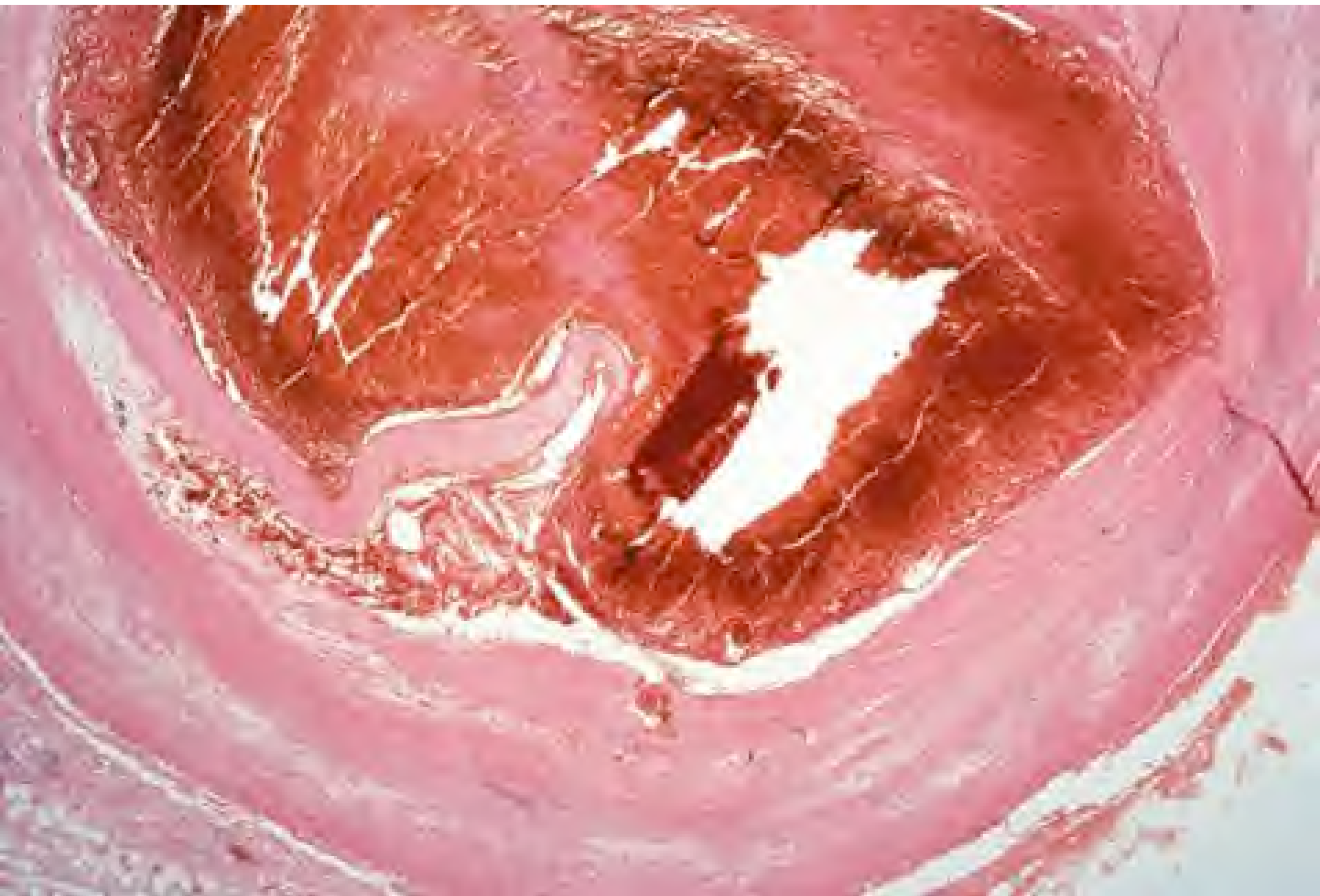


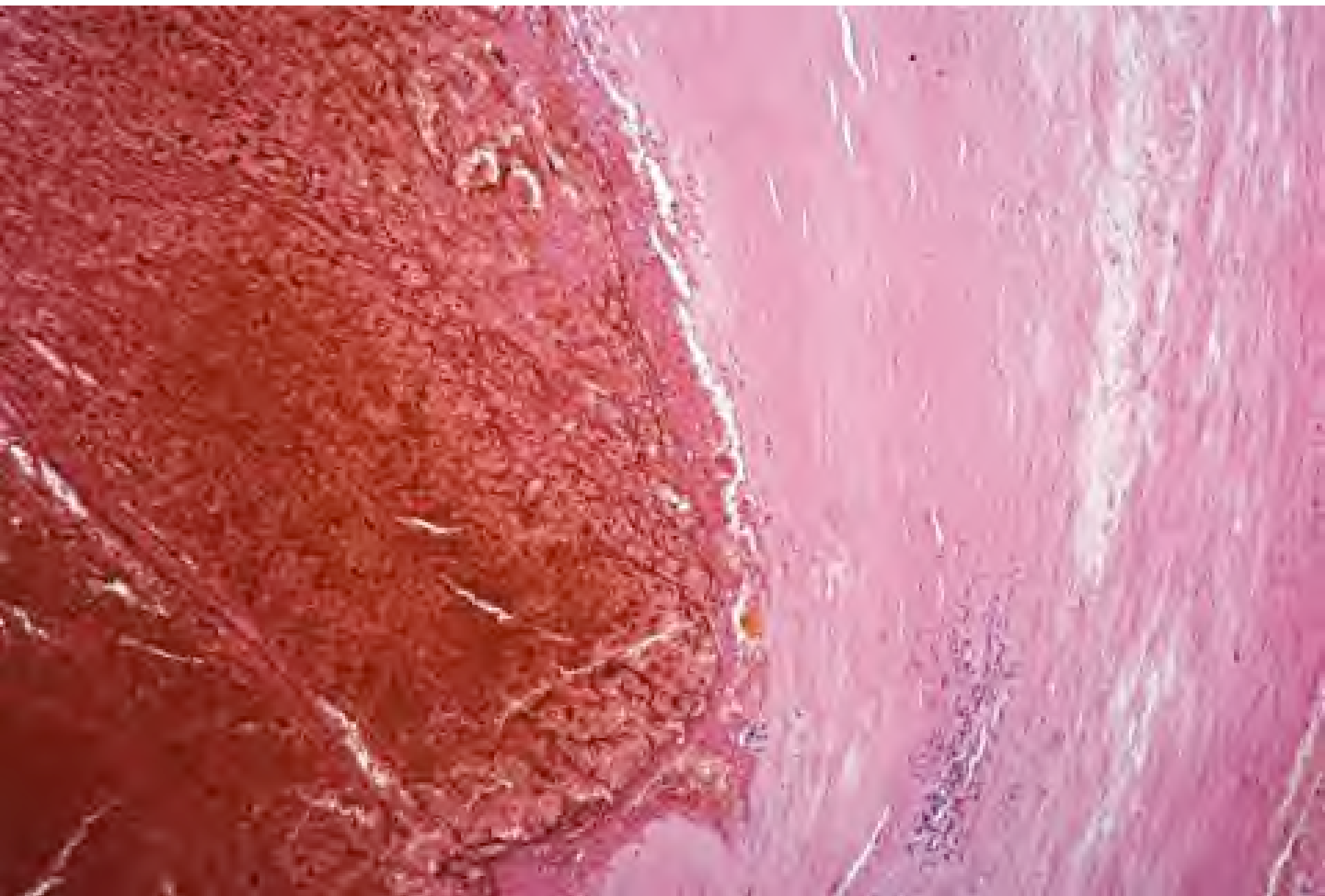




thrombus





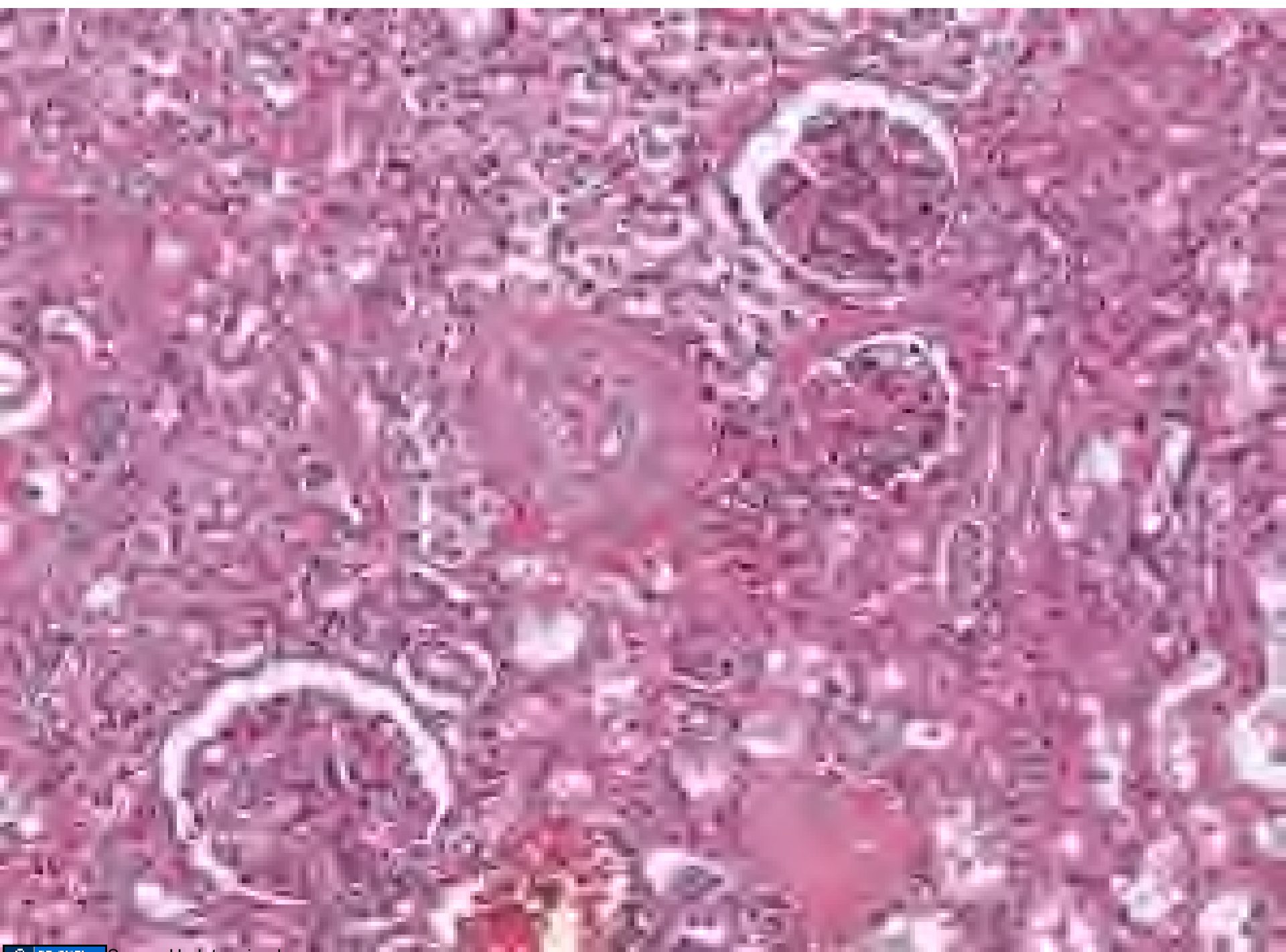


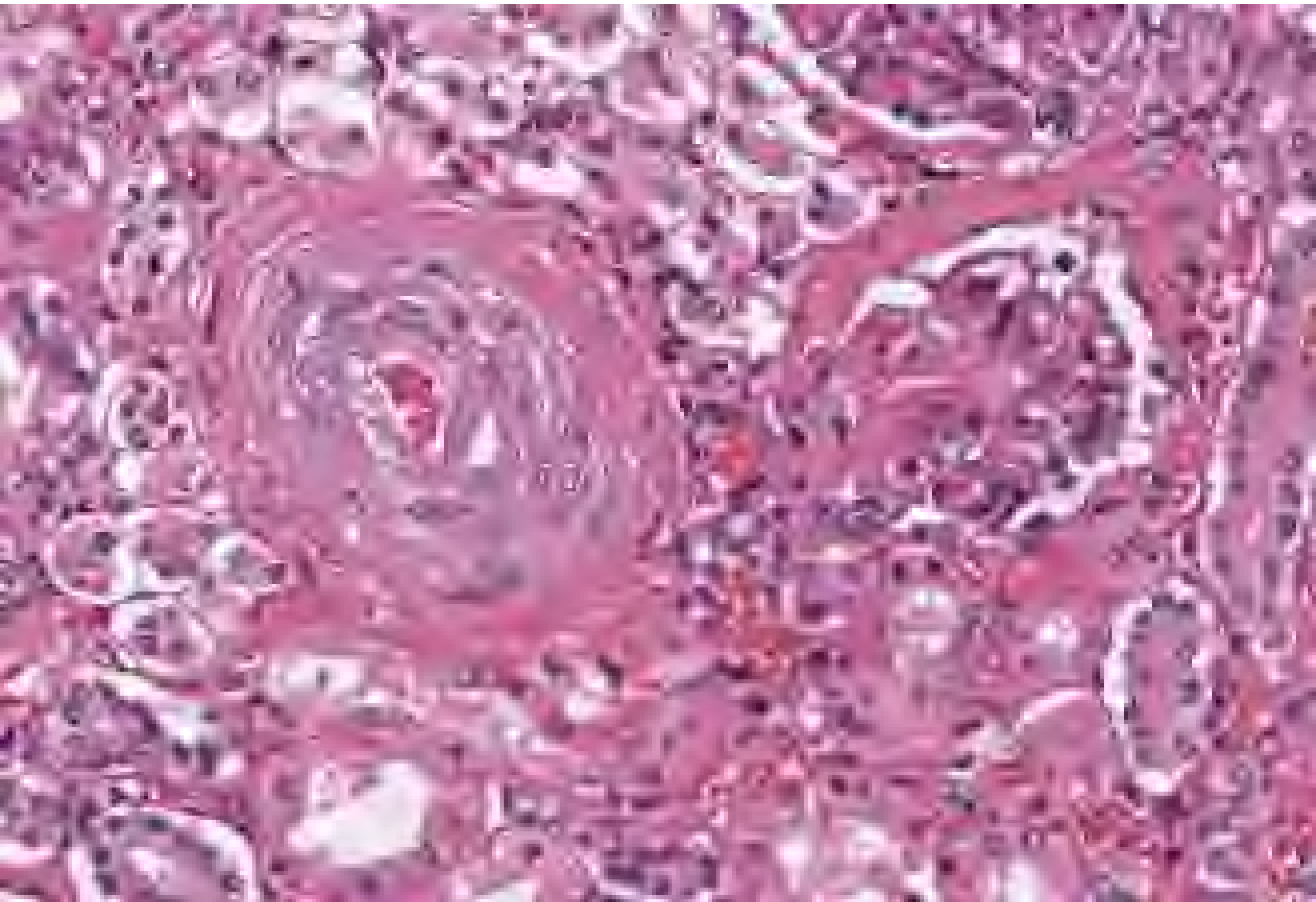
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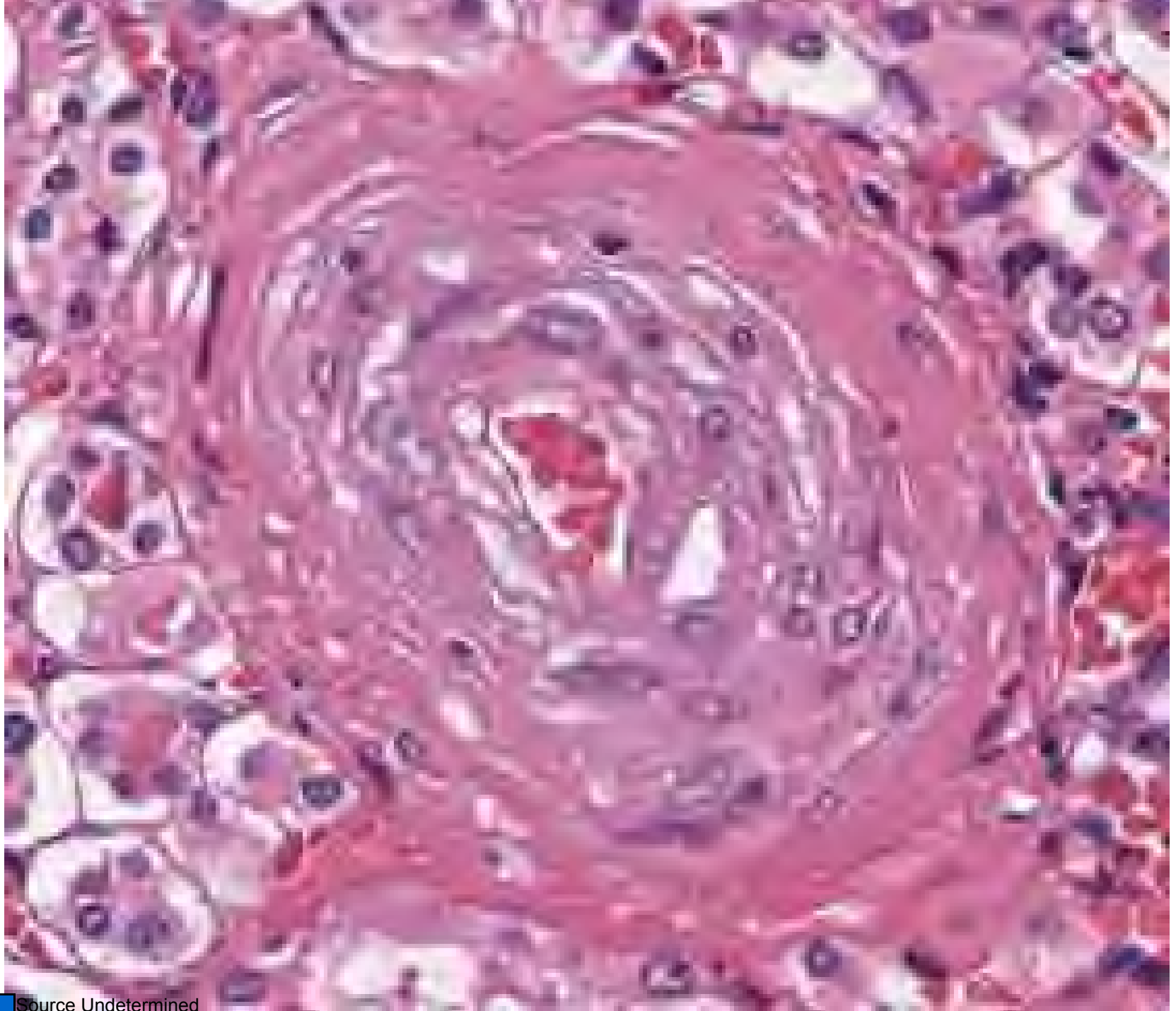


Normal Arteriole





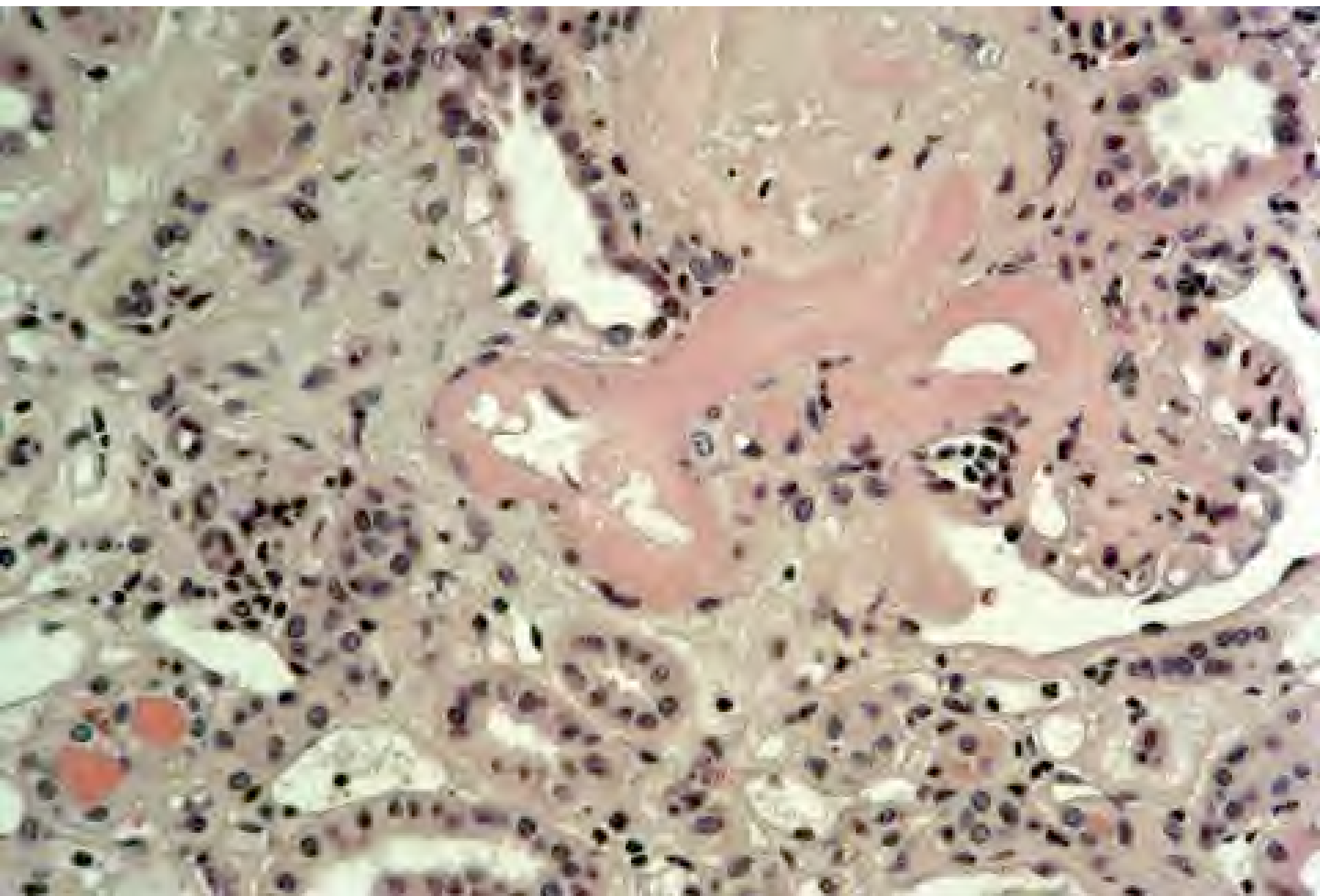


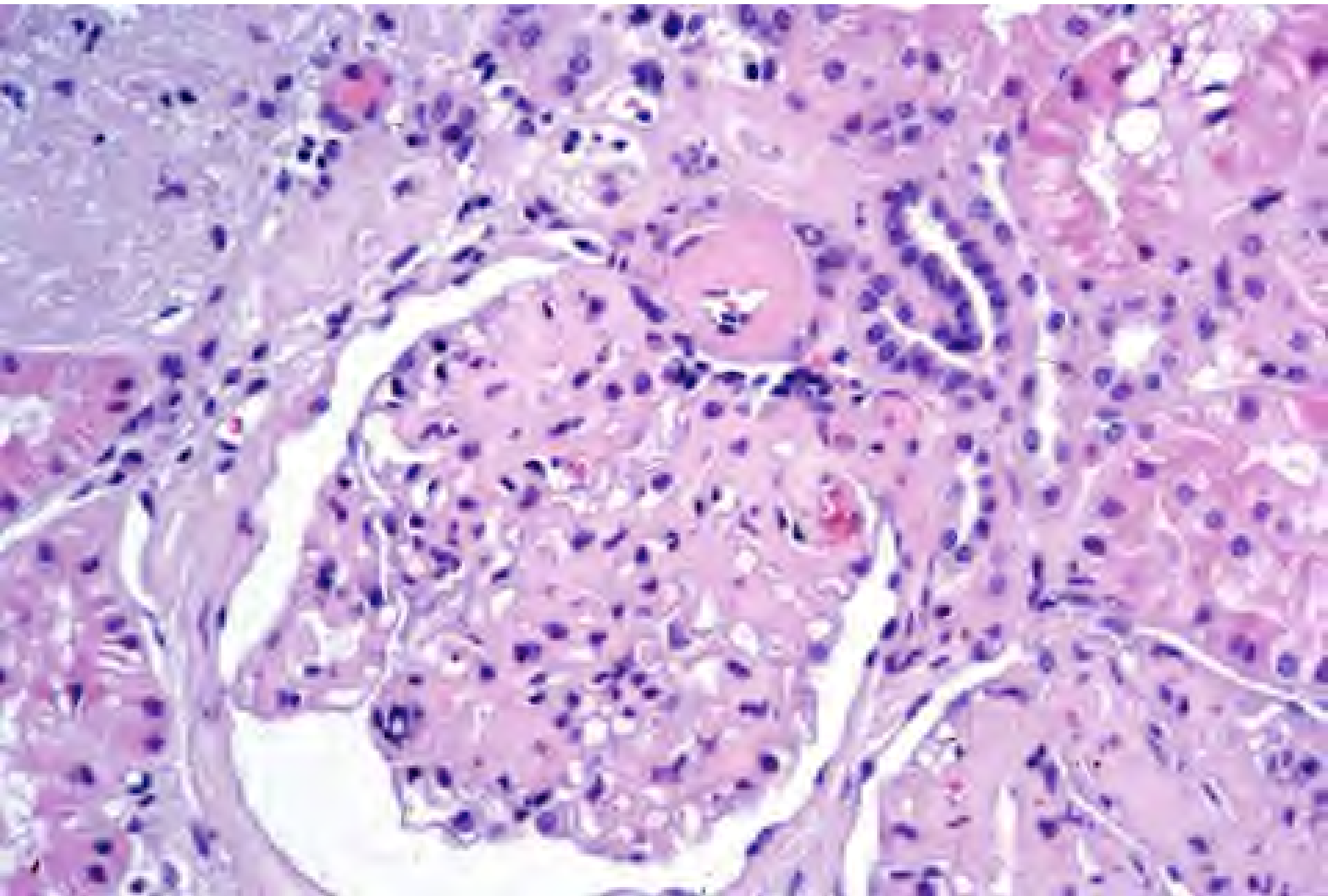


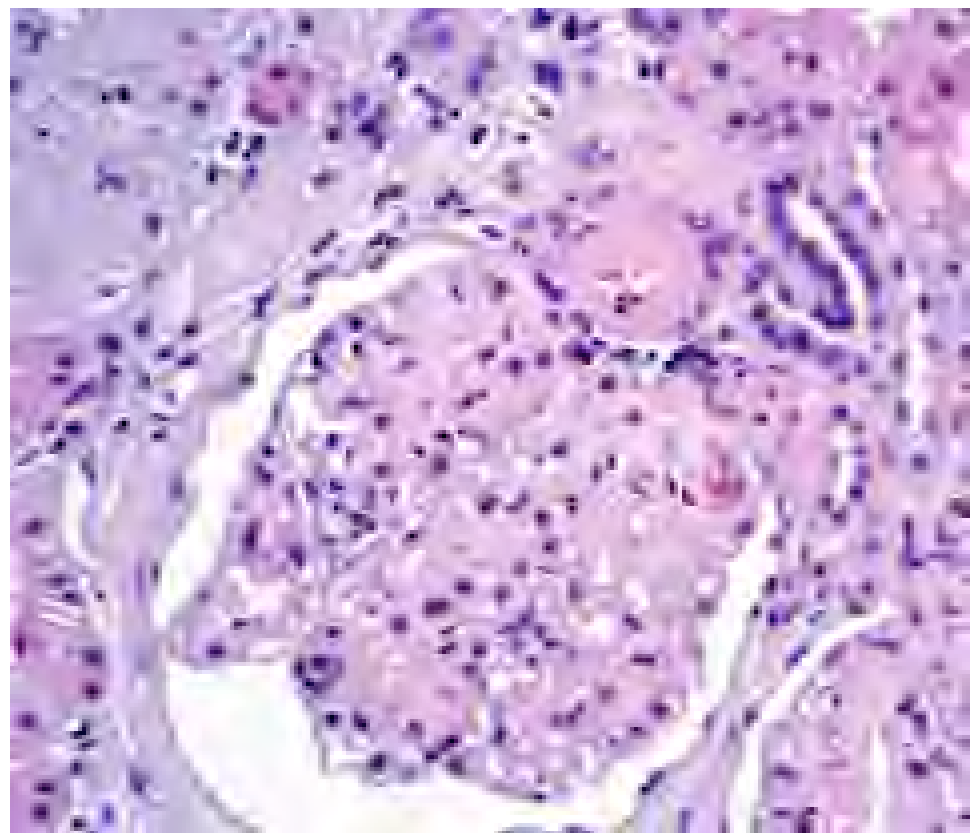
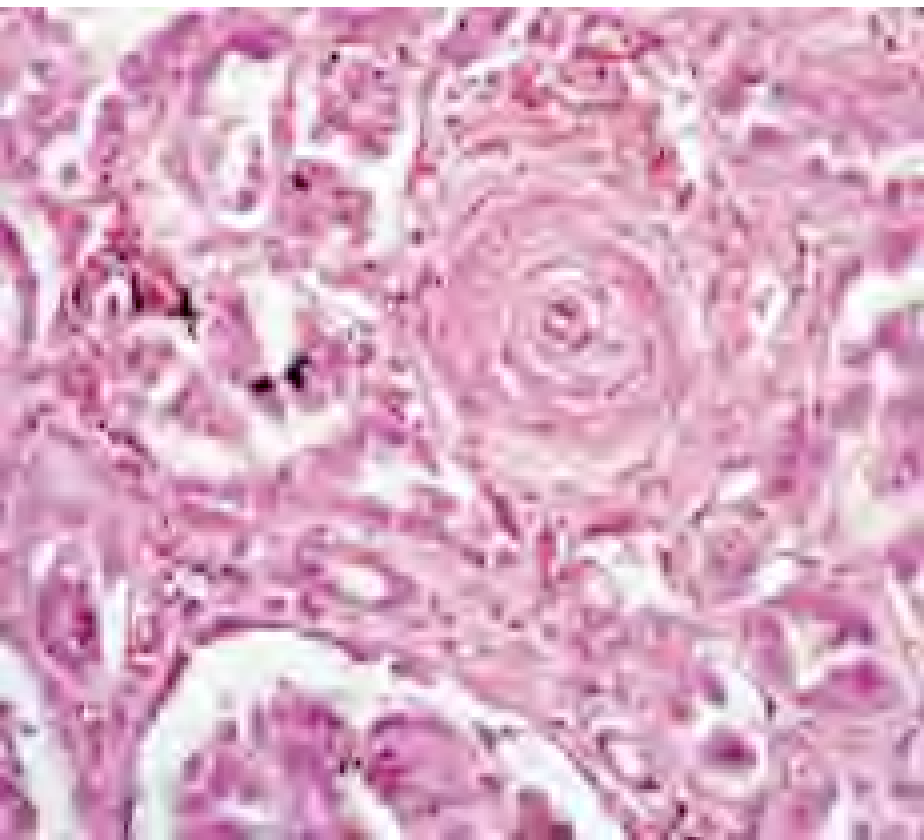
Hyaline Arteriosclerosis



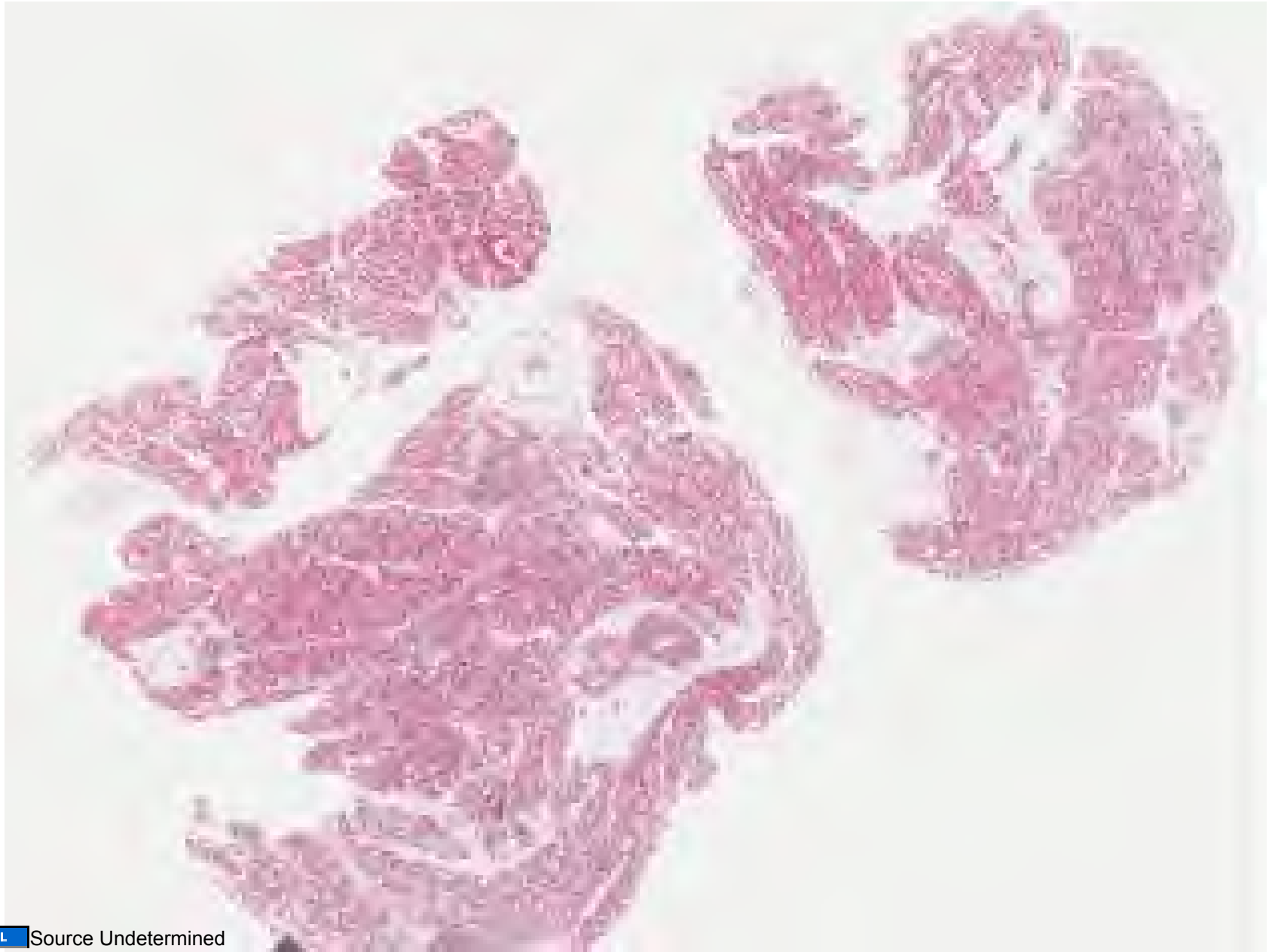


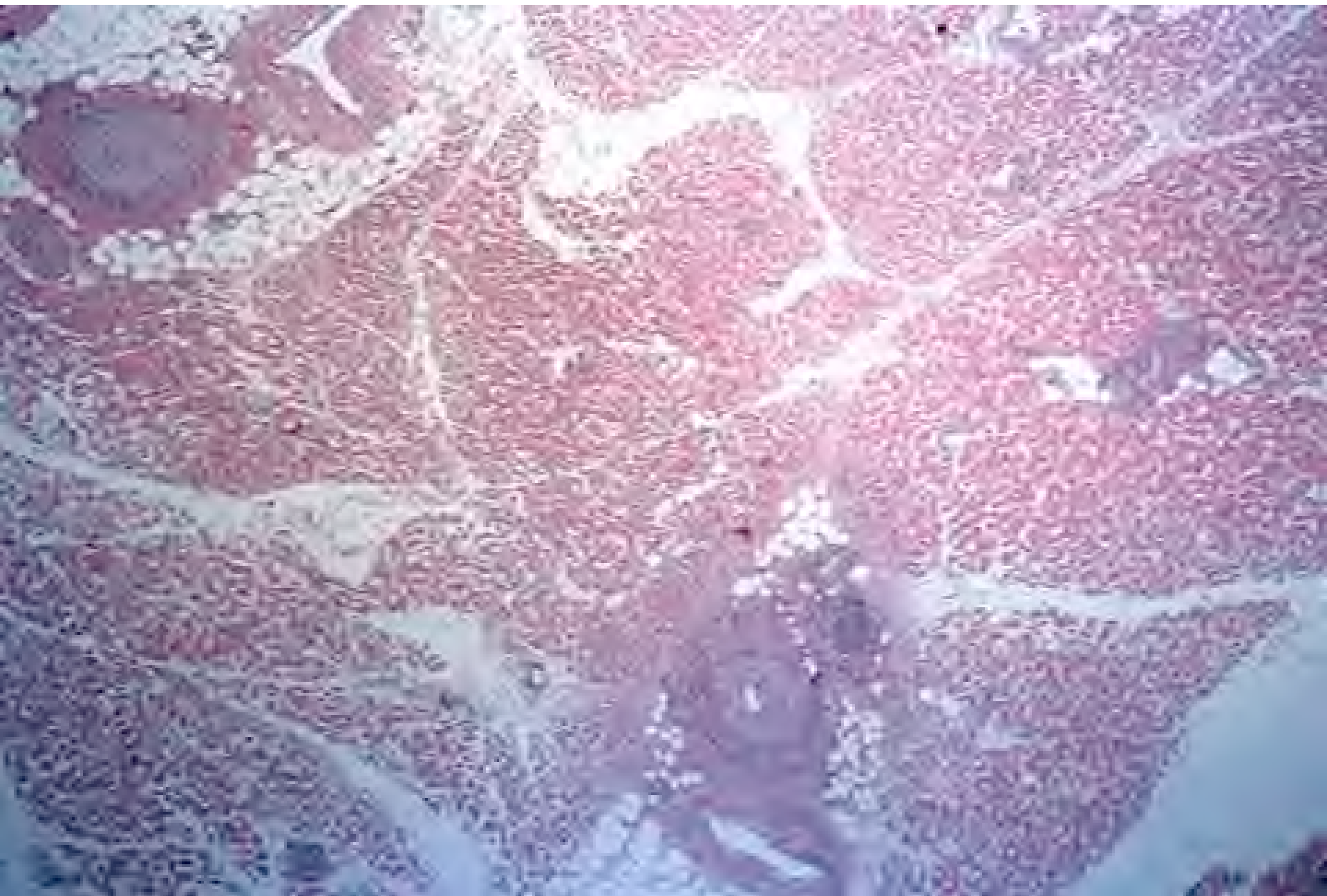


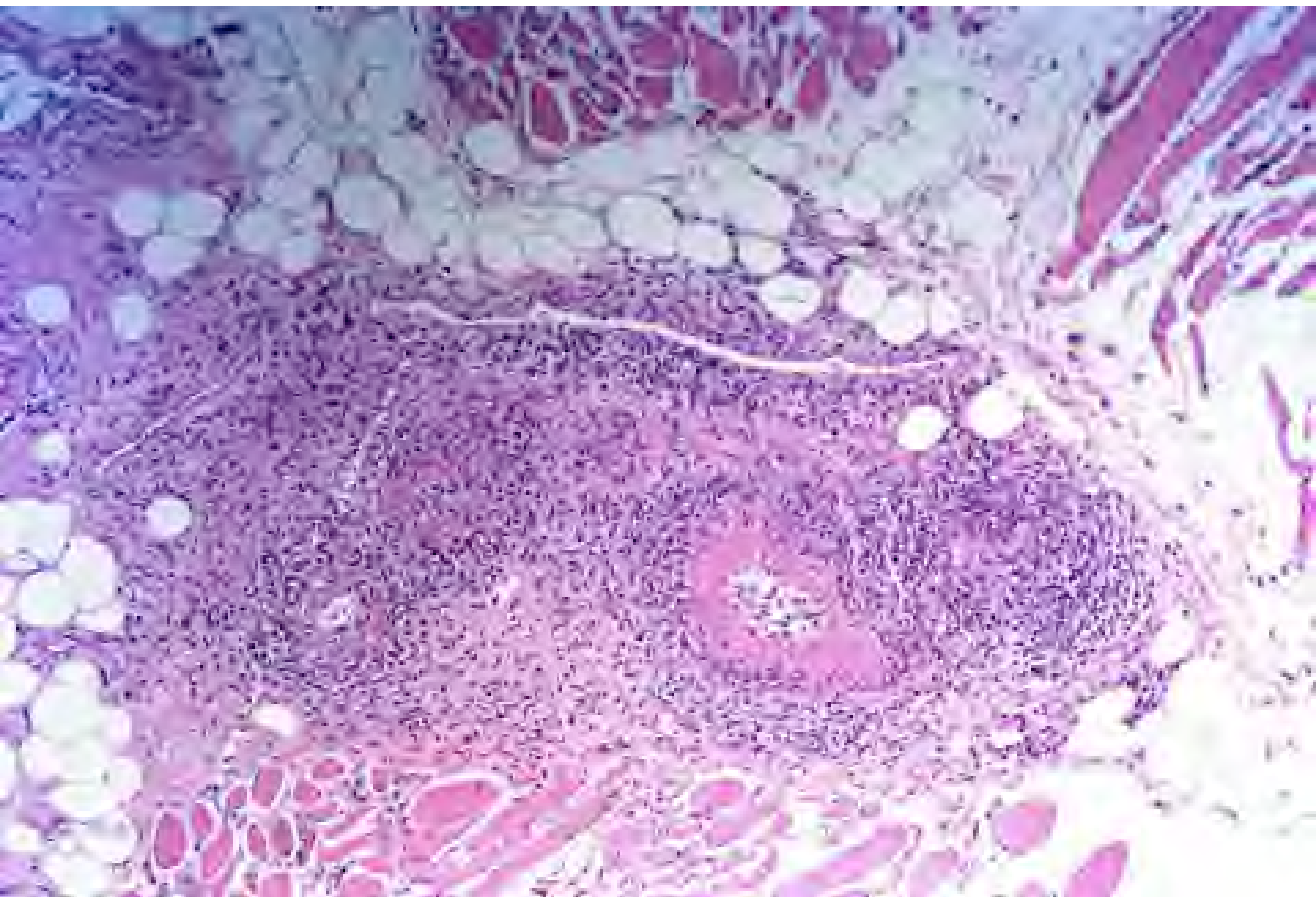


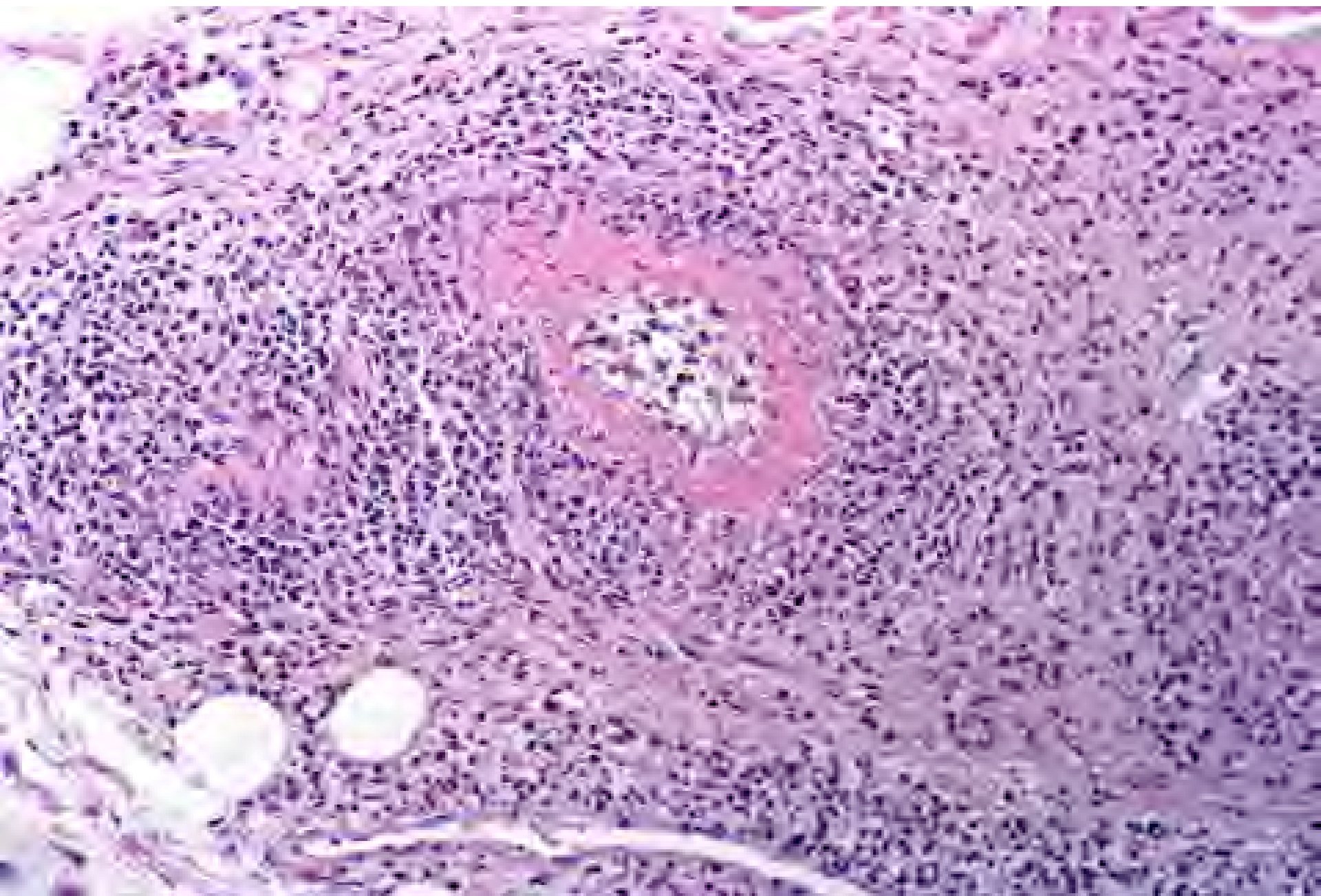


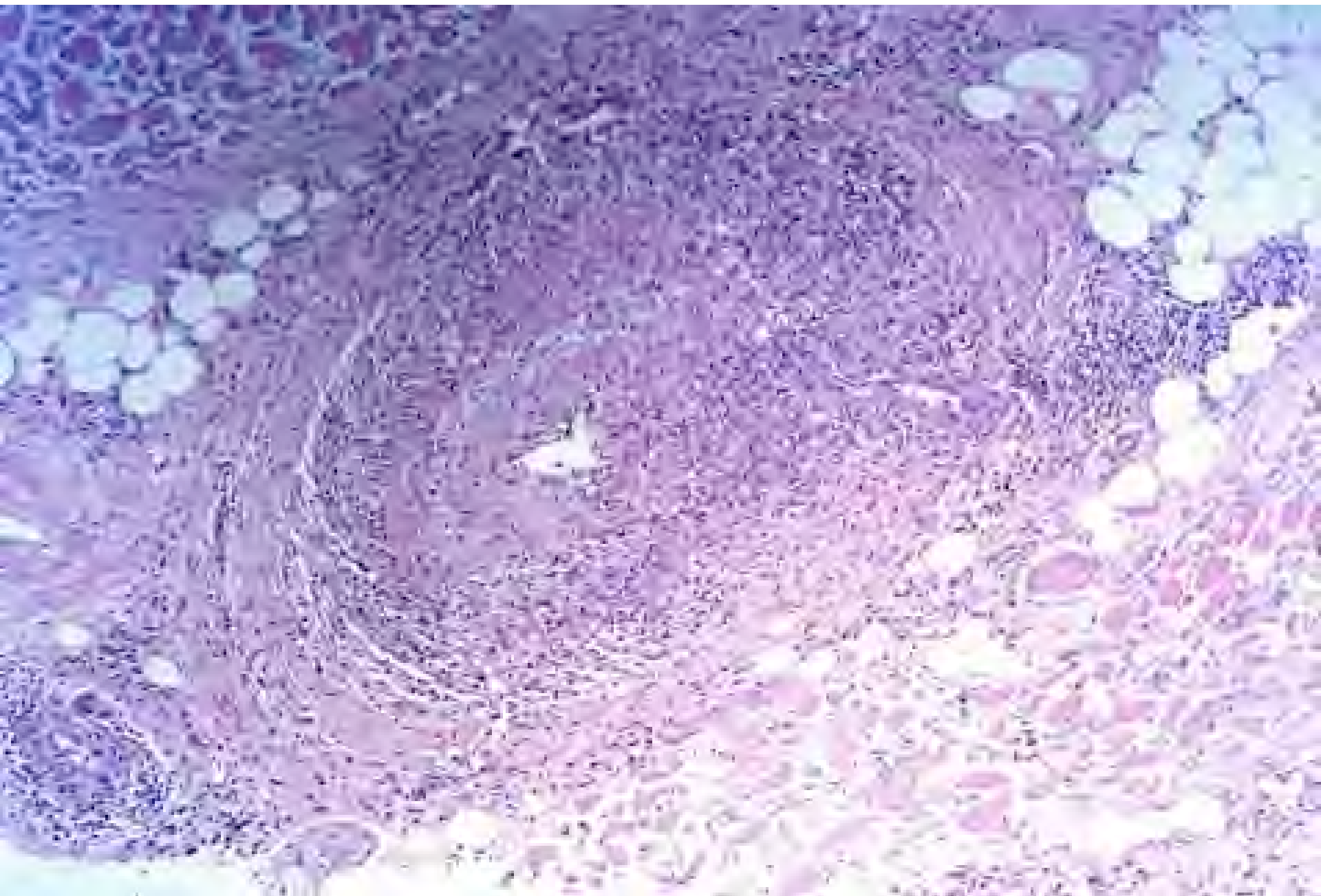
Polyarteritis Nodosa

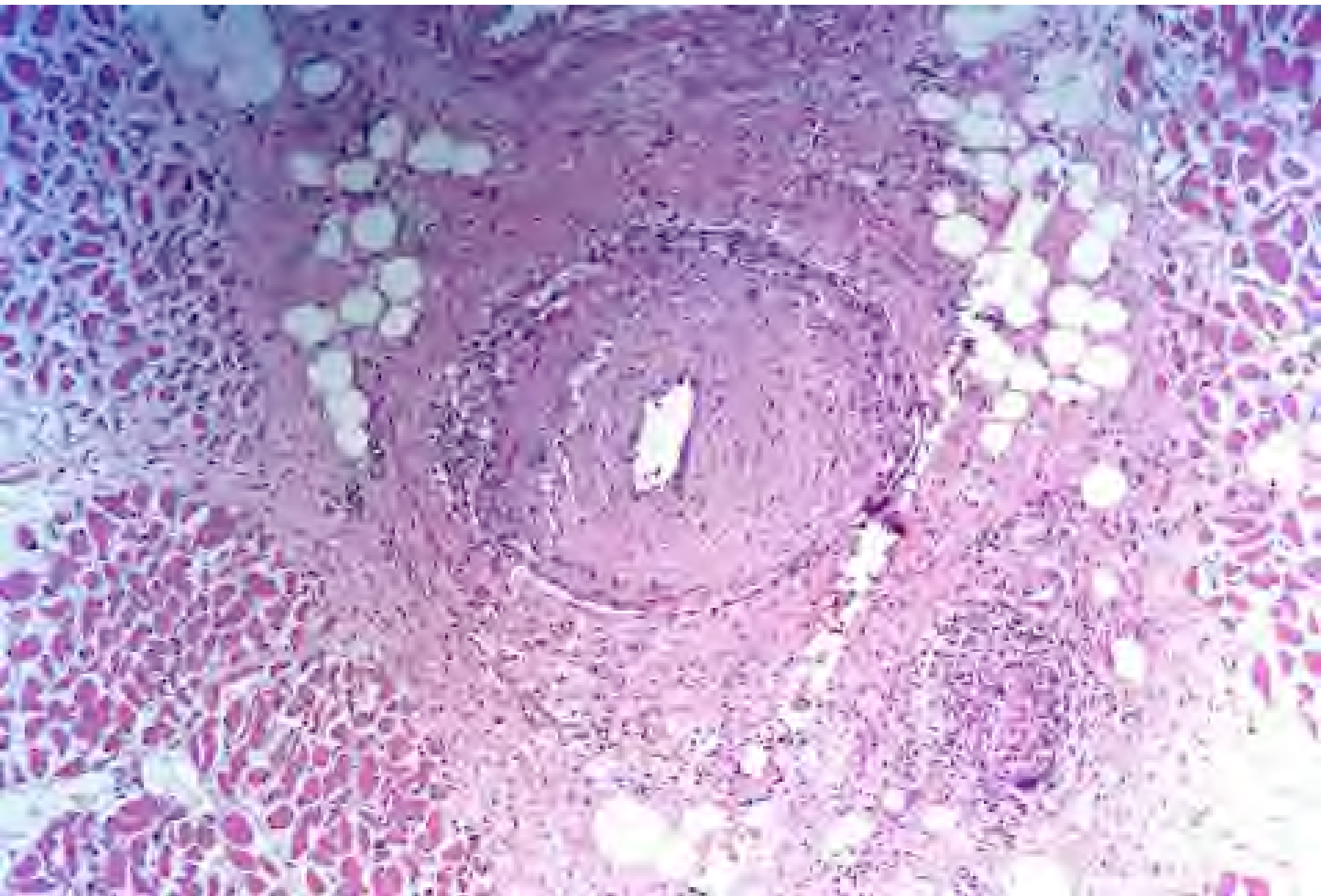


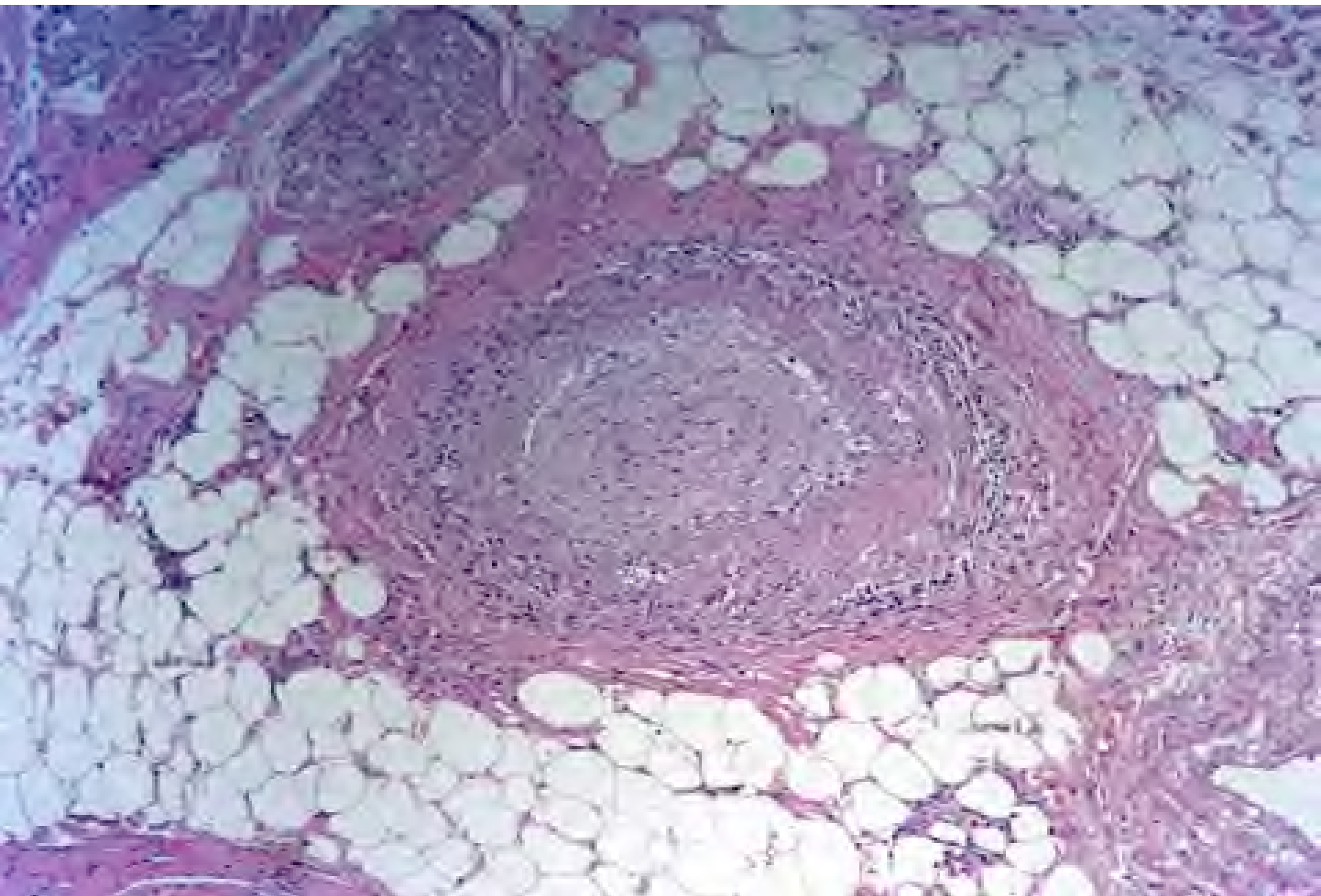




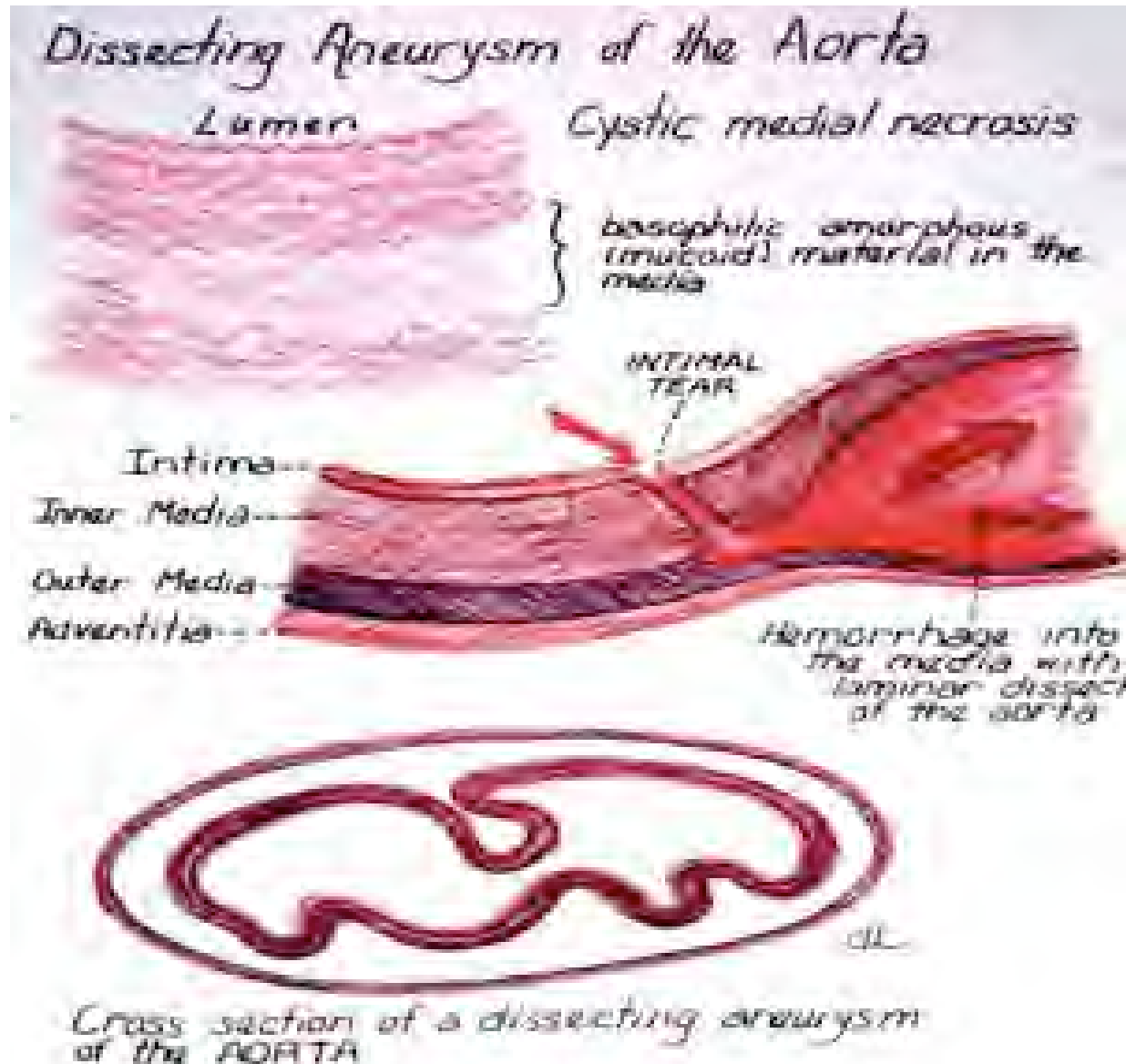




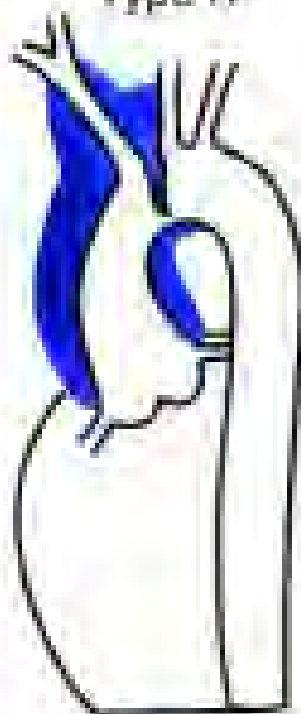




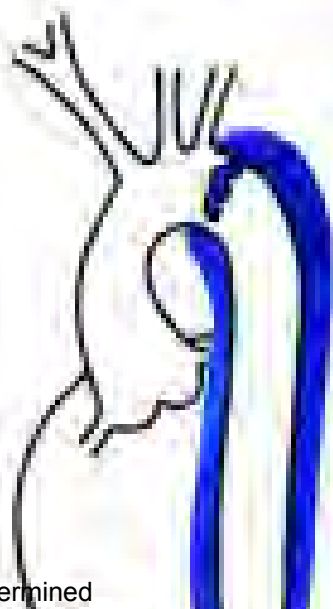
Aortic Dissection



Type A



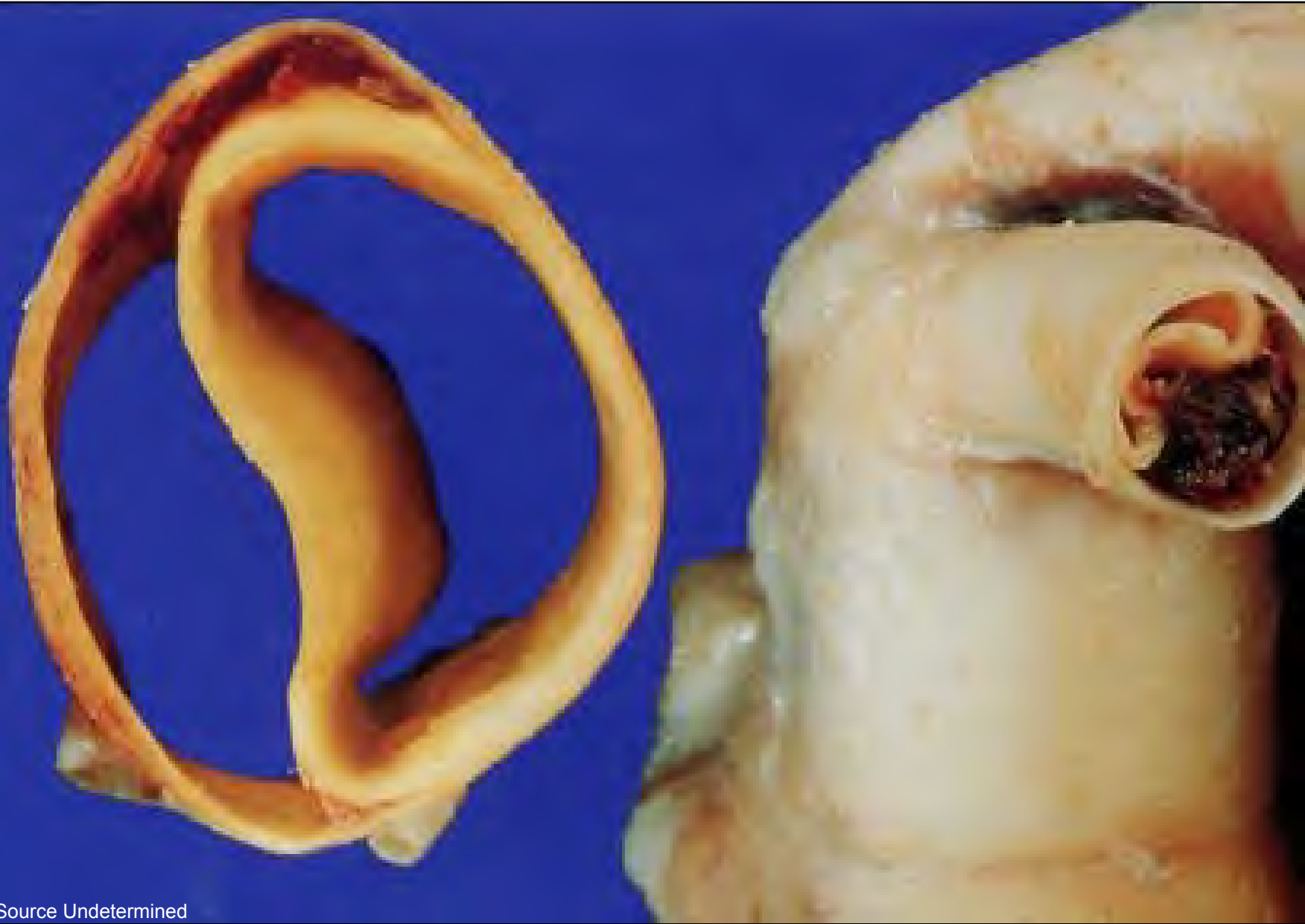
Type B



Heart and Aortic Arch

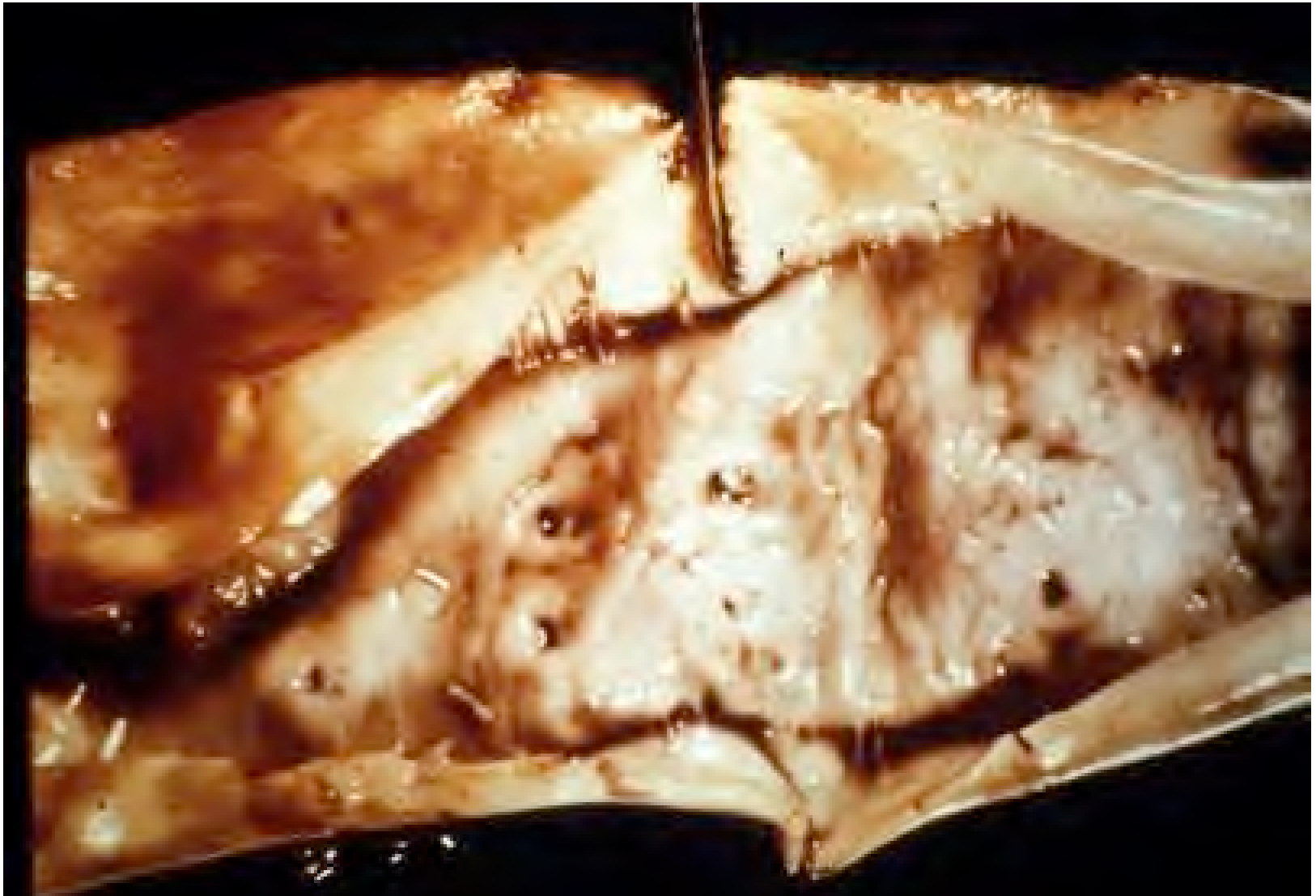


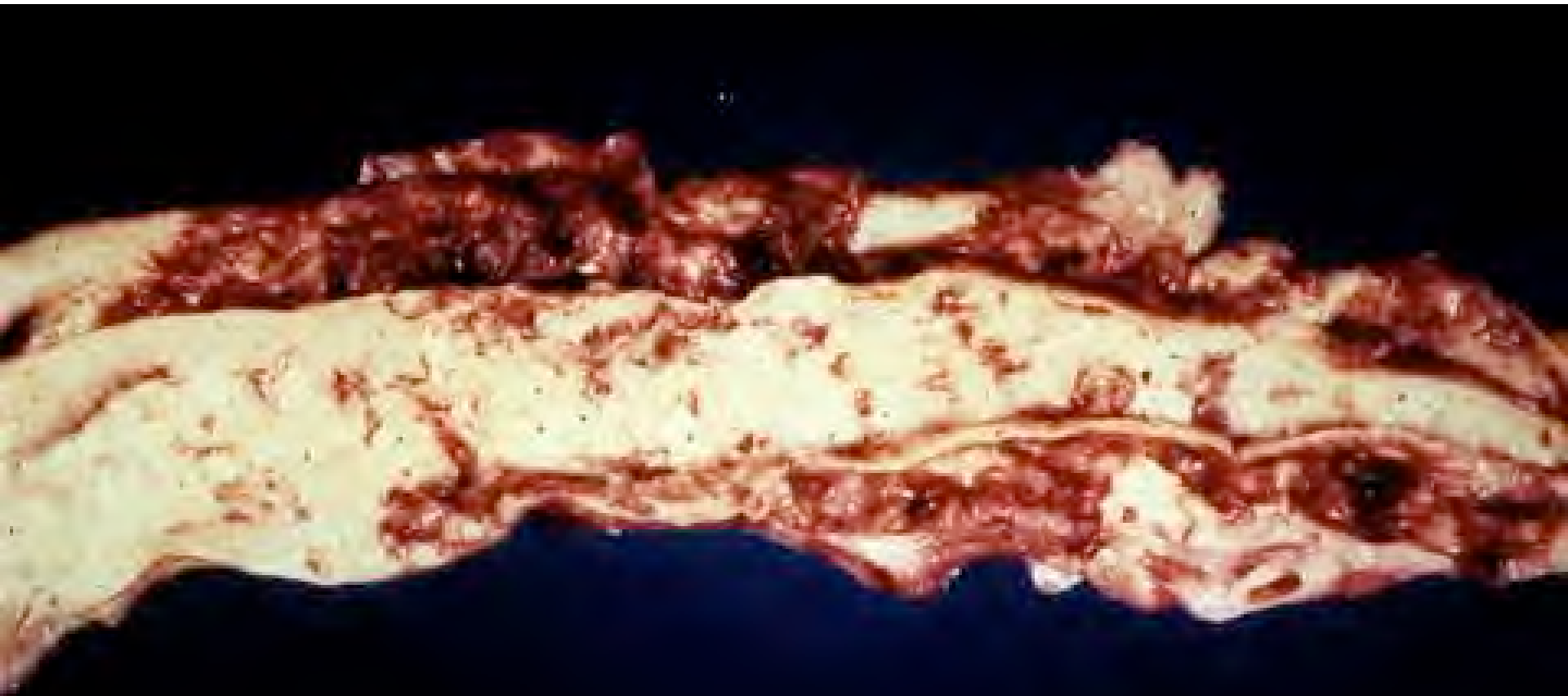
Left Subclavian Artery





Aortic Dissection

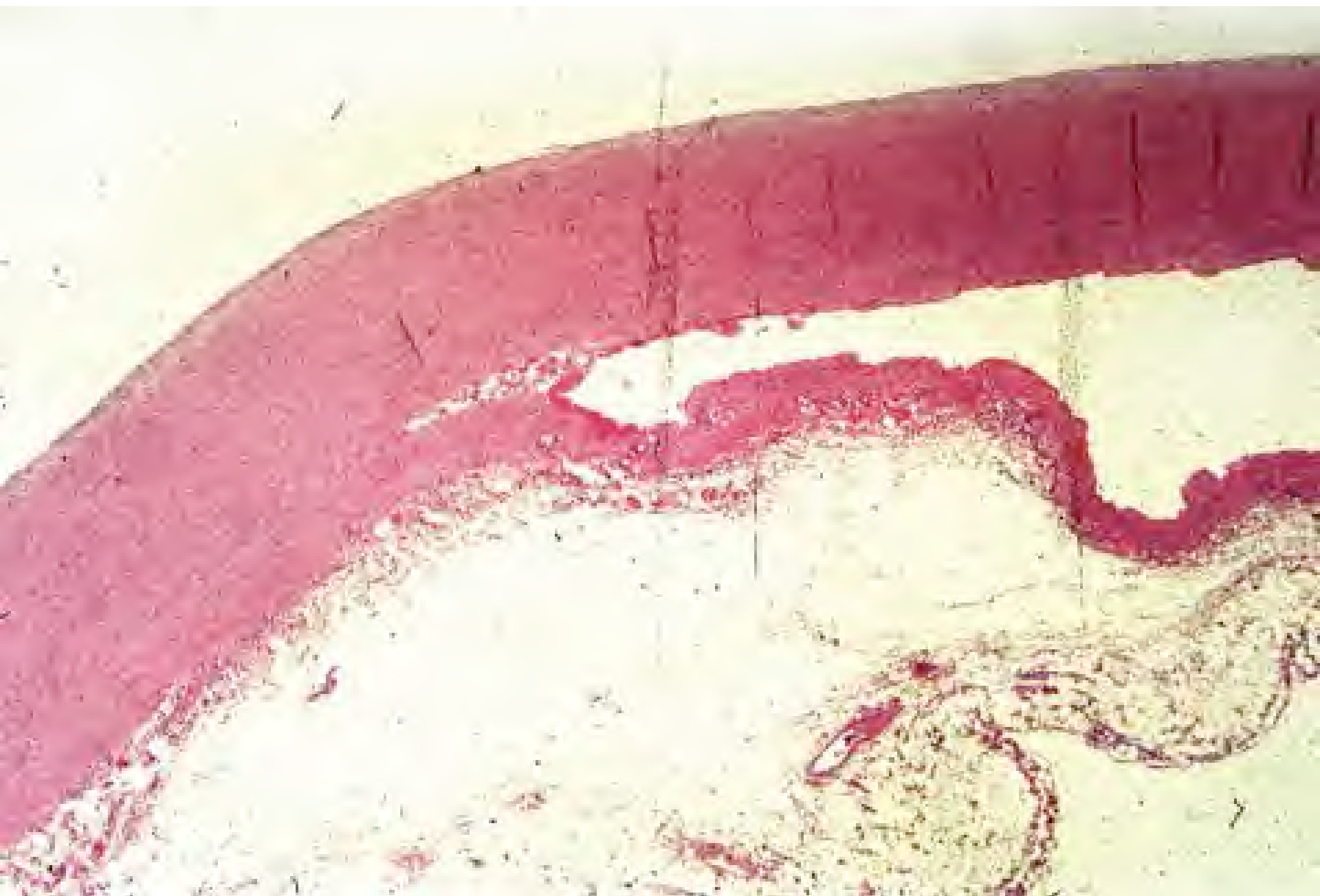


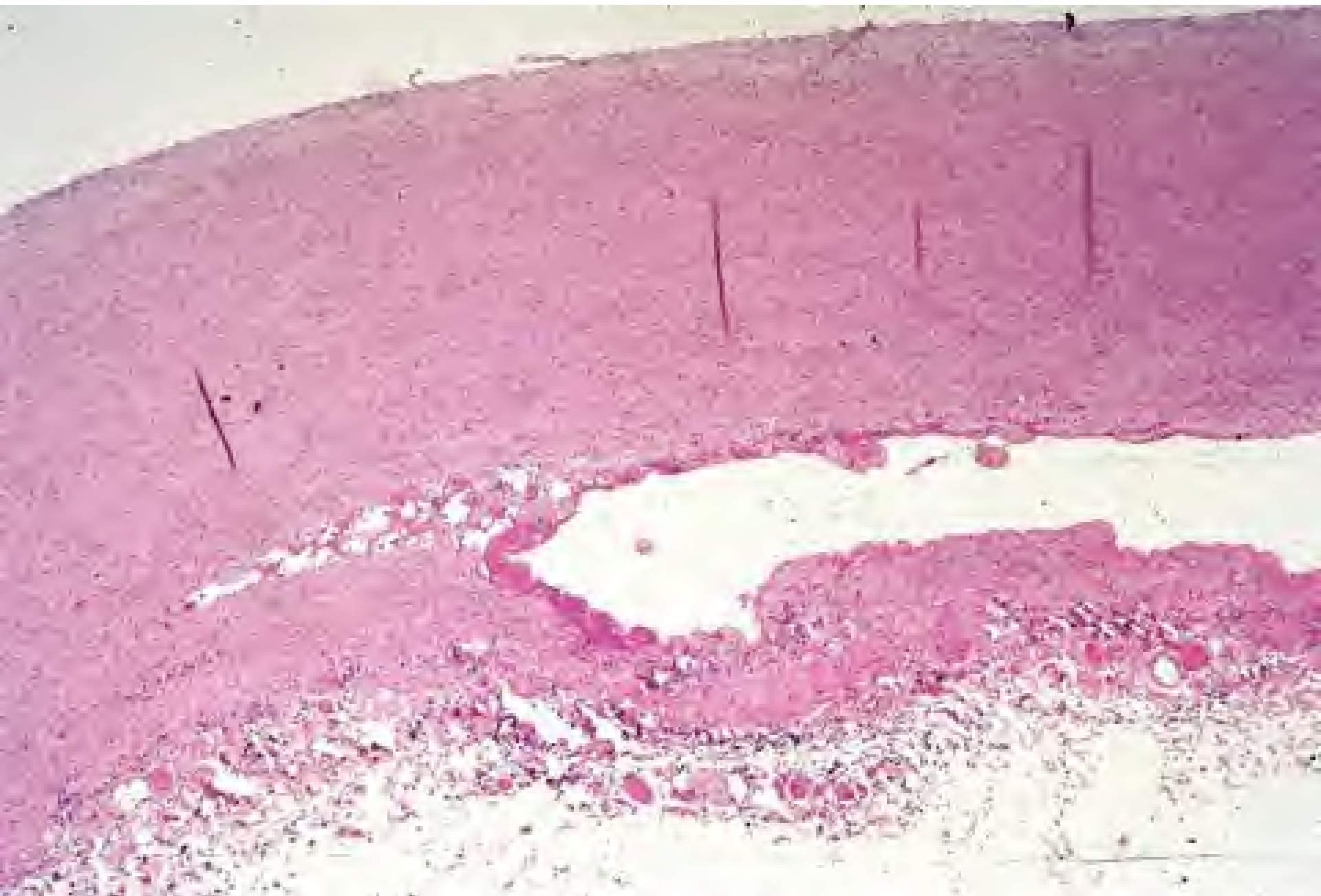


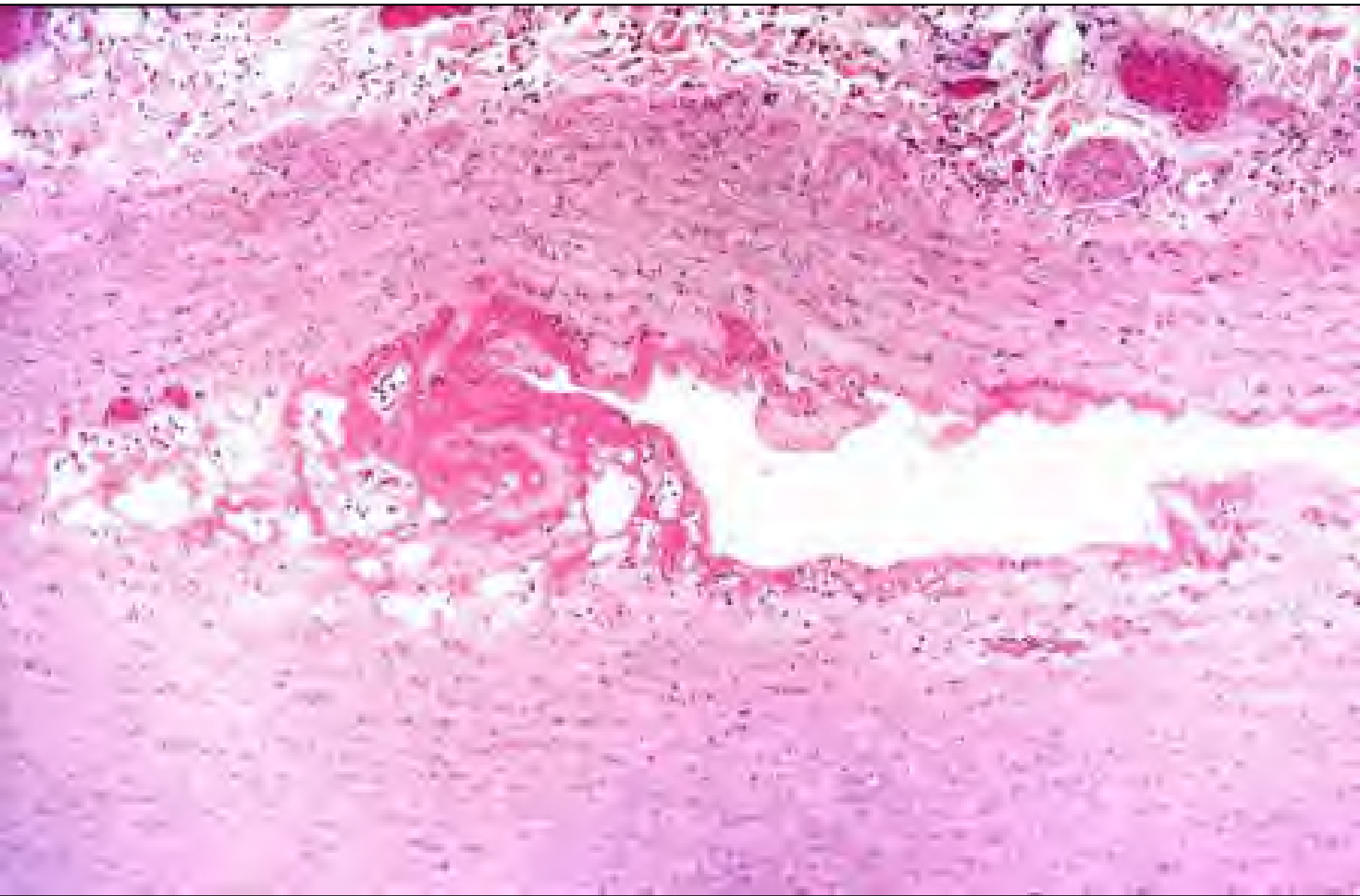
Aortic Dissection

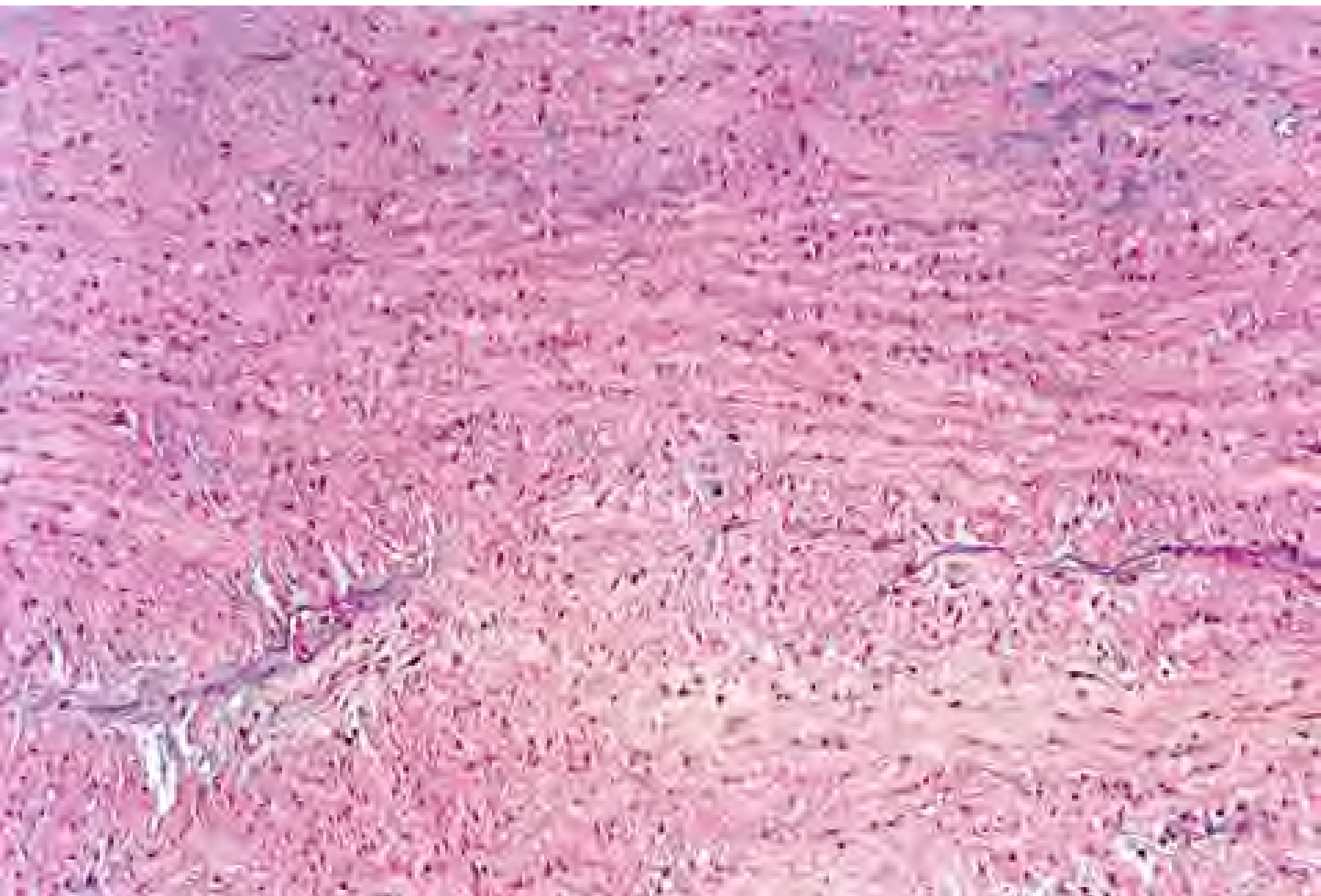


 PO-INCL G.D. Abrams, University of Michigan Medical School

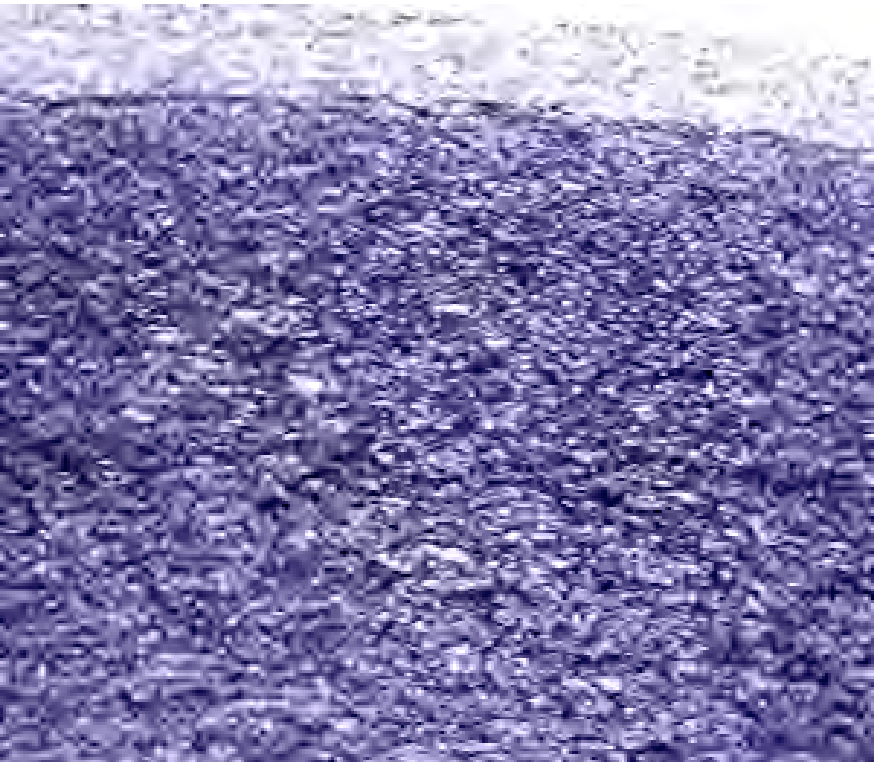








Normal Aortic Elastin



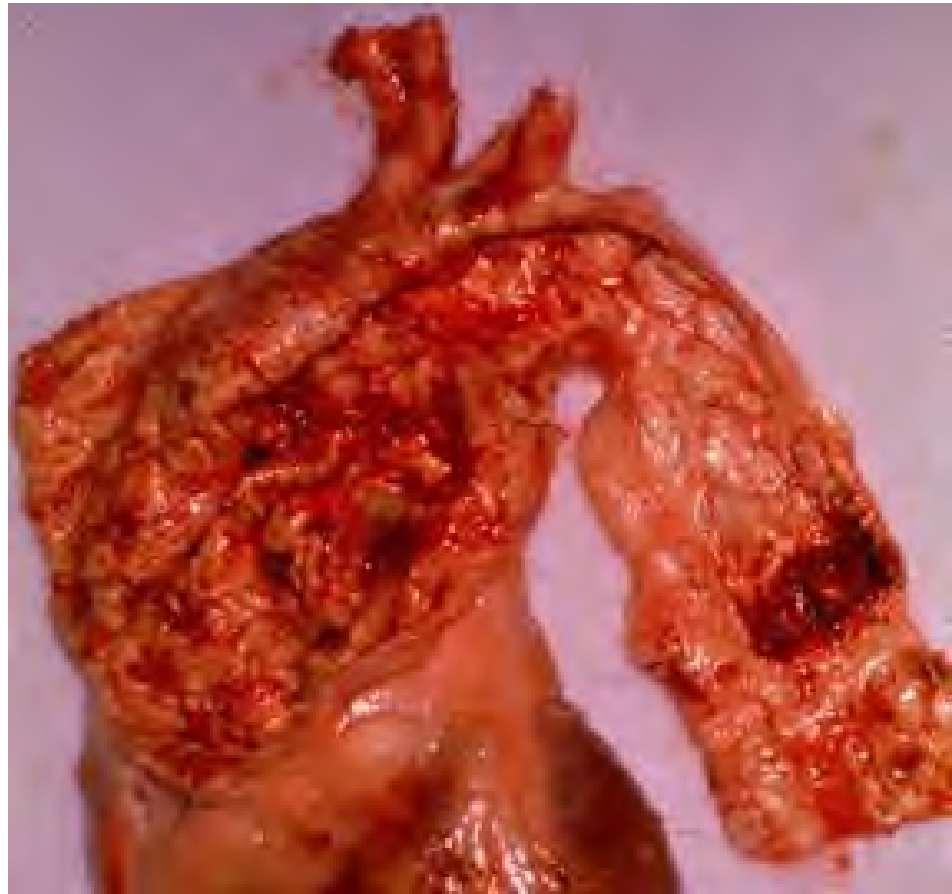
Fragmented Aortic Elastin Marfan's



Abdominal Aortic Aneurysm

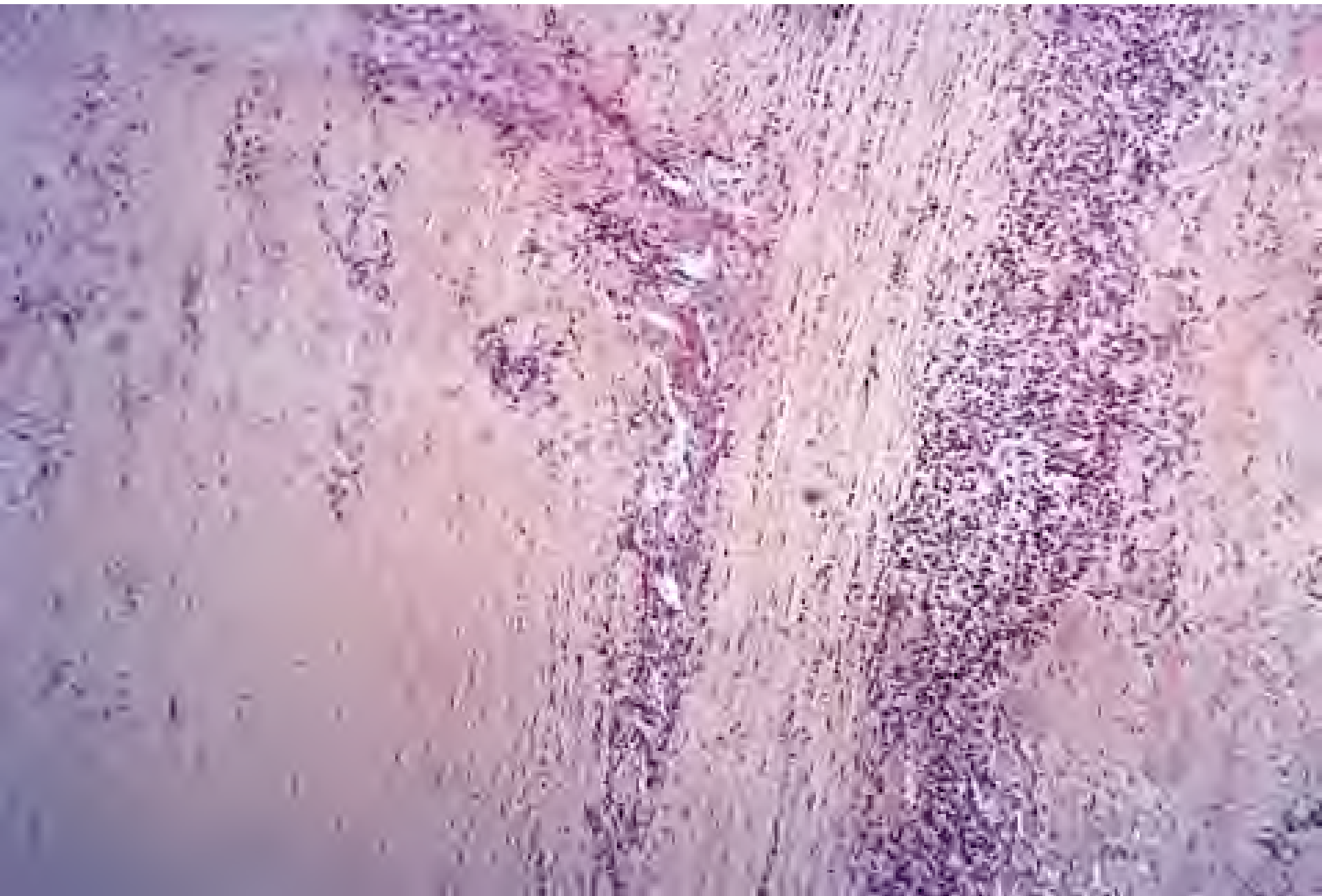


Syphilitic Aortitis Aneurysm



Syphilitic Aortitis





M-2 Cardiovascular Laboratory - 2

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

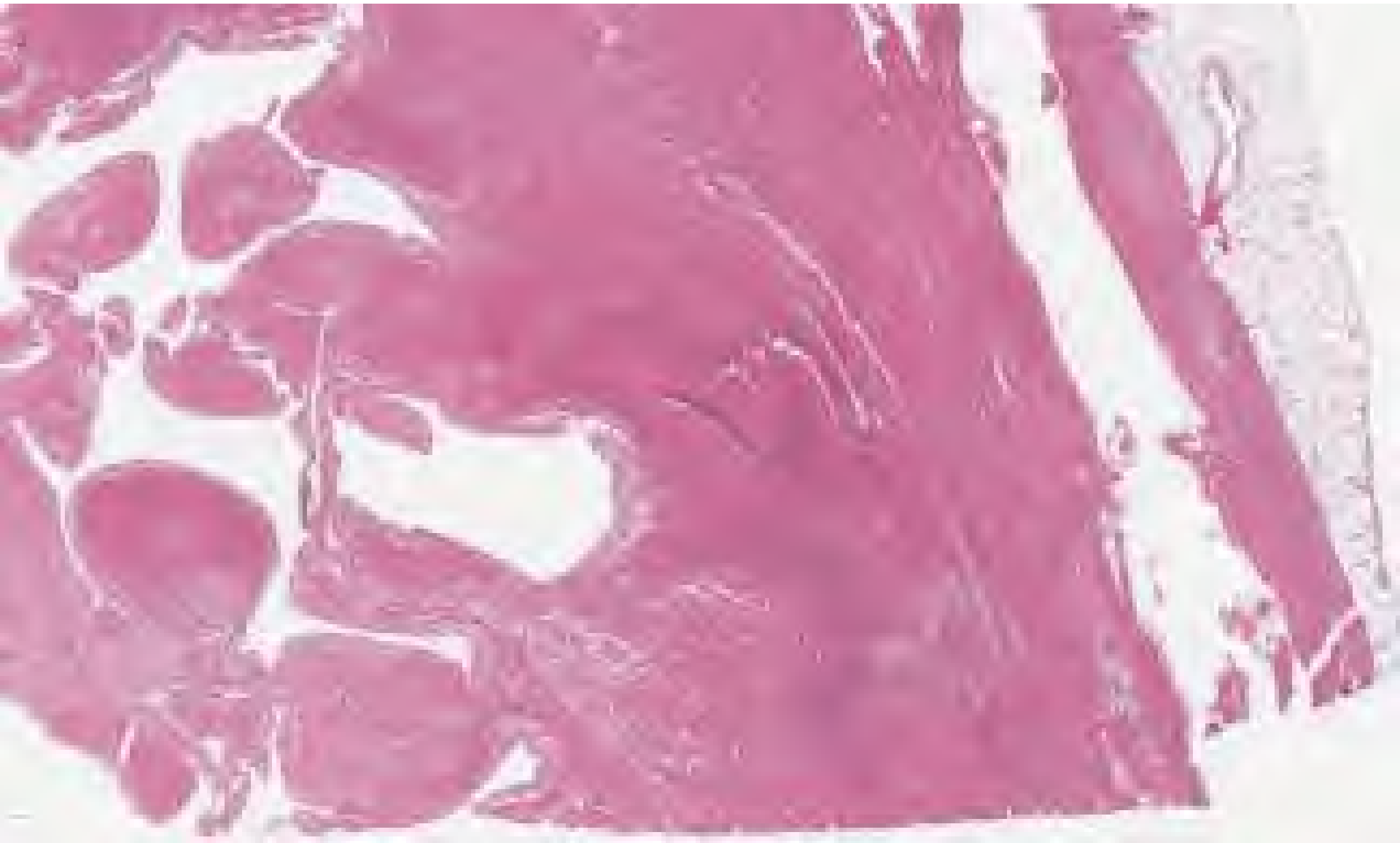
Recent Myocardial Infarction

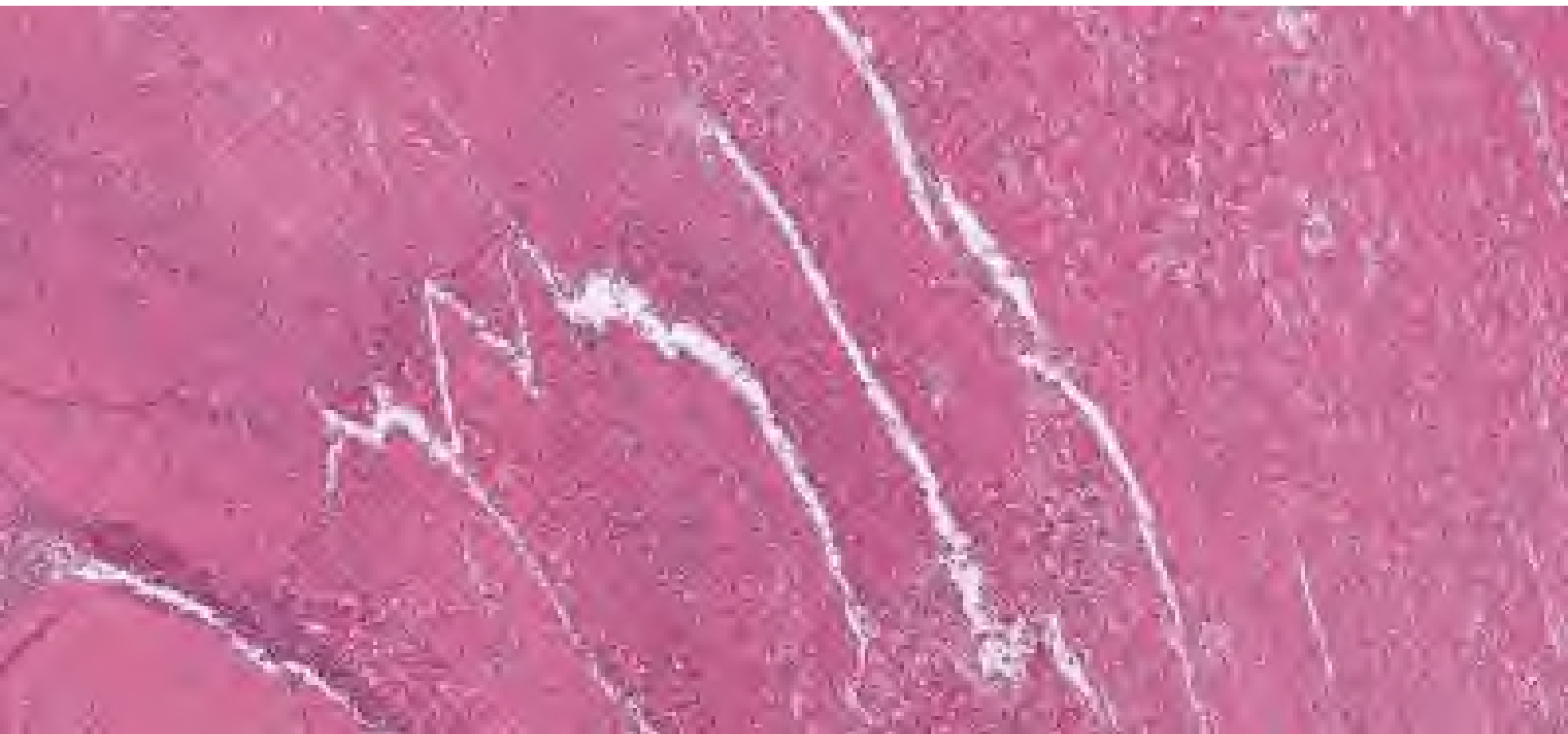


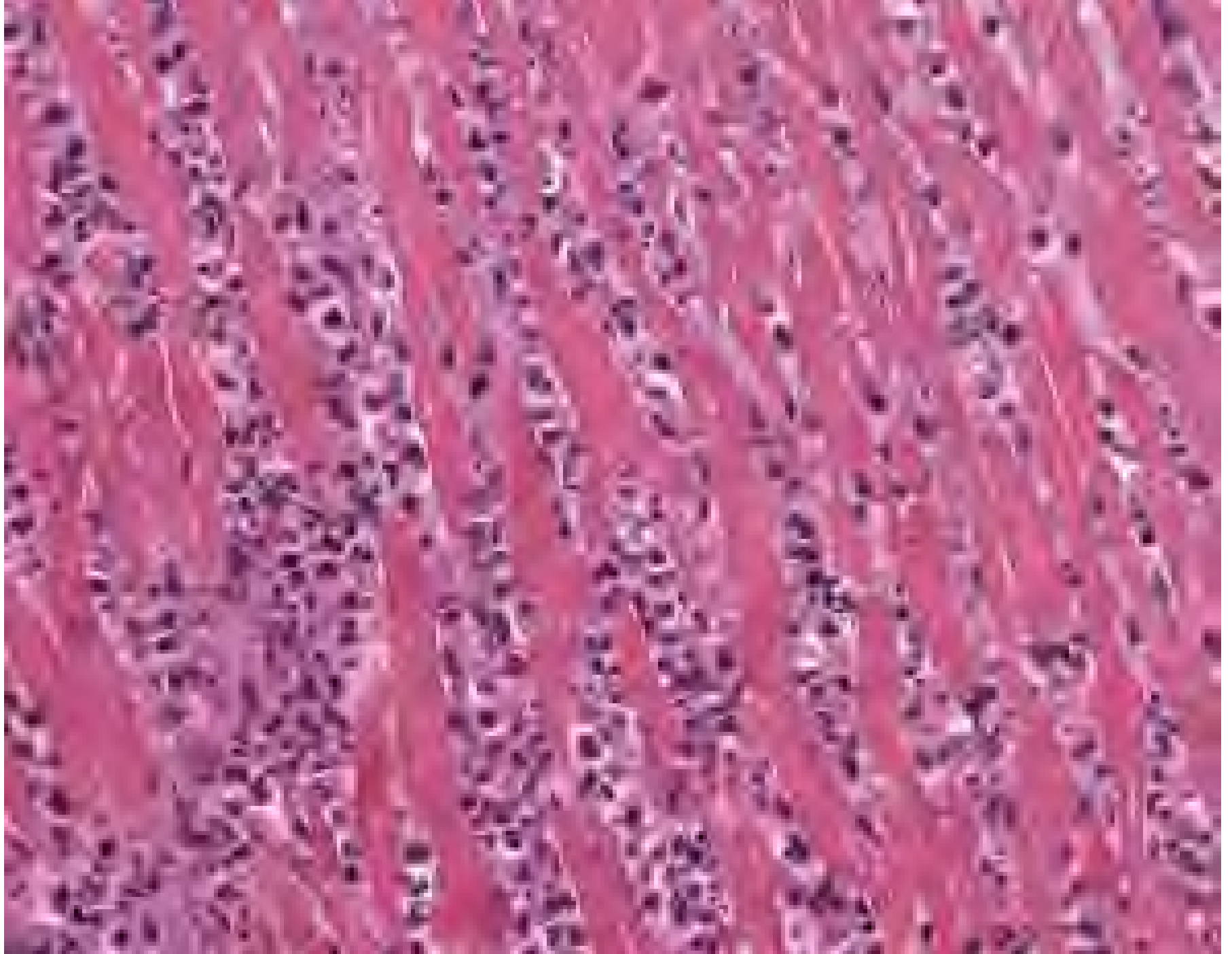


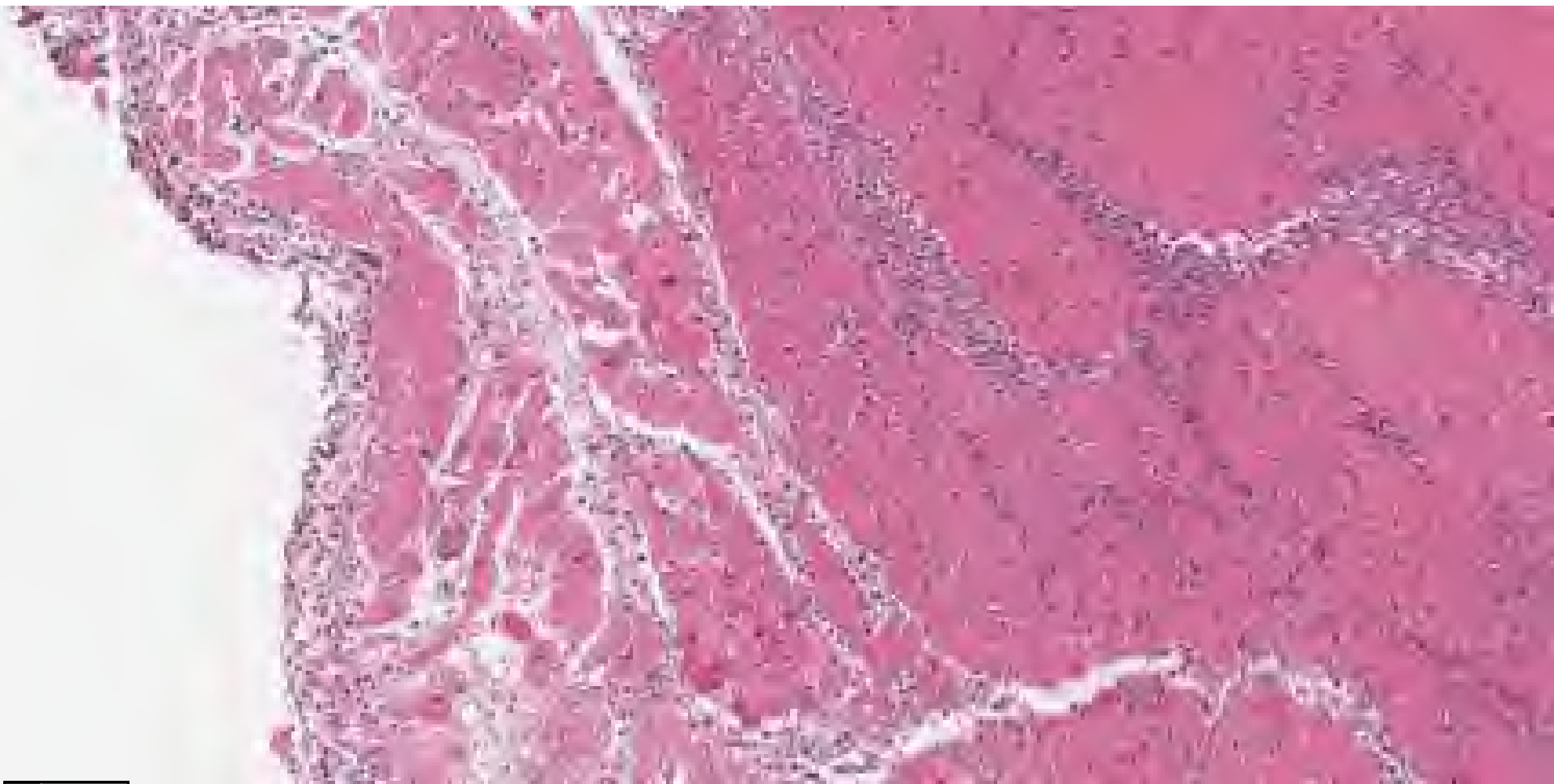
Myocardial Infarction

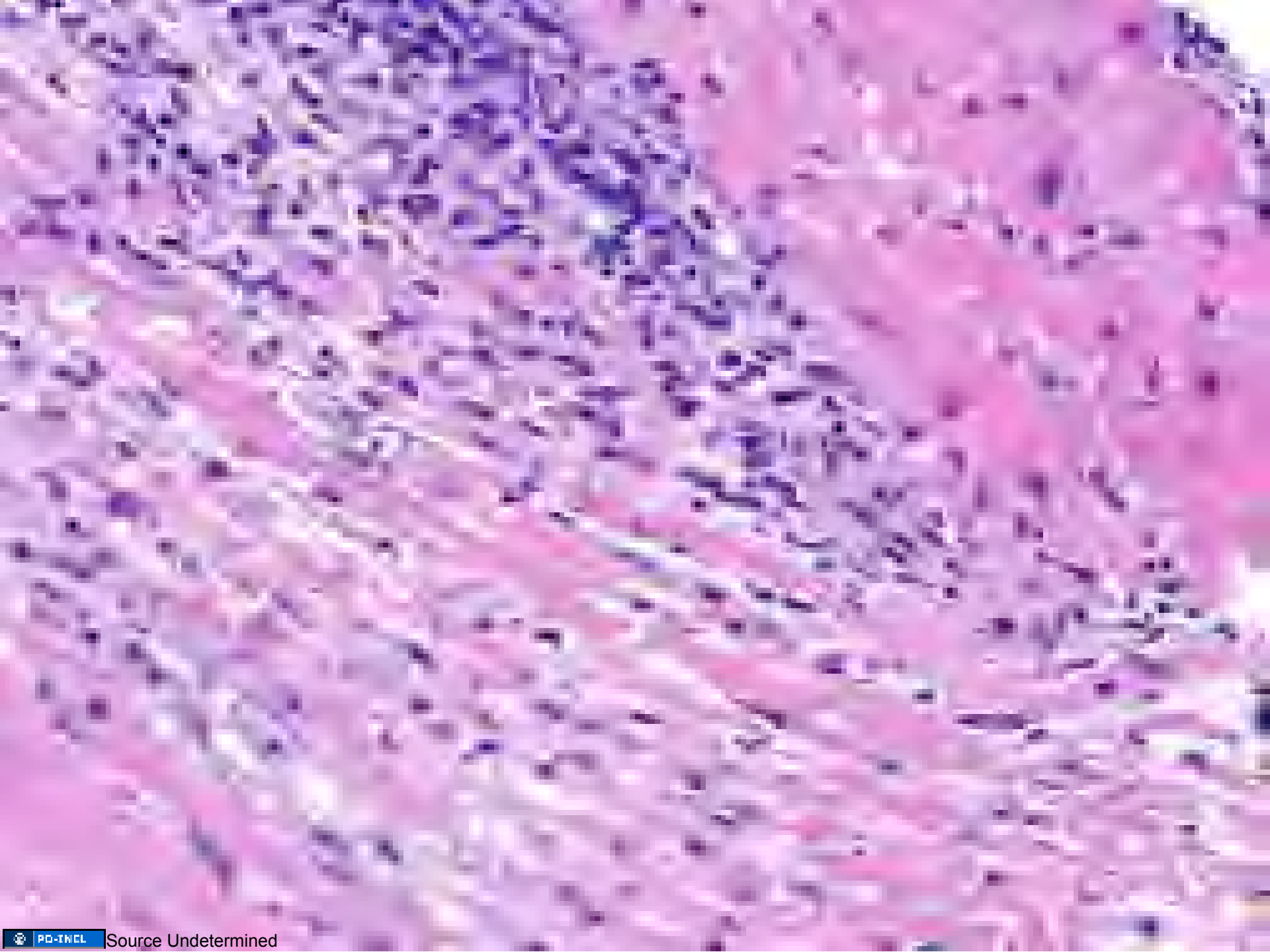












After ~ 40 minutes of ischemia myocardial cells die and membranes leak enzymes and proteins.

	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

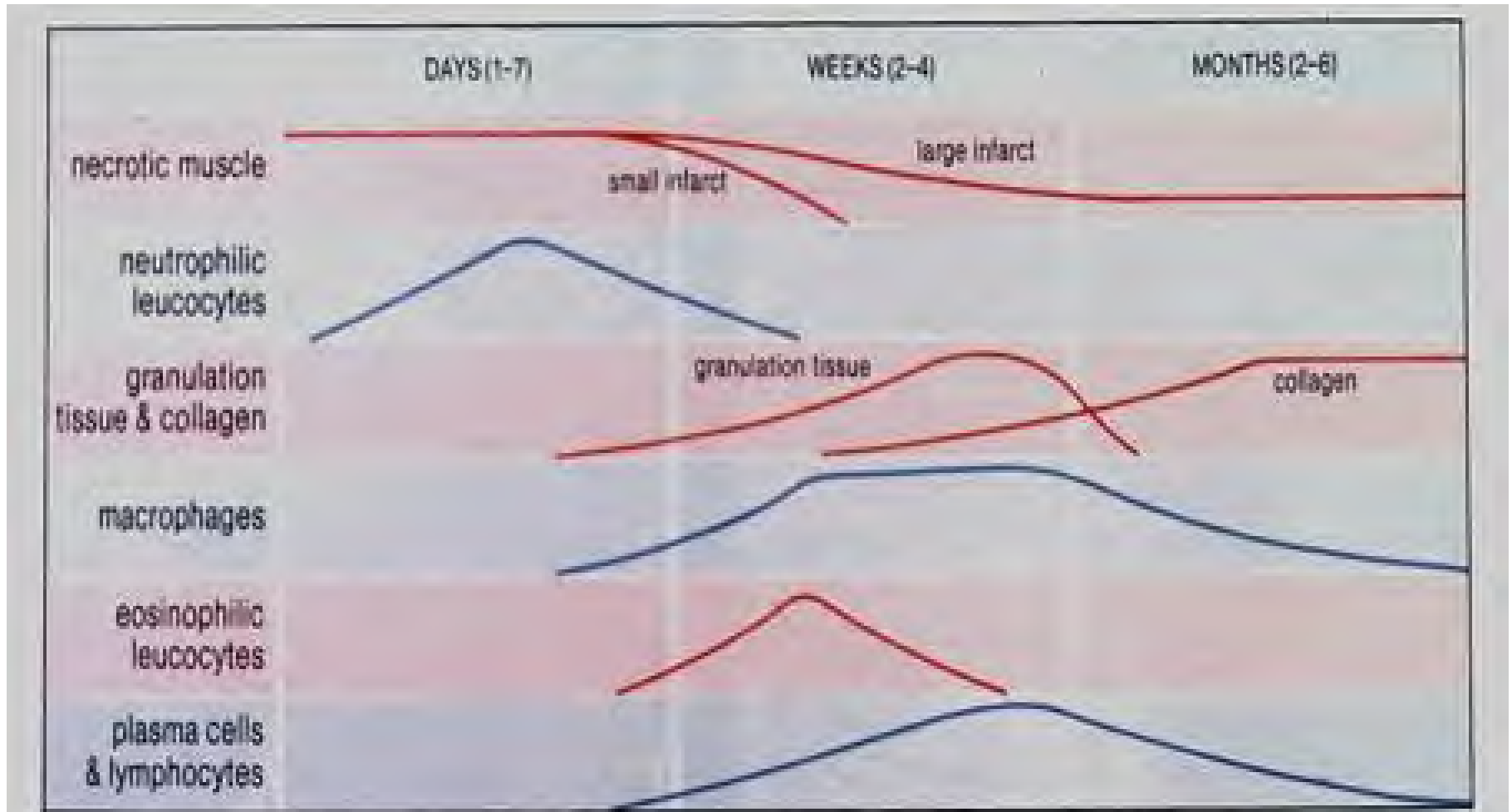
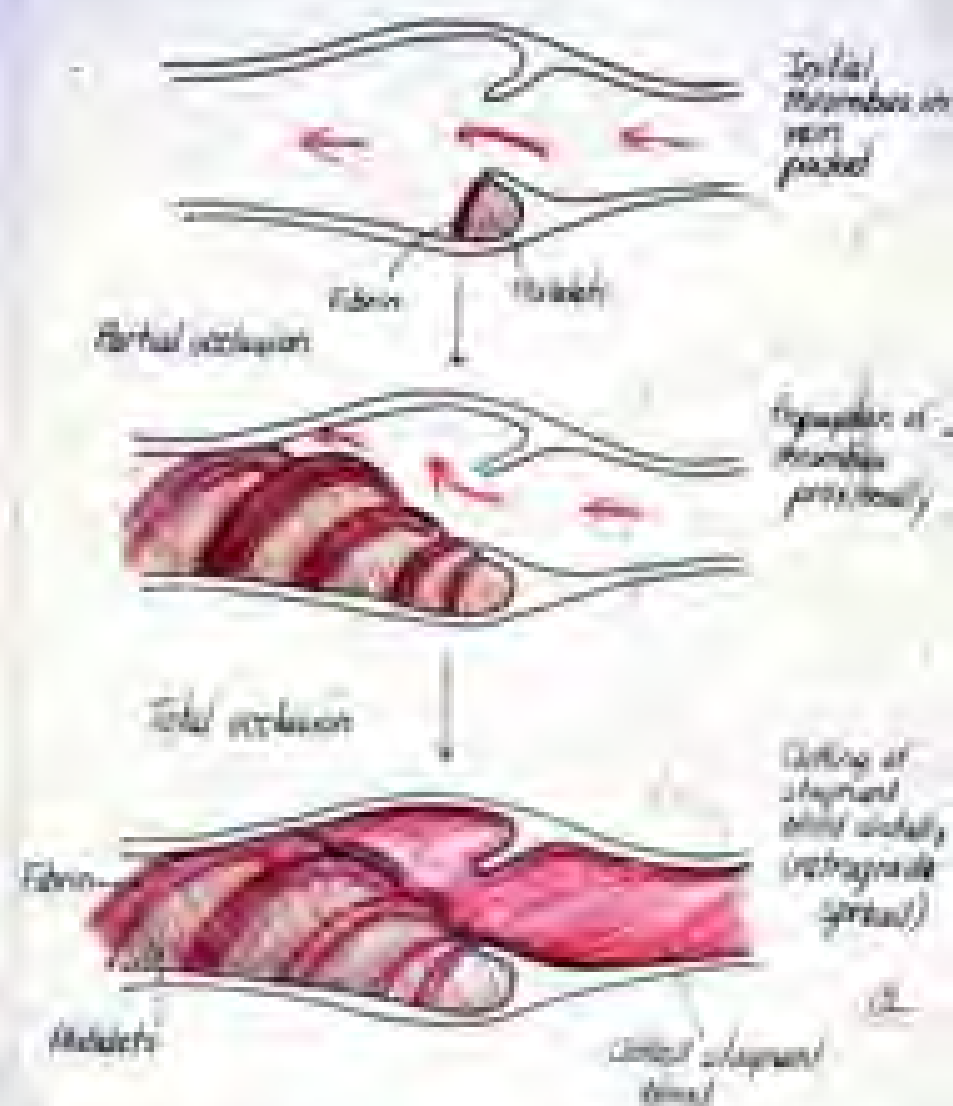


Fig. 3.49 Diagram of histology at various stages of infarct repair.

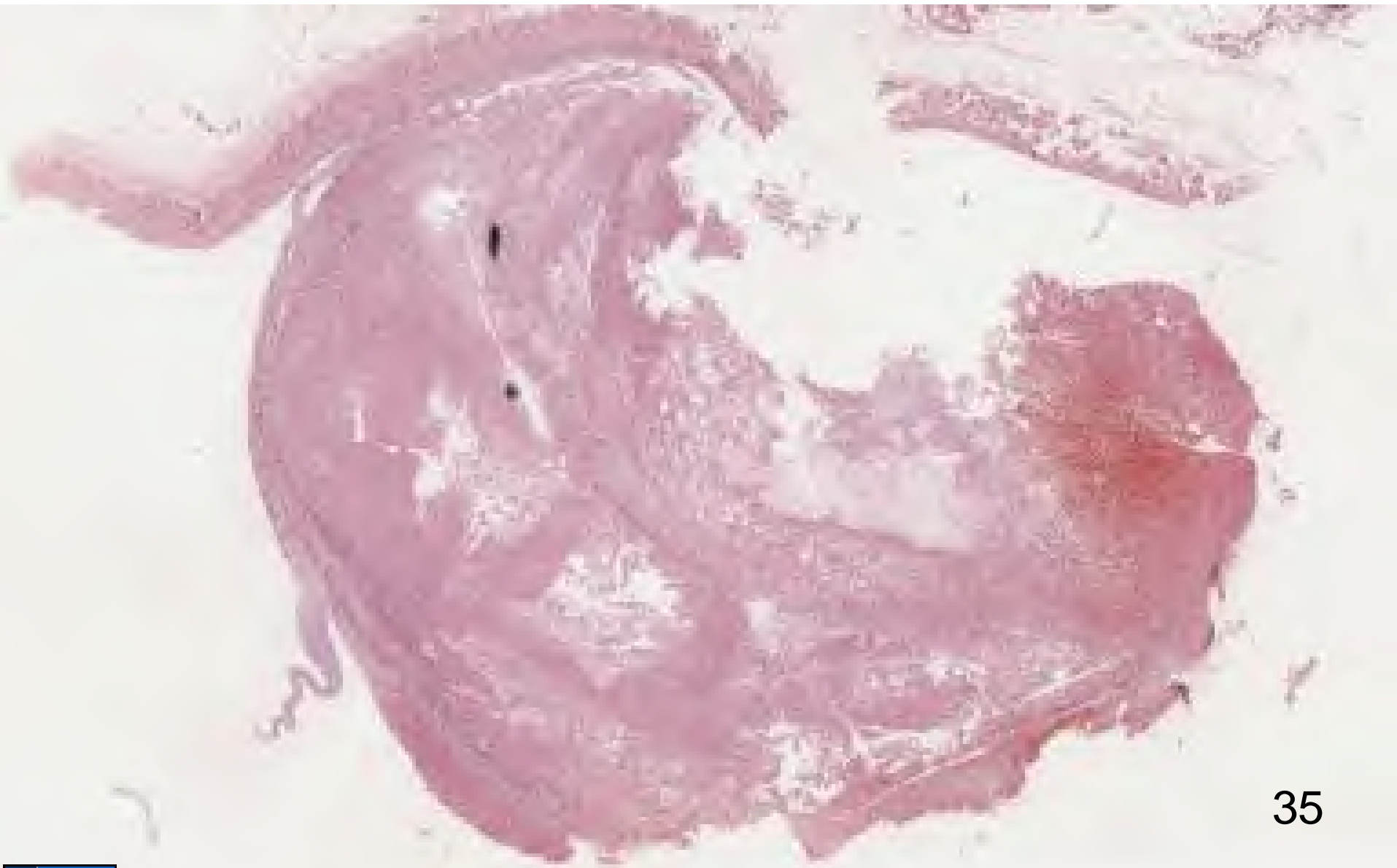
Antemortem Thrombus/Embolus



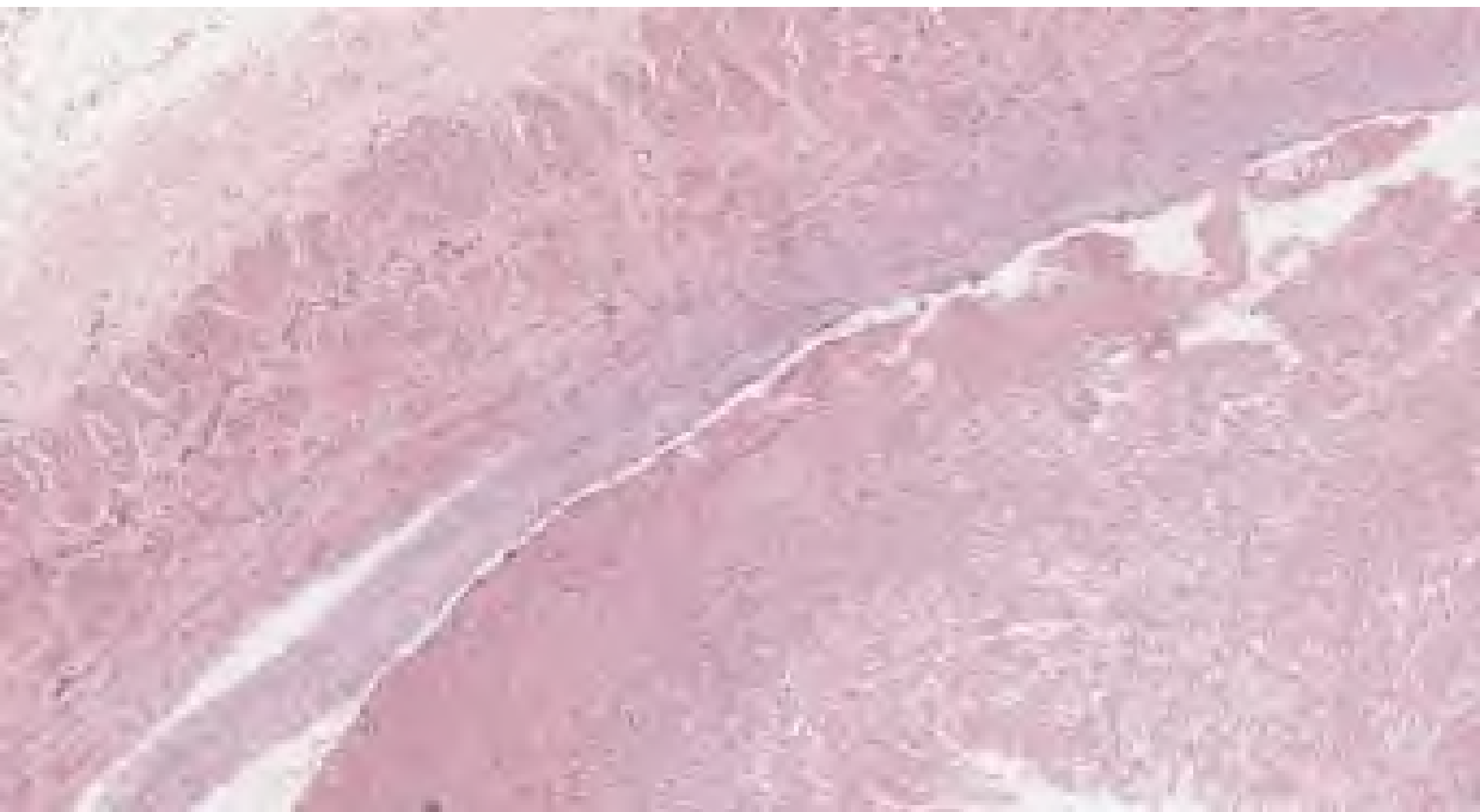
The Stages of Venous Thrombosis

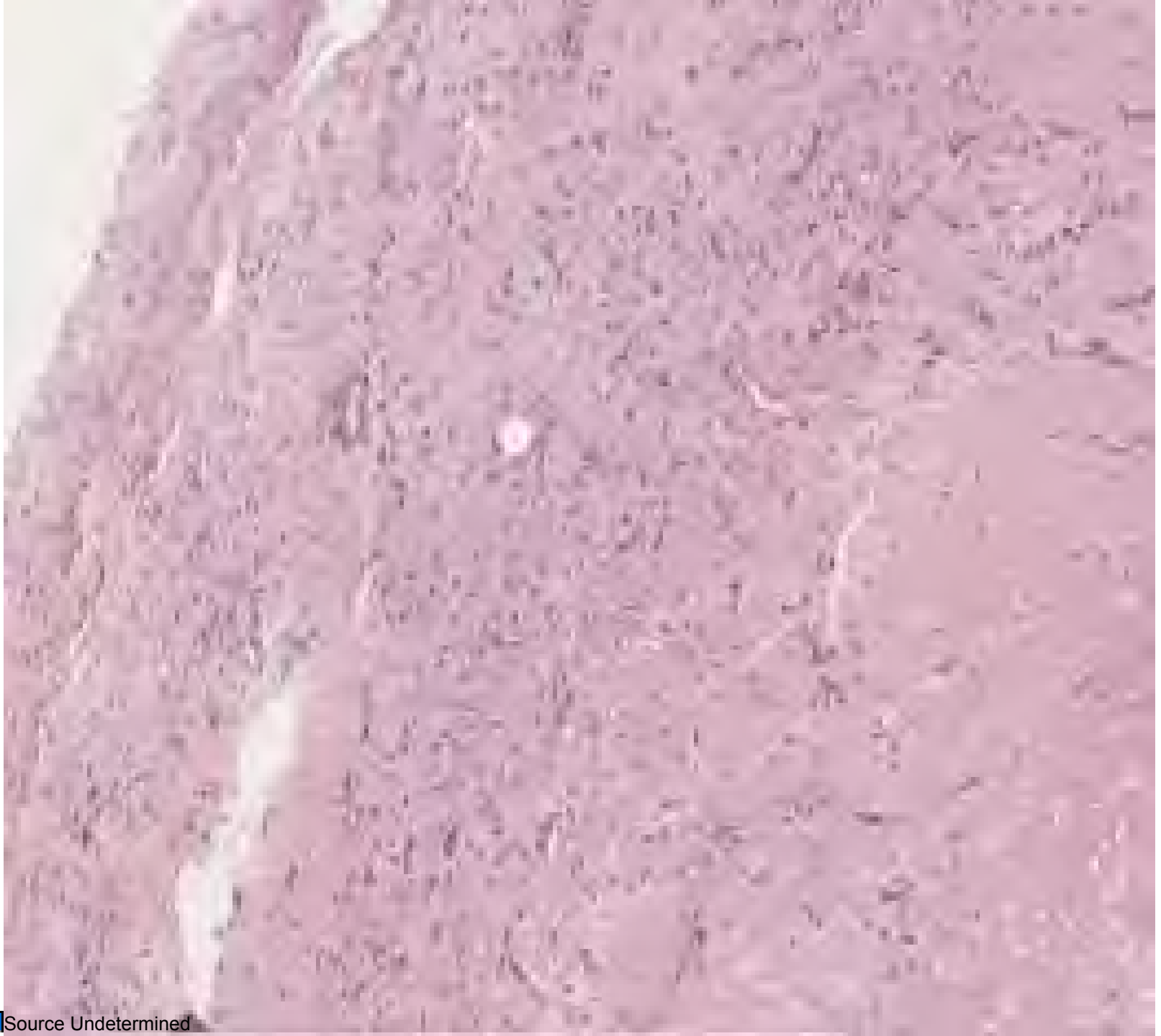


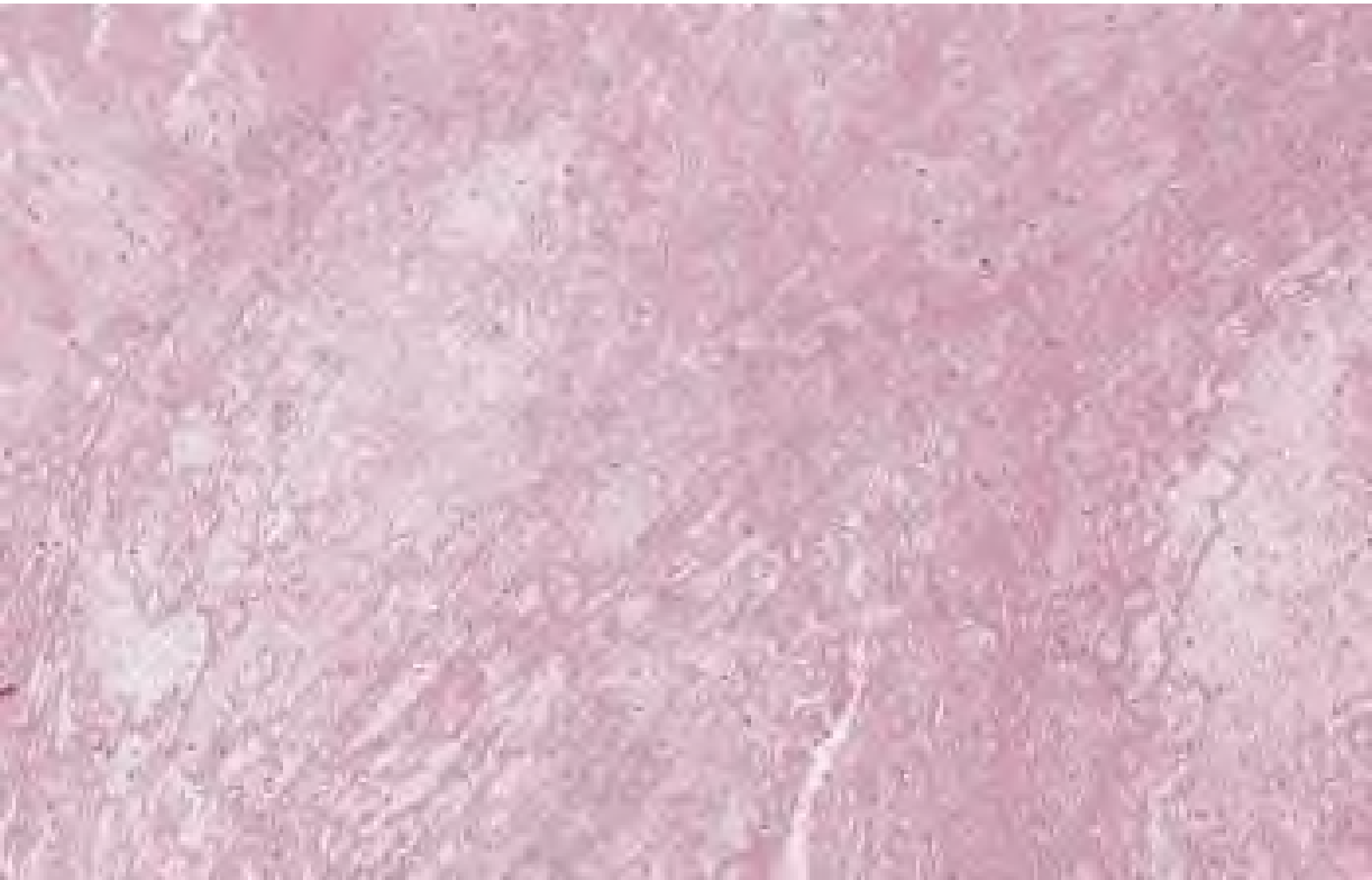
Thrombus in IVC

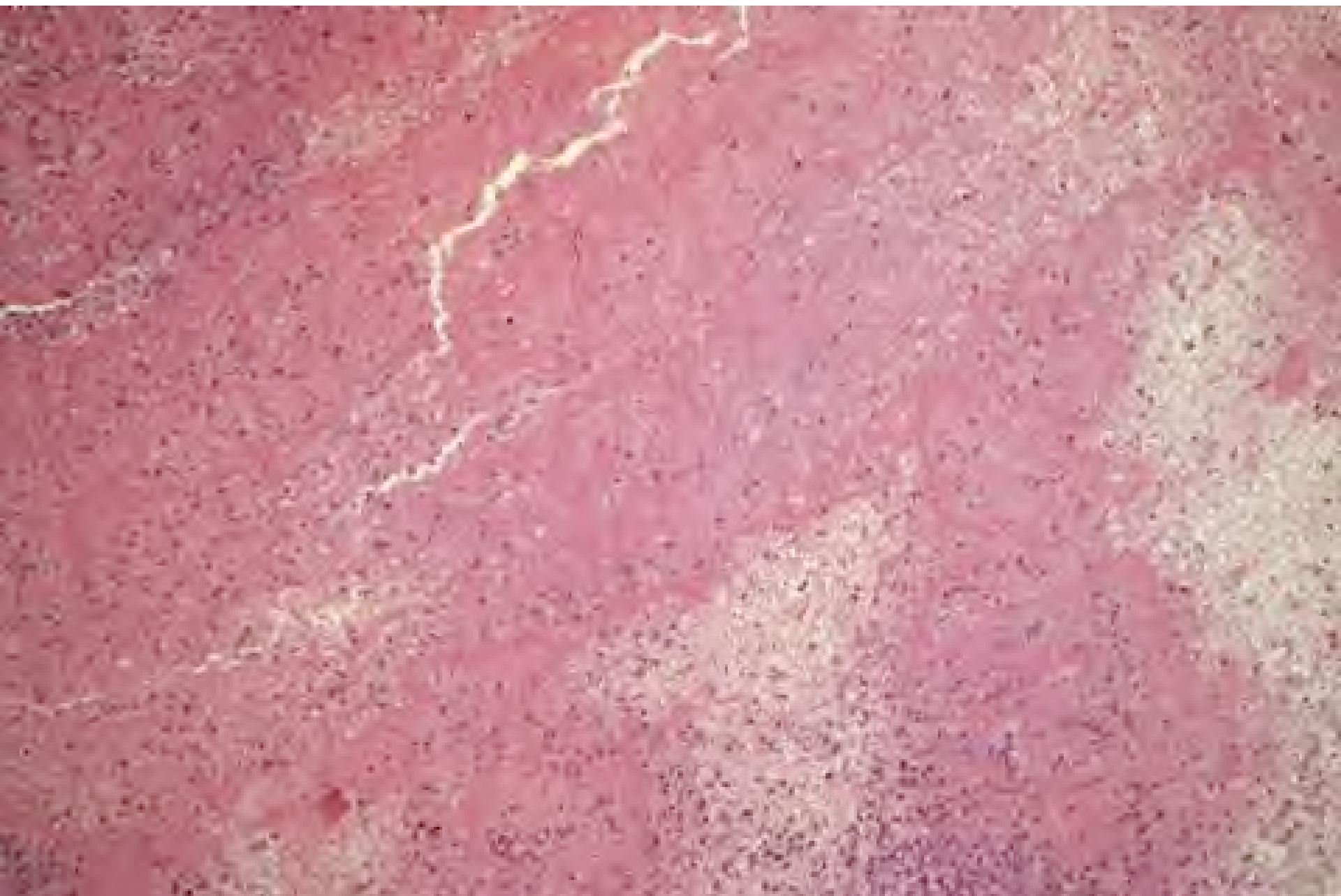


35

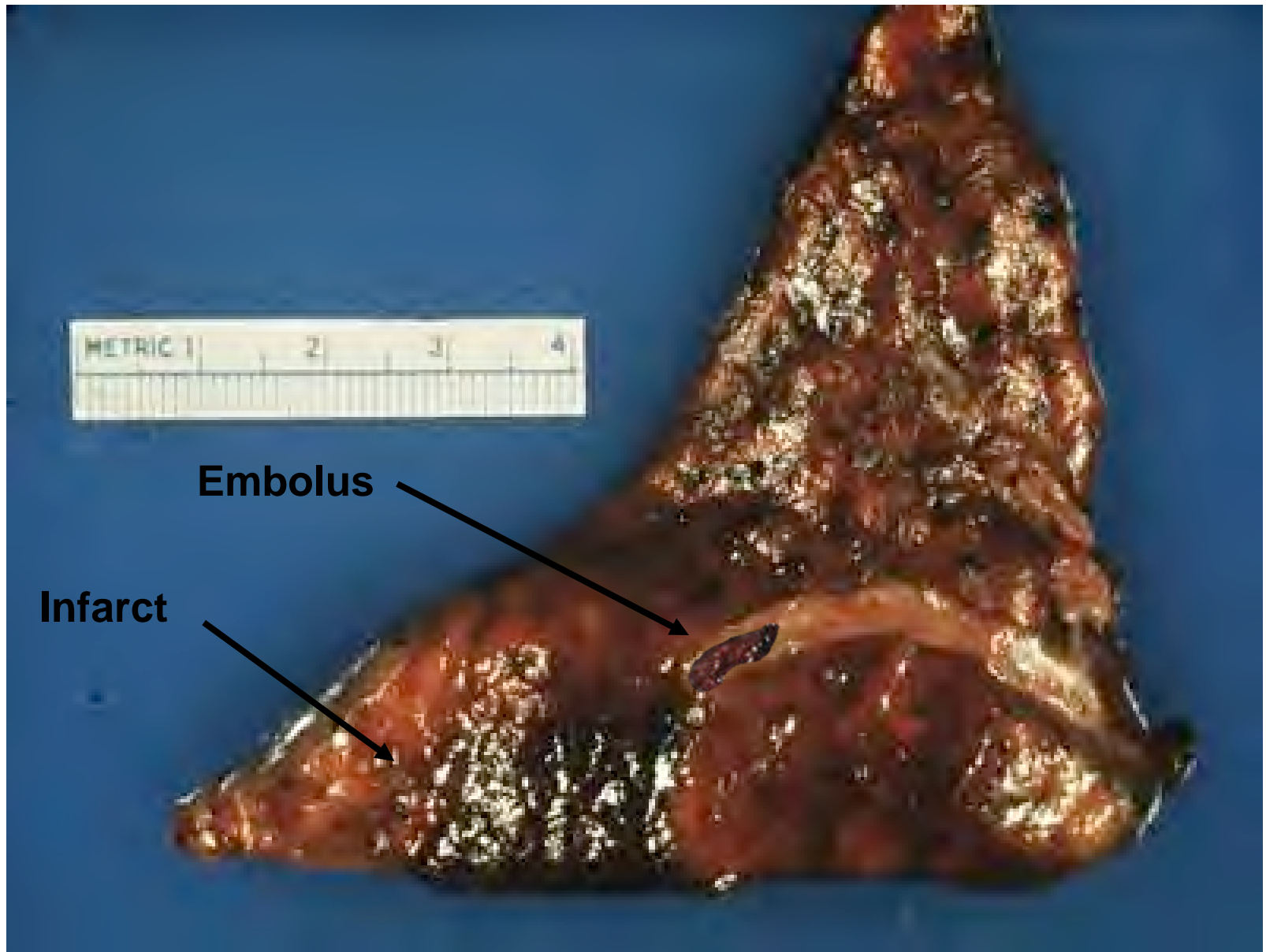


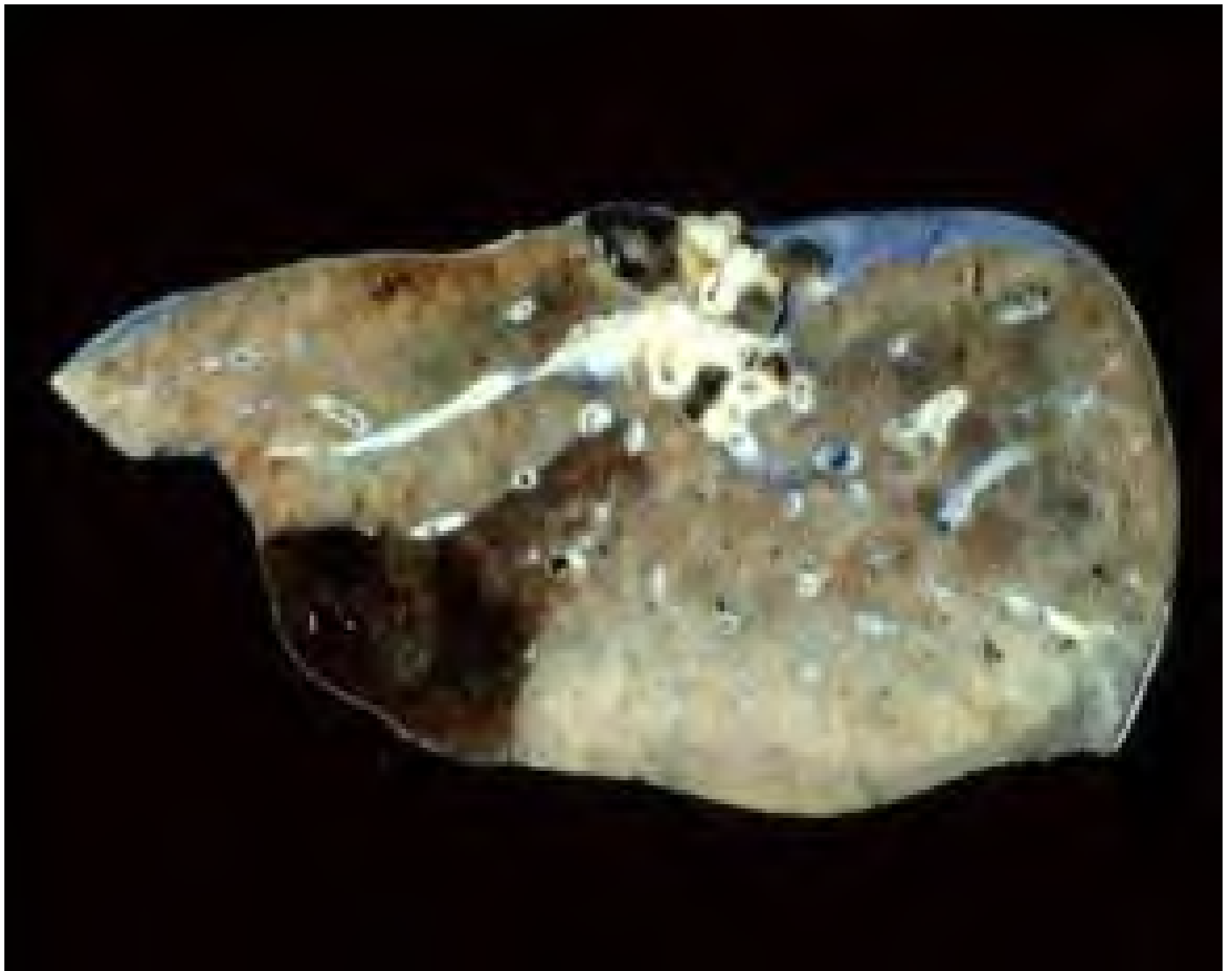




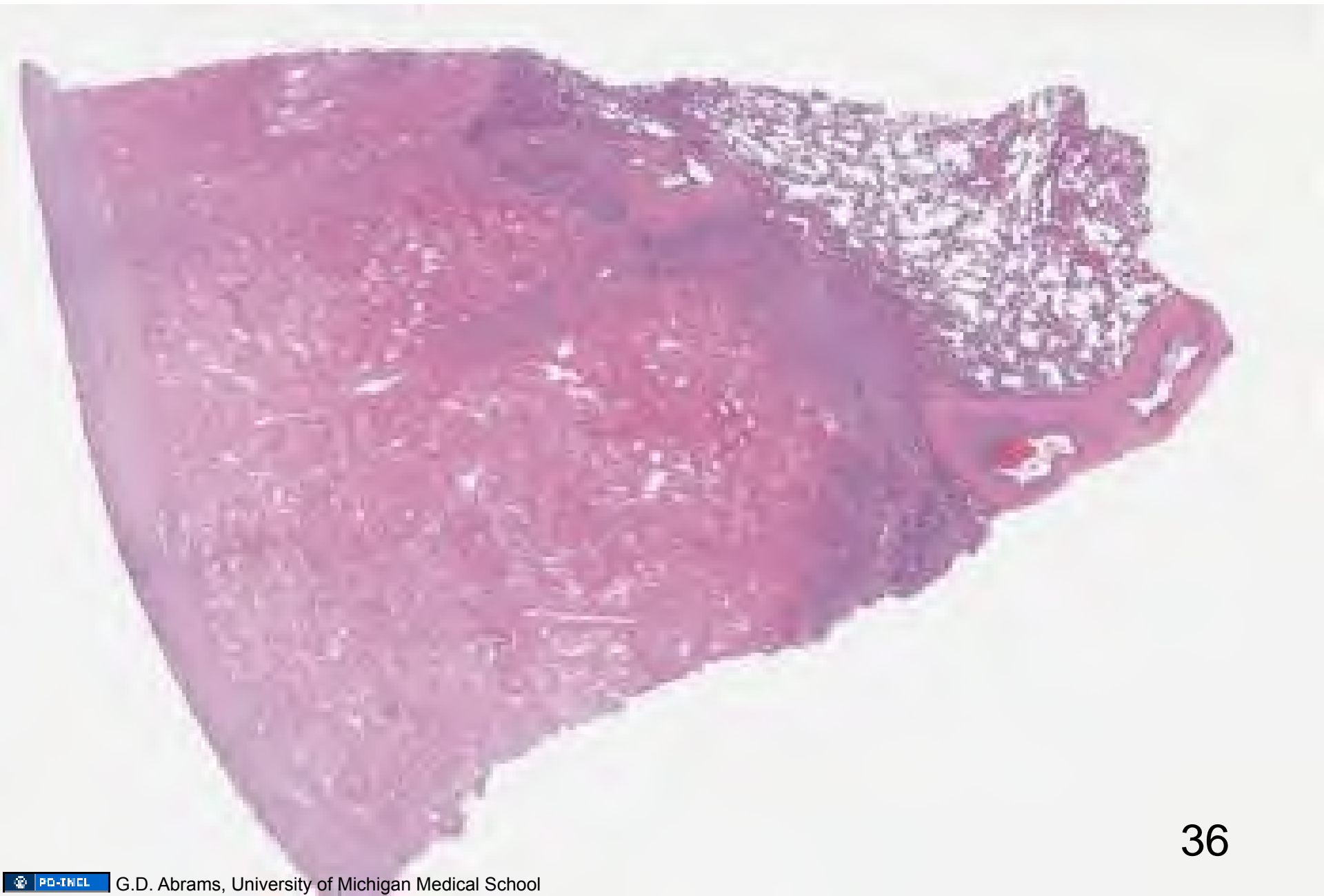


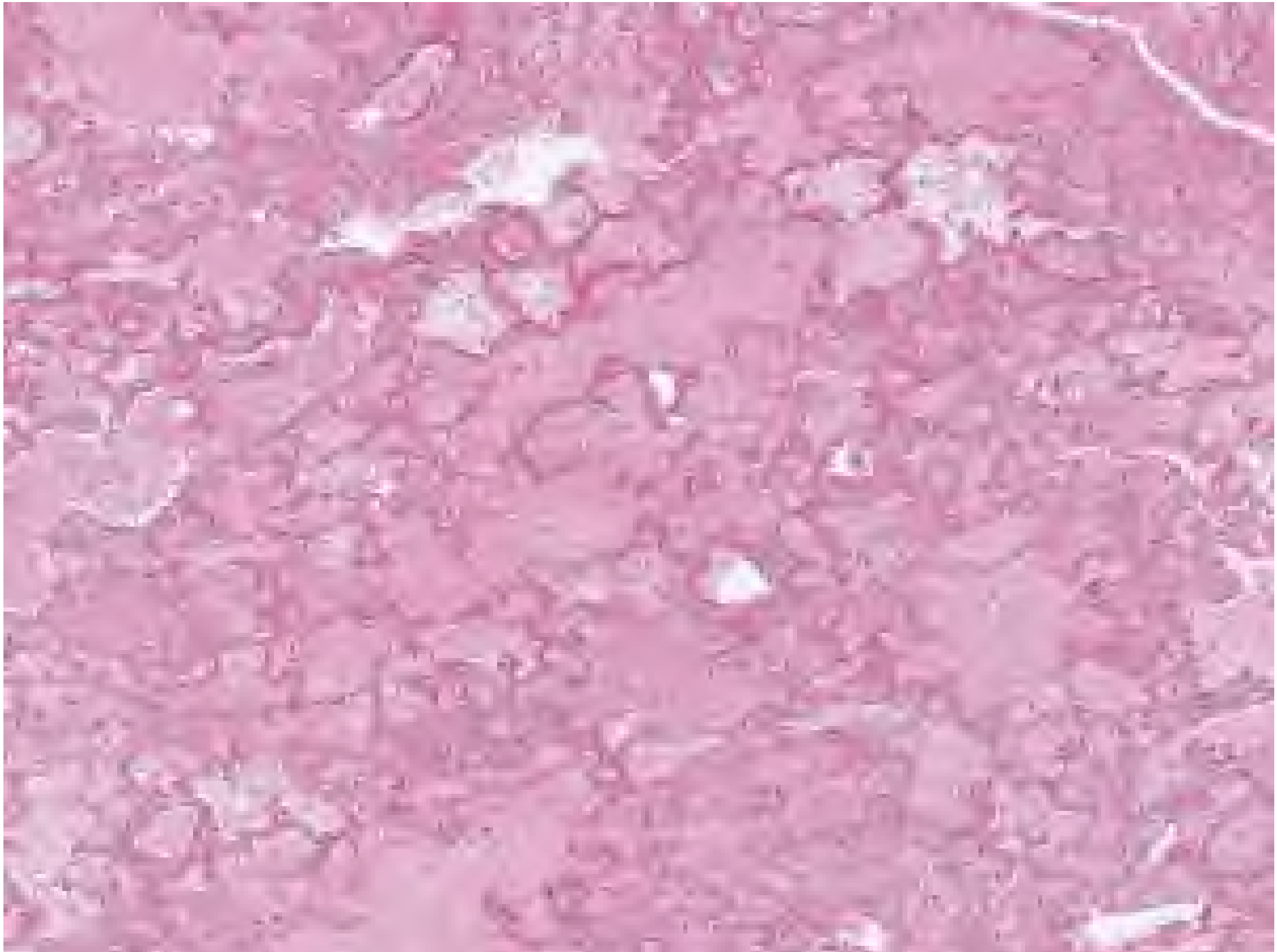
Pulmonary Infarct

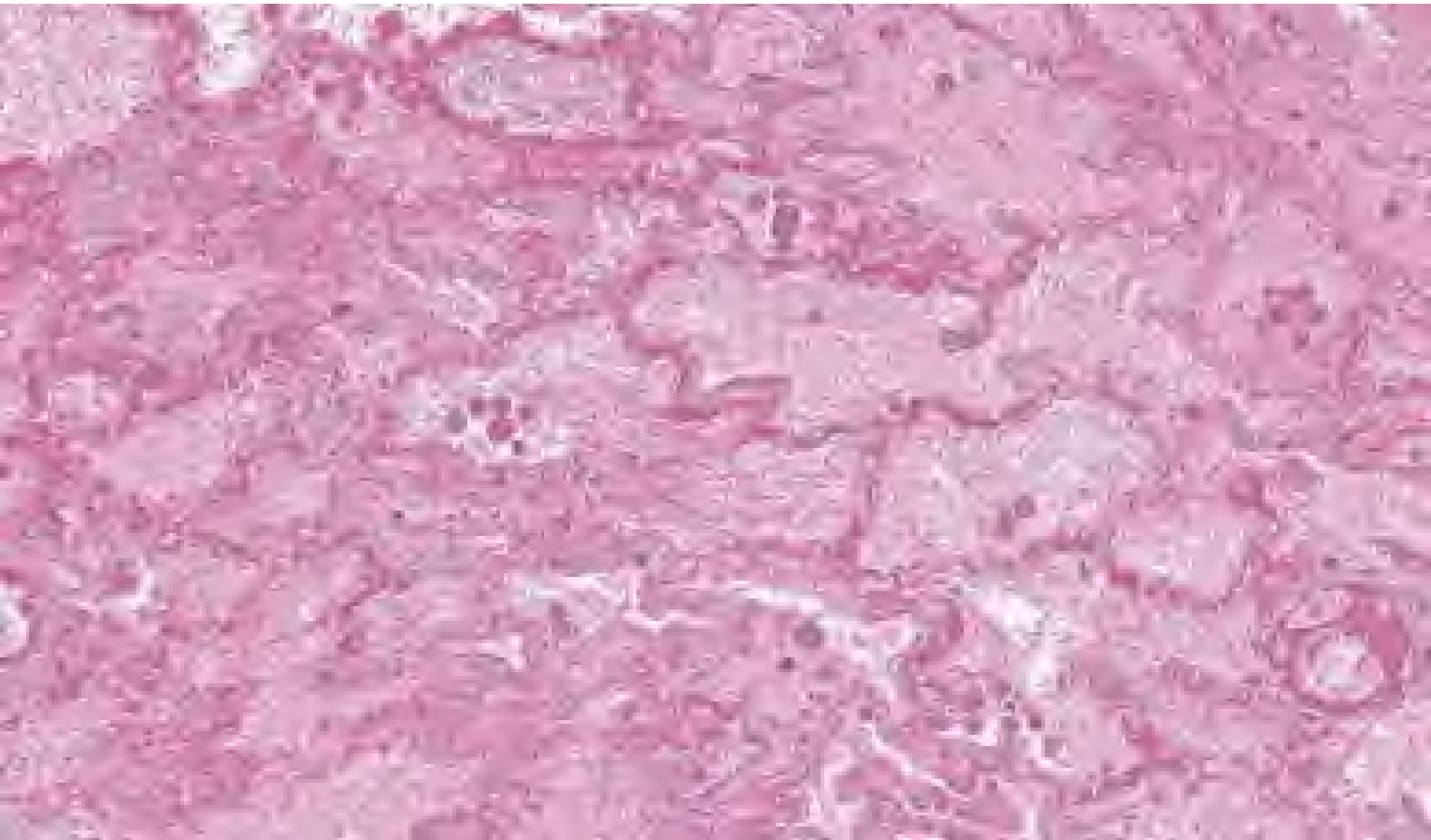


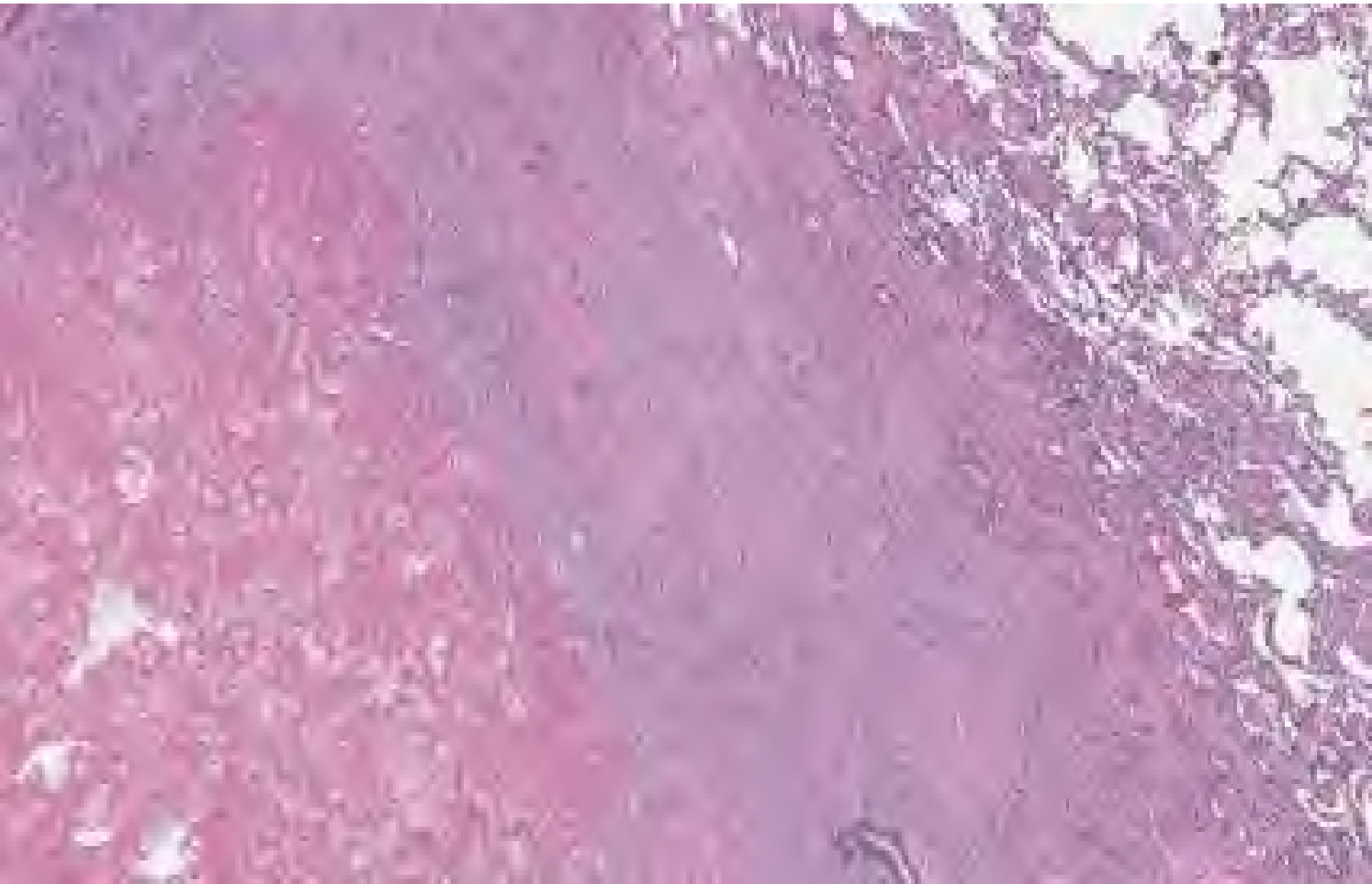


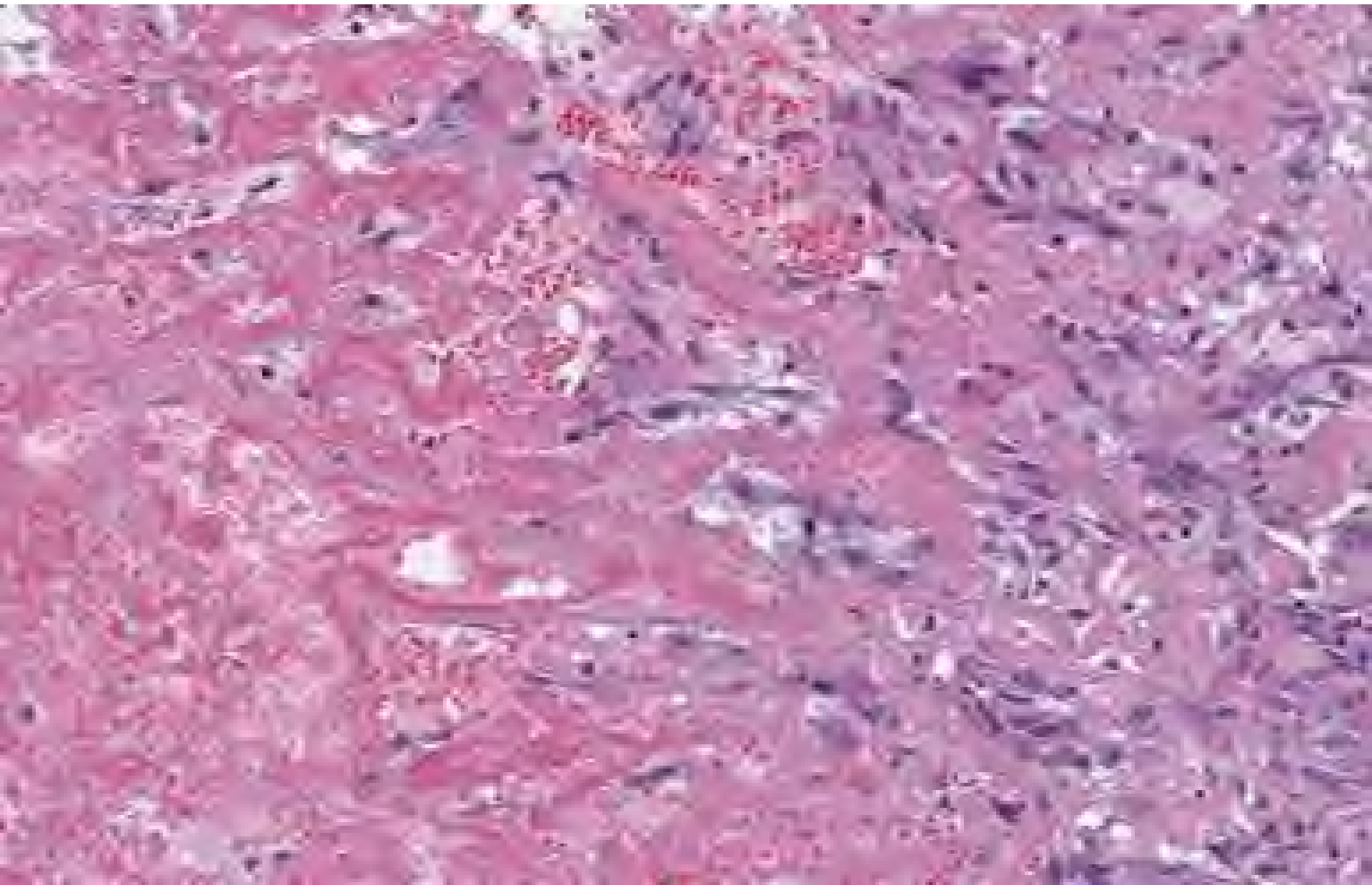
Pulmonary Infarct

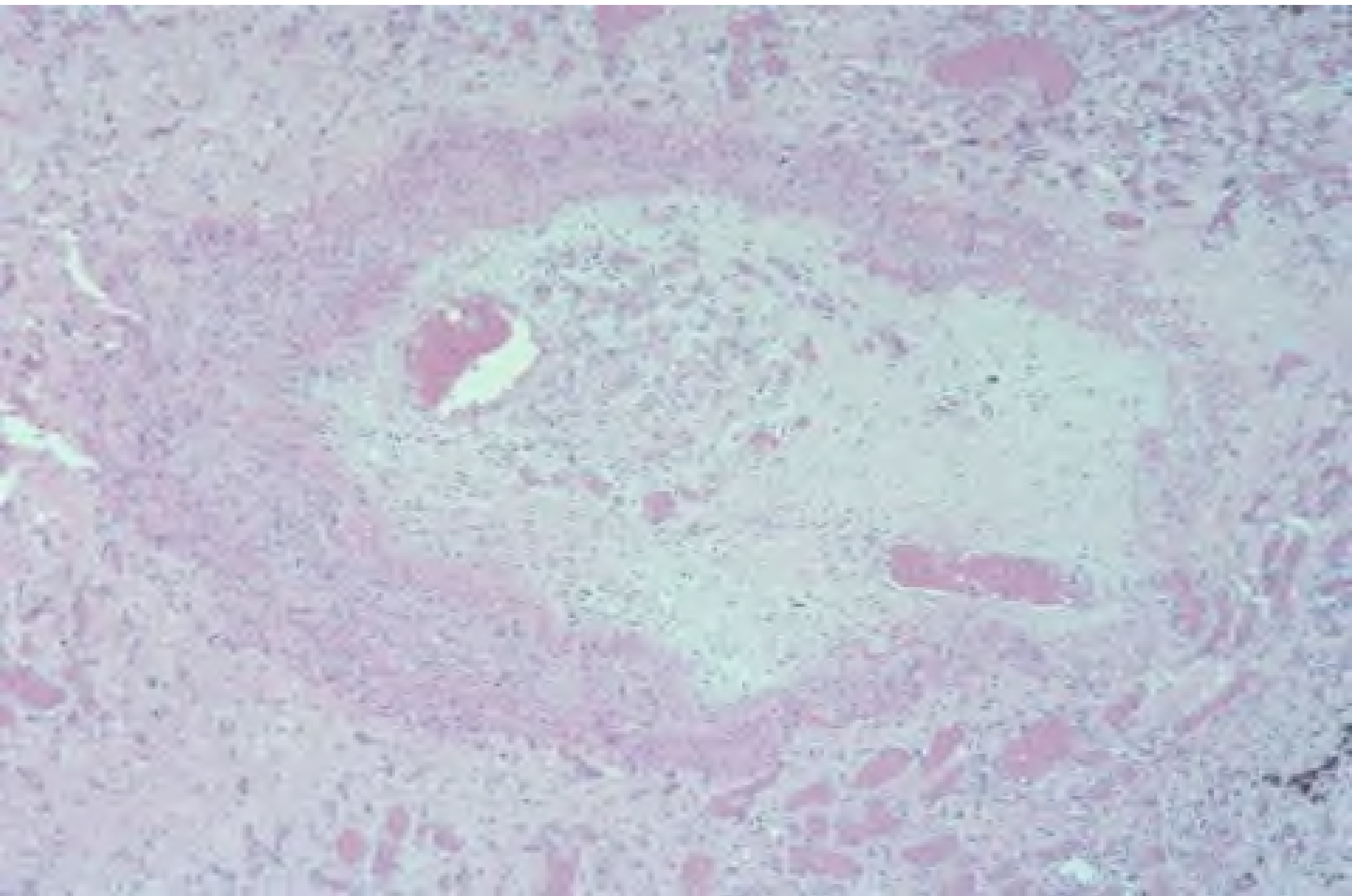








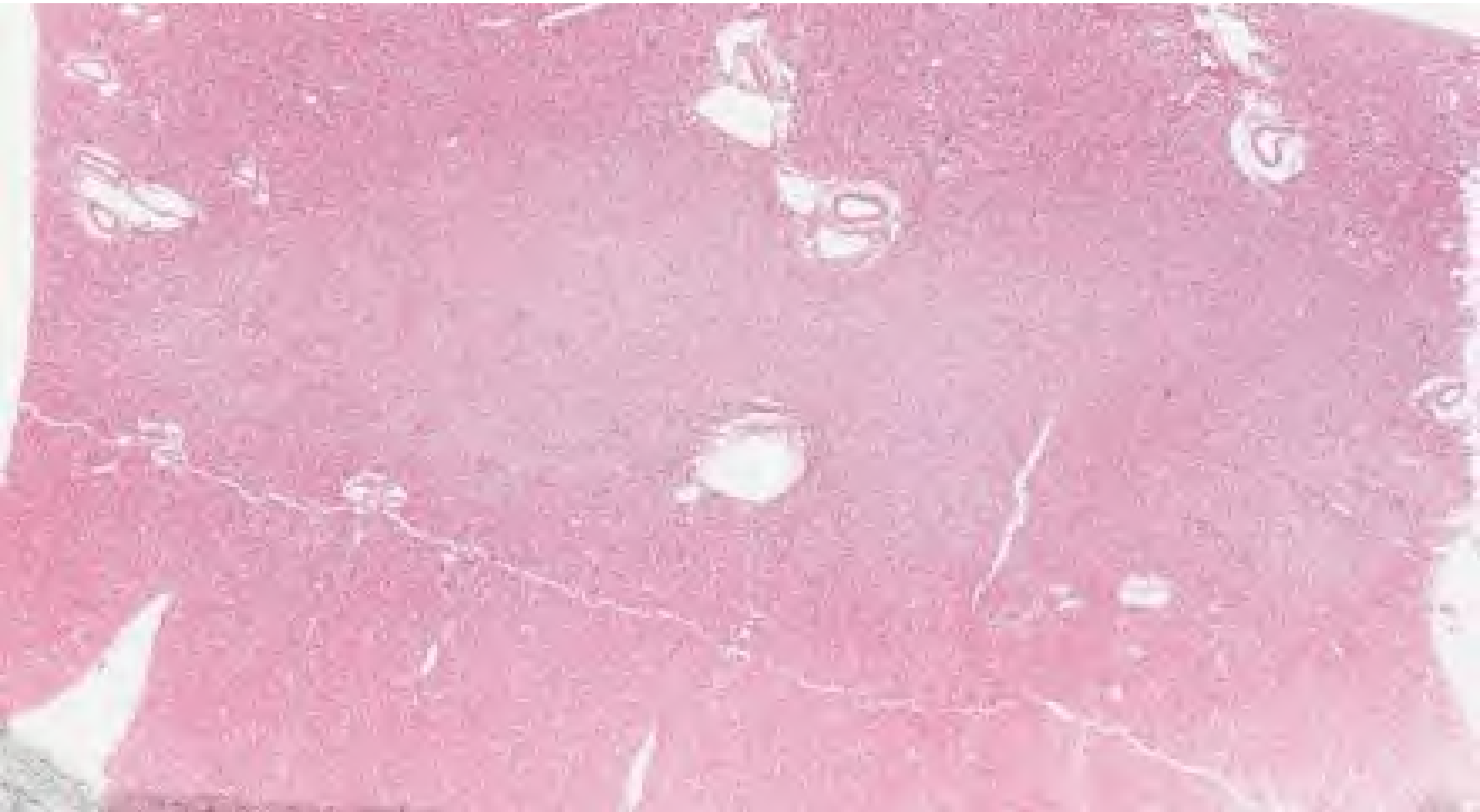


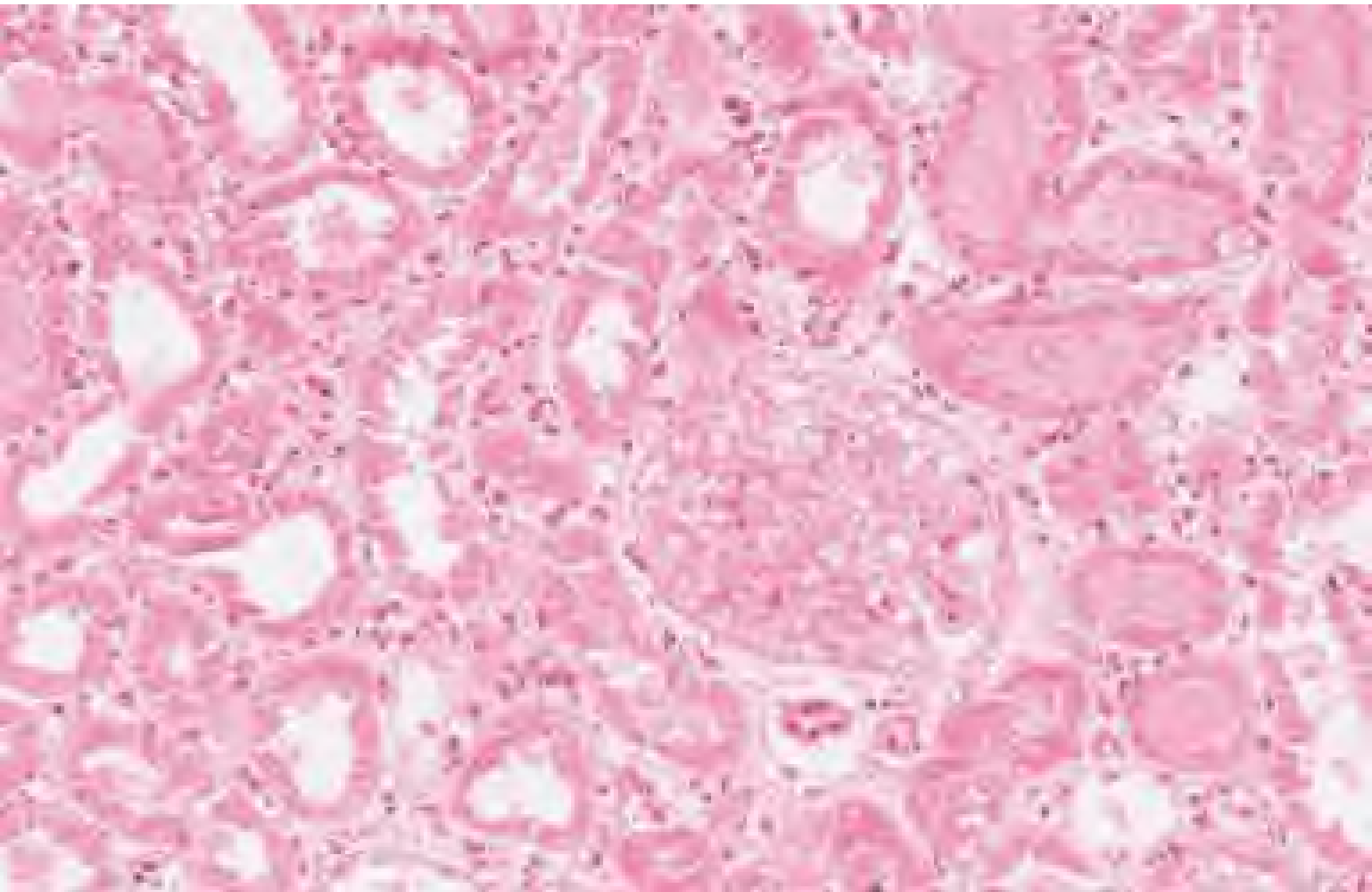


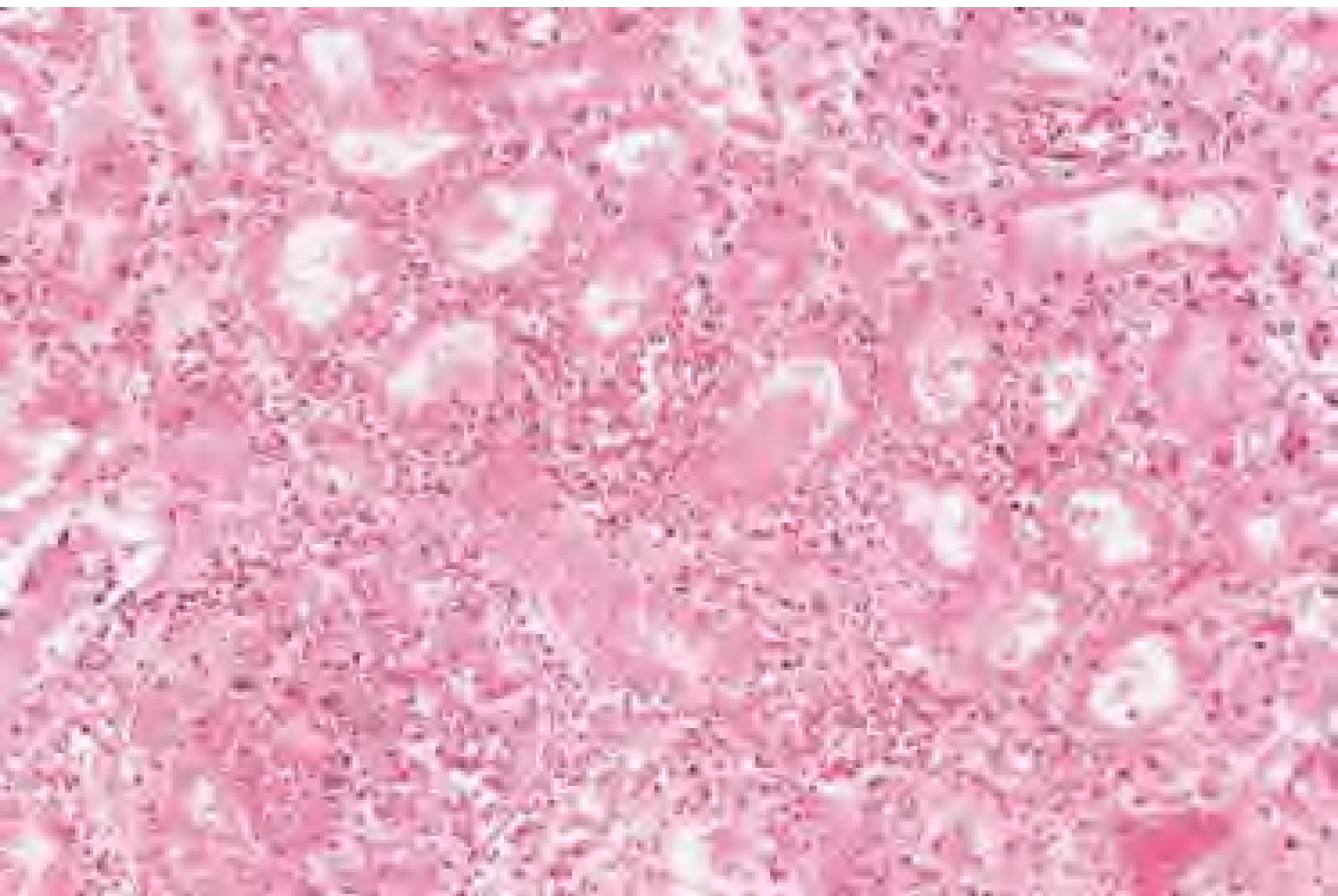
Renal Infarct

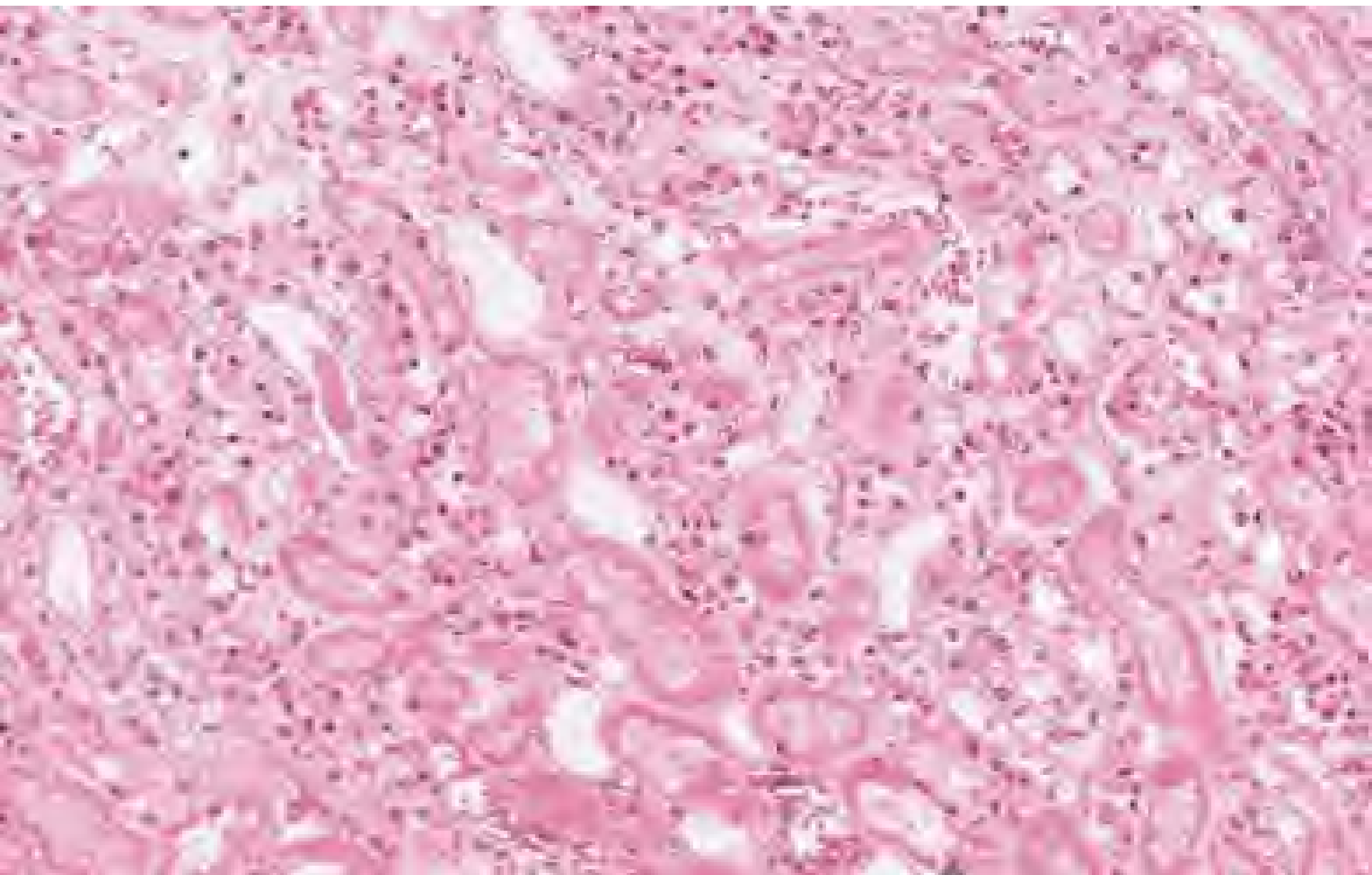


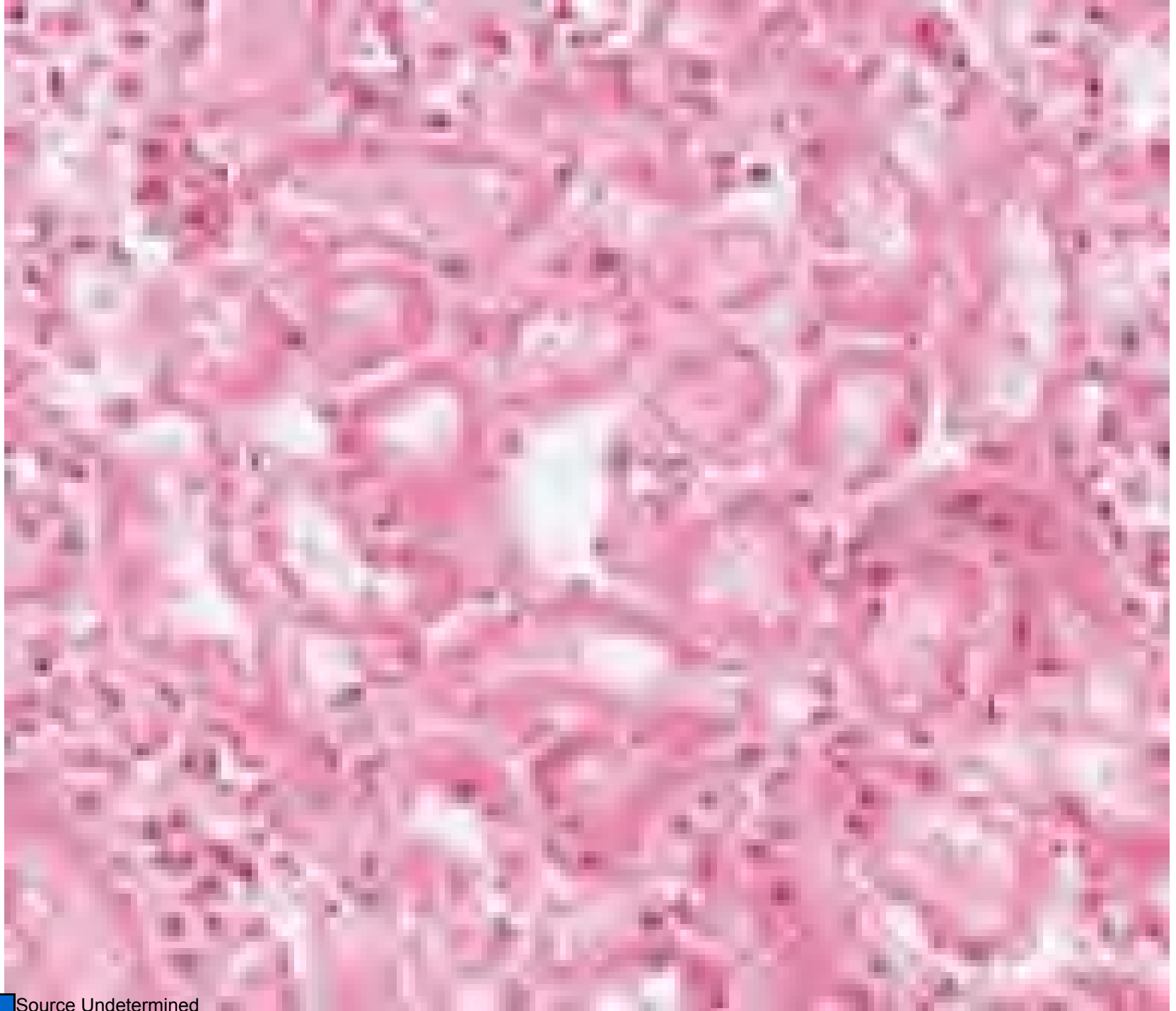
Renal Infarct

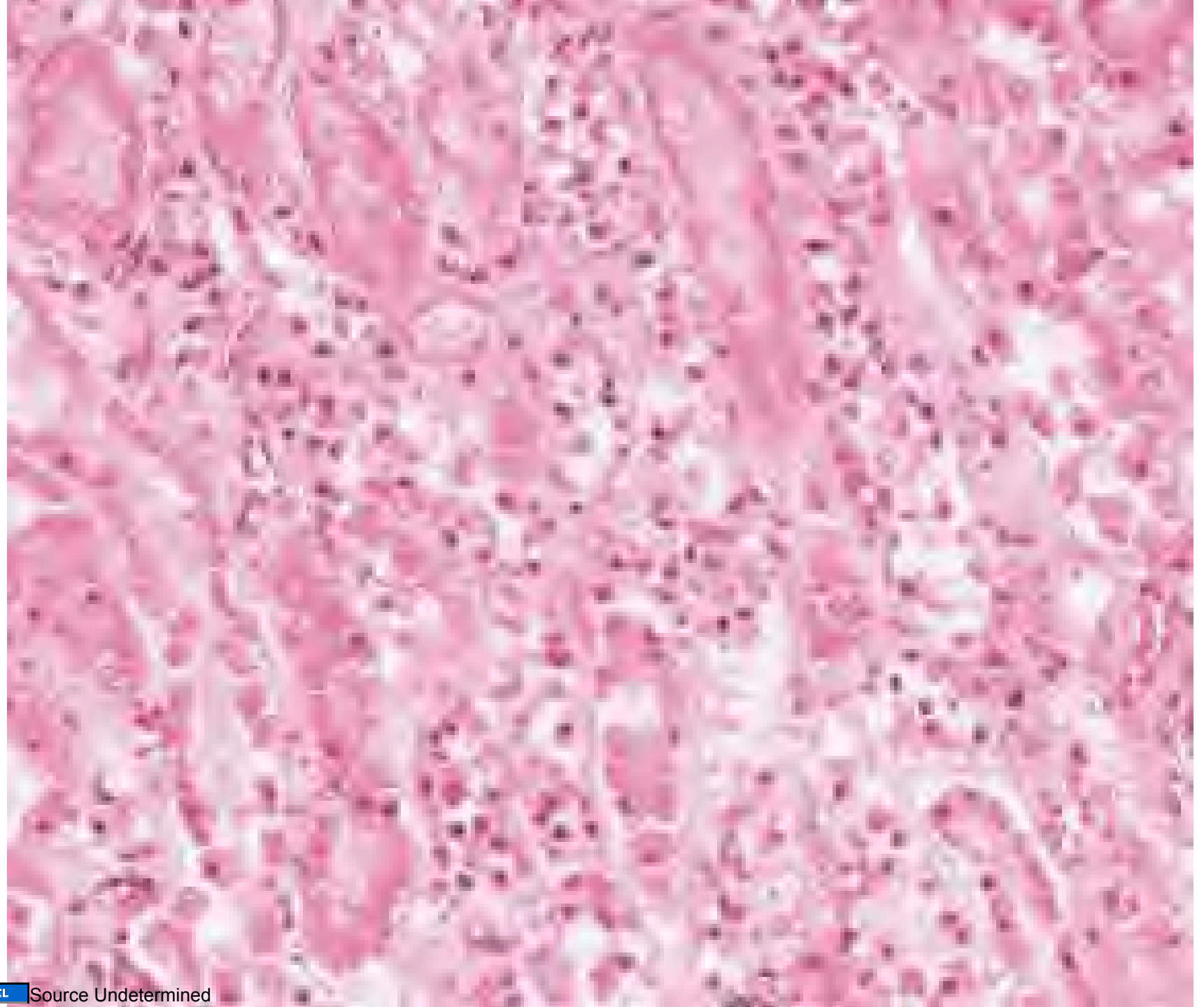


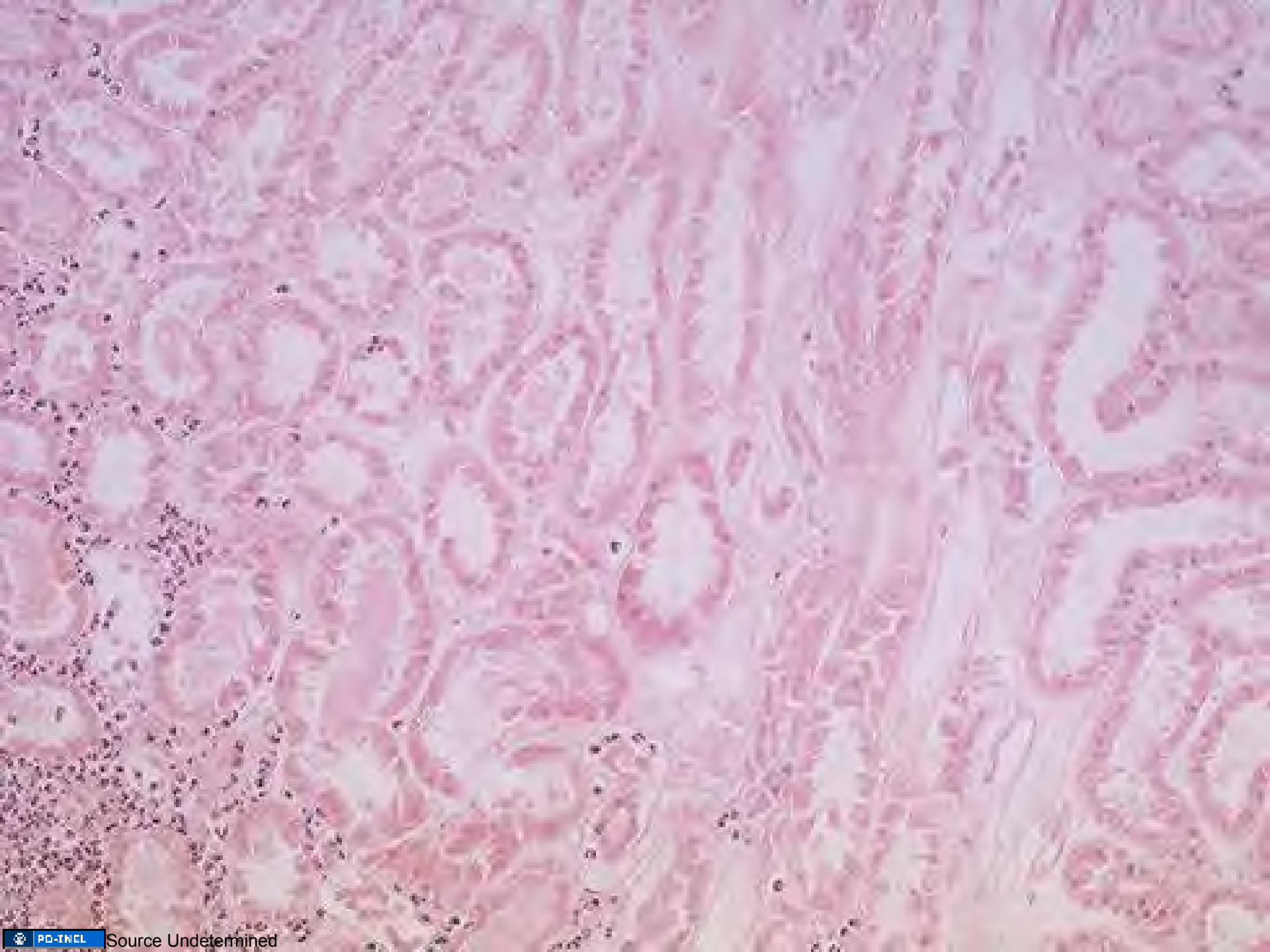


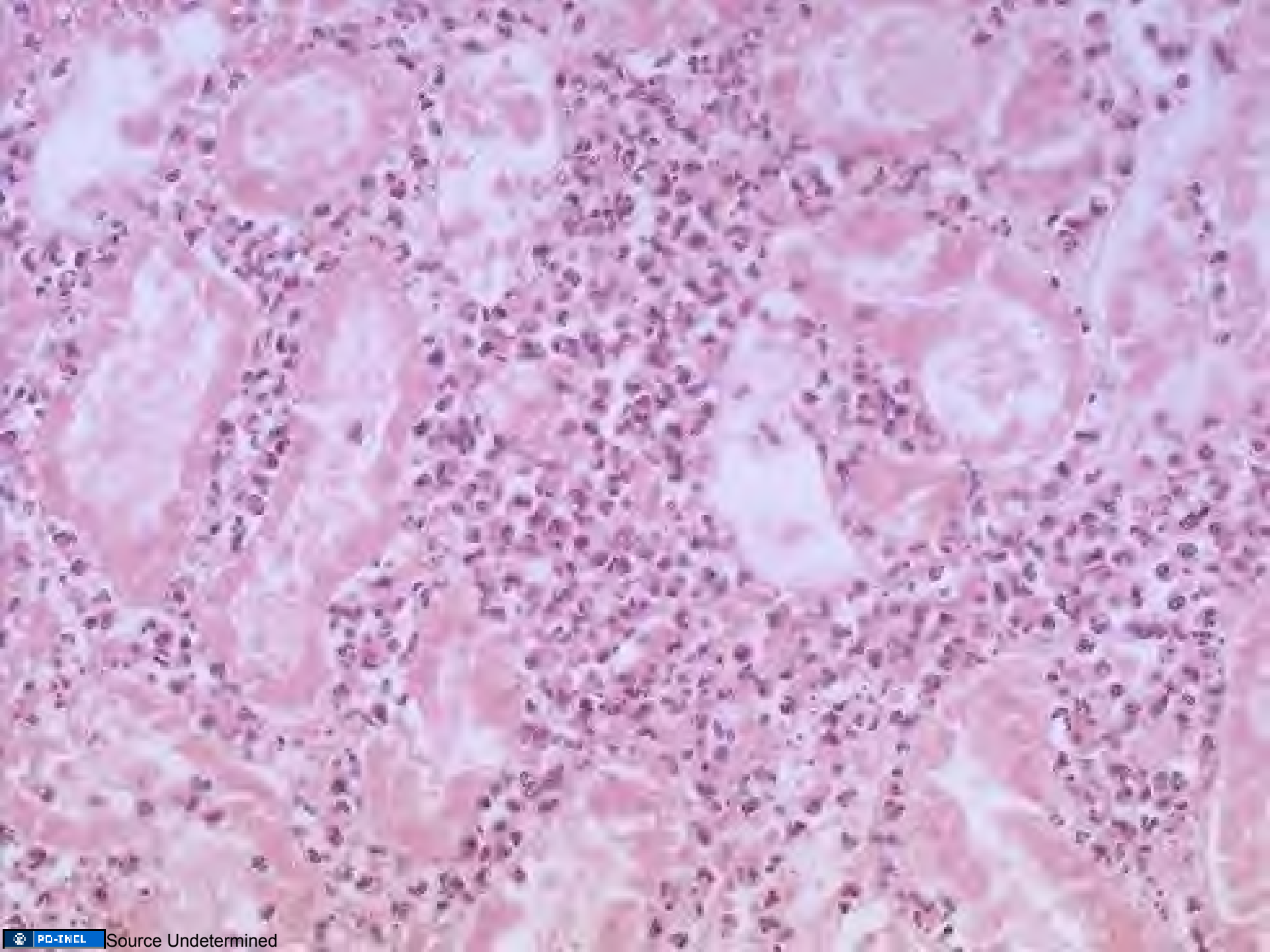








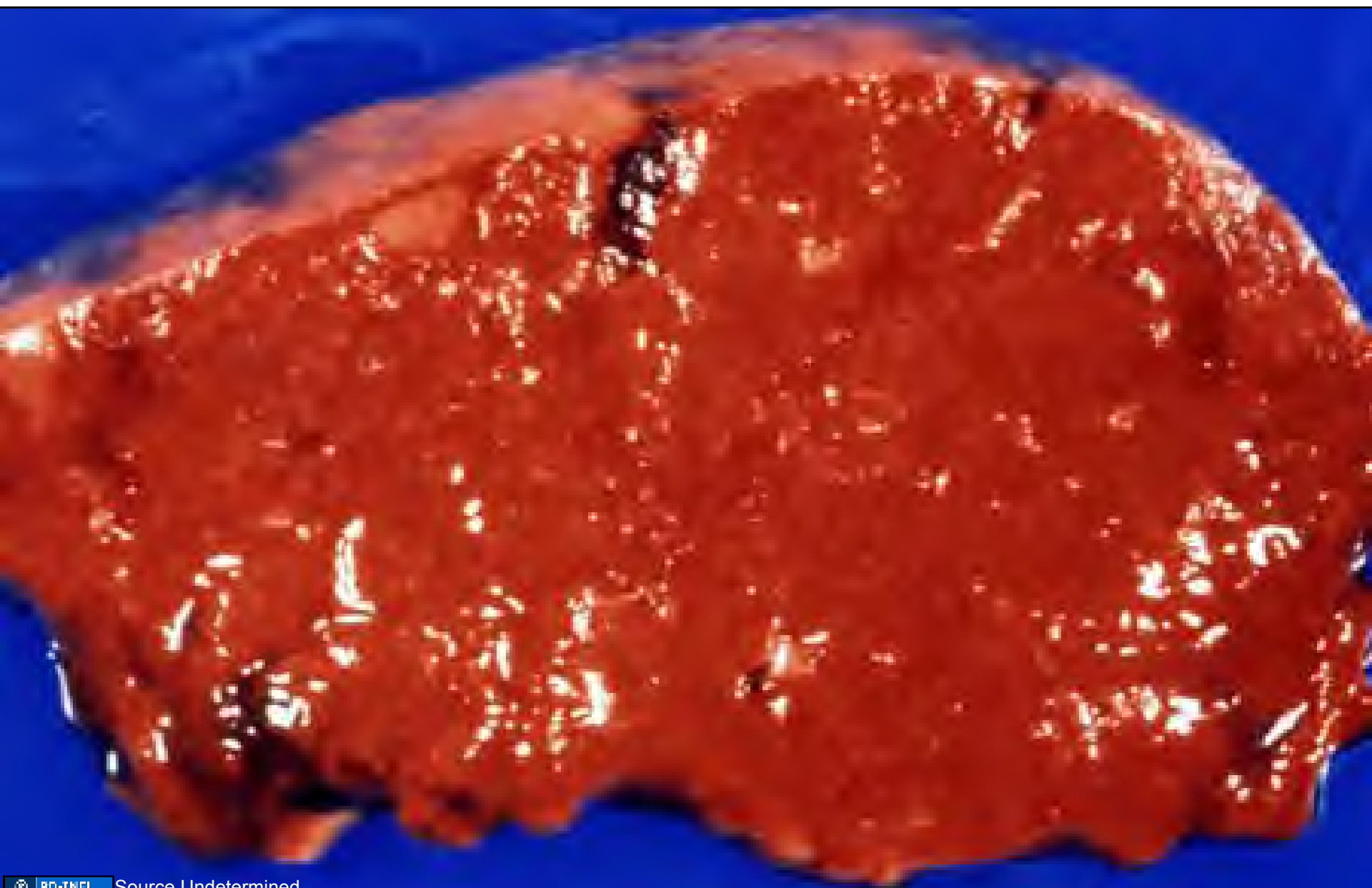




M-2 Cardiovascular Laboratory - 3

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

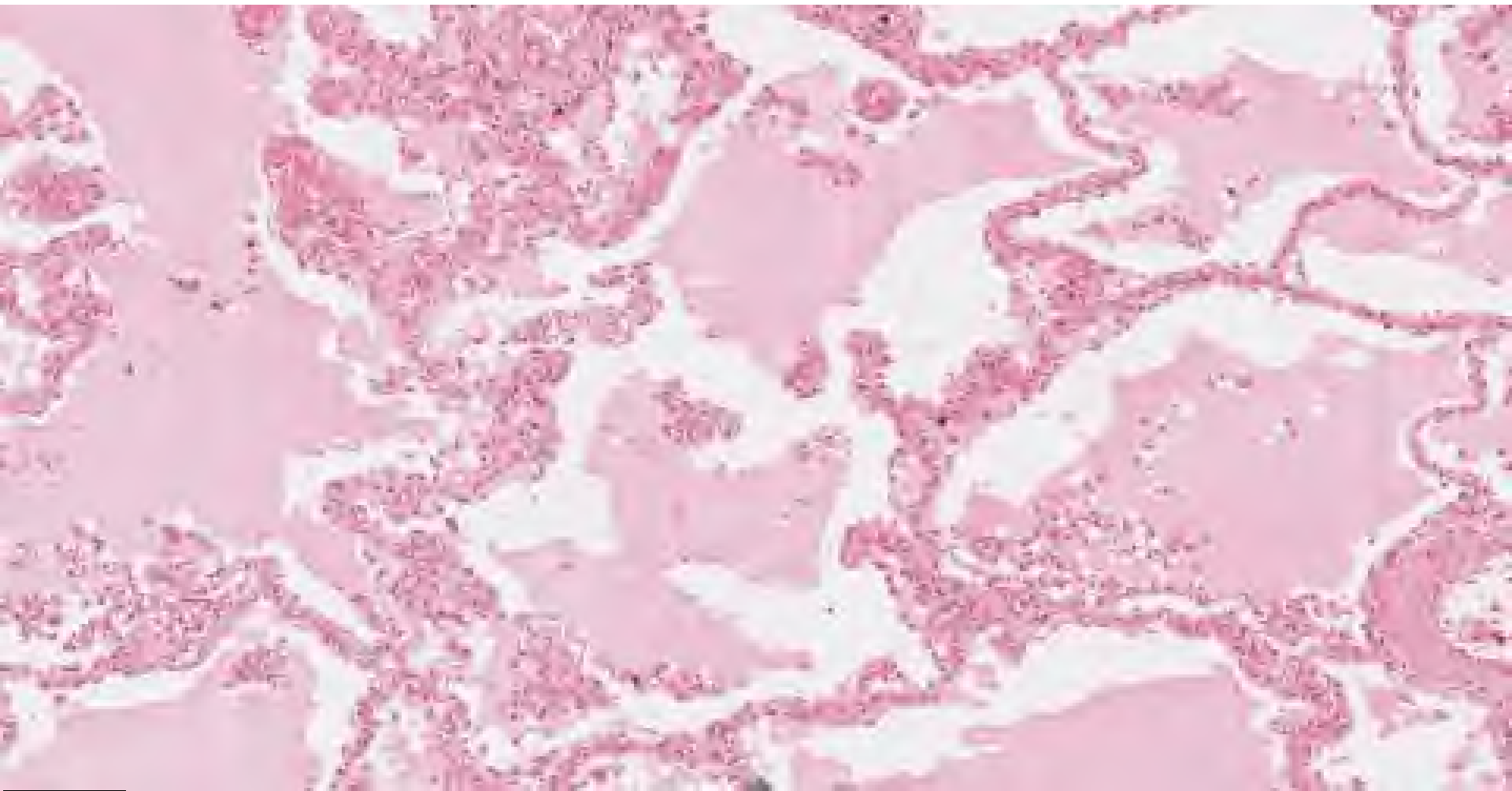
Acute Pulmonary Edema

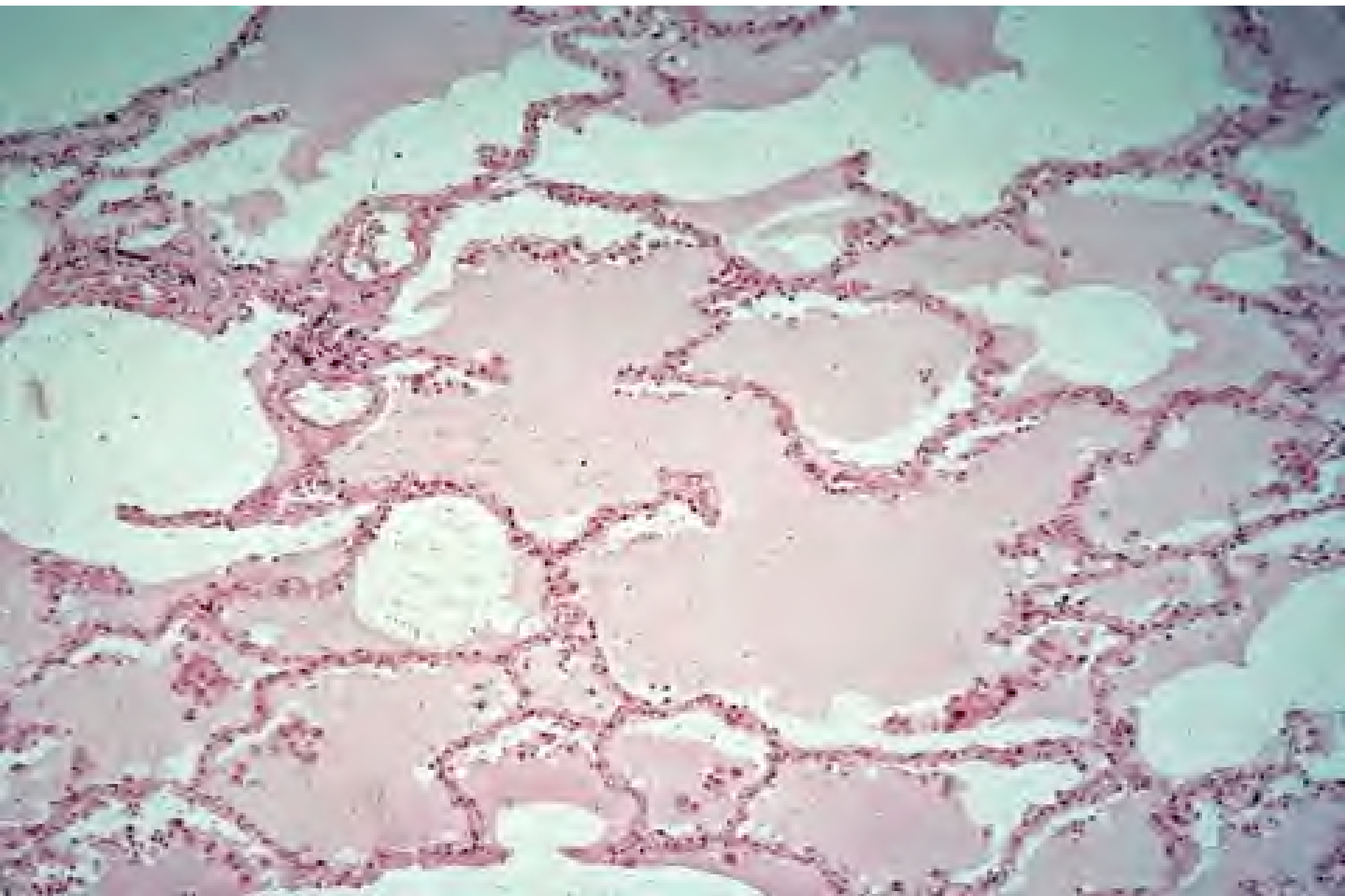


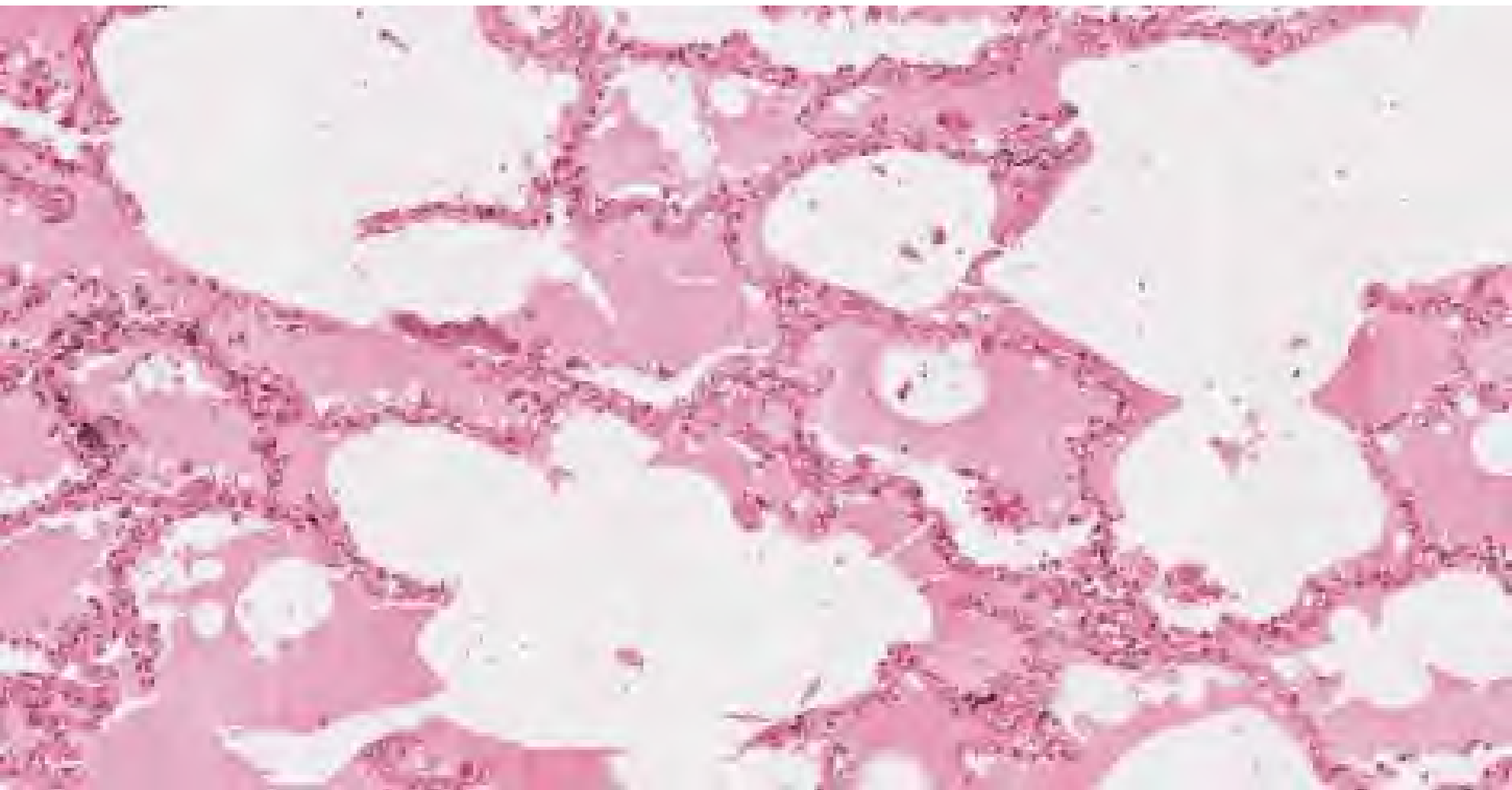


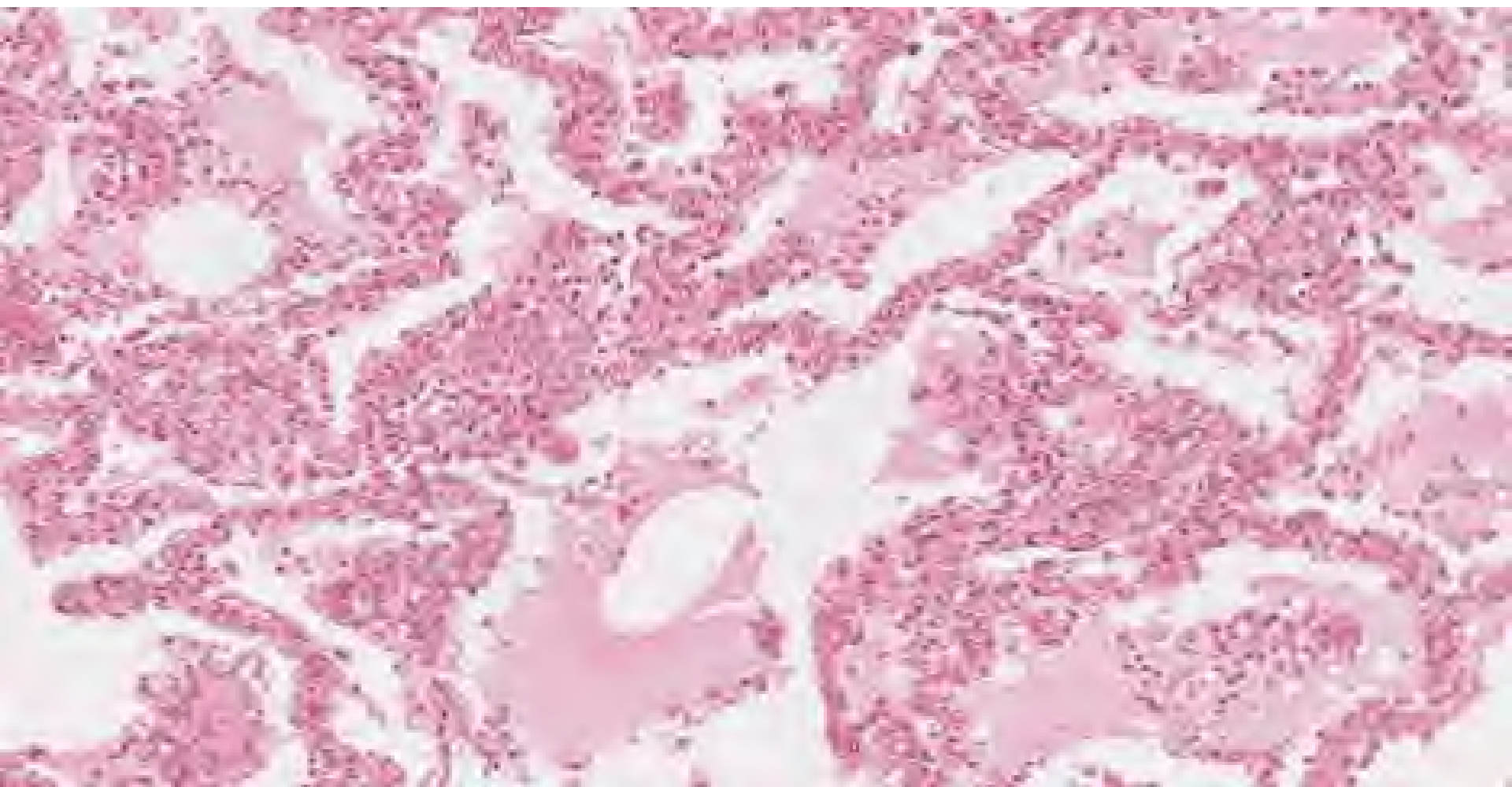
Acute Pulmonary Edema

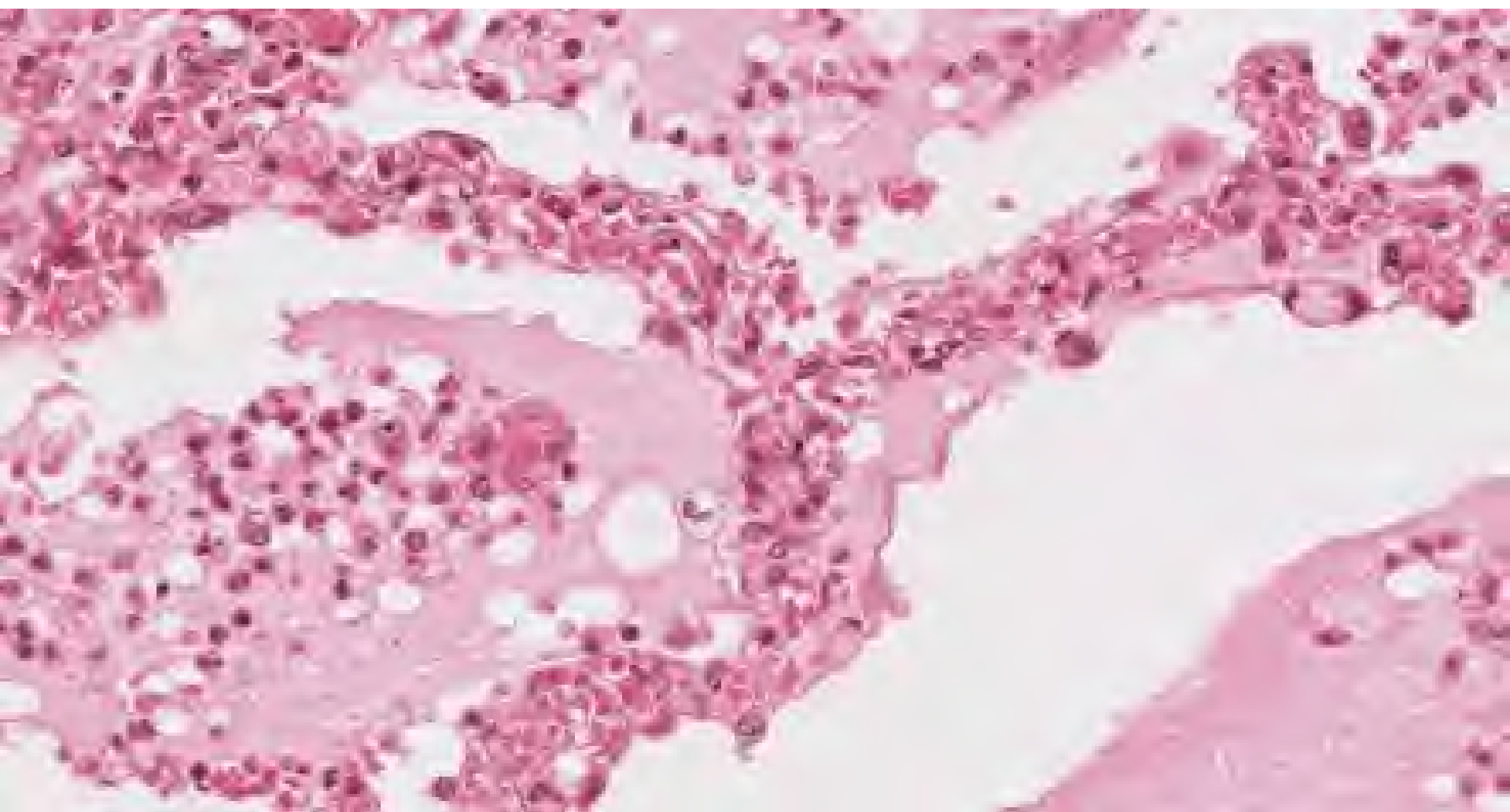




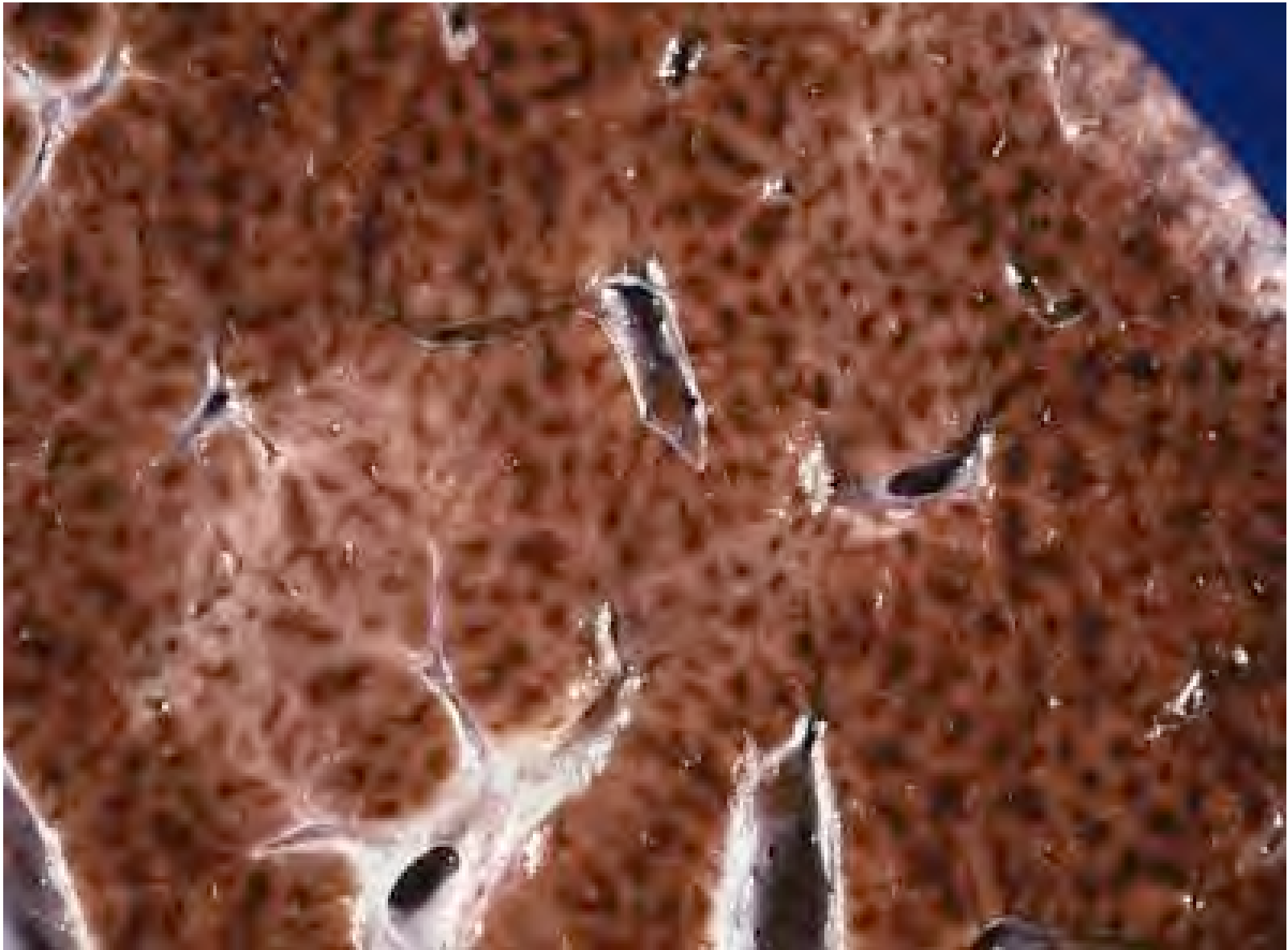




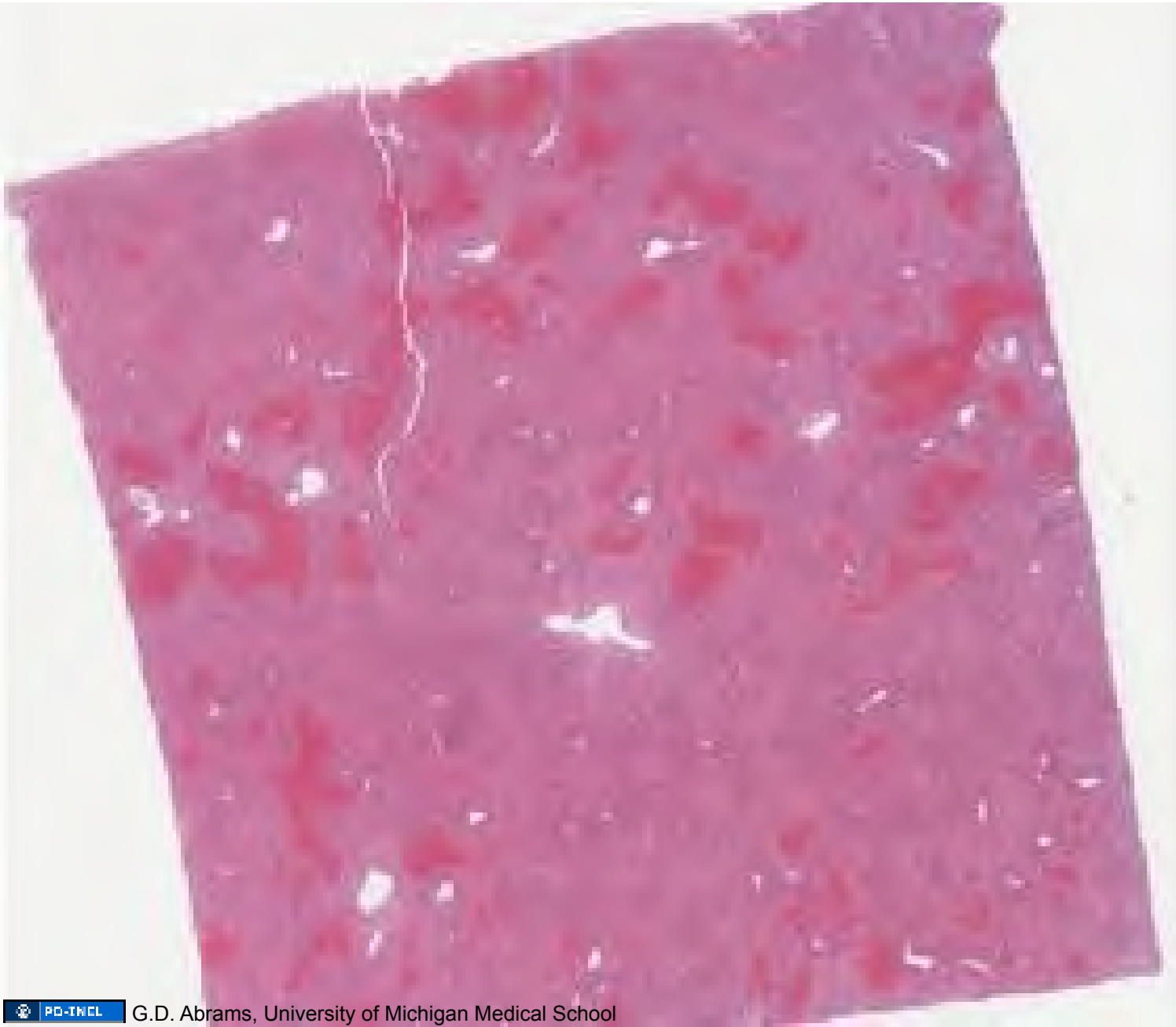


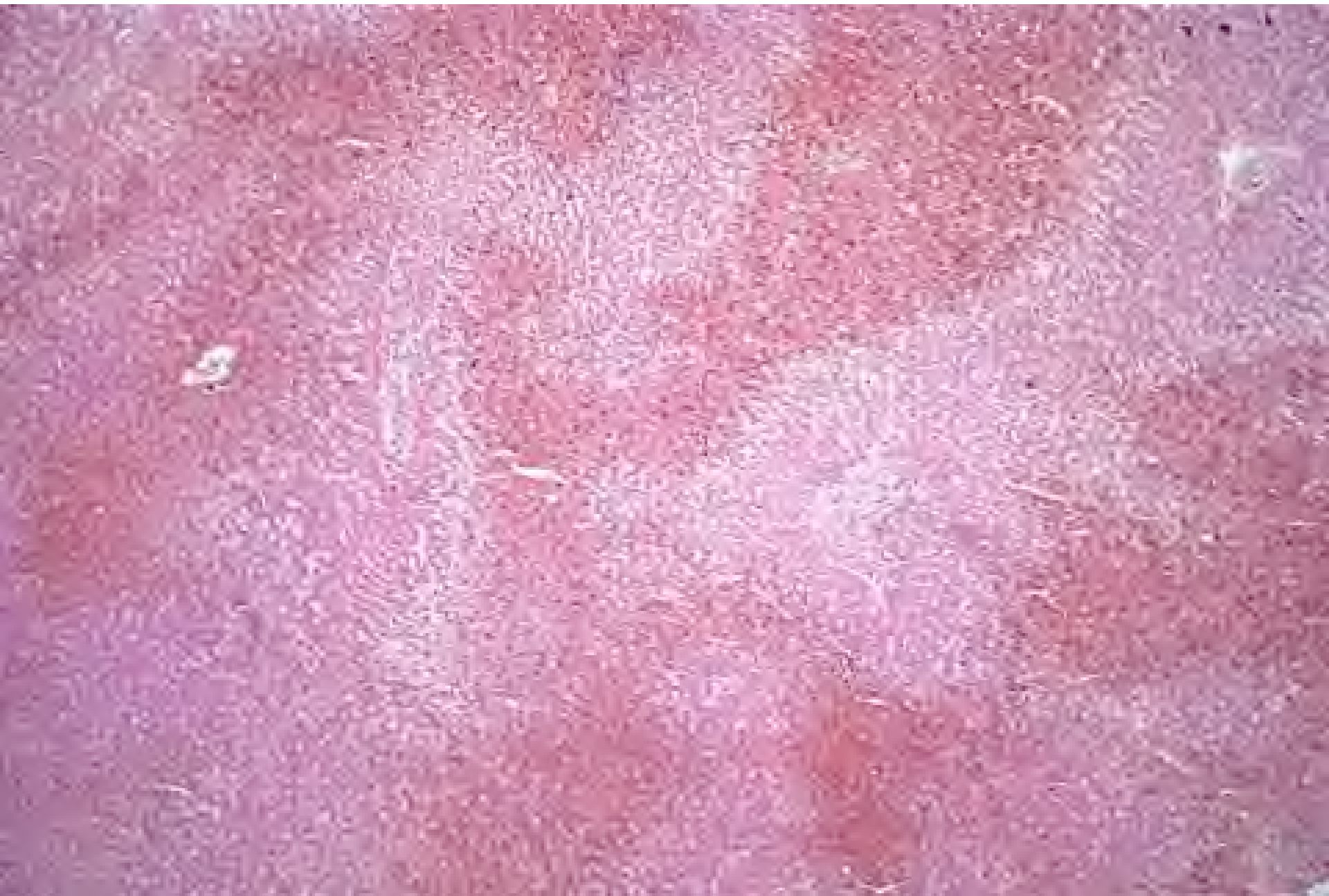


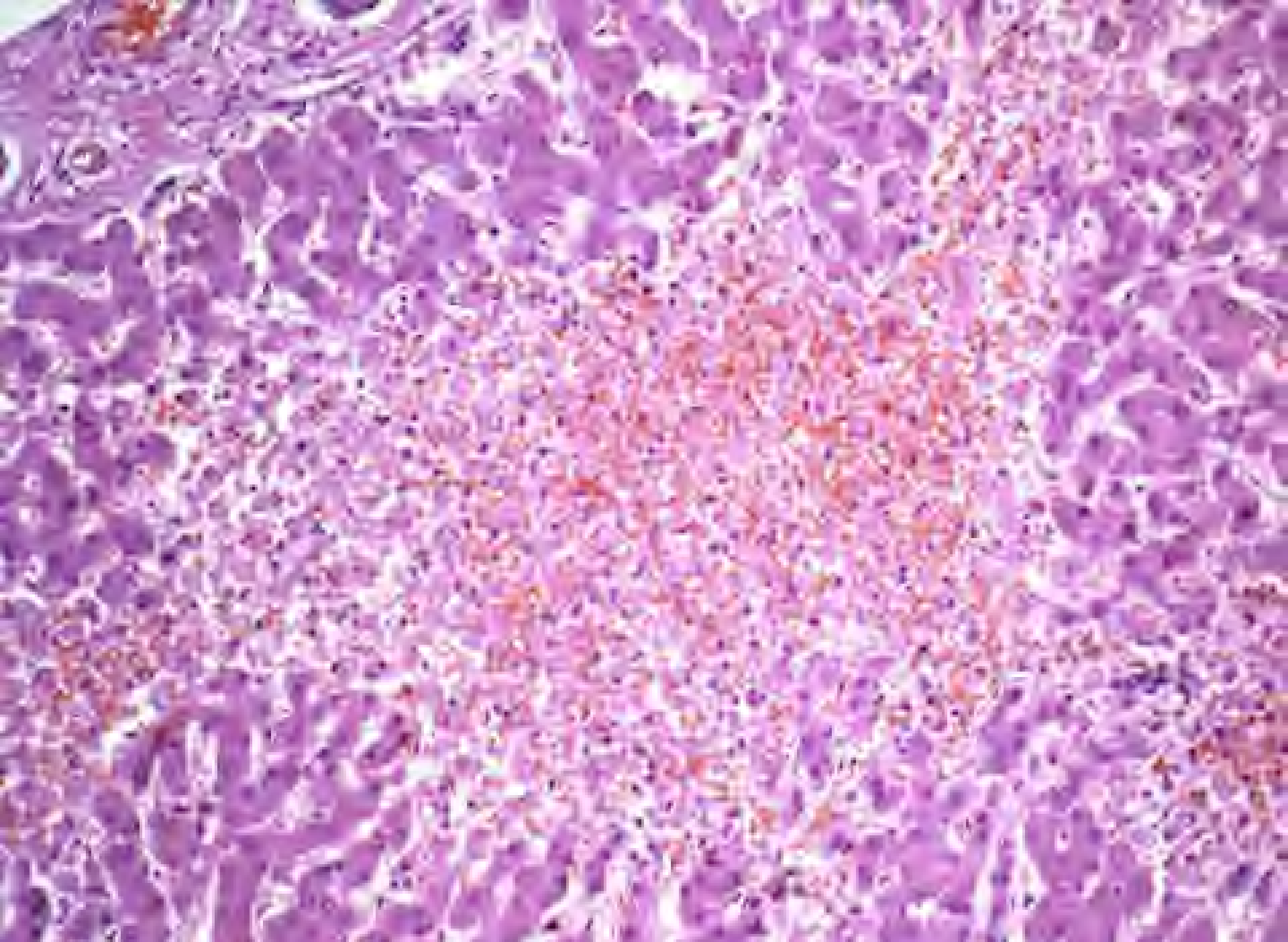
Central Hemorrhagic Necrosis

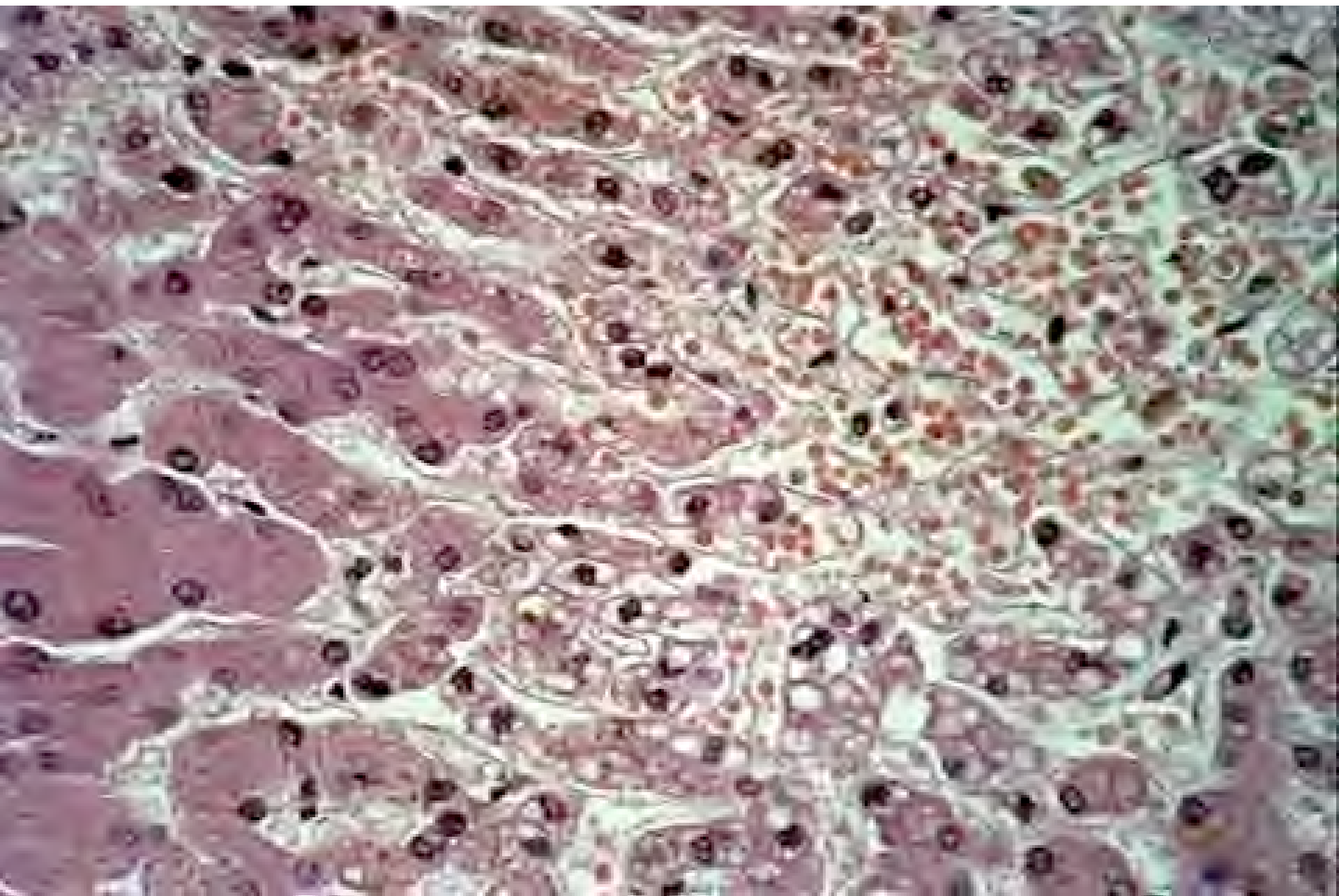


Central Hemorrhagic Necrosis







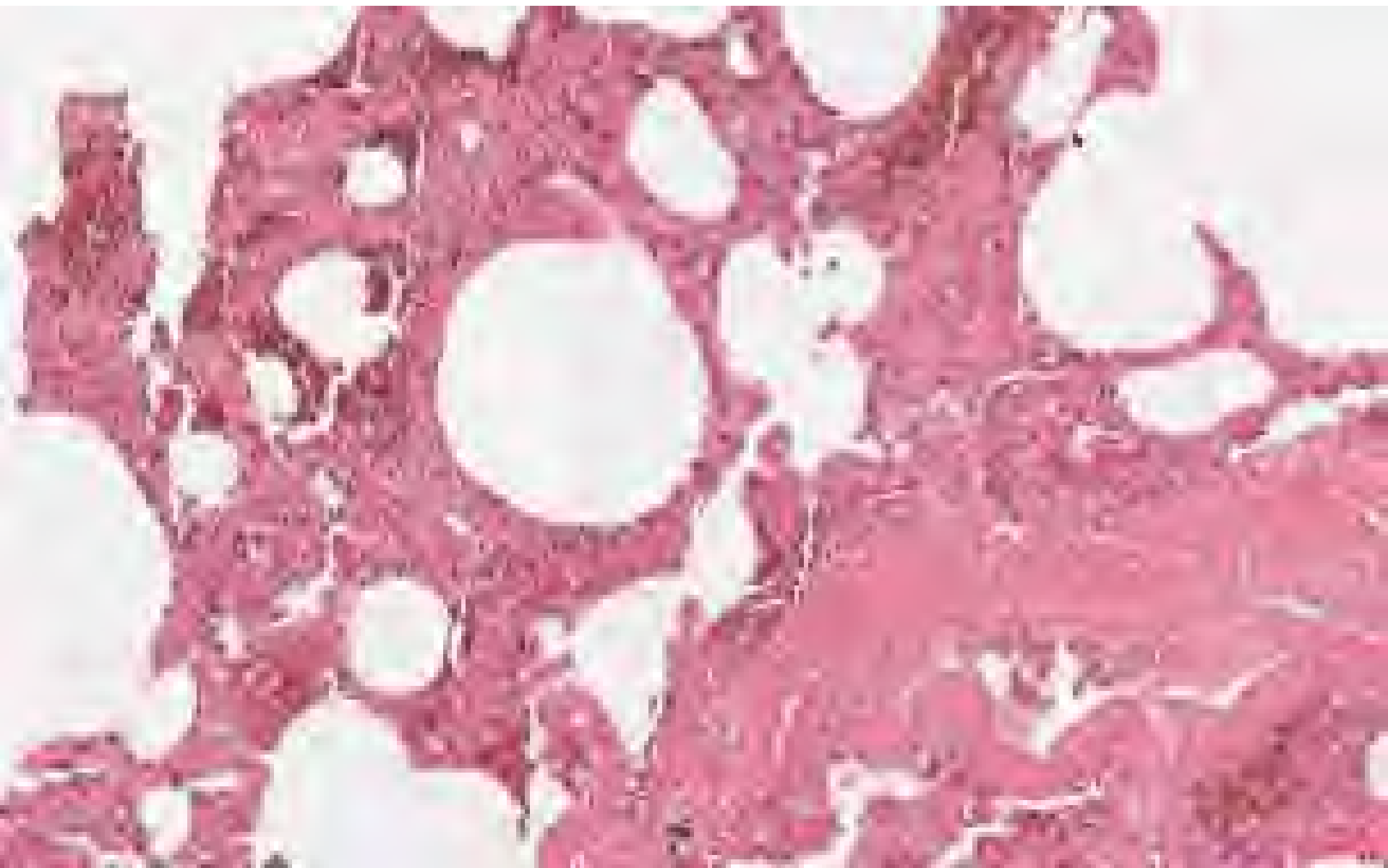


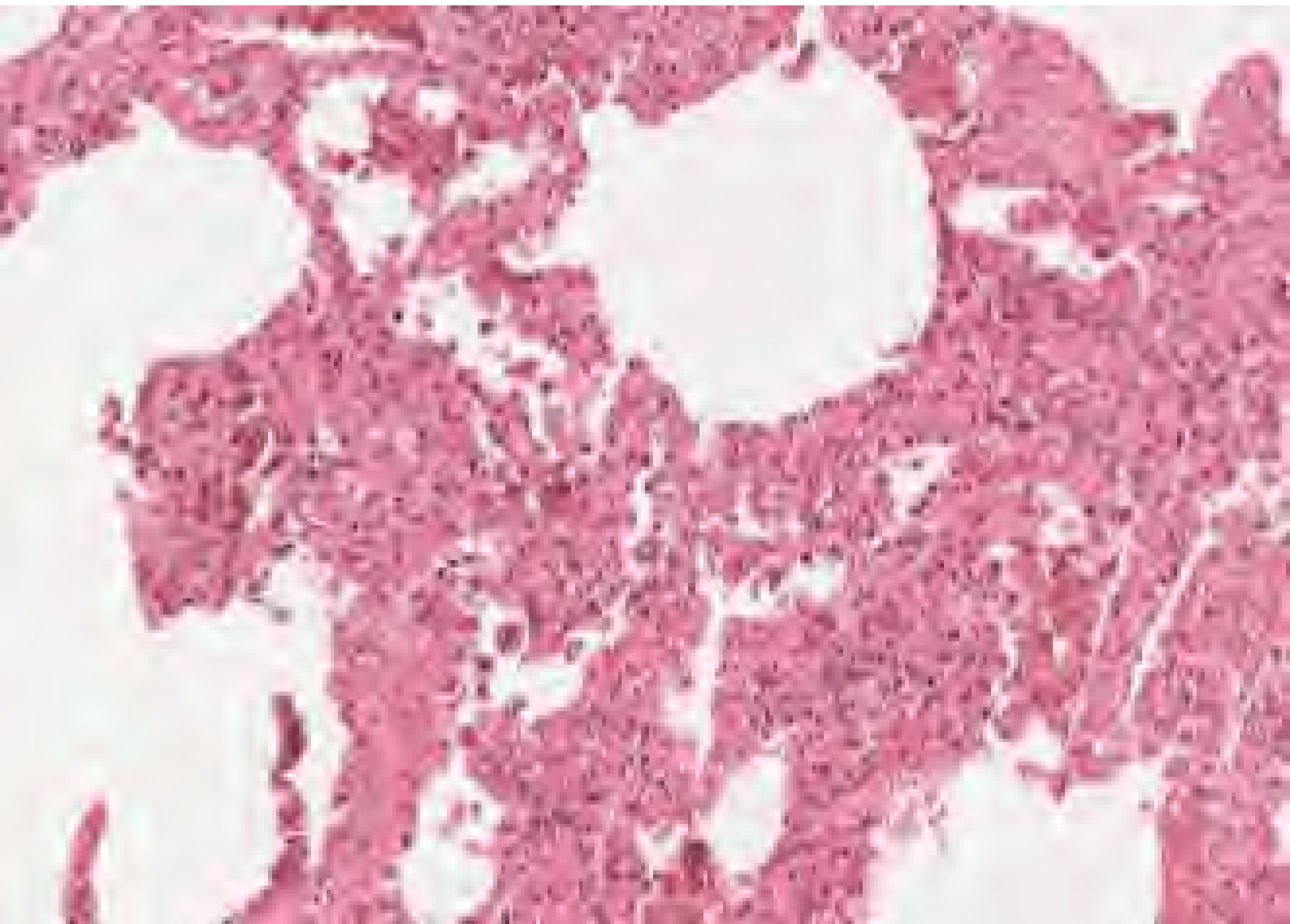
Congested Lung

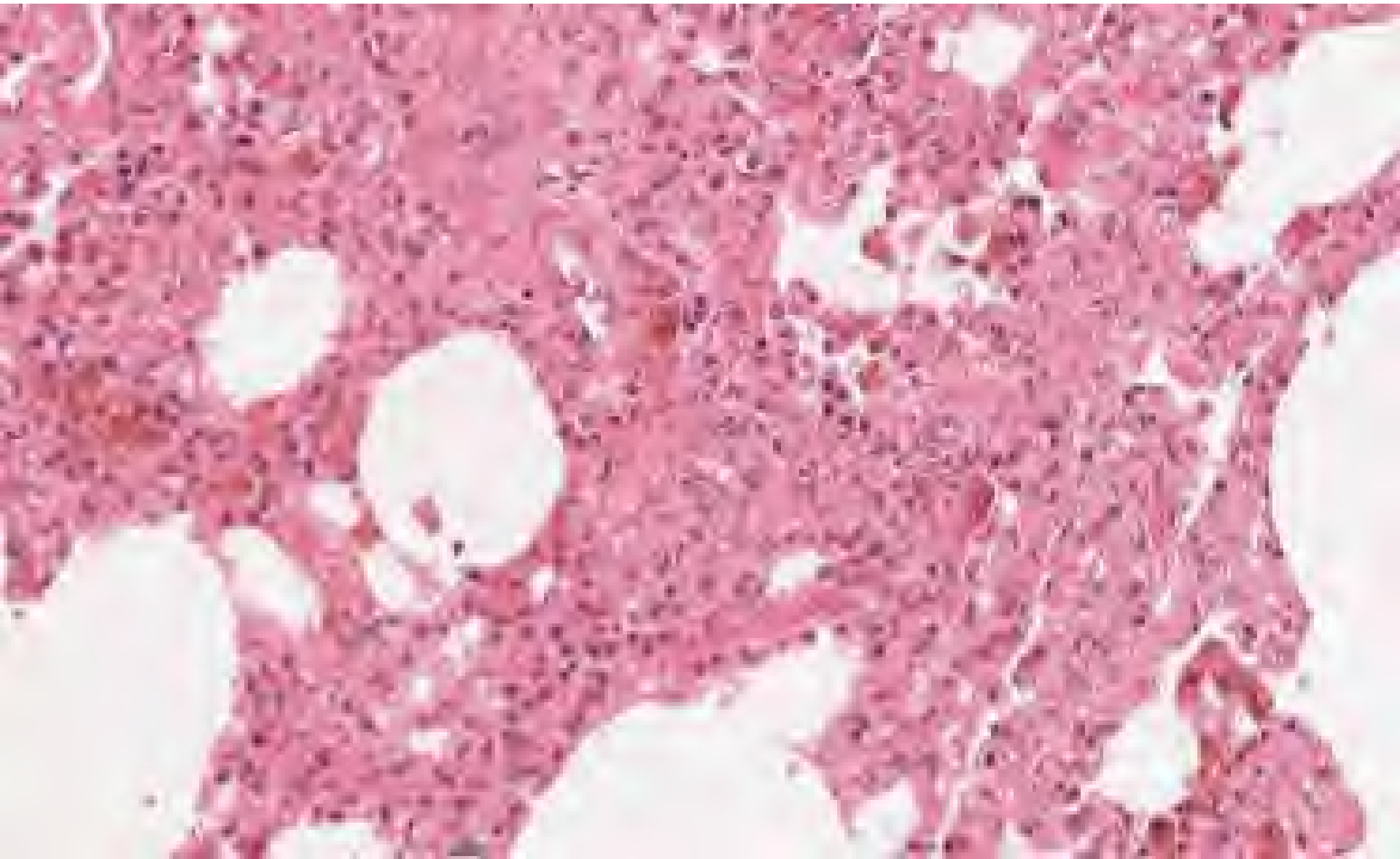


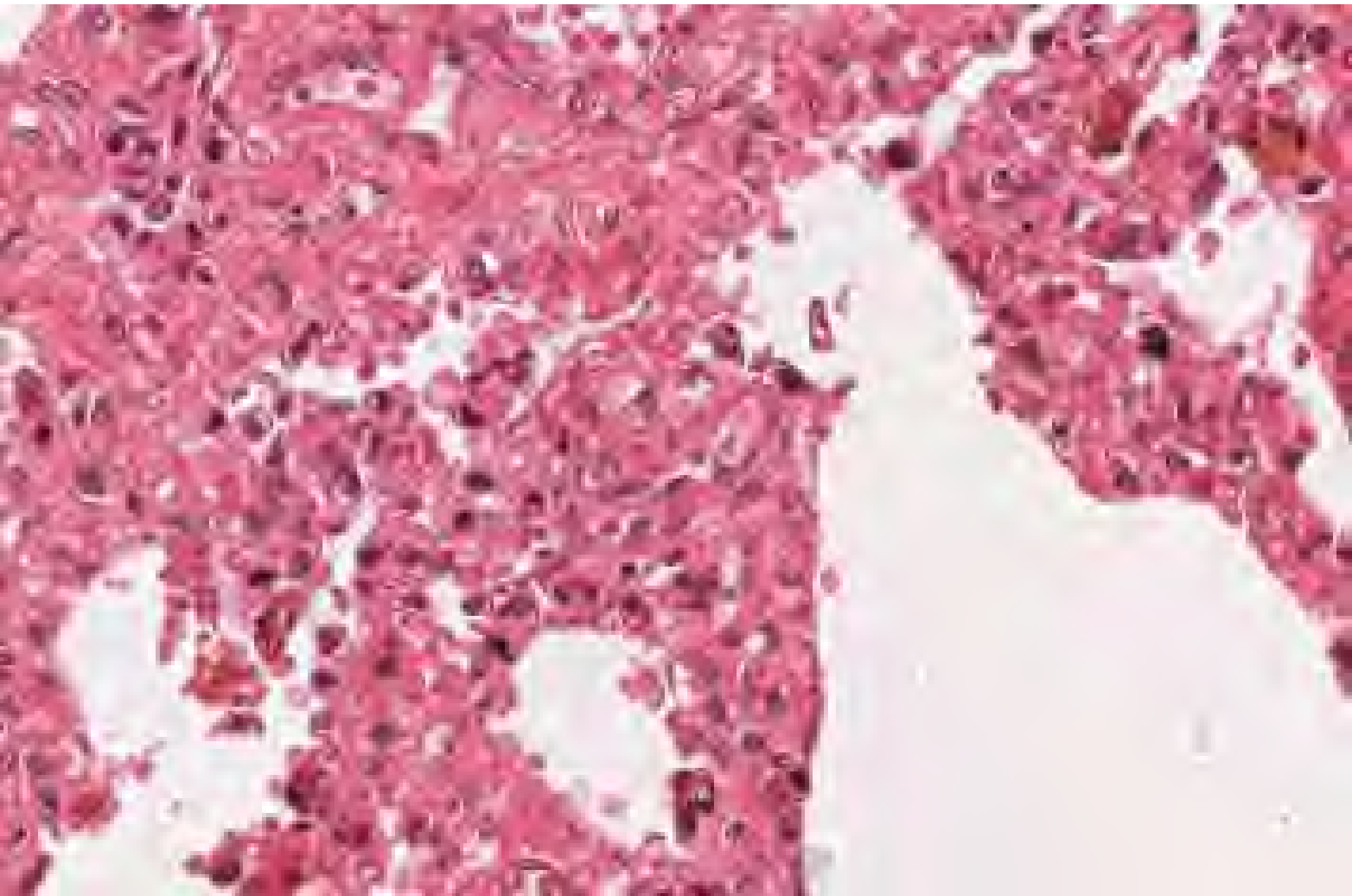
Chronic Pulmonary Congestion

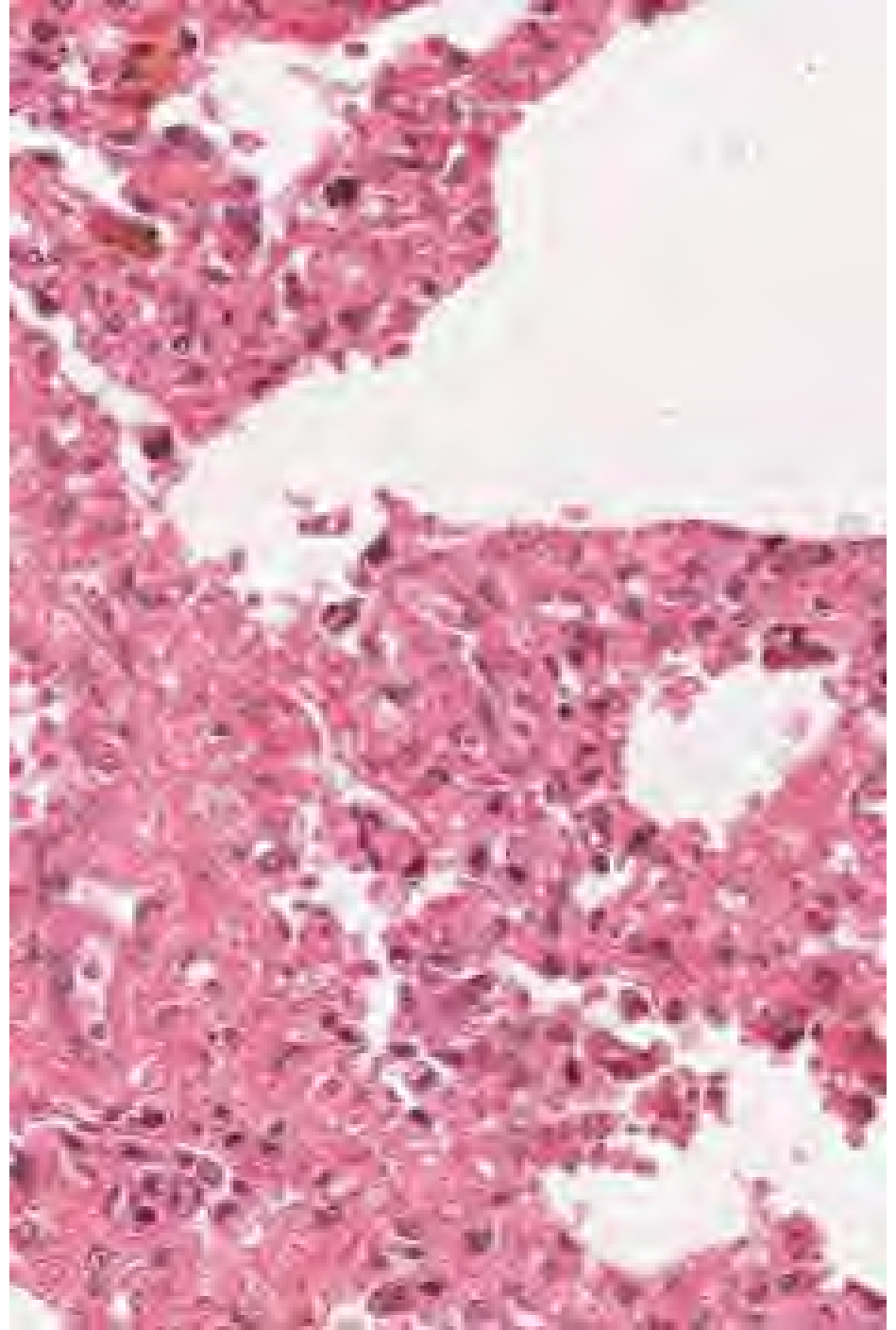
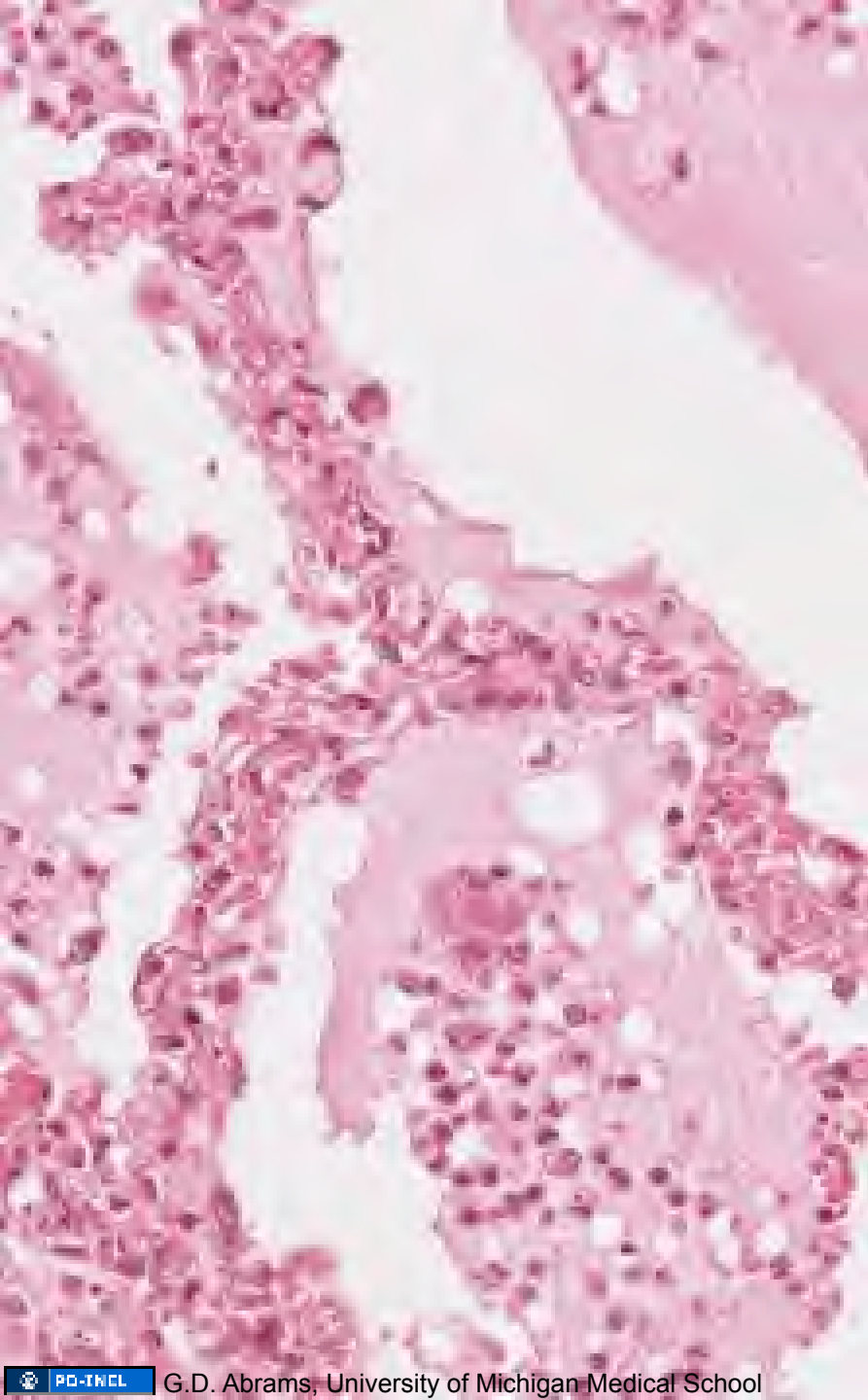












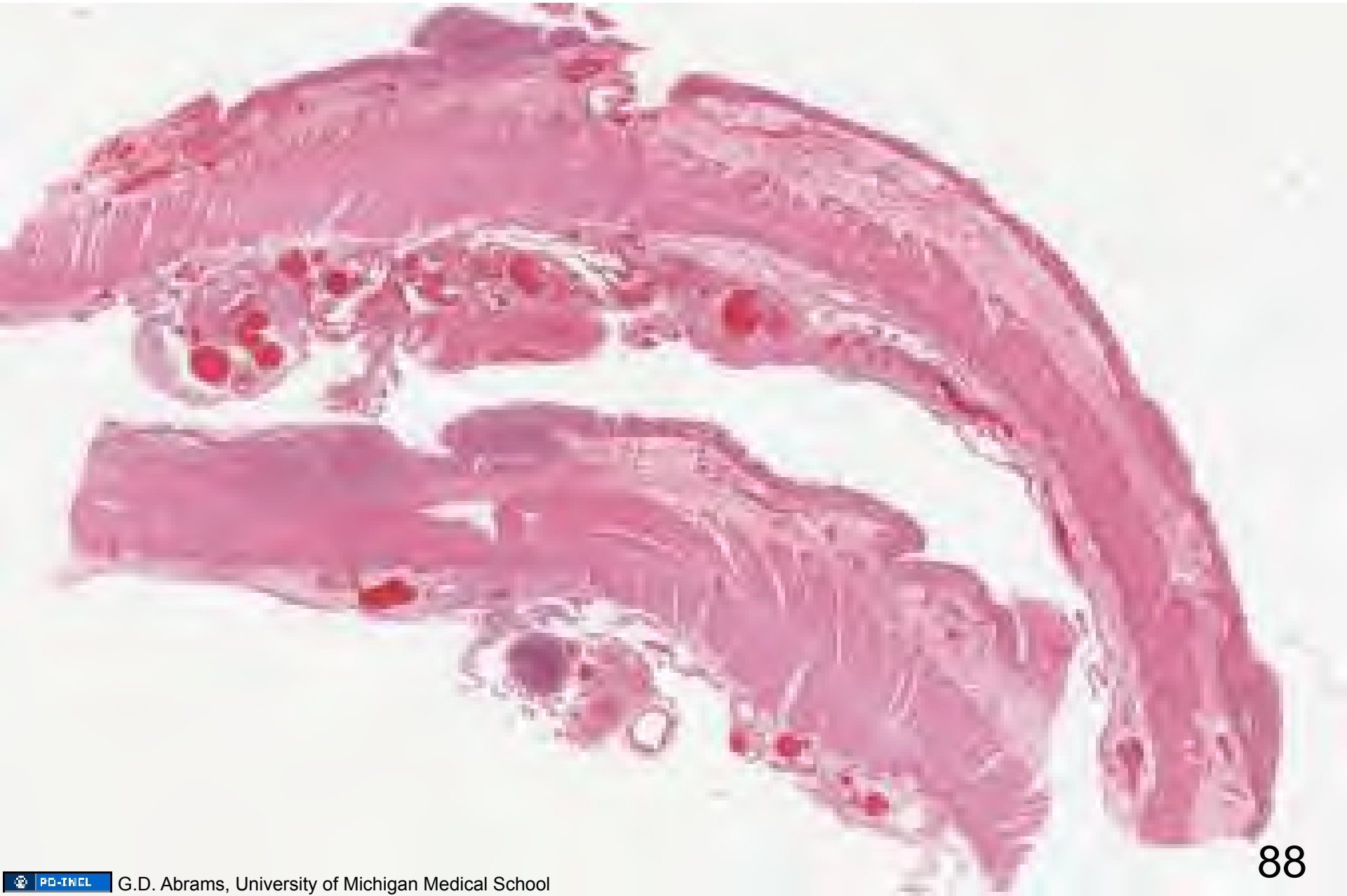
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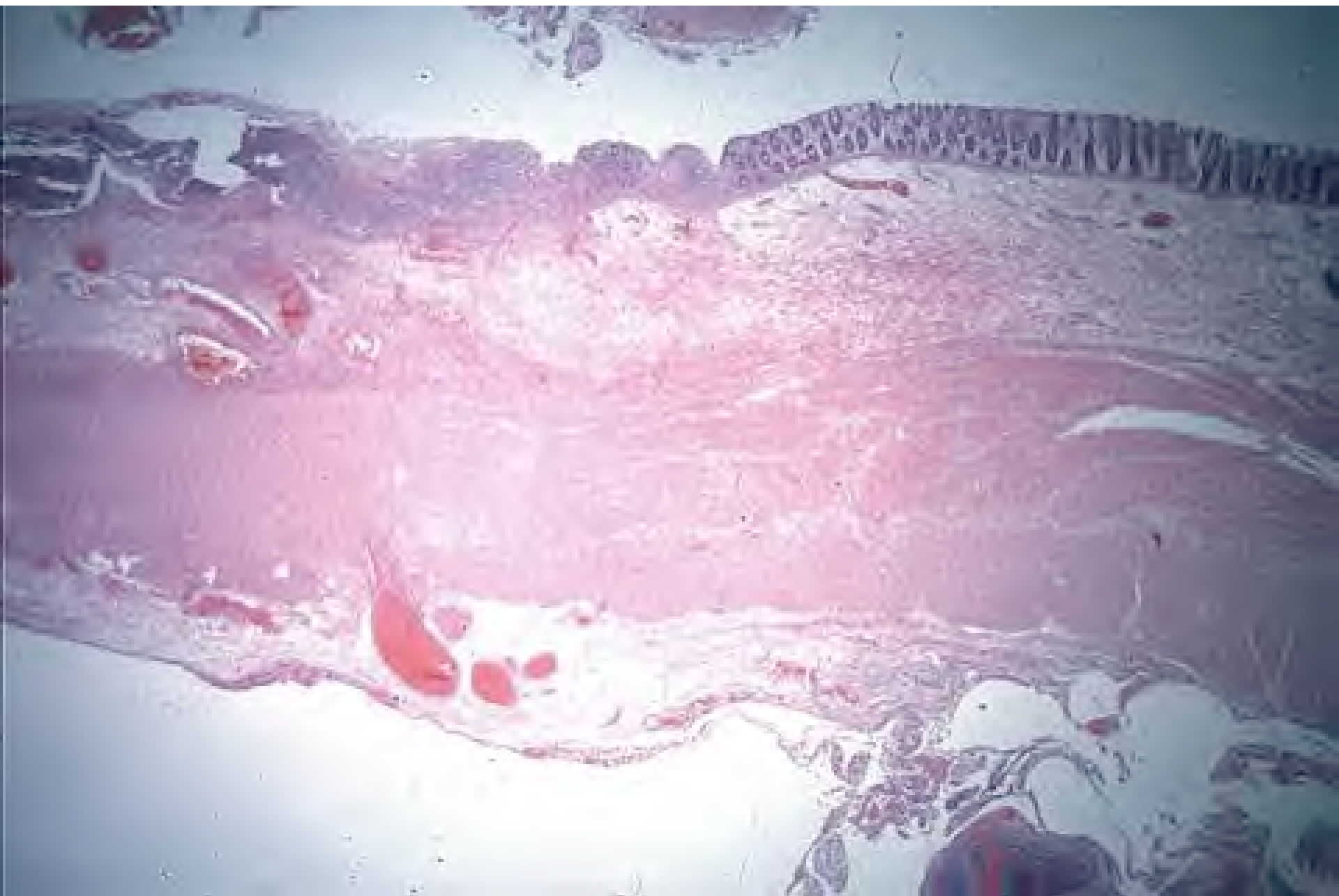


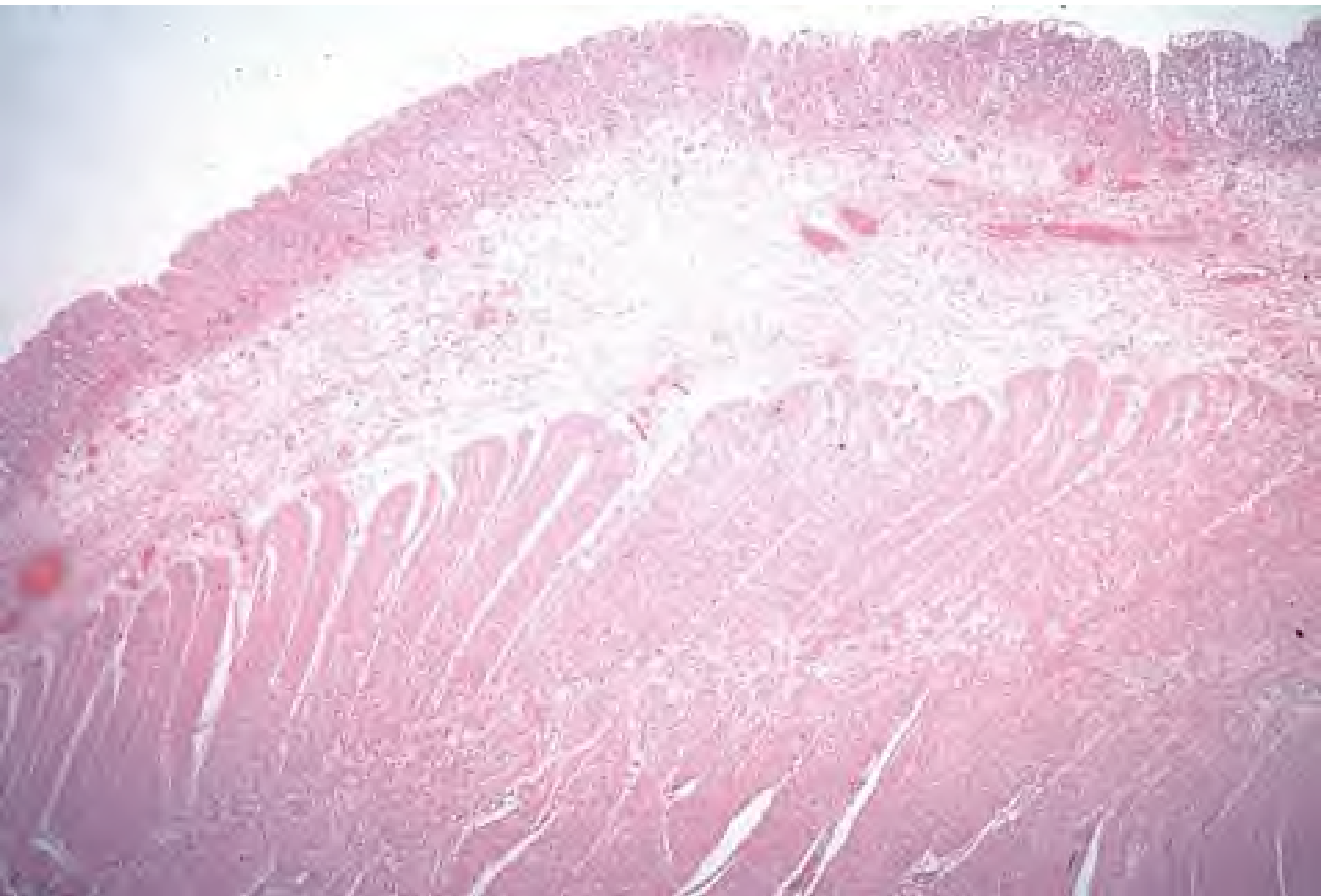
Ischemic Colitis

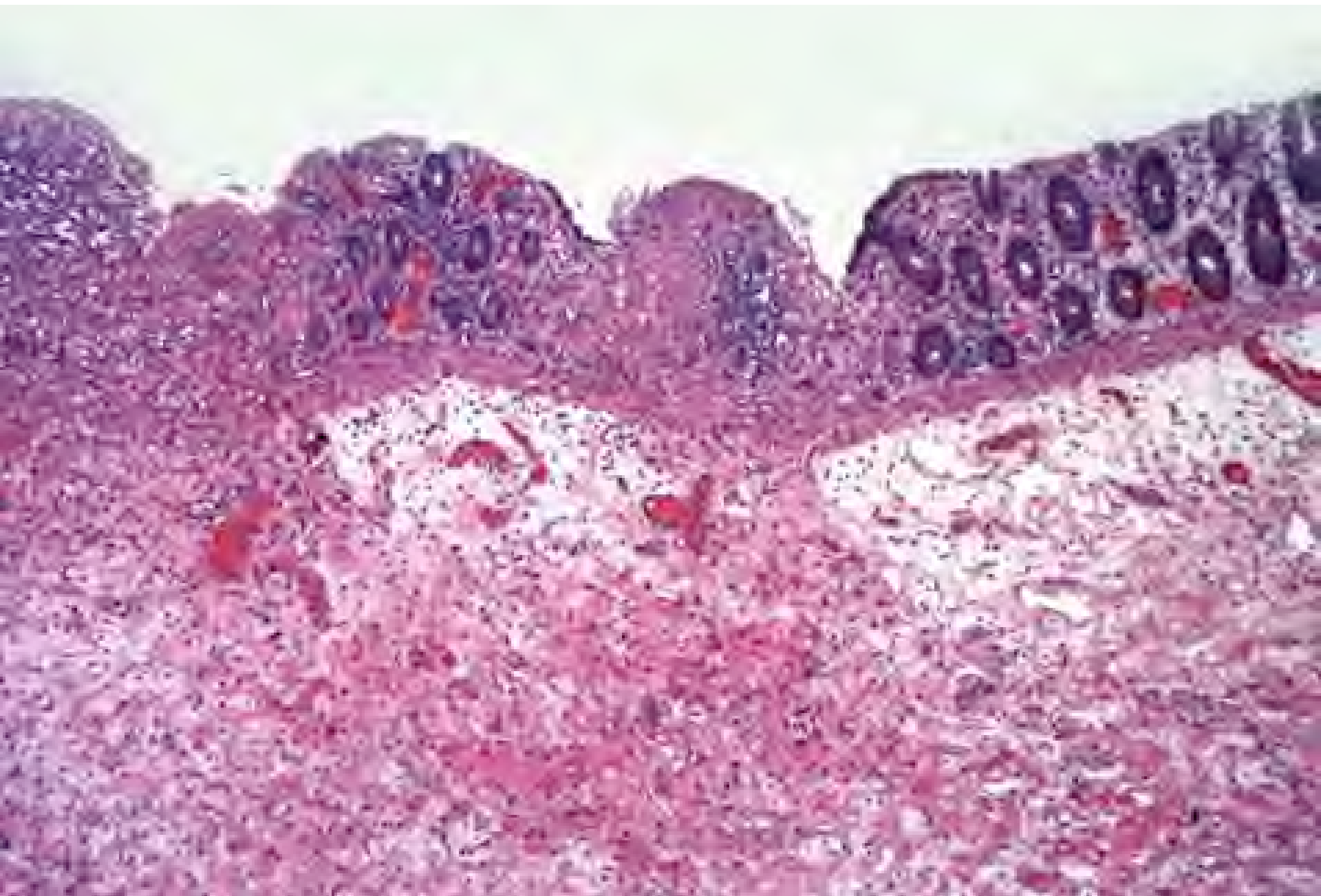


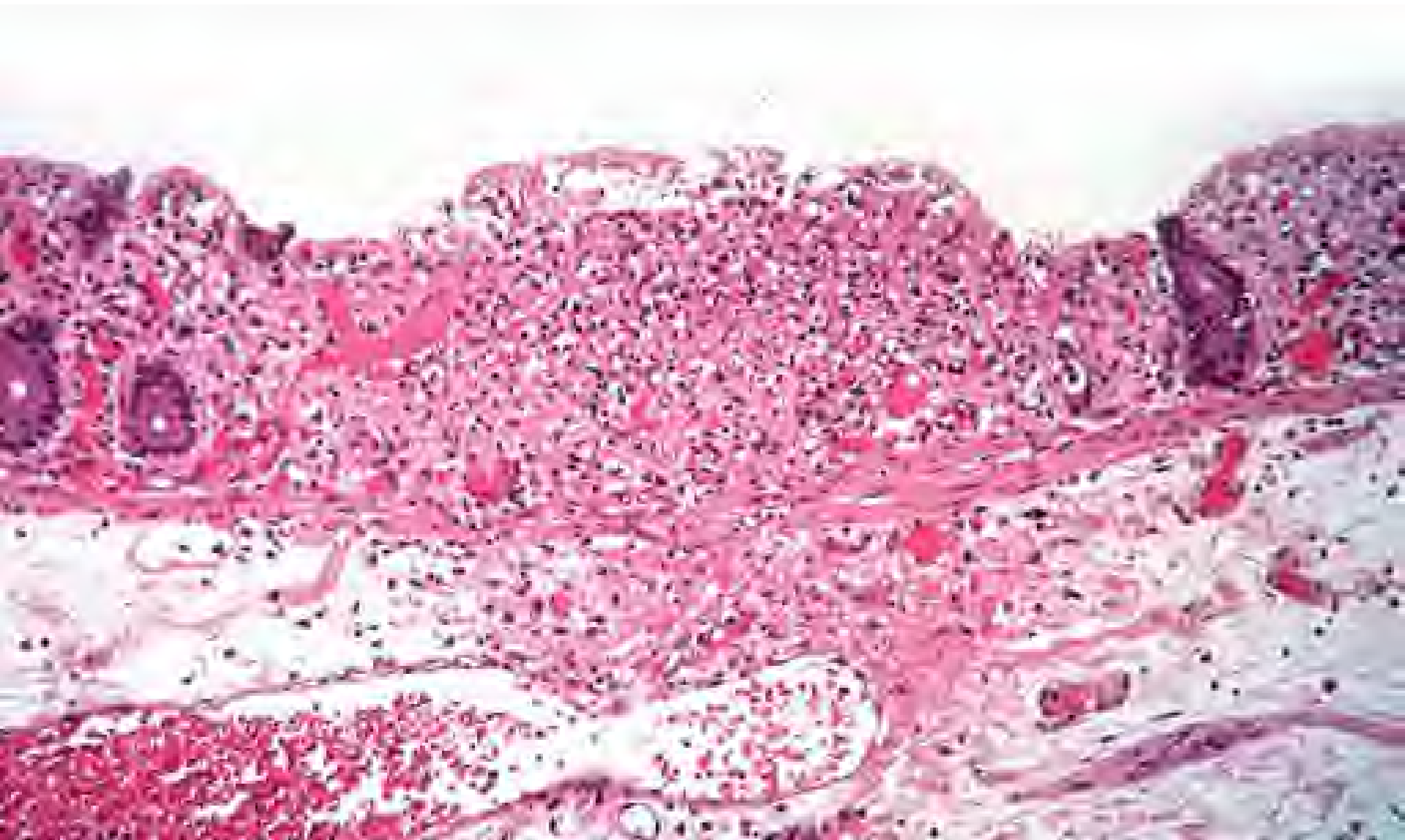
Colon Ischemia

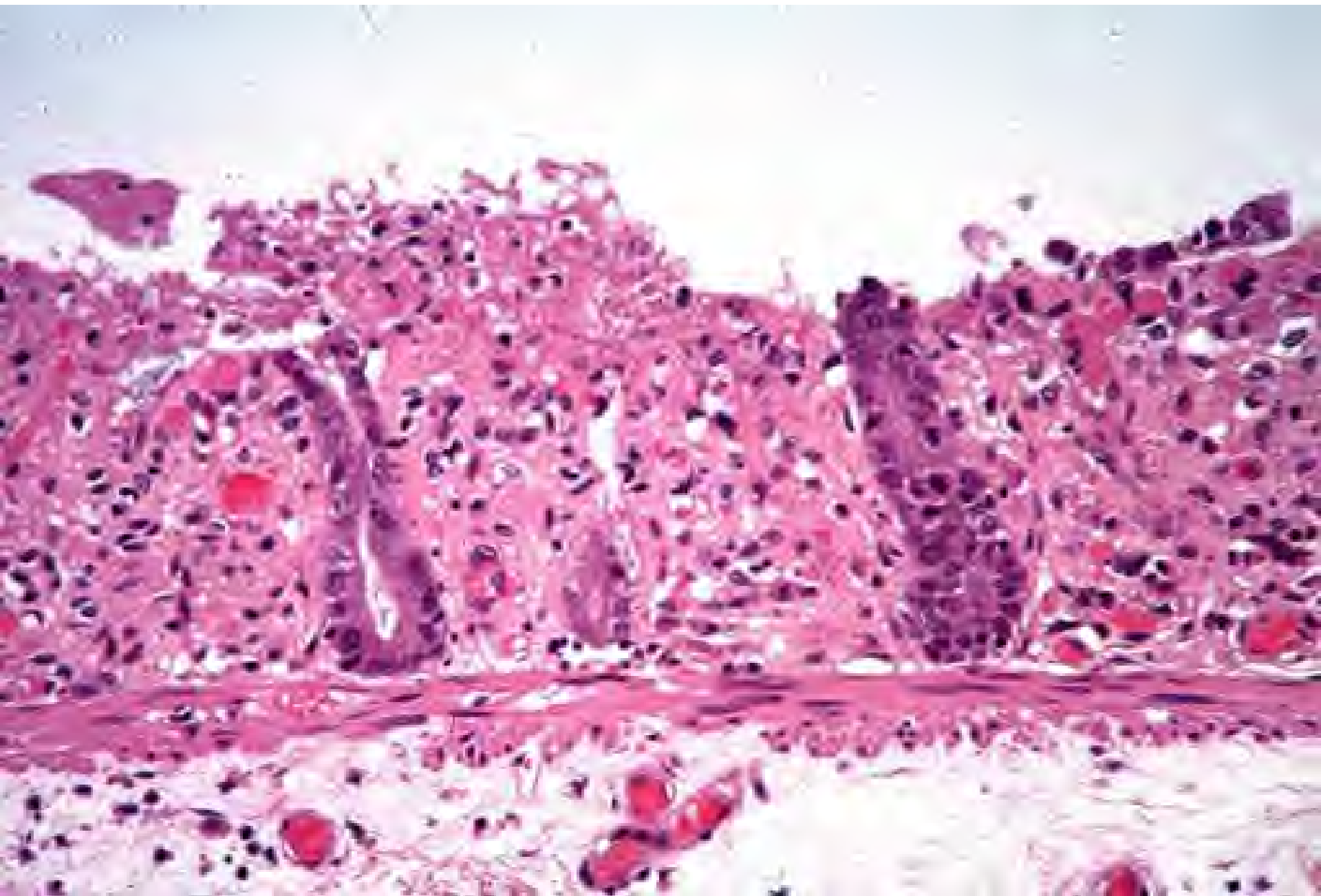


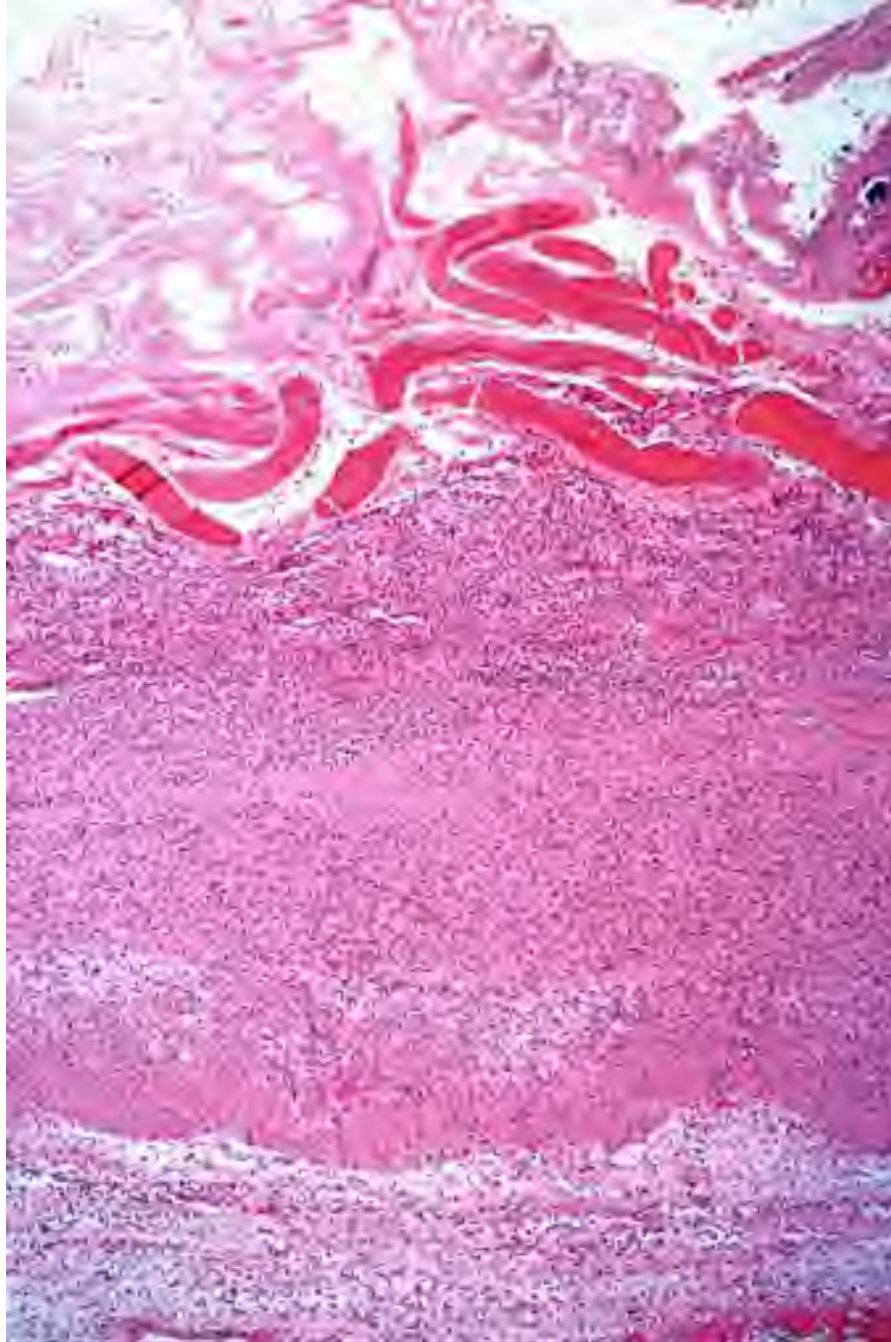






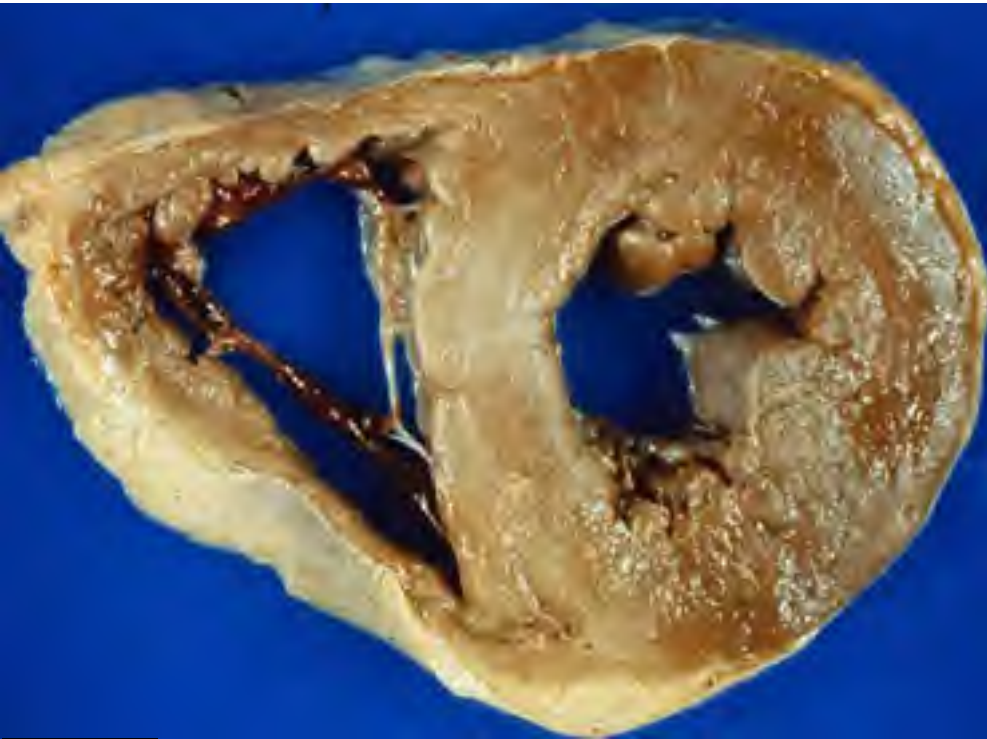




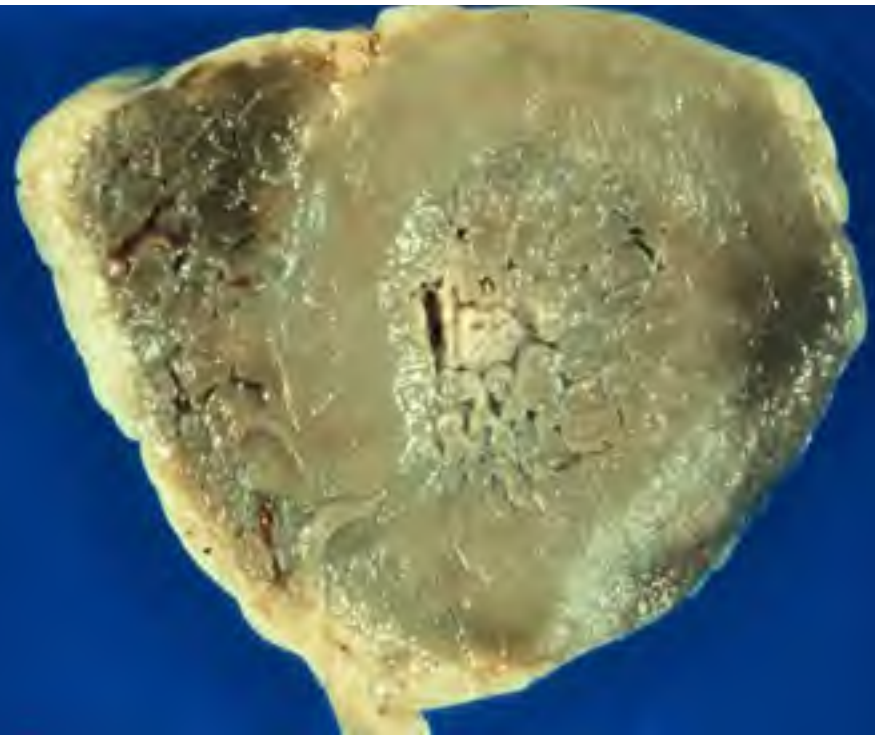




Normal Heart

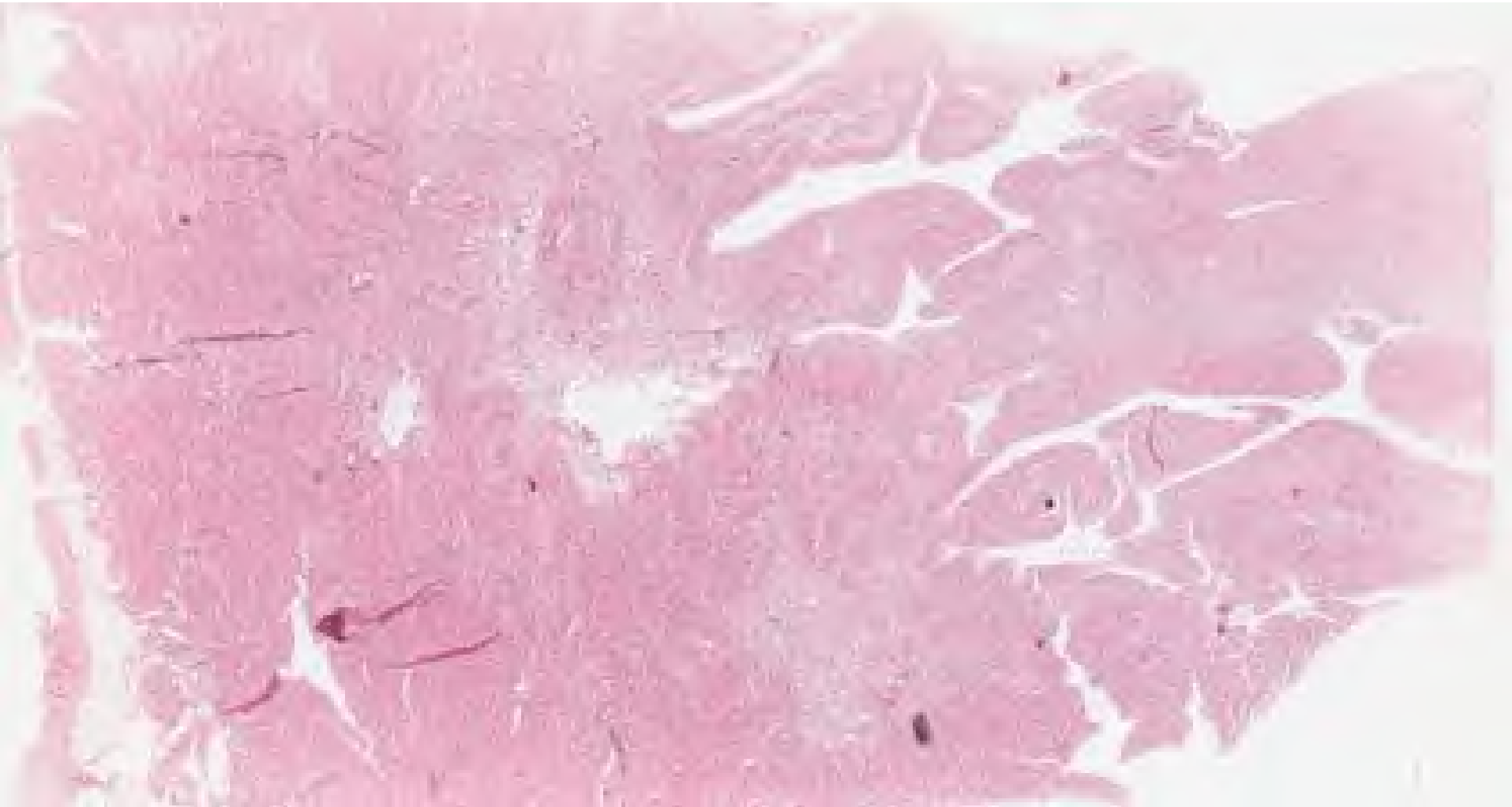


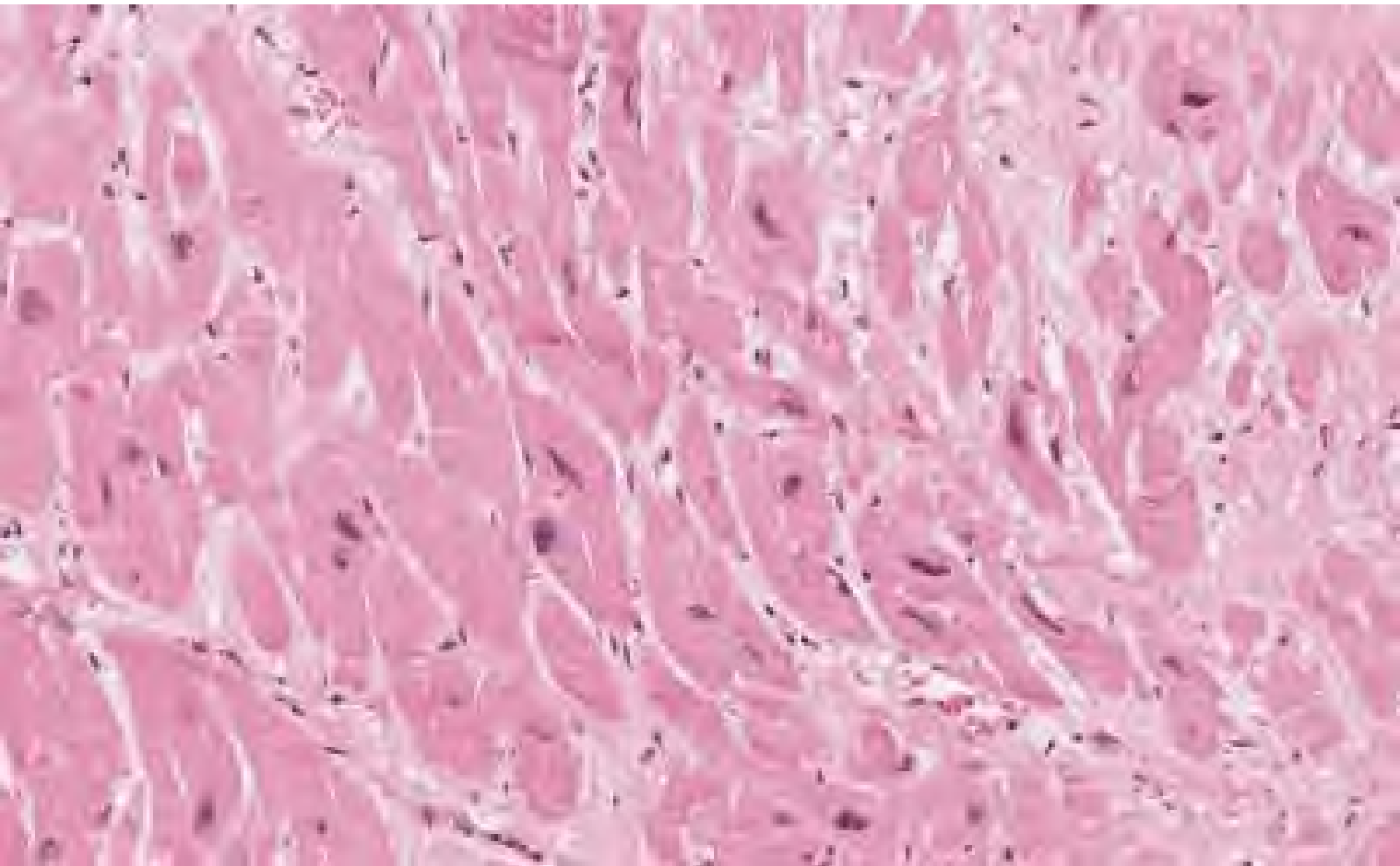
Hypertrophied Heart

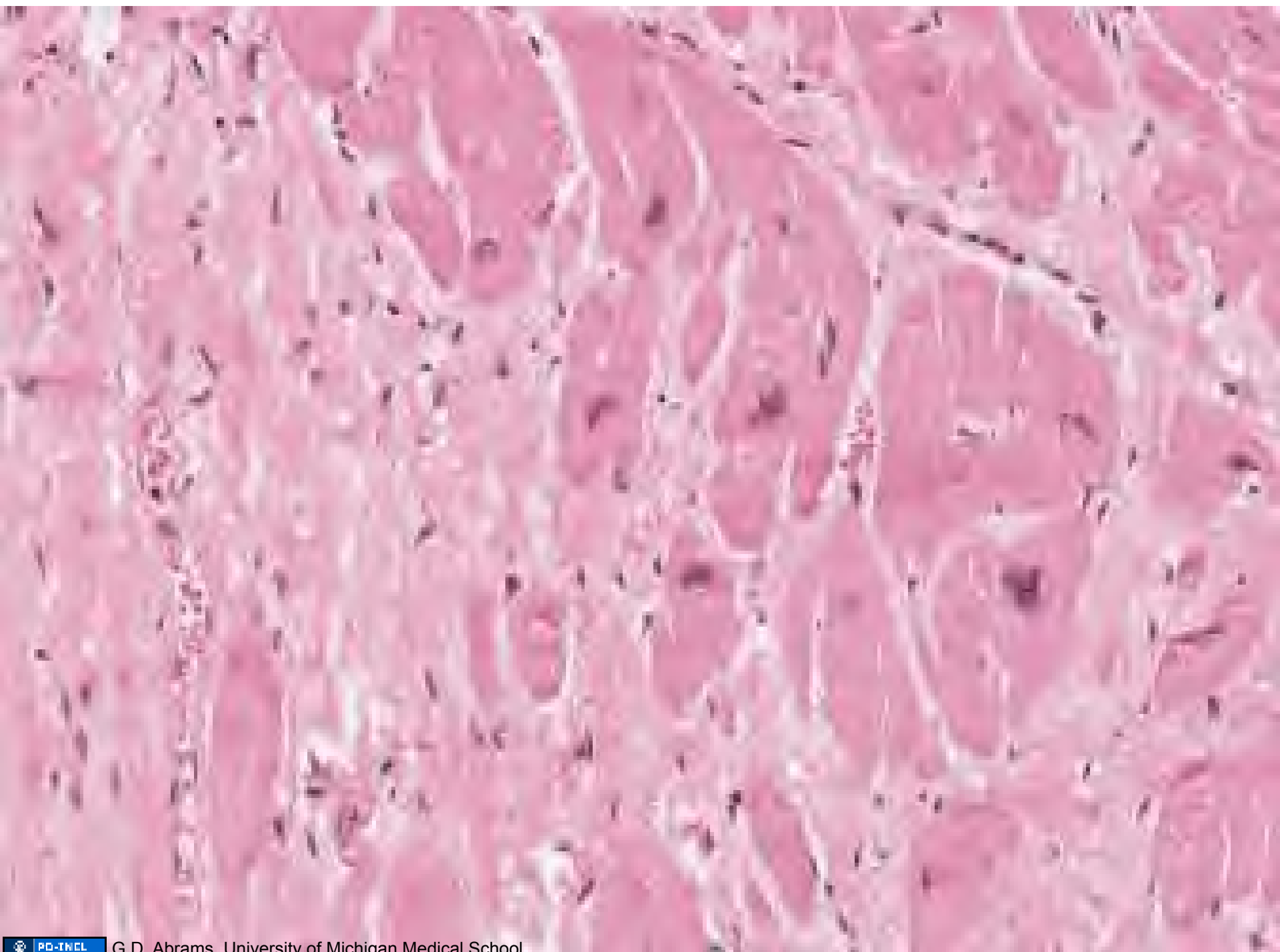


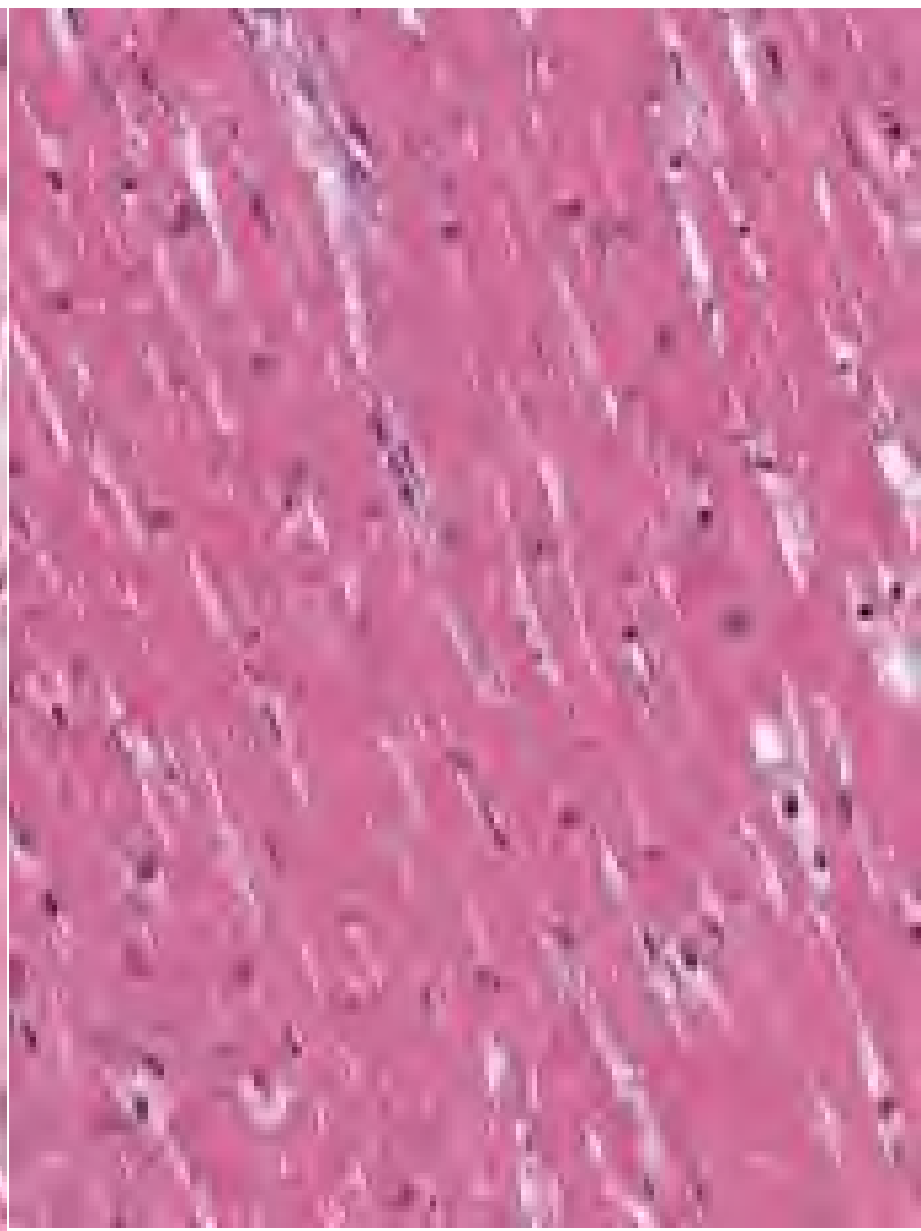
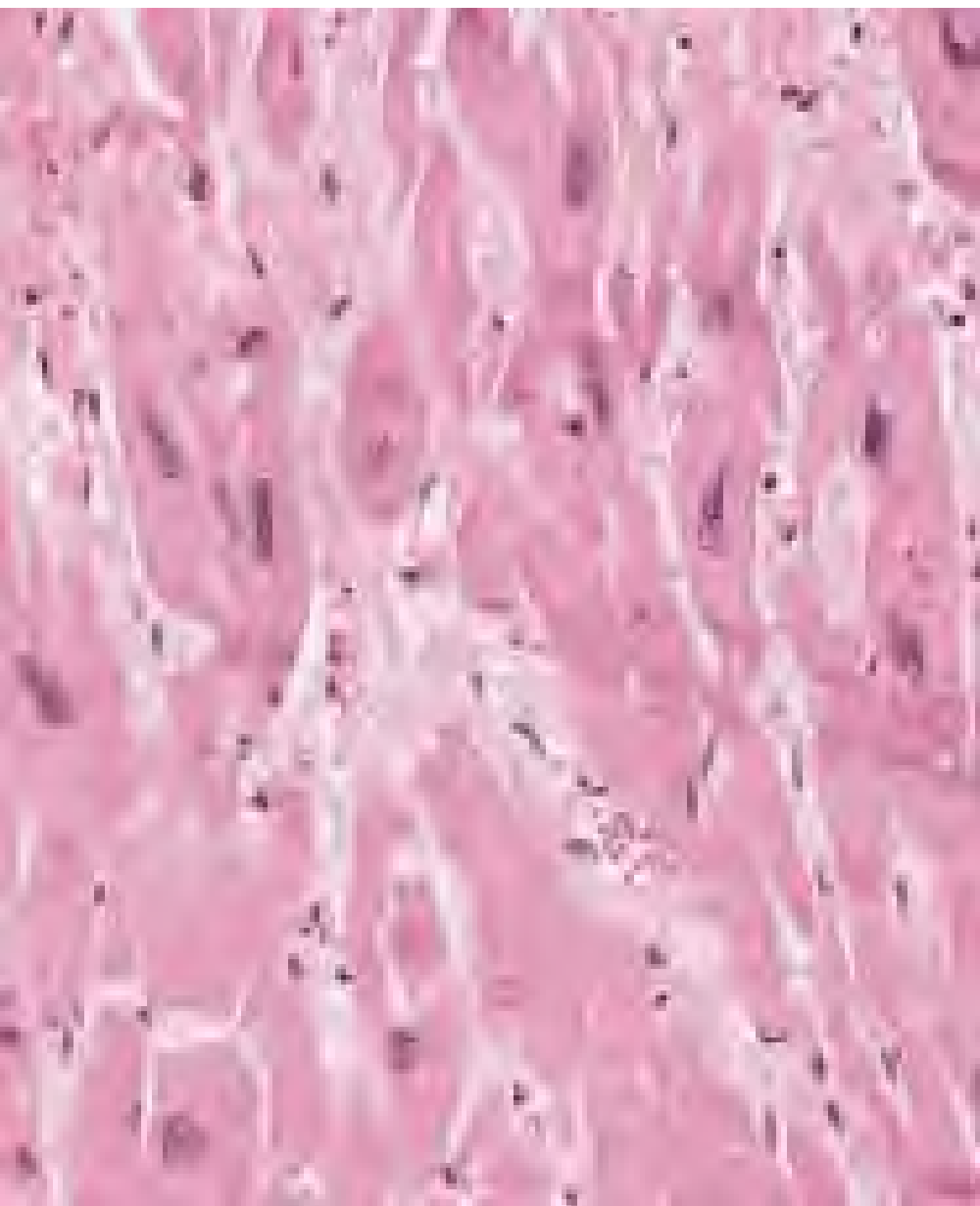
 PD-INCL Department of Pathology, University of Michigan (both images)

Myocardial Hypertrophy





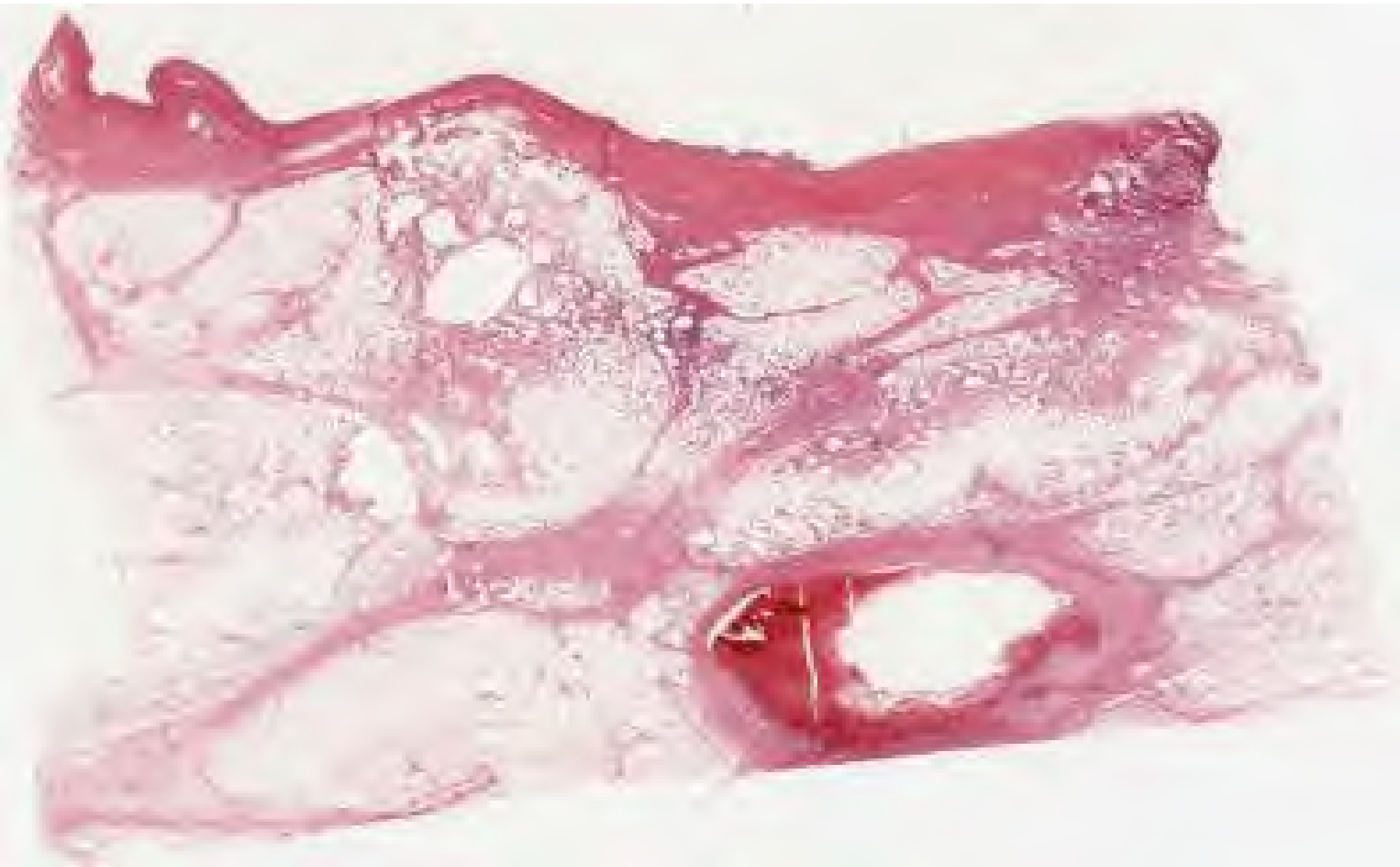




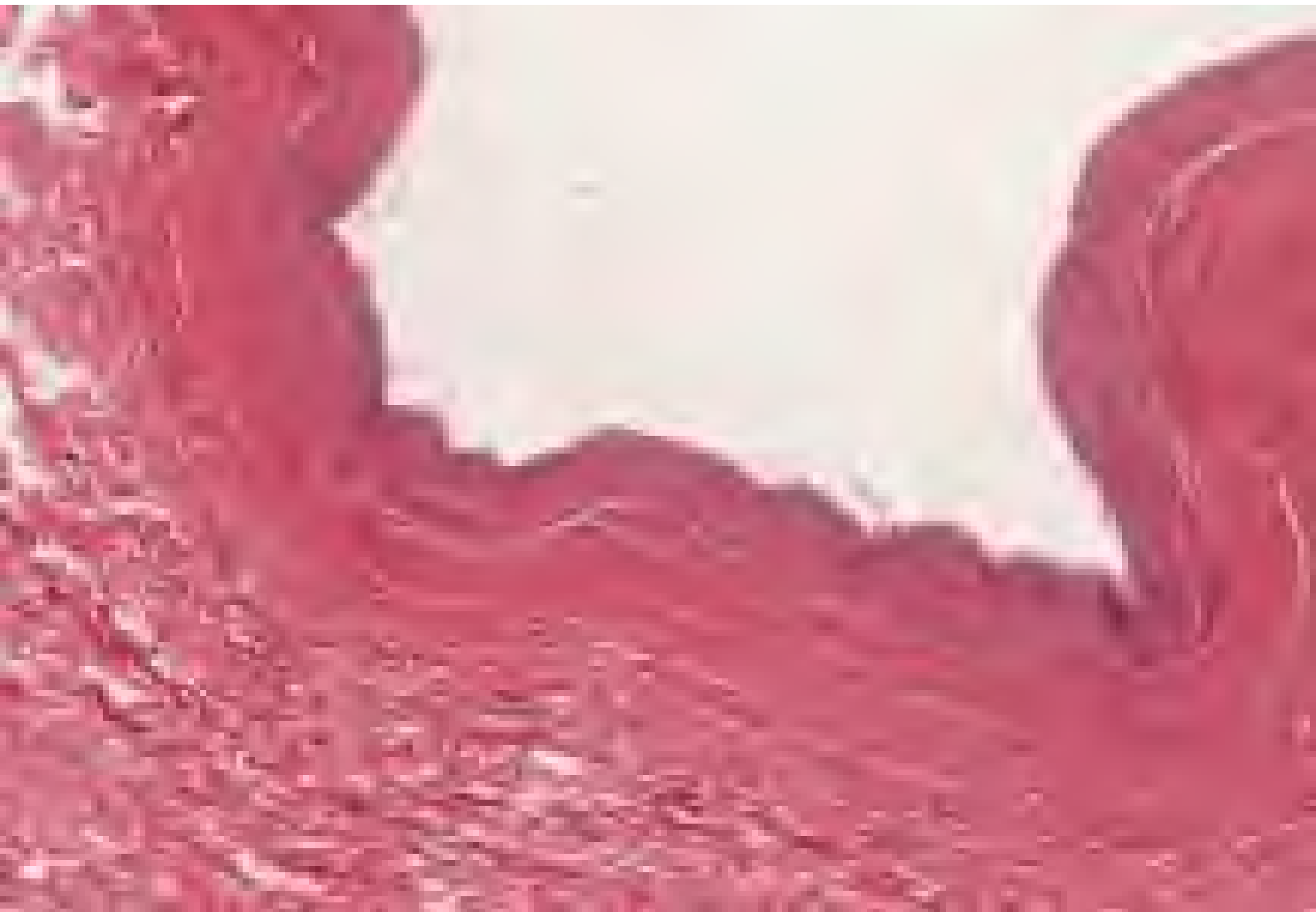
Gangrene

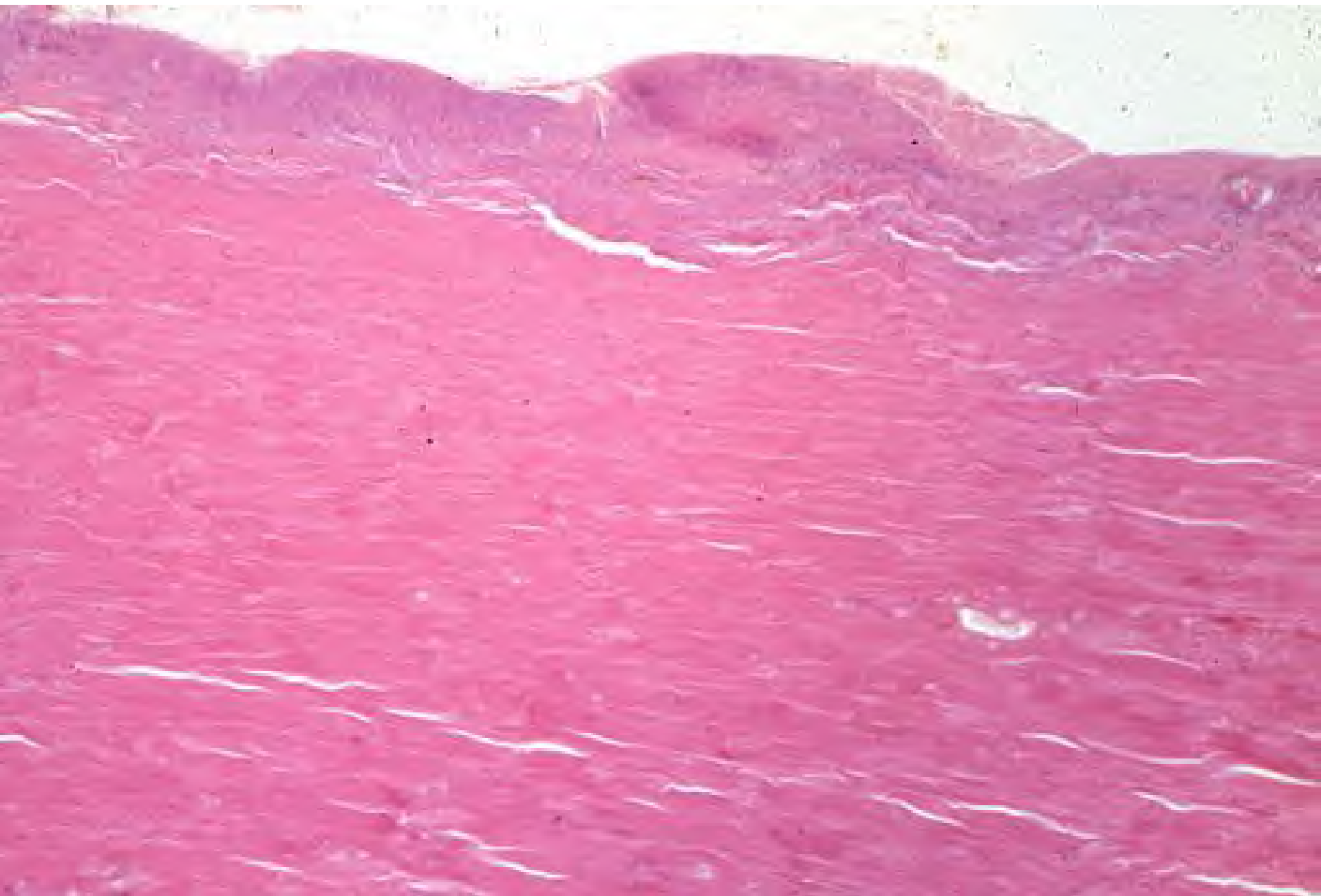


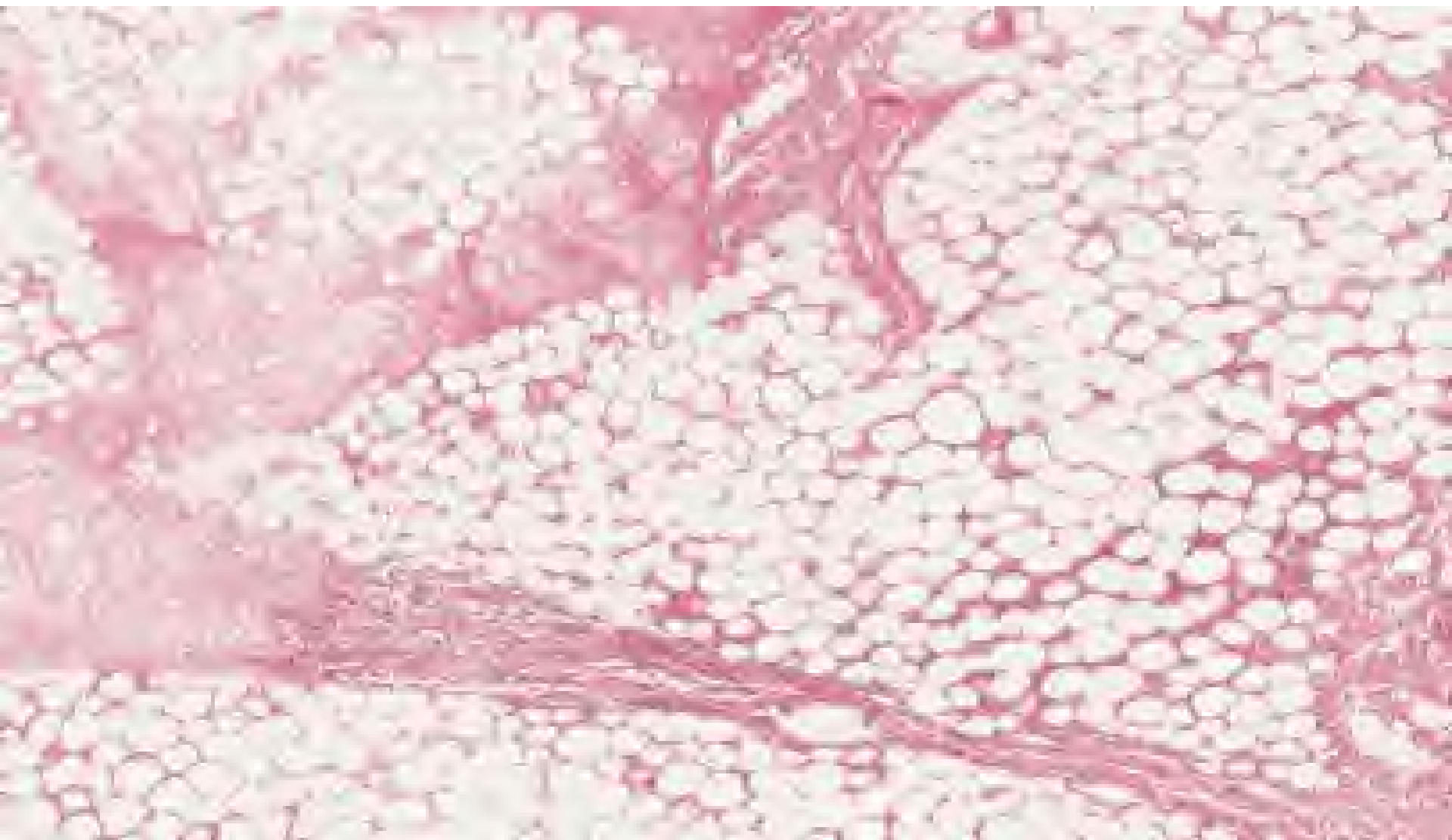
Gangrene

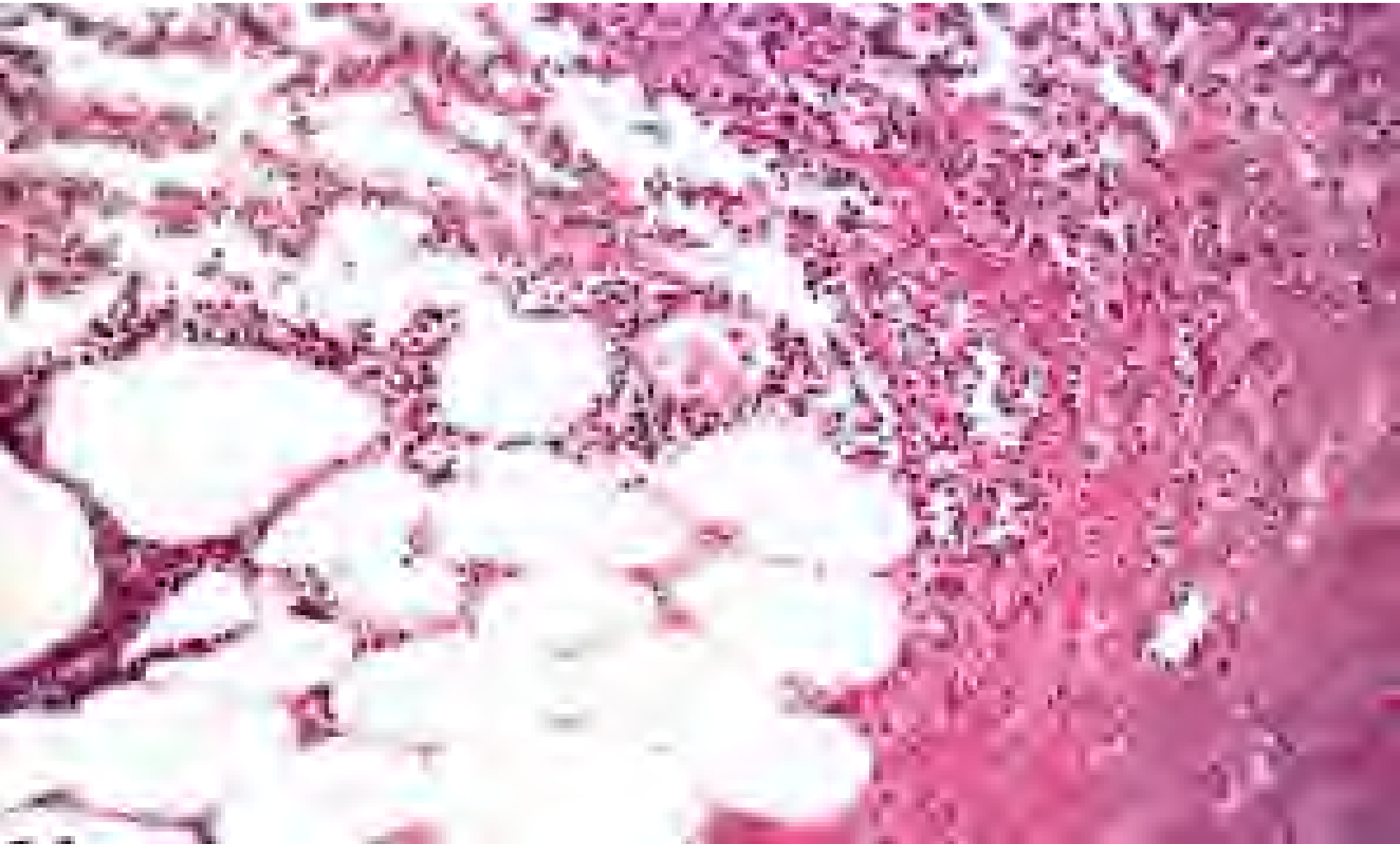


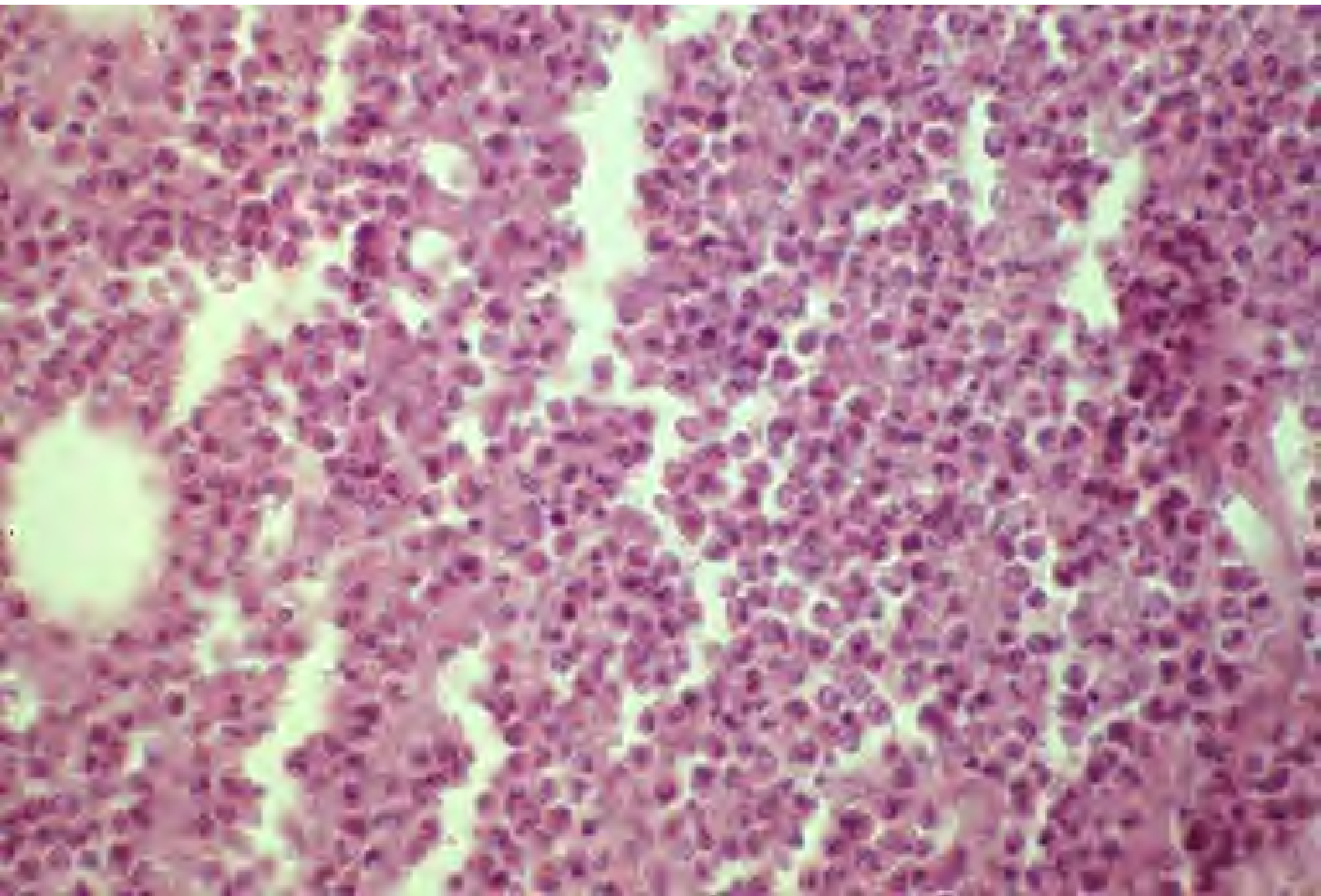












M-2 Cardiovascular Laboratory - 4

50 Rheumatic heart disease

Pericarditis

Myocarditis

Endocarditis

51 Infective endocarditis

58 Myocarditis

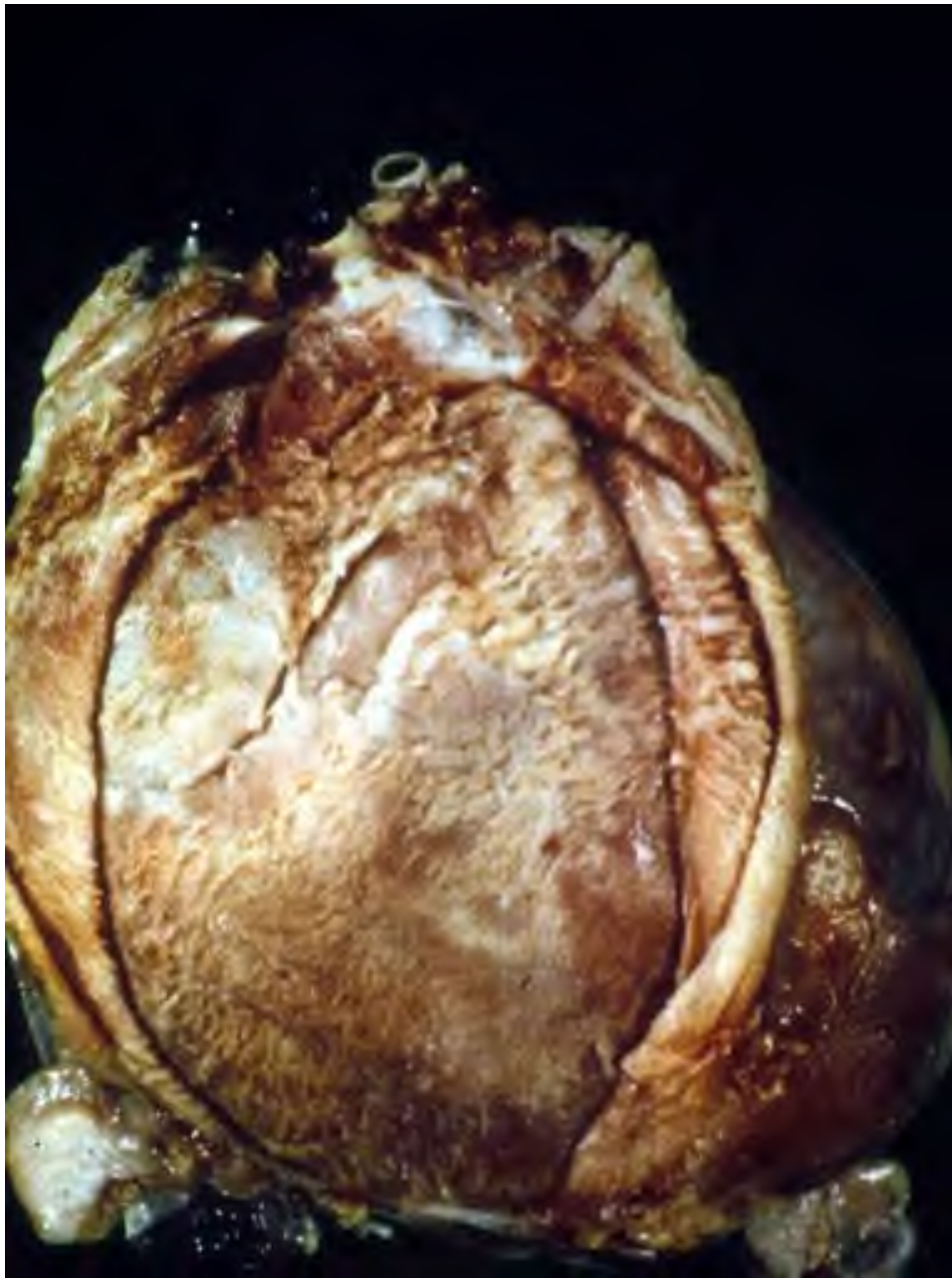
21 Pericarditis

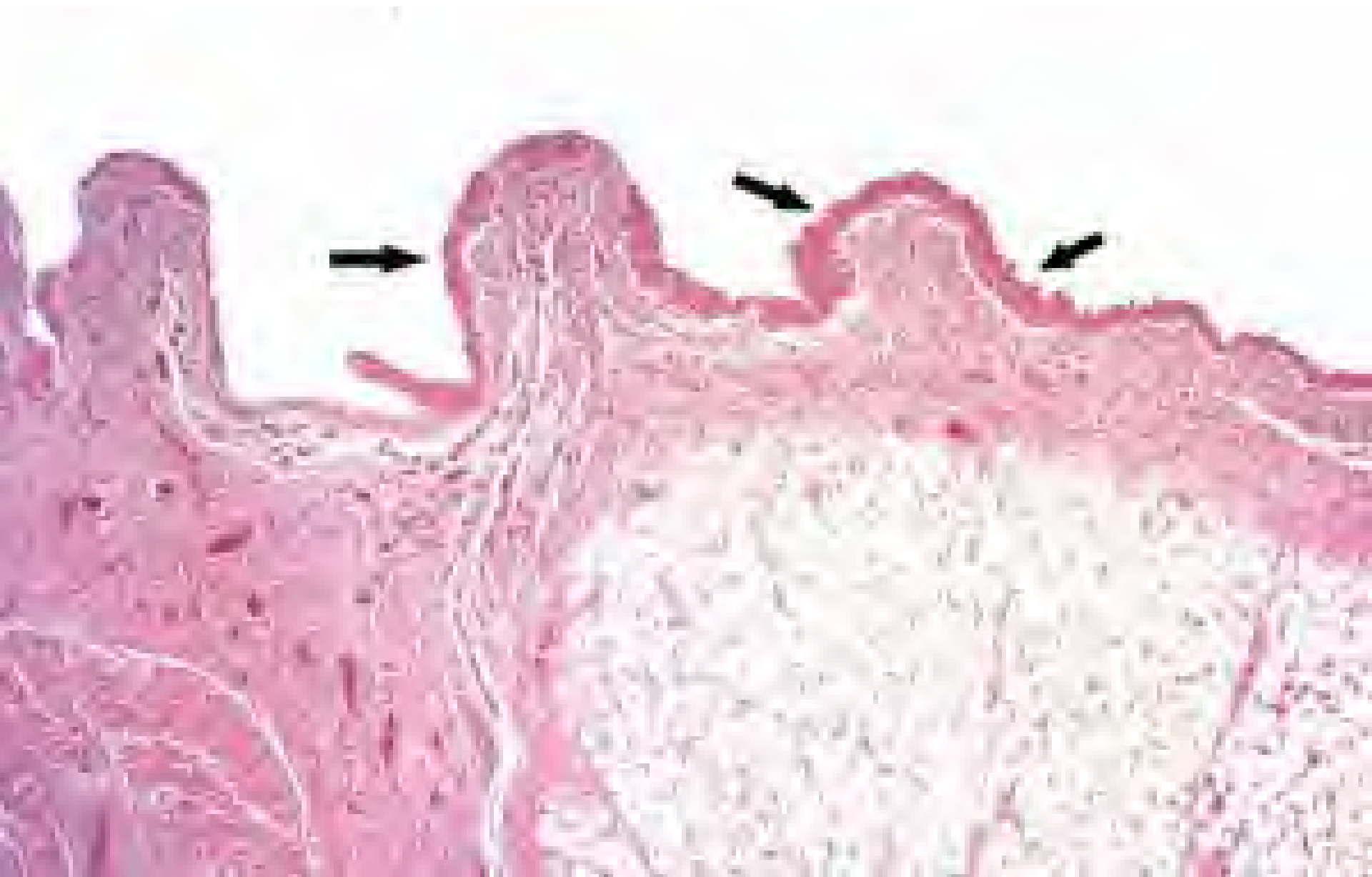
Atrial Myxoma

Rheumatic Heart Disease

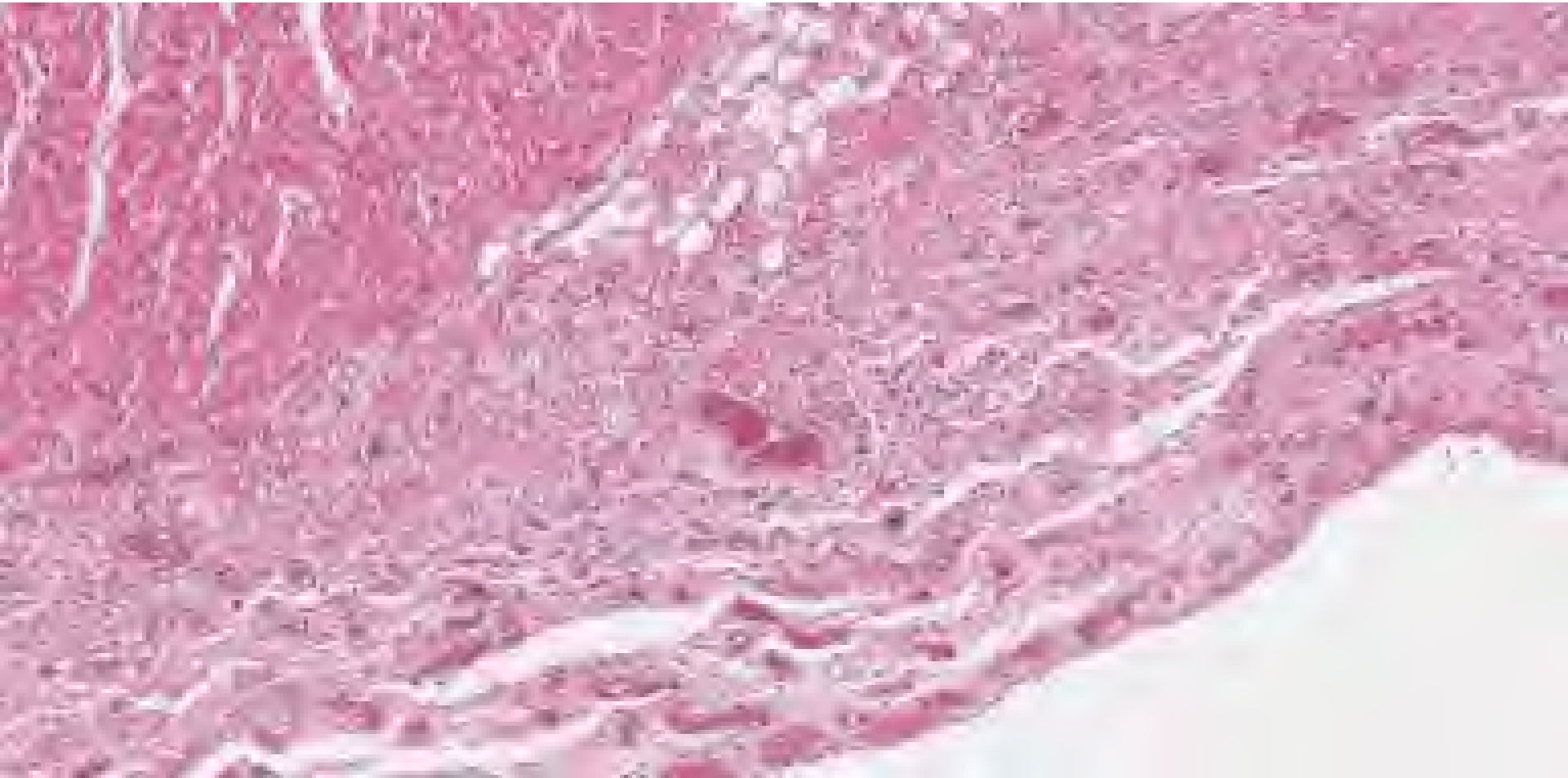


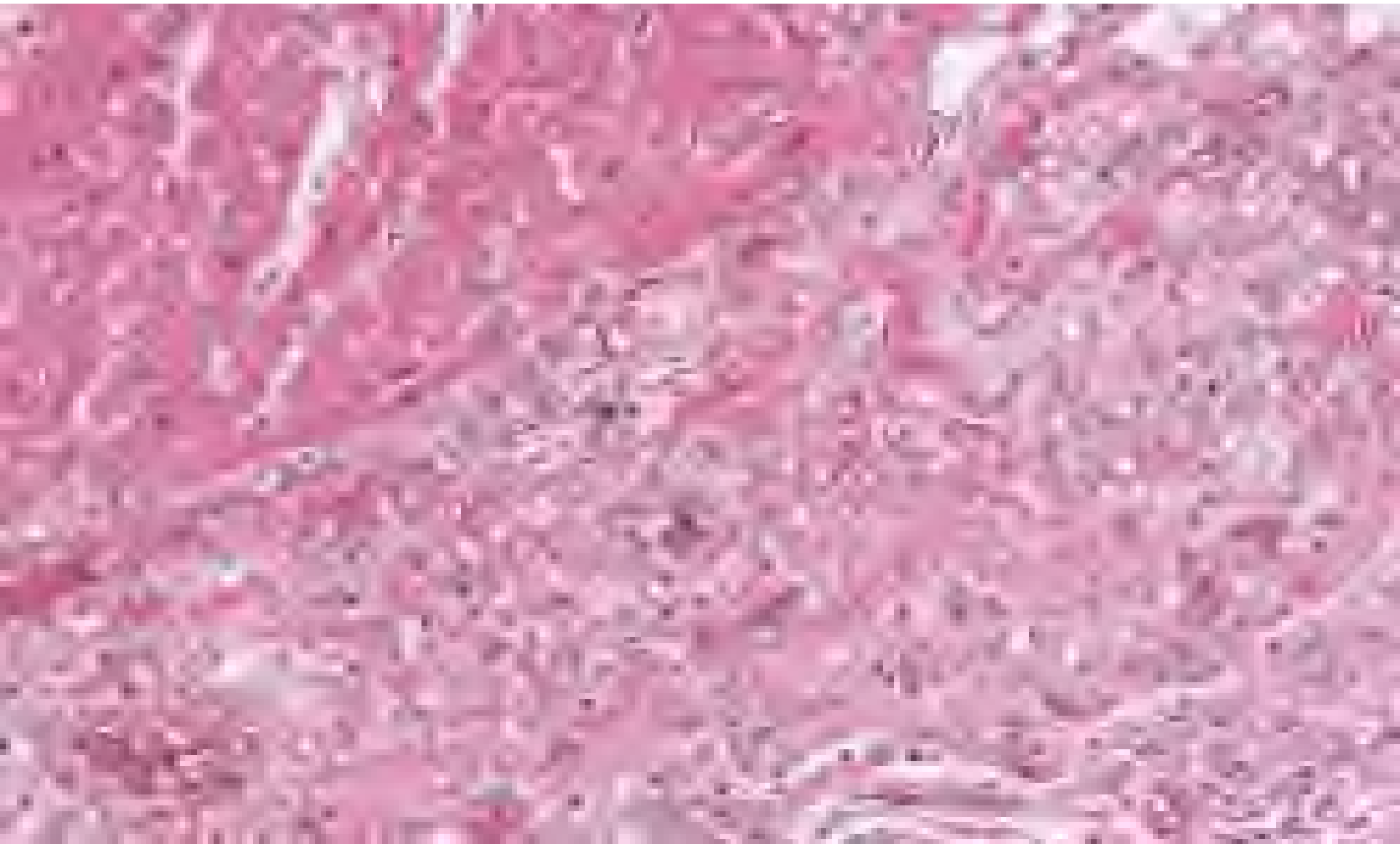
Rheumatic Pericarditis





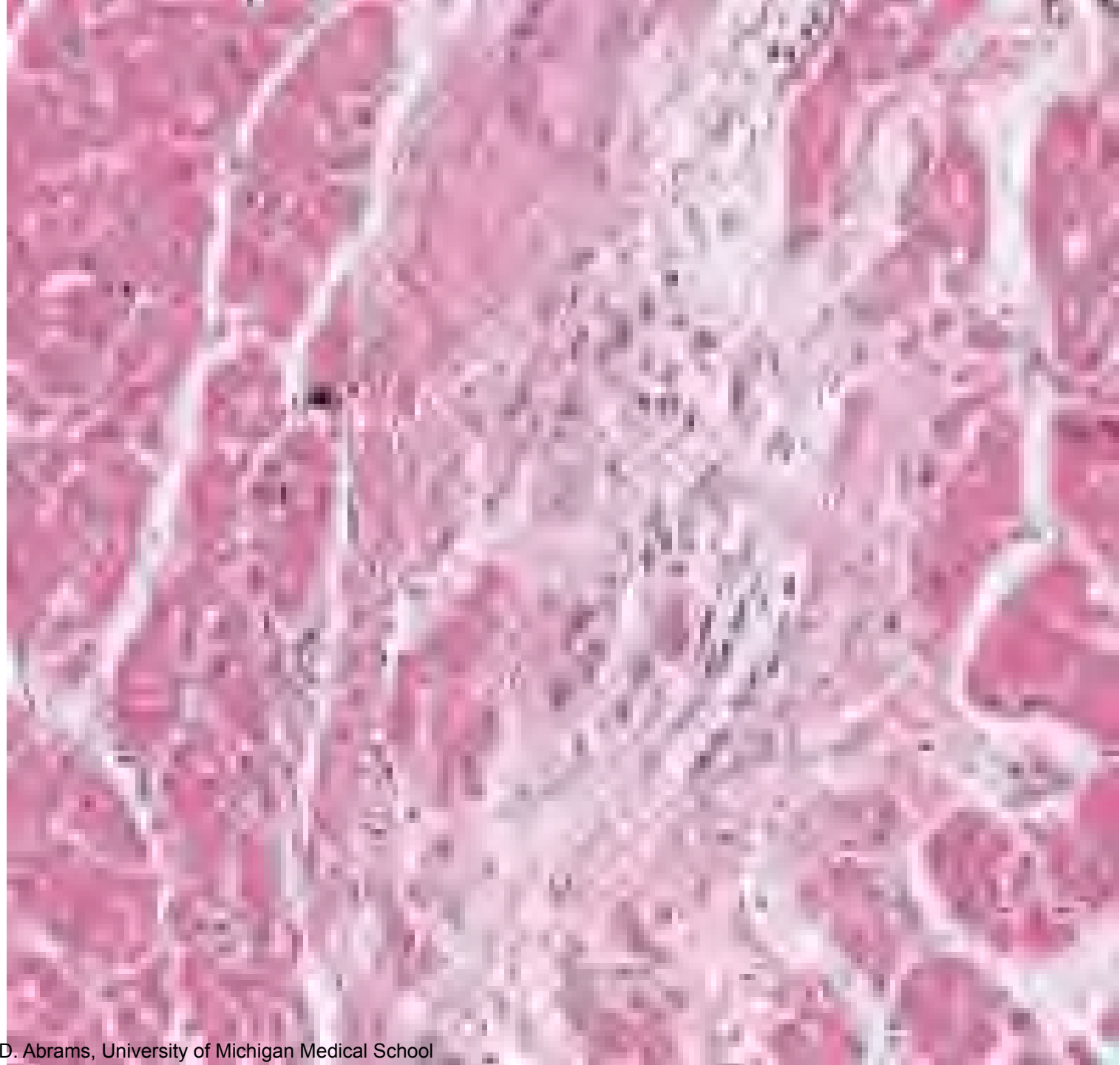
Rheumatic Pericarditis

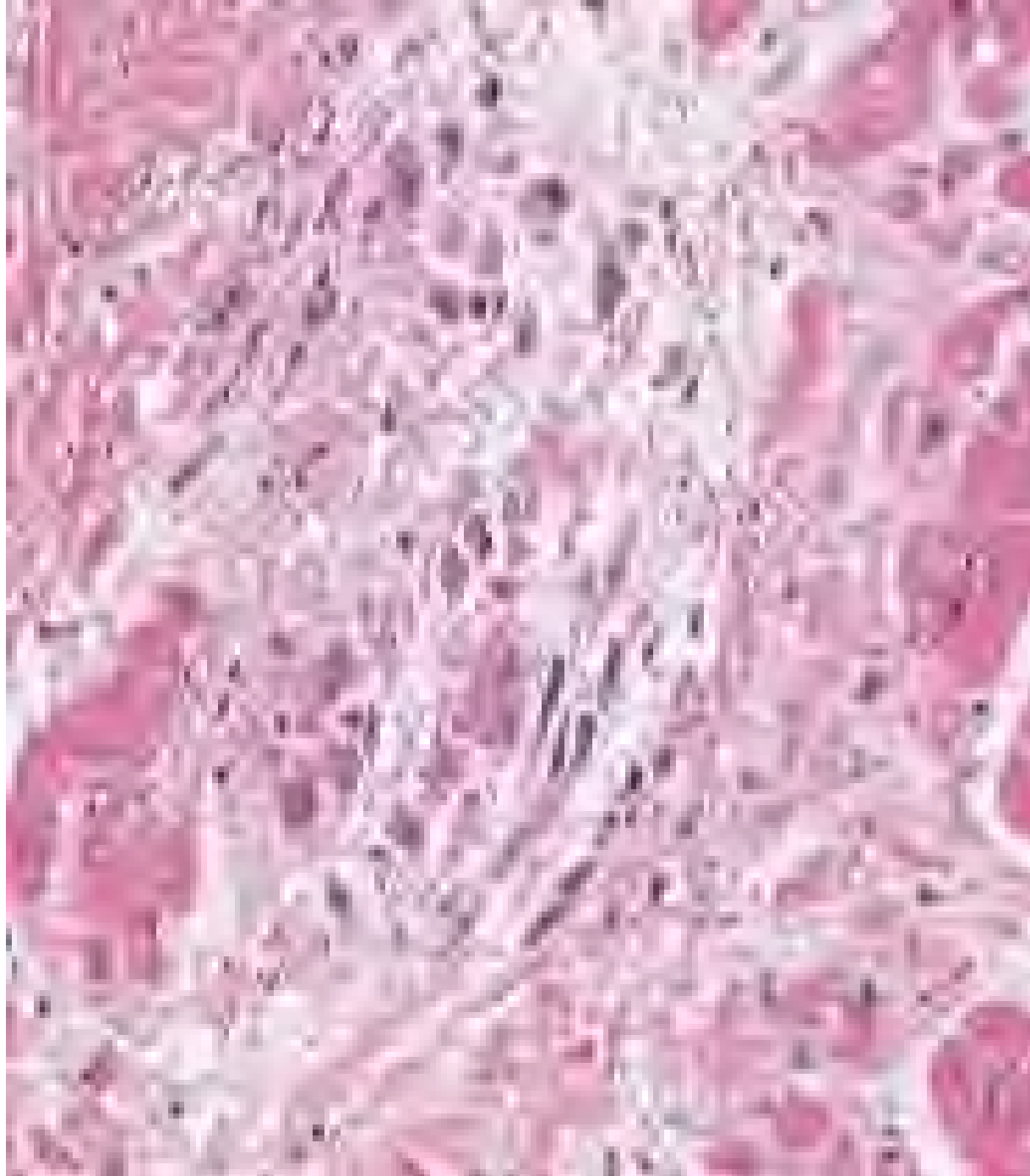


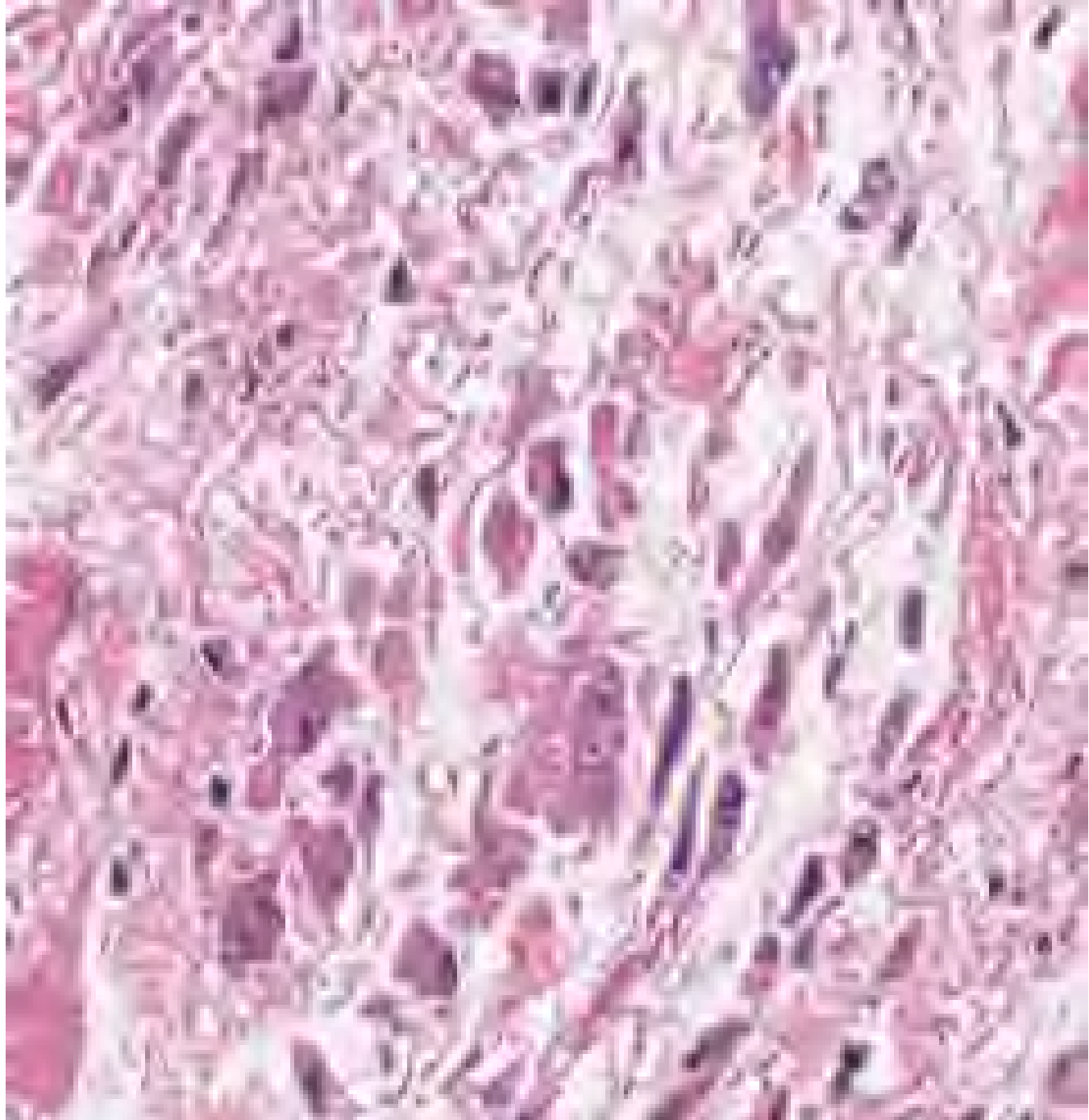


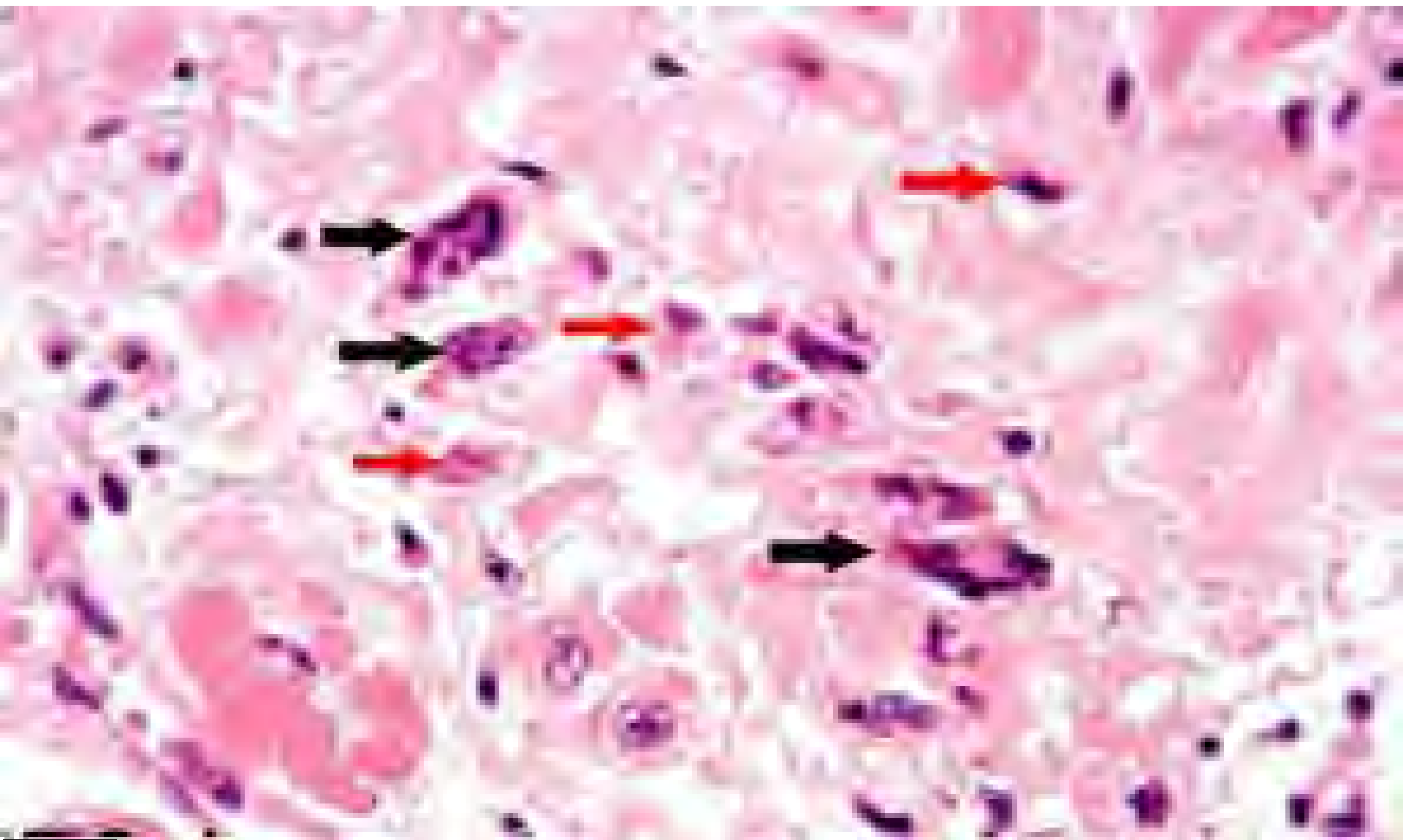
Rheumatic Myocarditis











Rheumatic Endocarditis



Vegetations

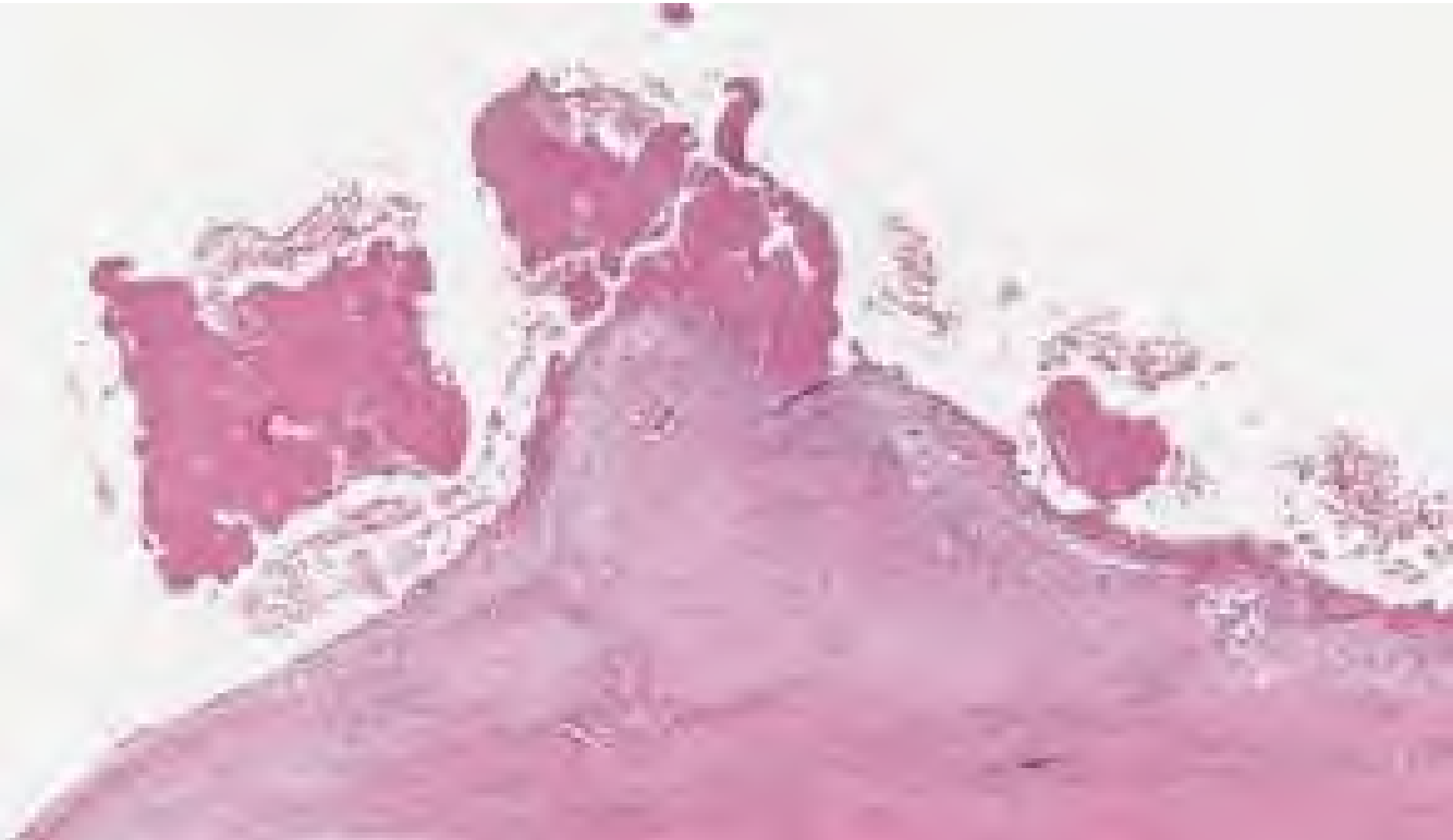


Rheumatic Endocarditis





Rheumatic Endocarditis



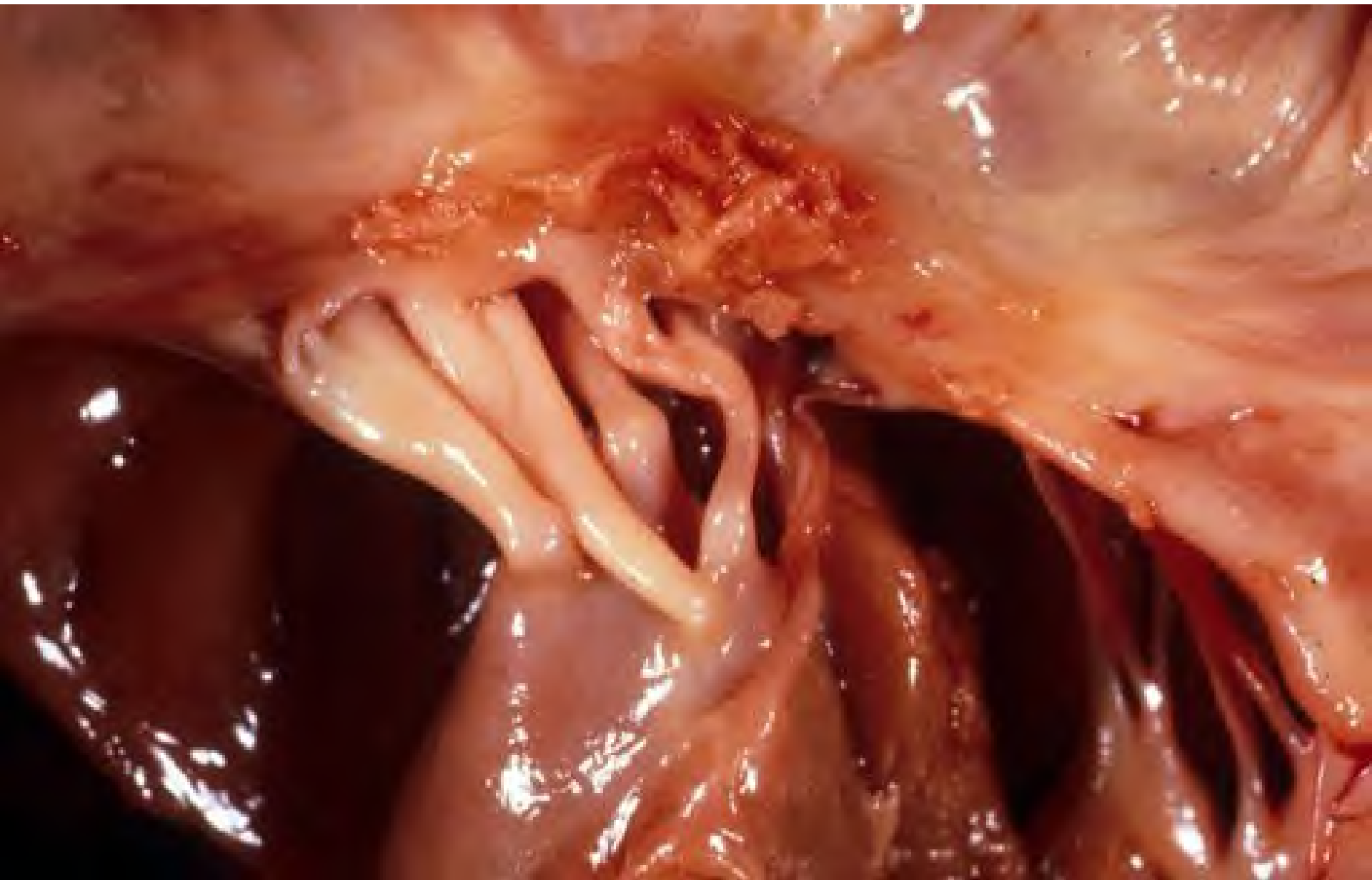




Bacterial Endocarditis - Aortic Valve



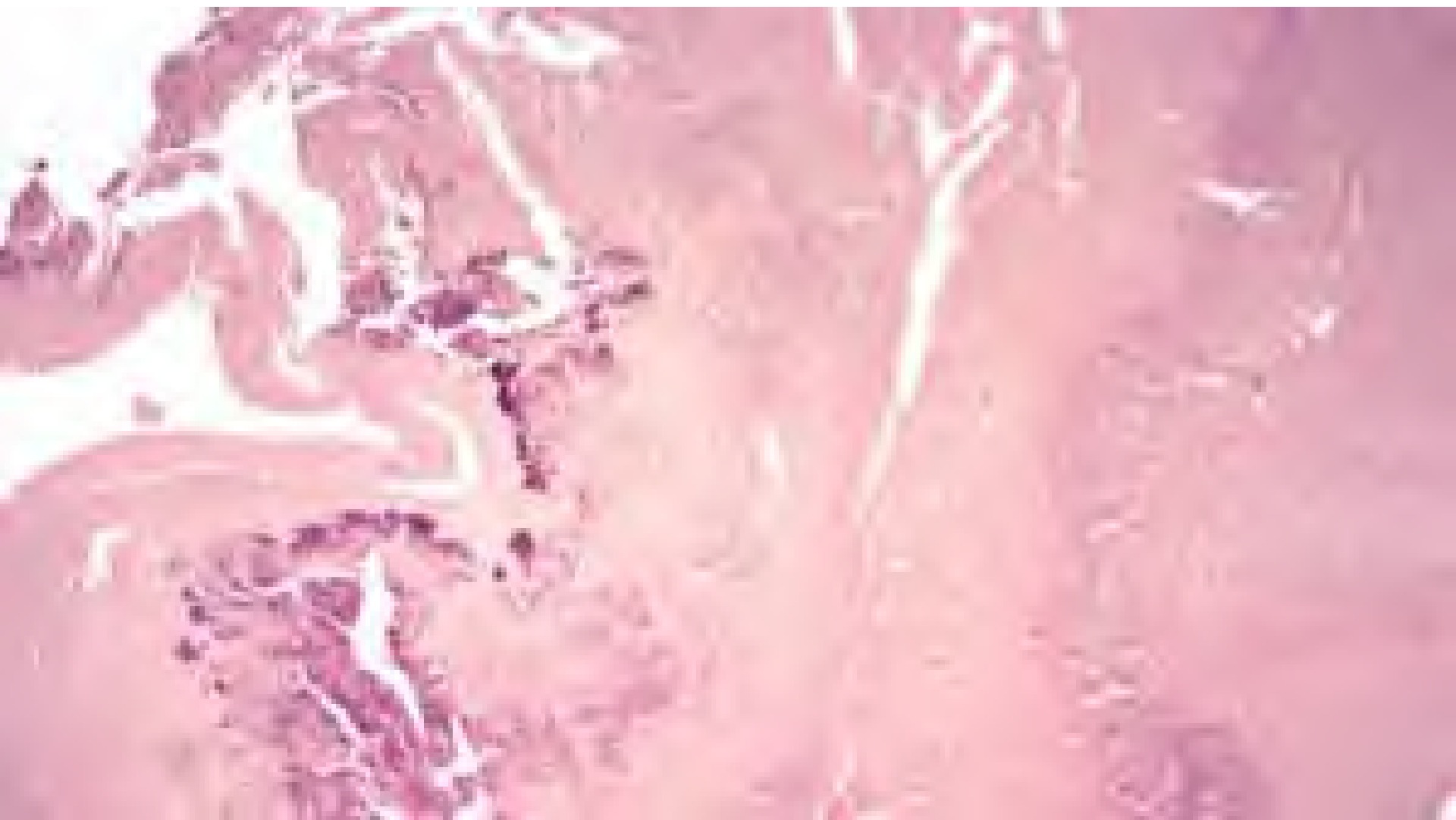


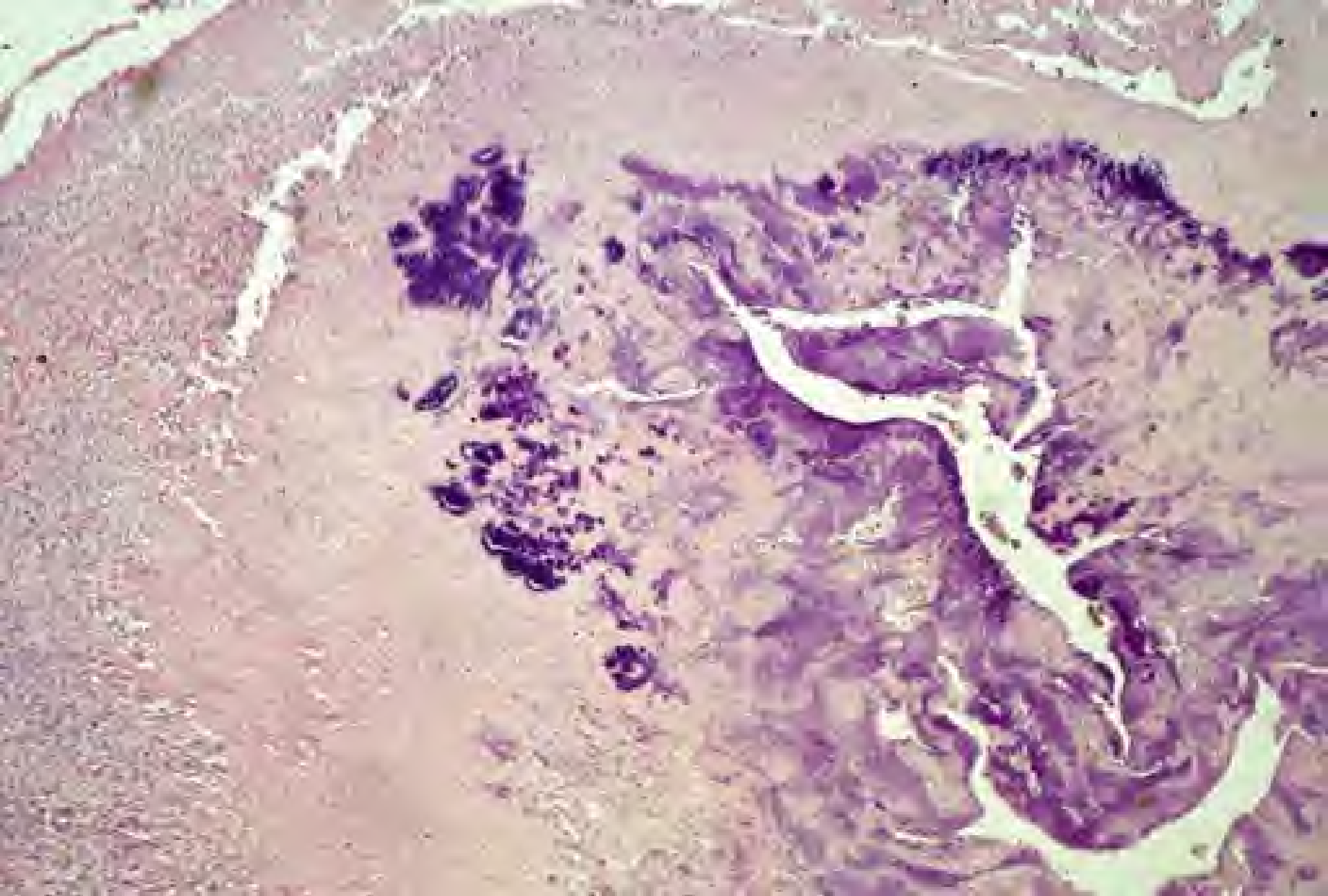


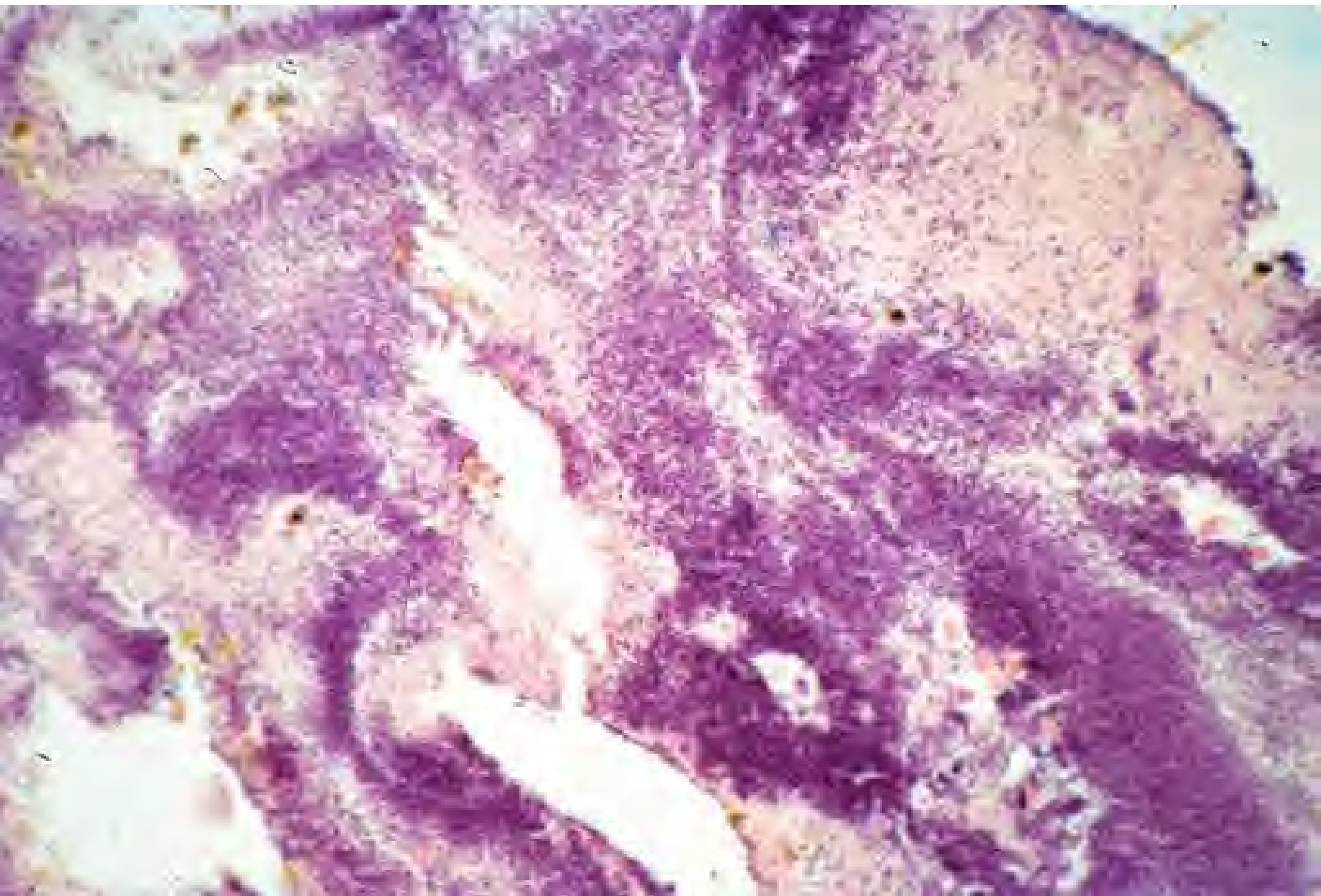
Bacterial Endocarditis - Aortic Valve



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

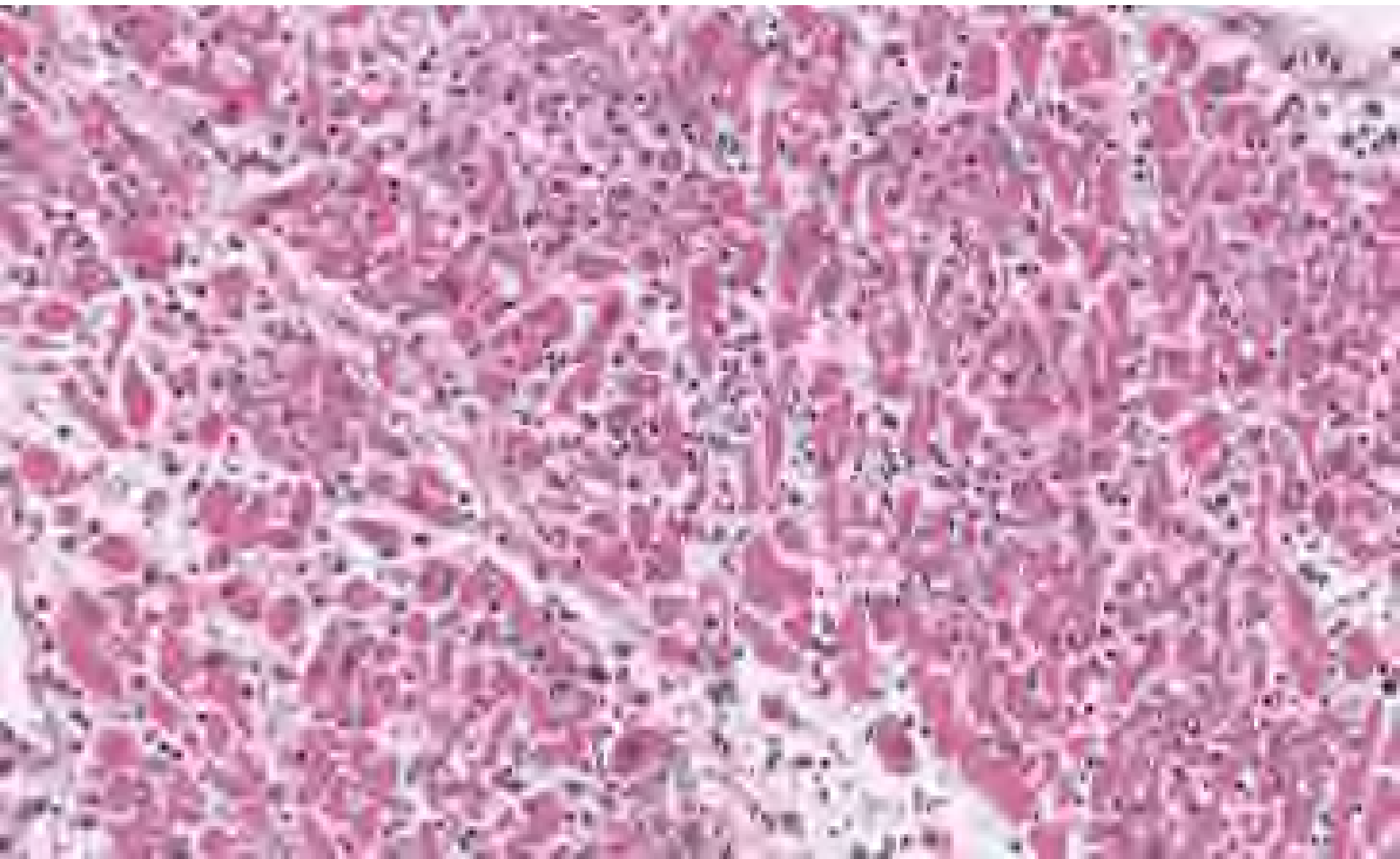


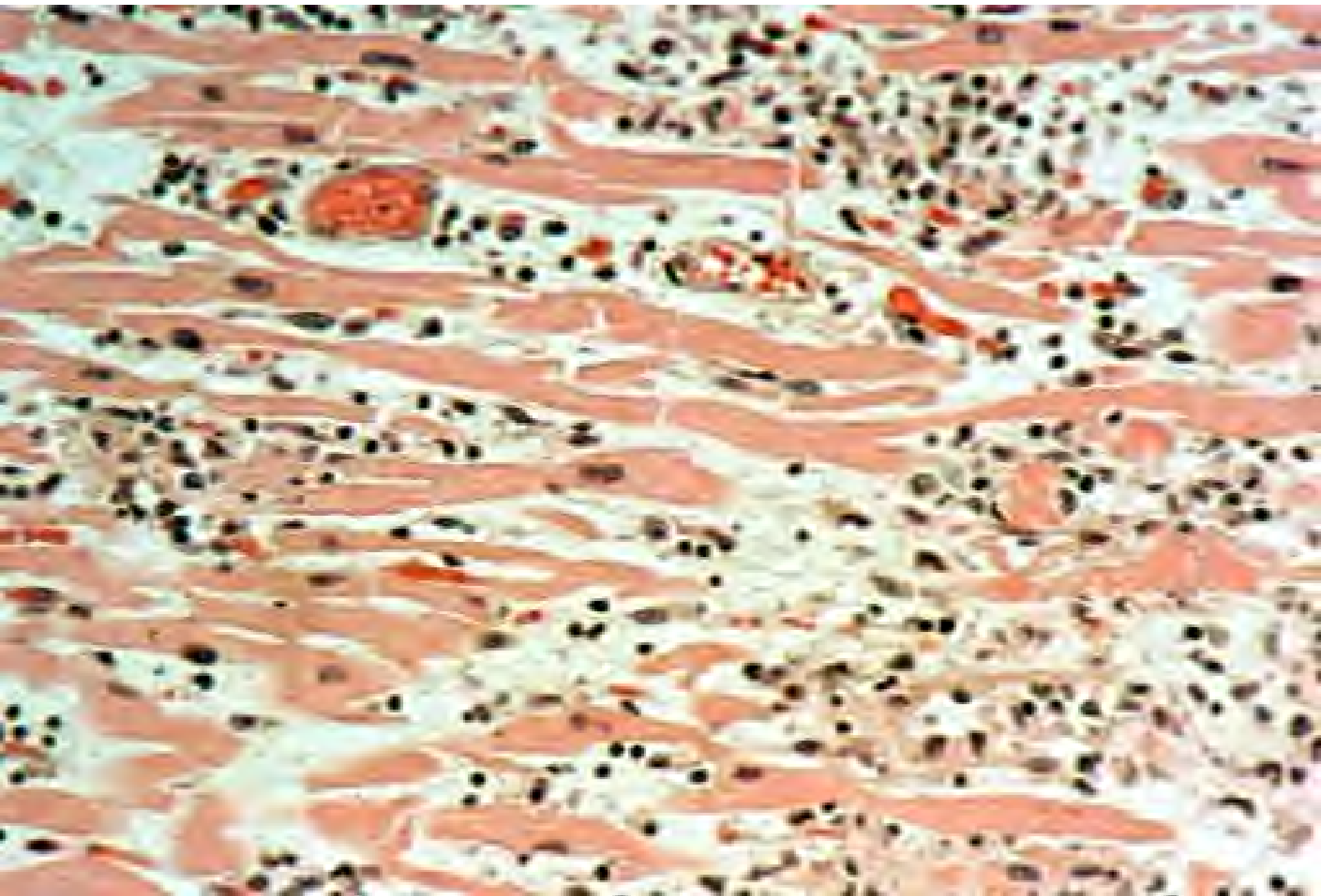


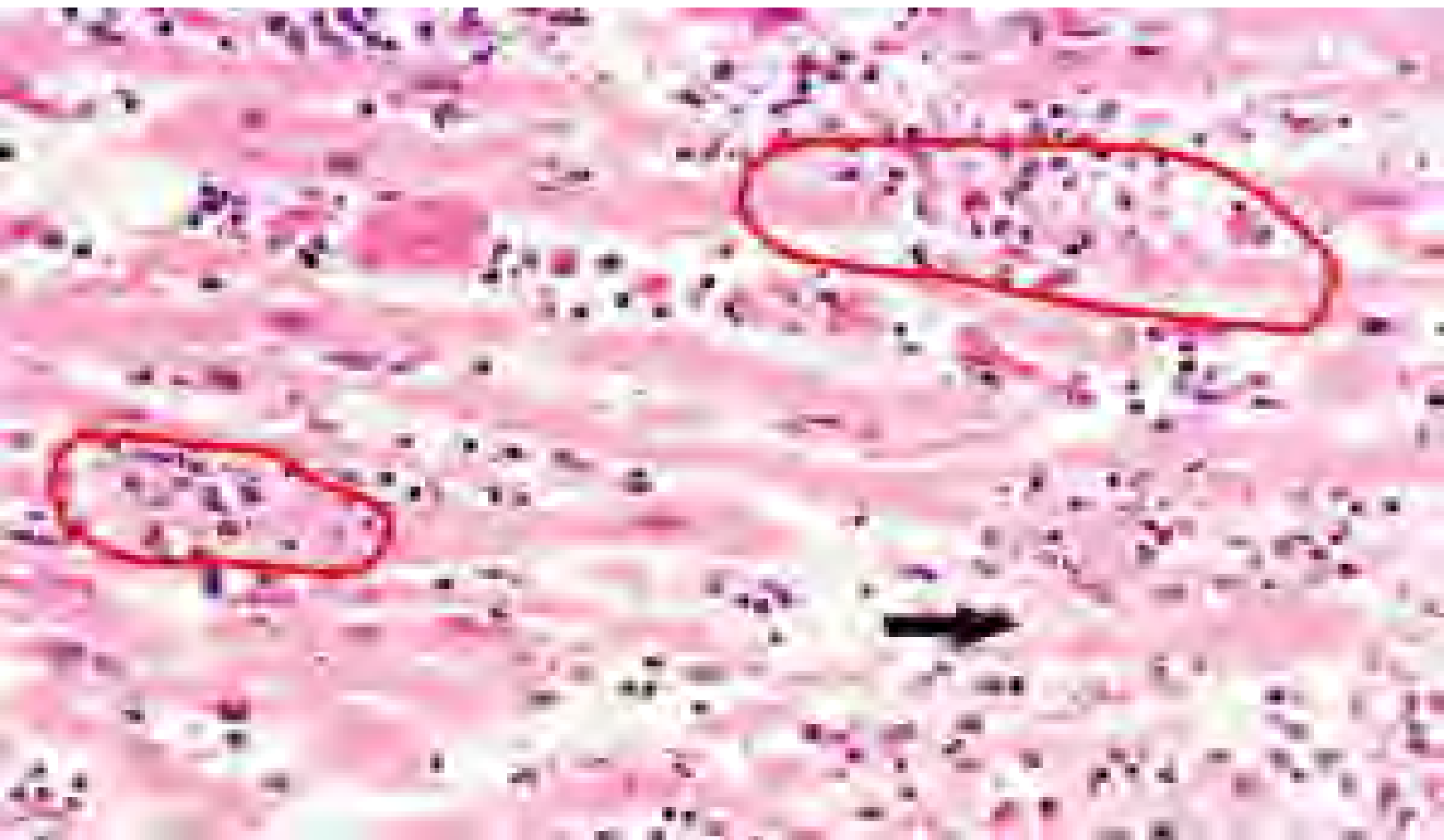


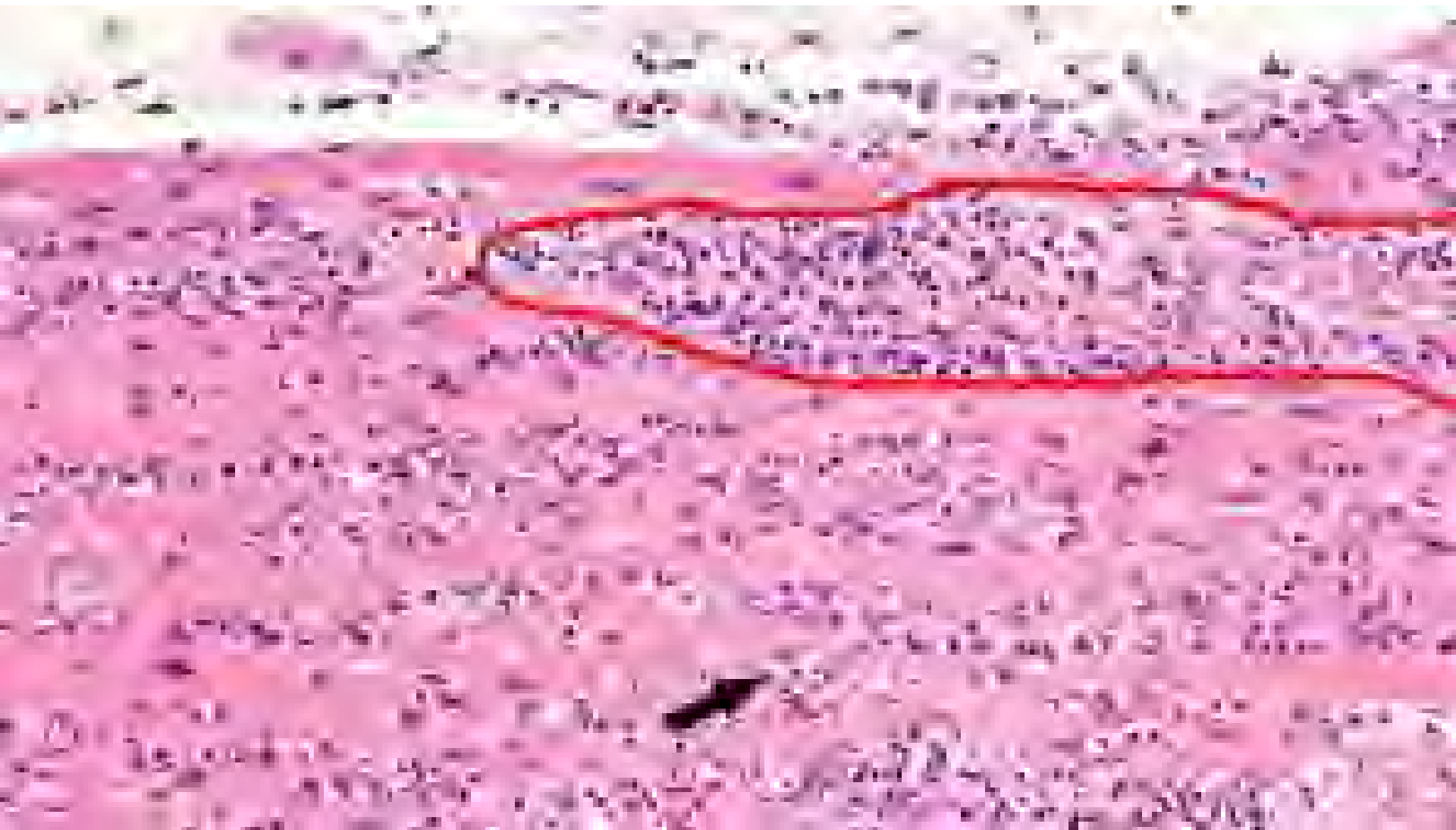
Myocarditis

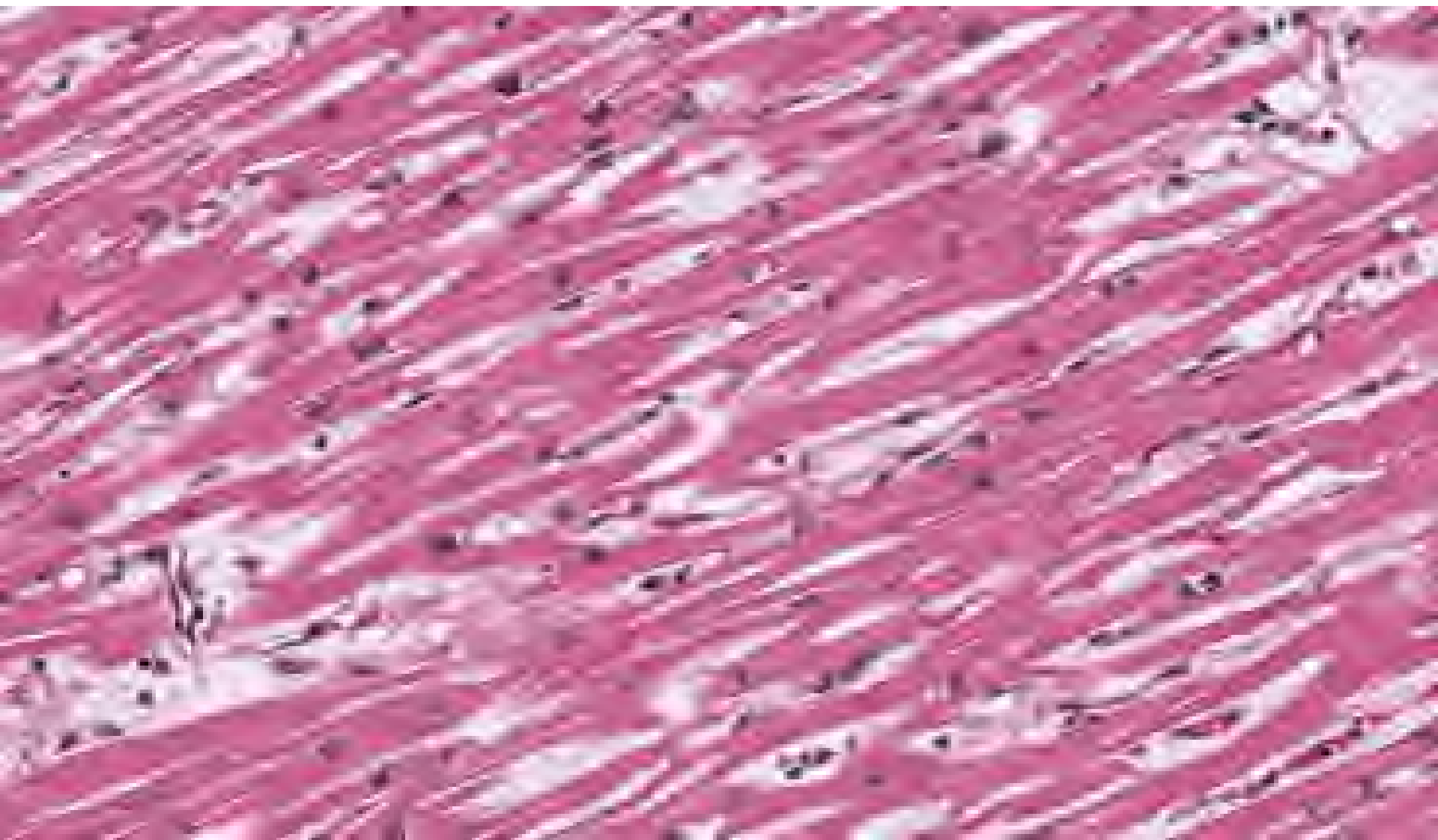


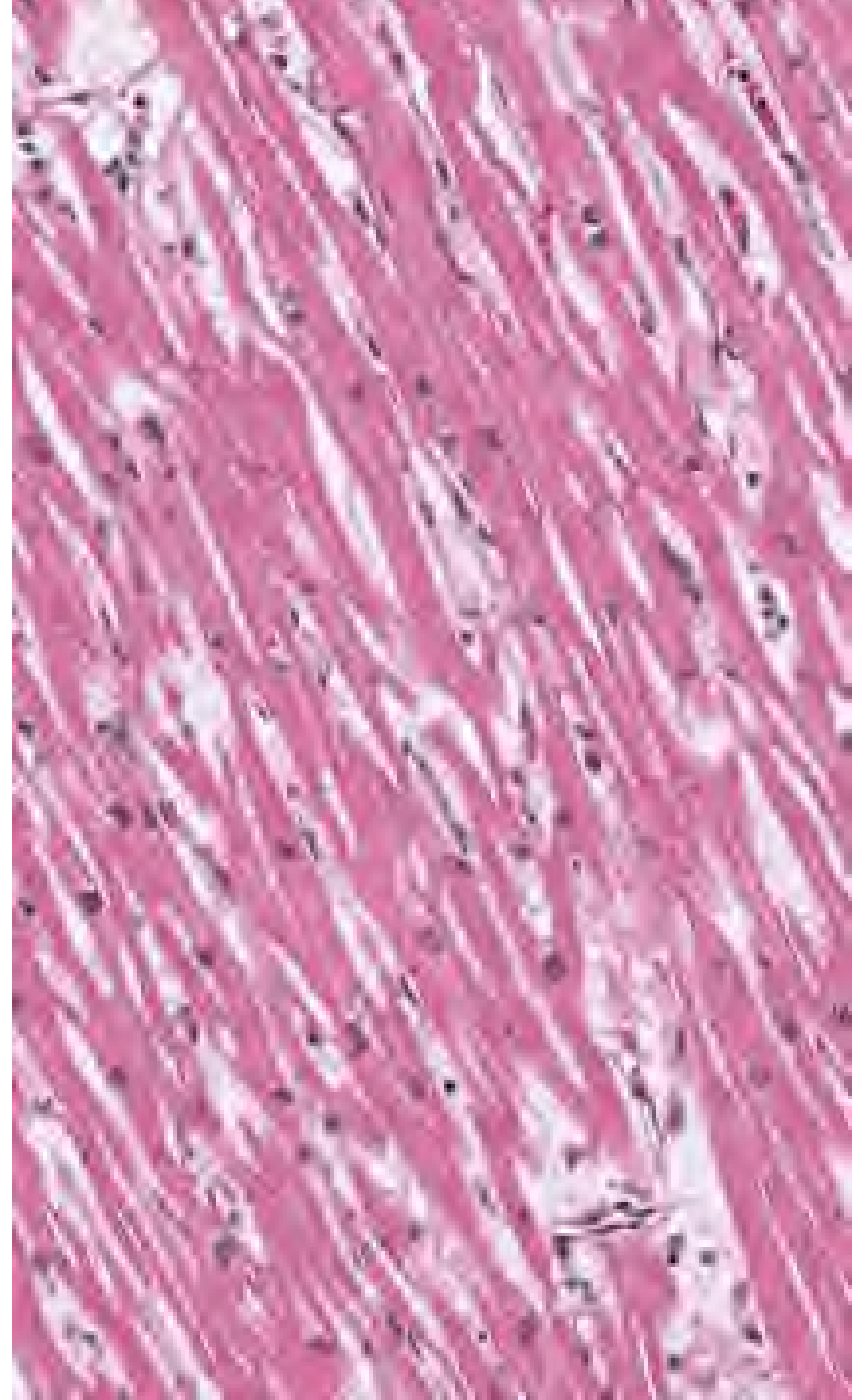
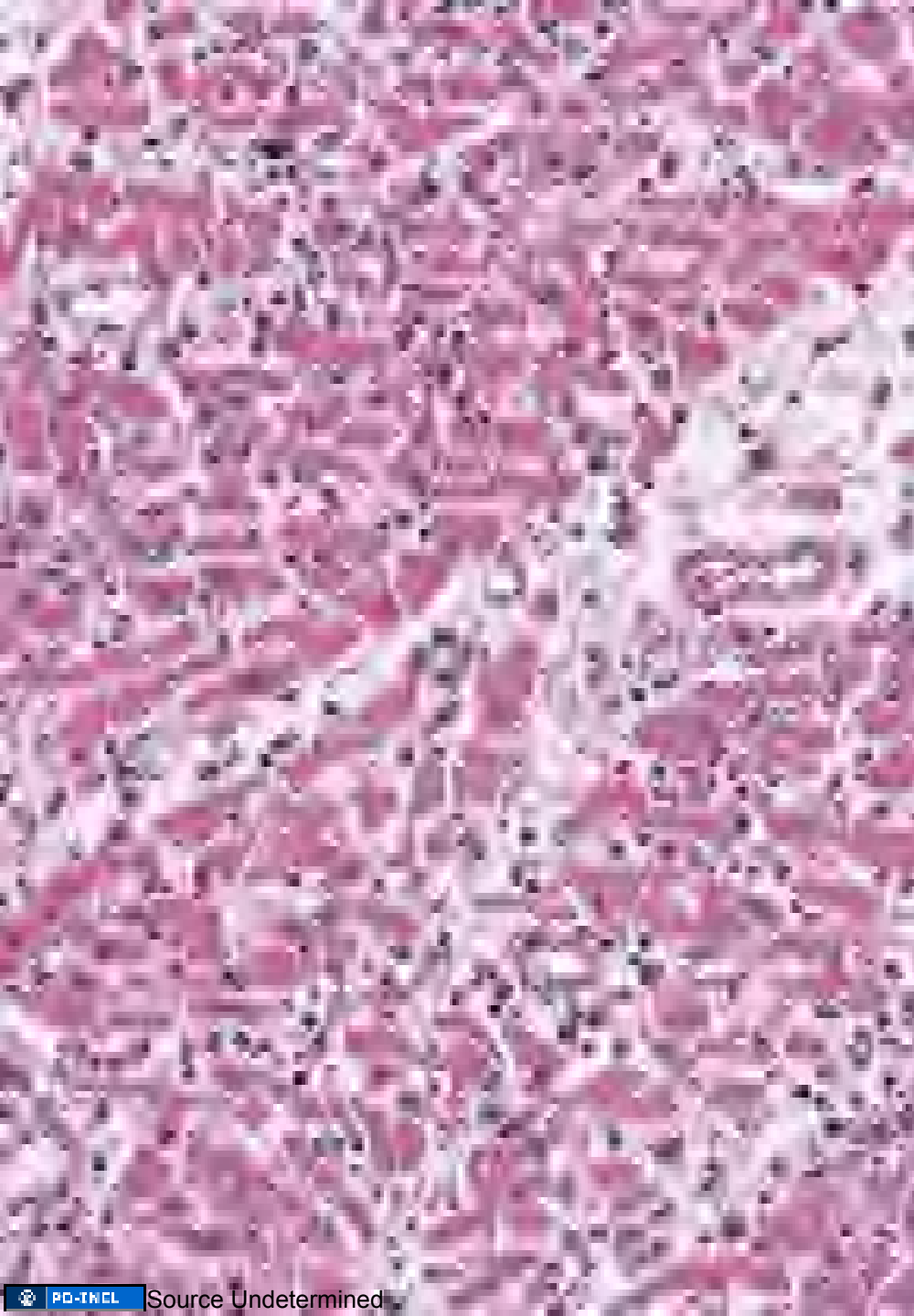






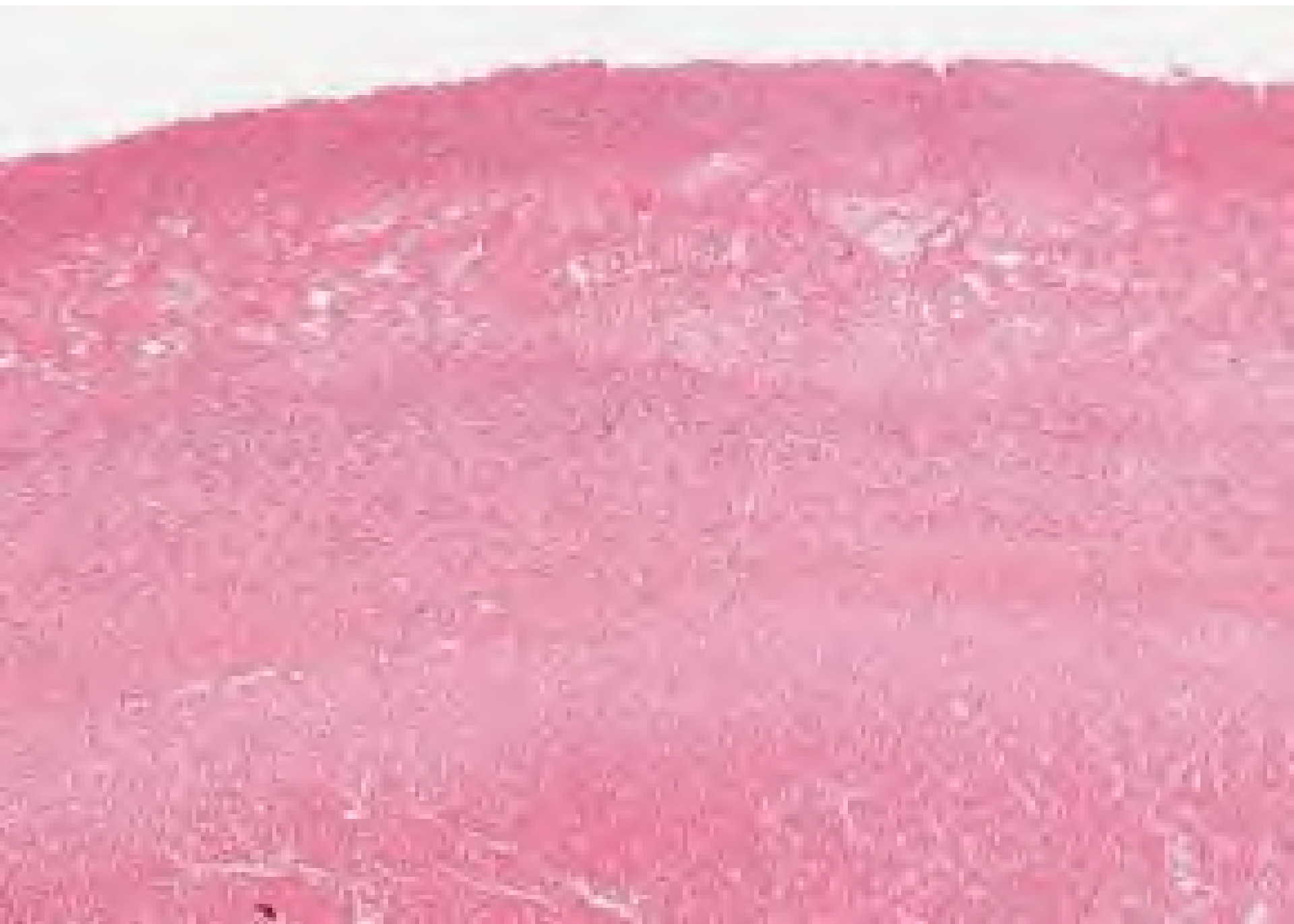


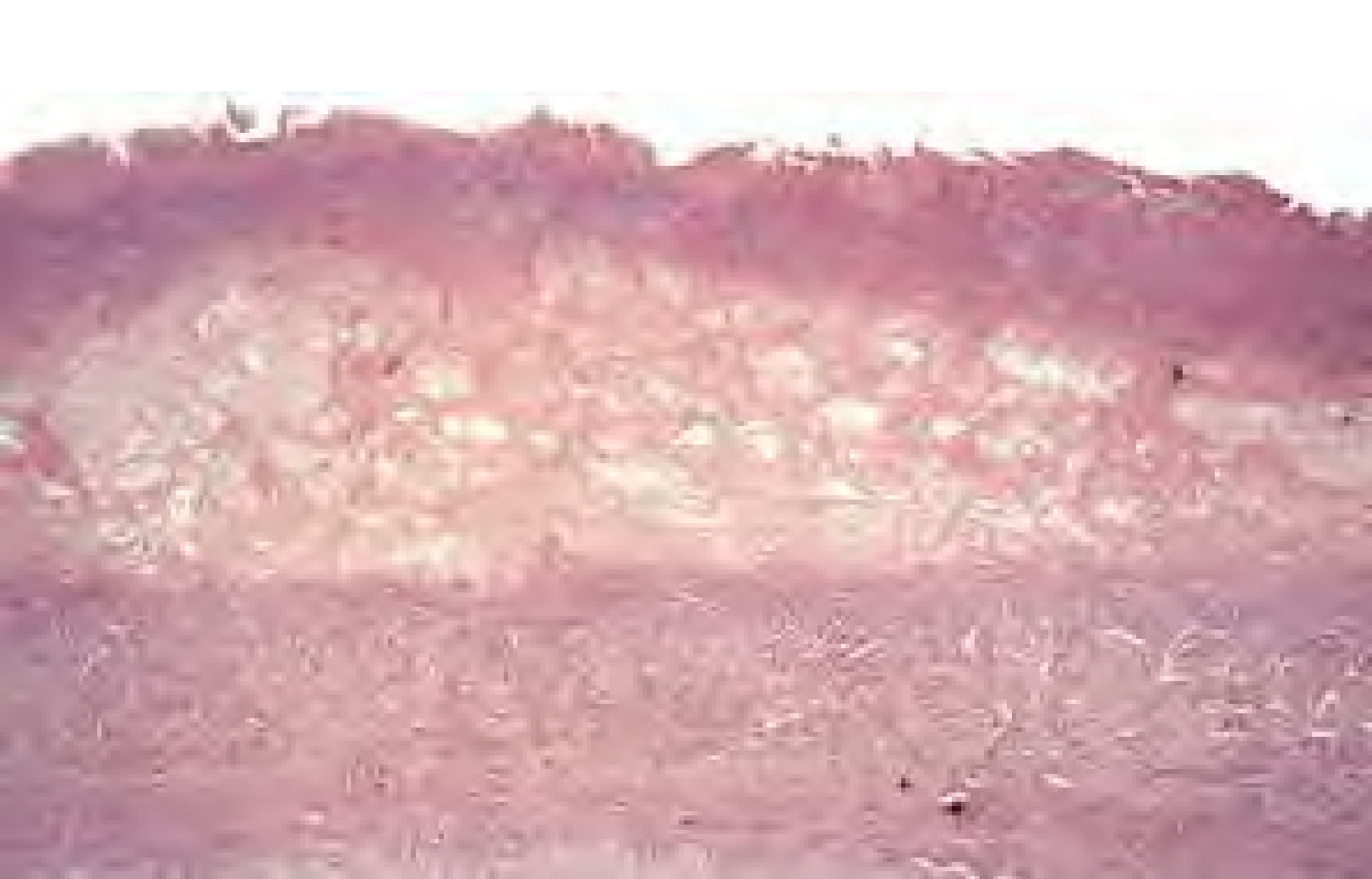




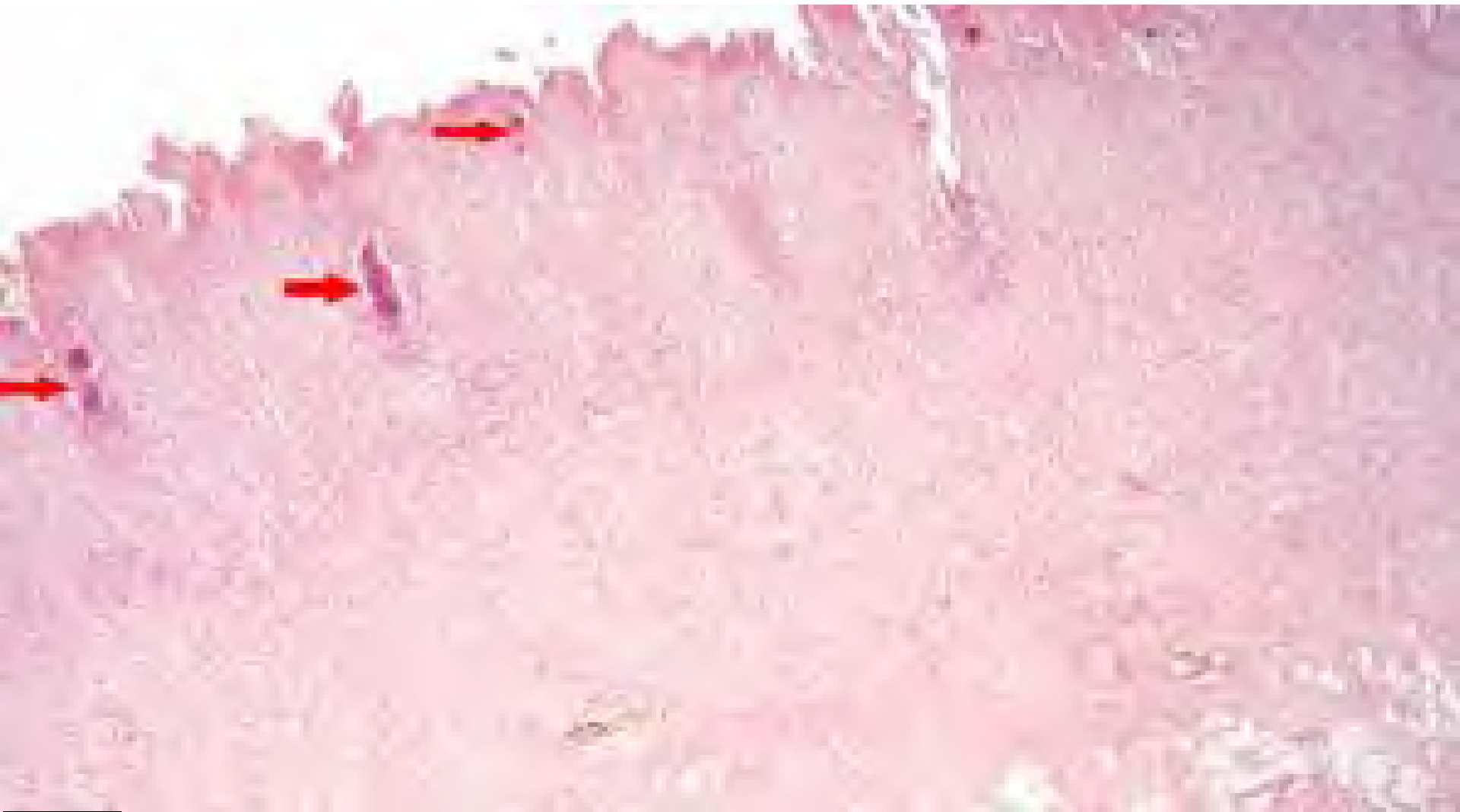
Pericarditis (epicarditis)

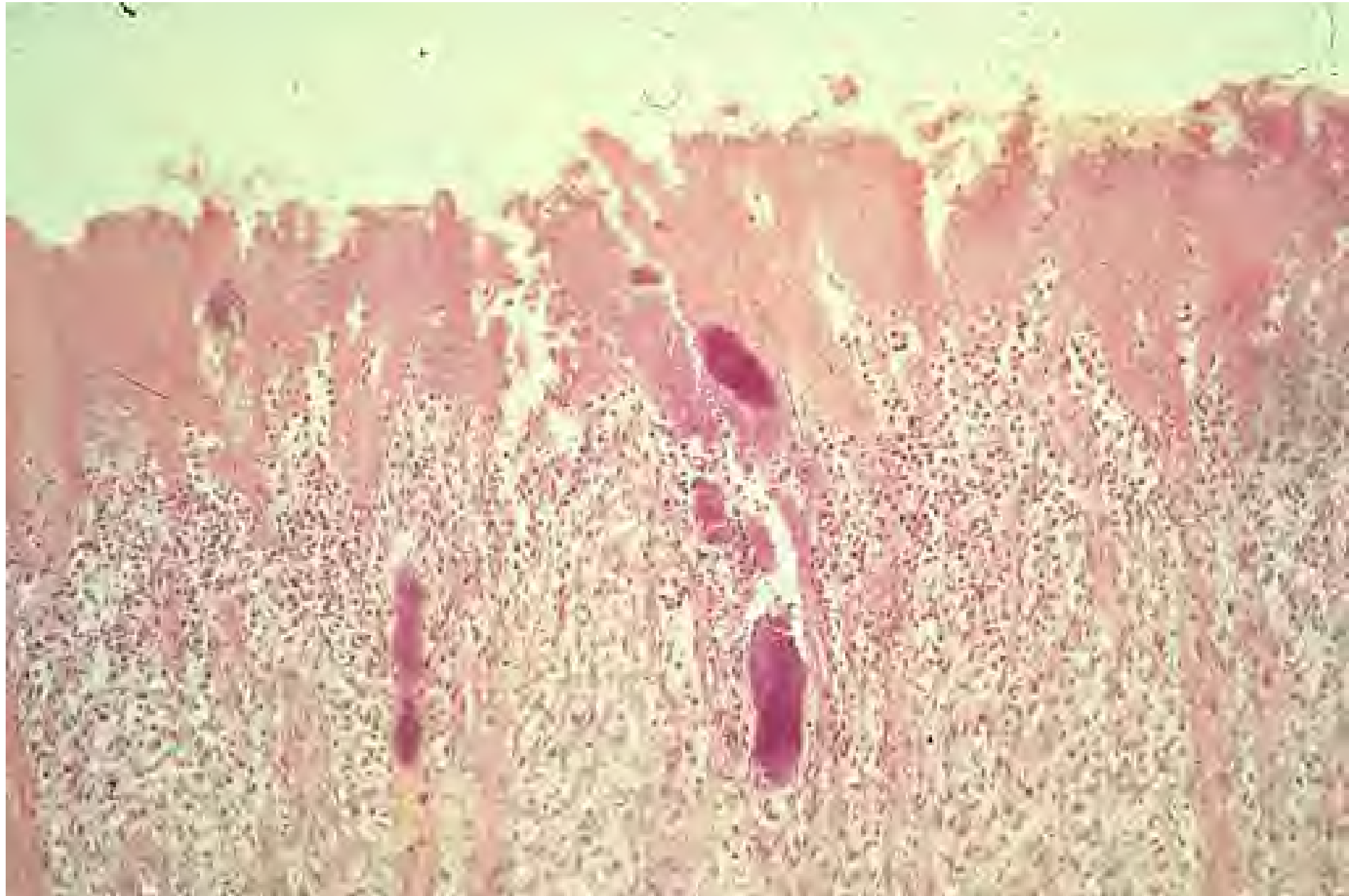


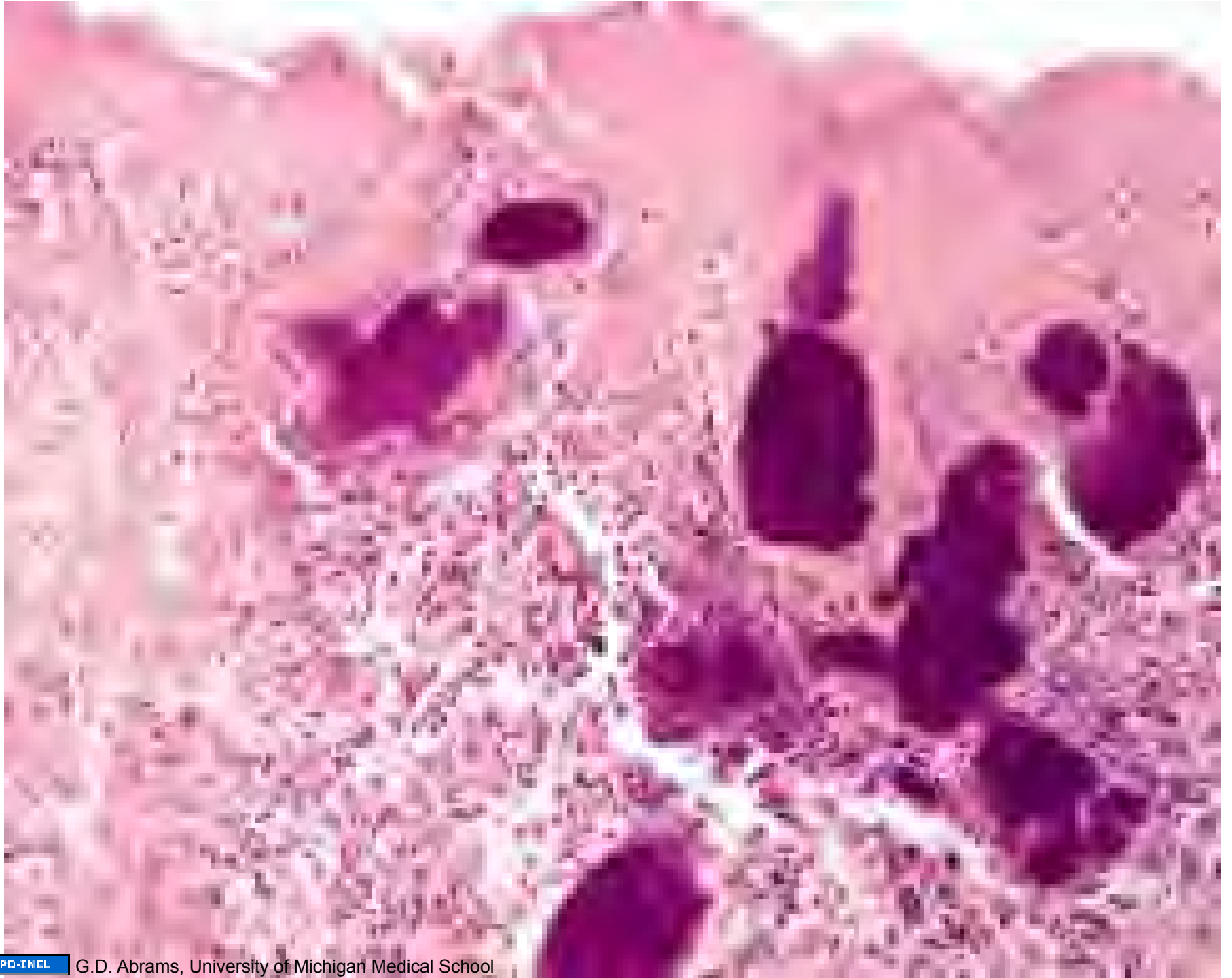


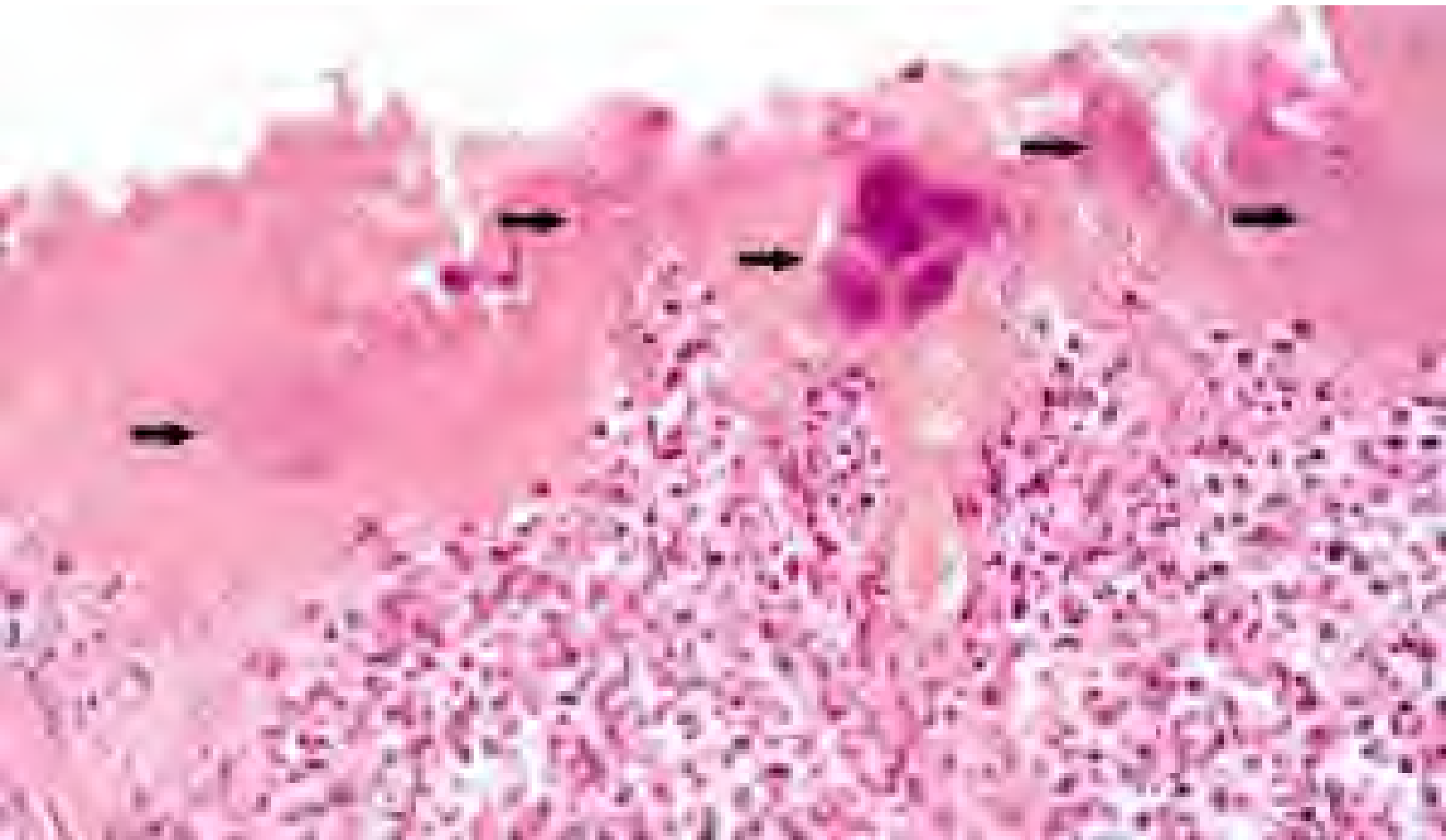


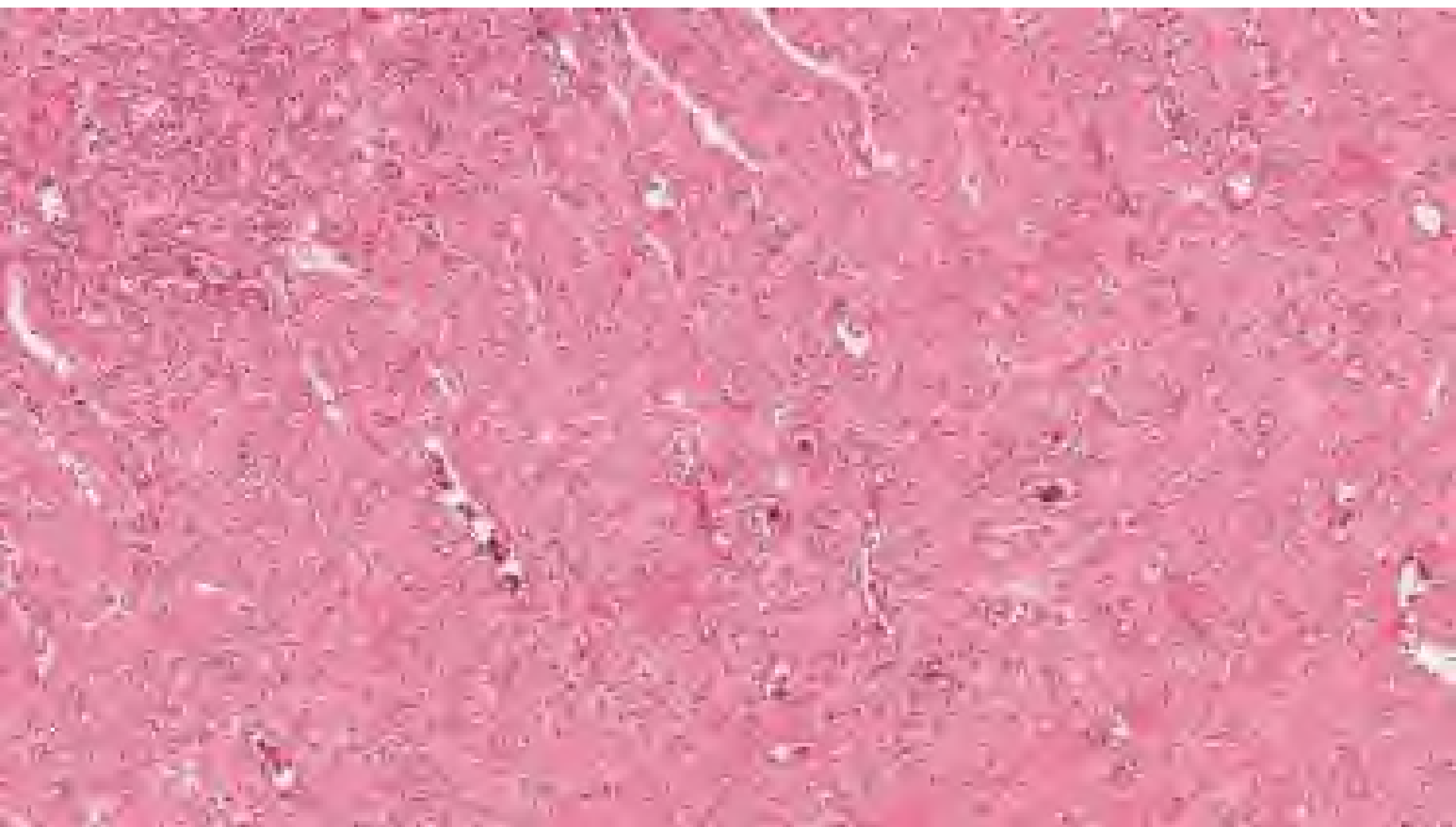


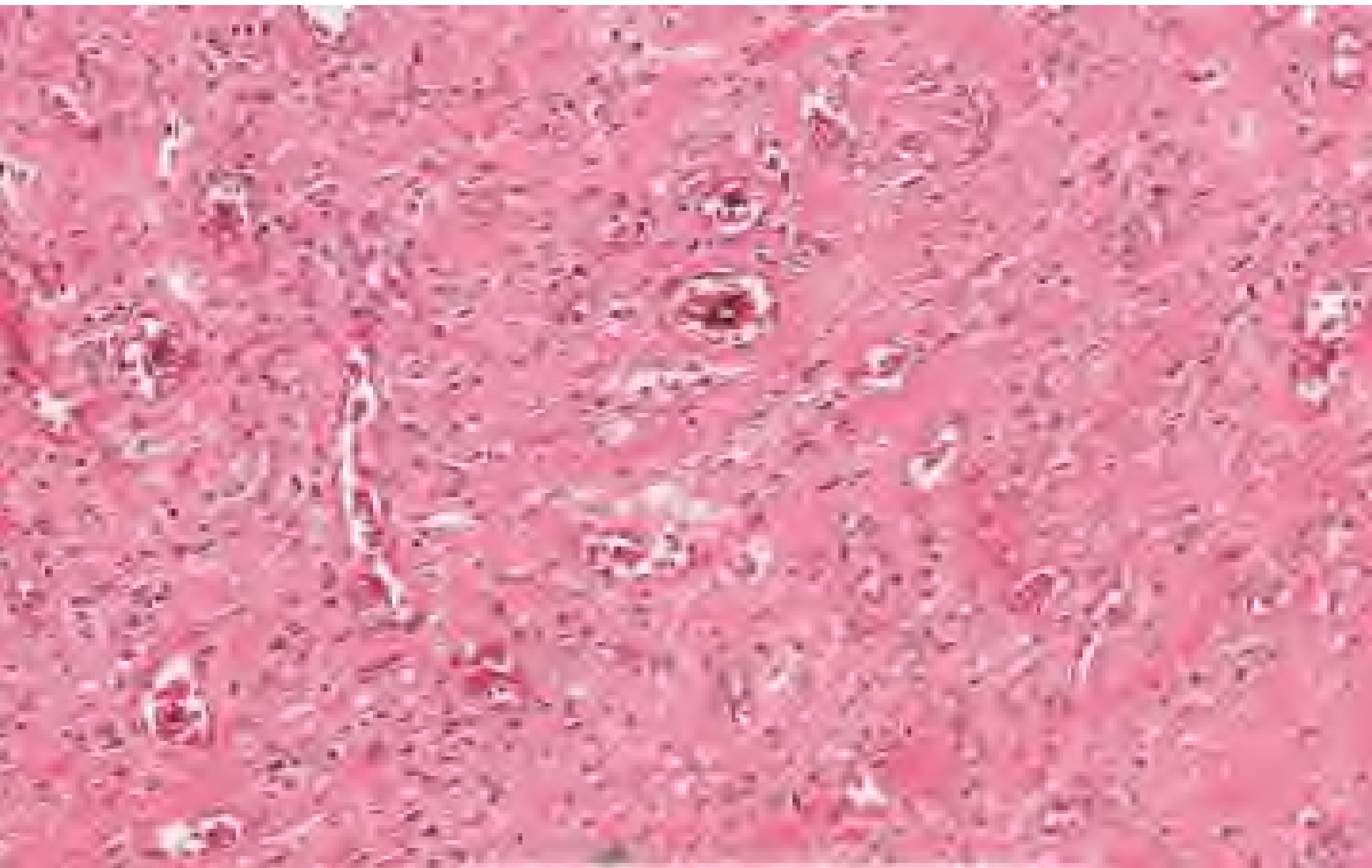




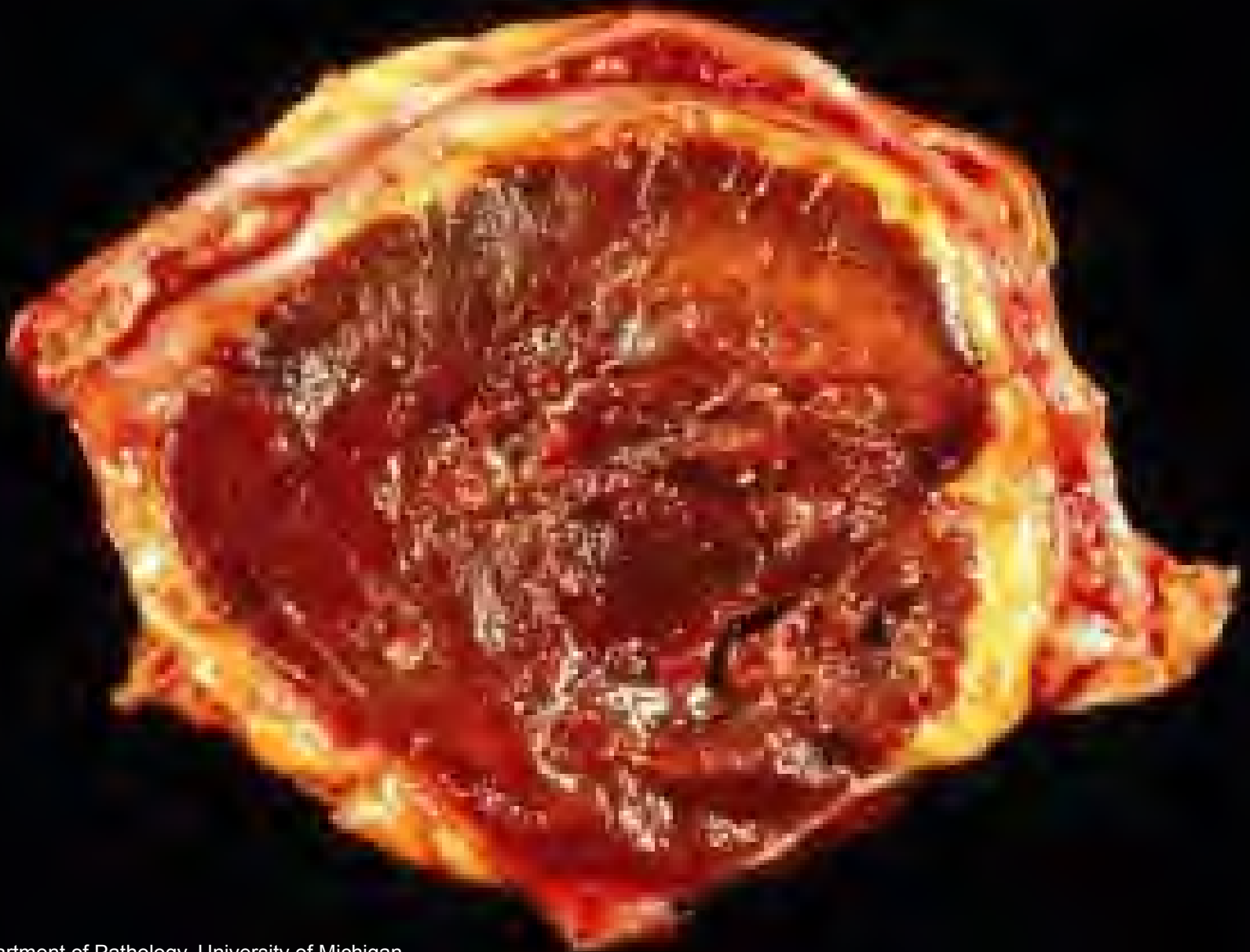








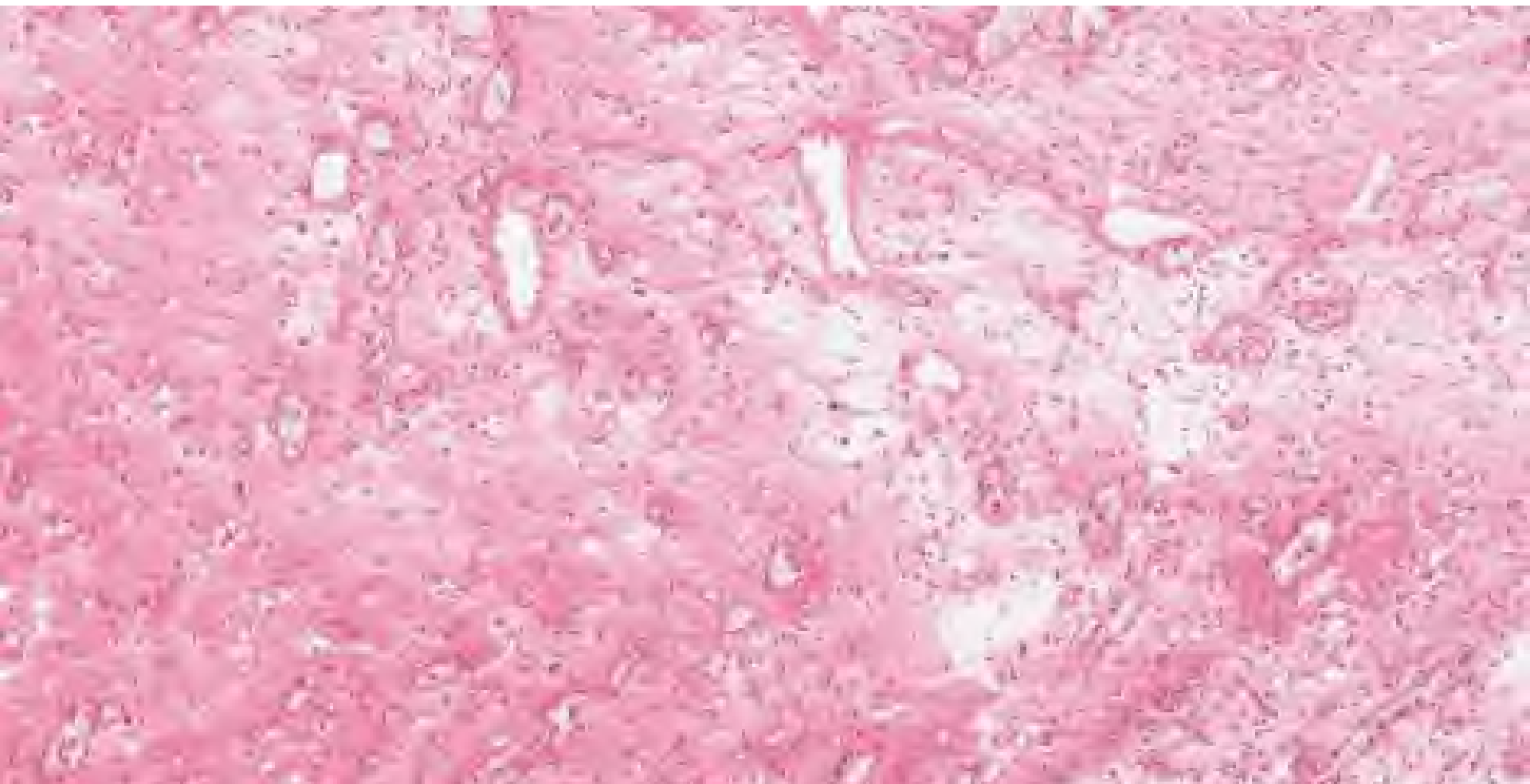
Constrictive Pericarditis



Pericarditis (epicarditis)







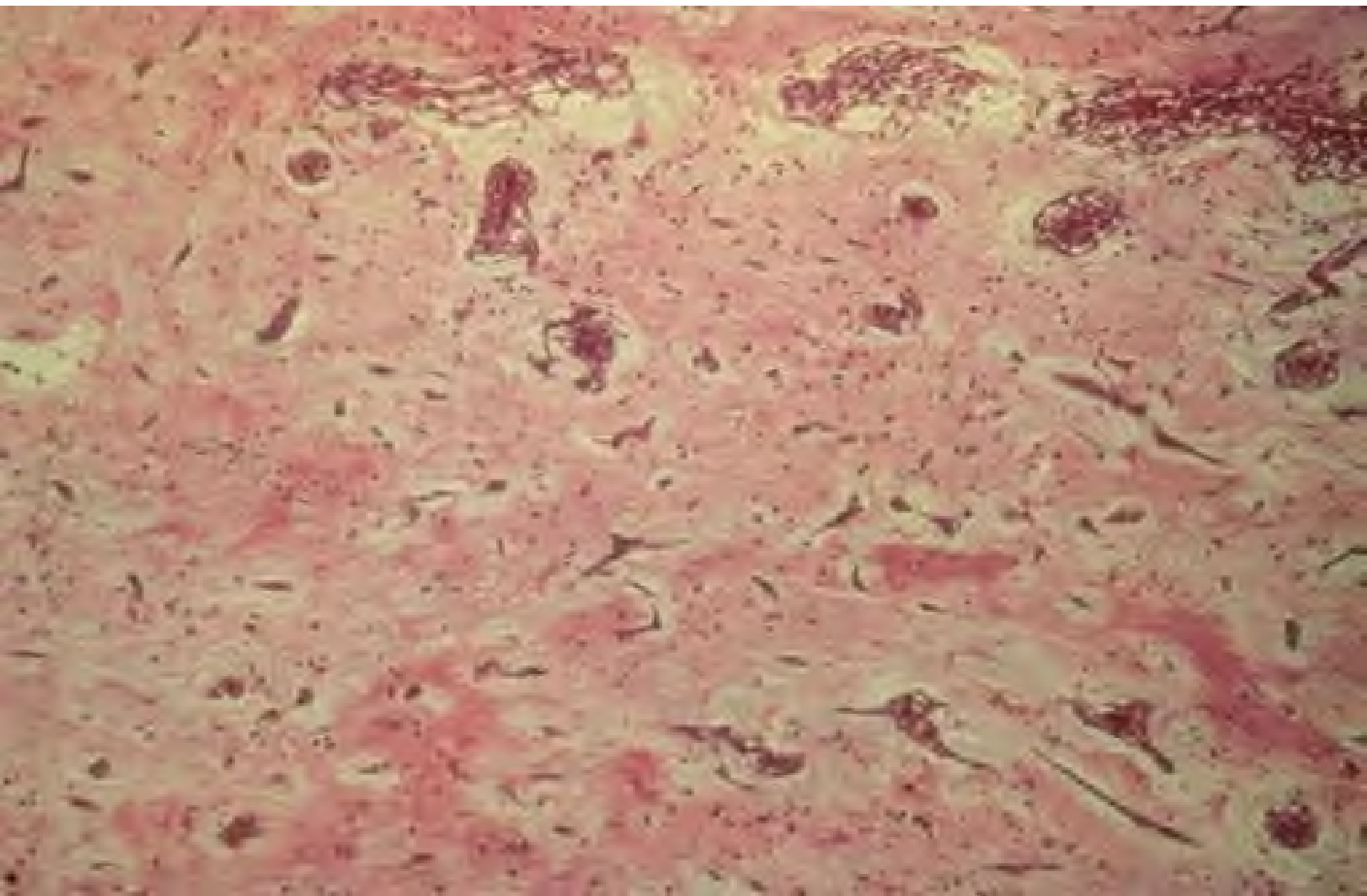
Case Presentation

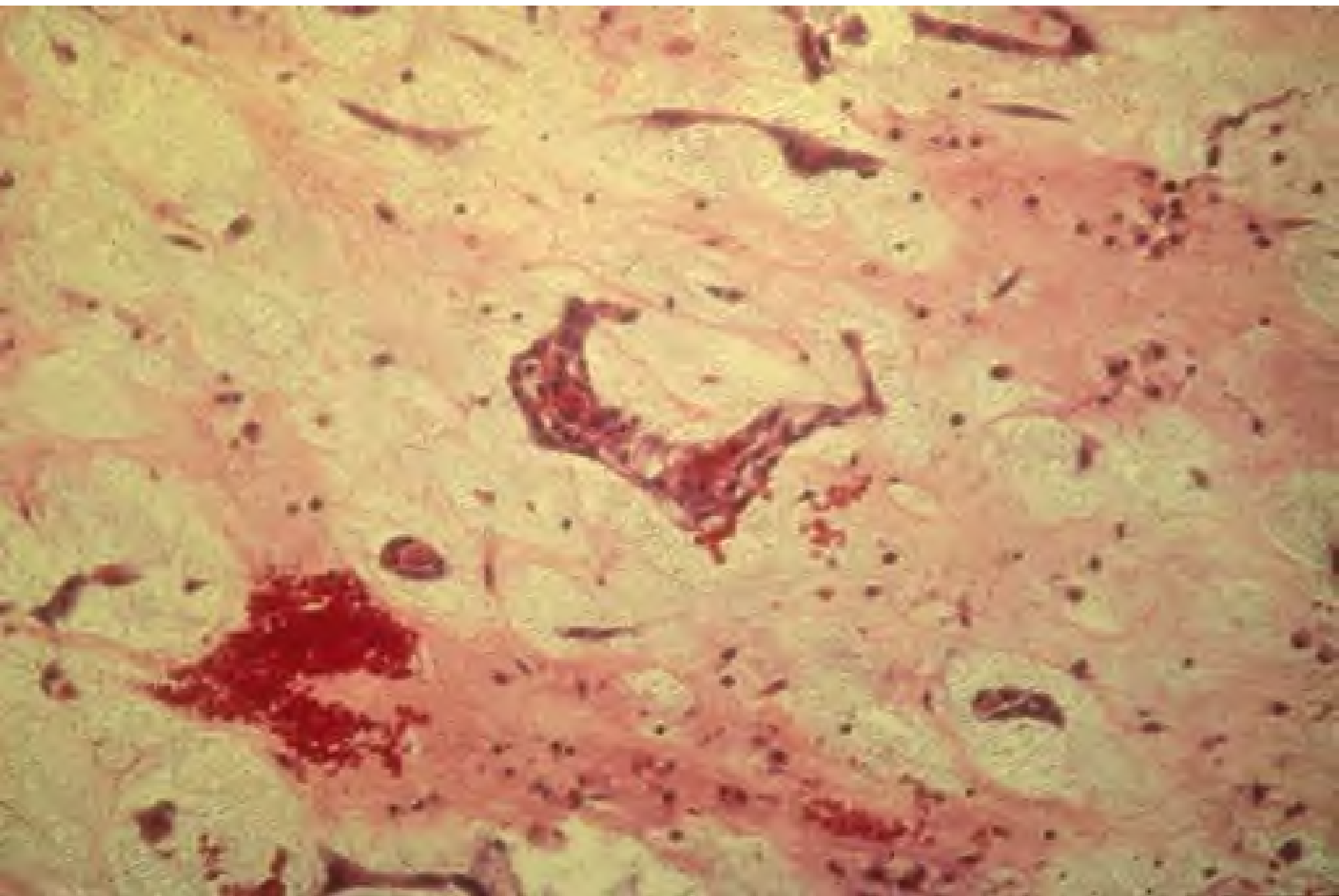
Atrial Myxoma

Case presentation - **Atrial Myxoma**









M-2 Cardiovascular Laboratory – 5



Following slides are intended for review

Cardio Lab 5

Case Presentation 1

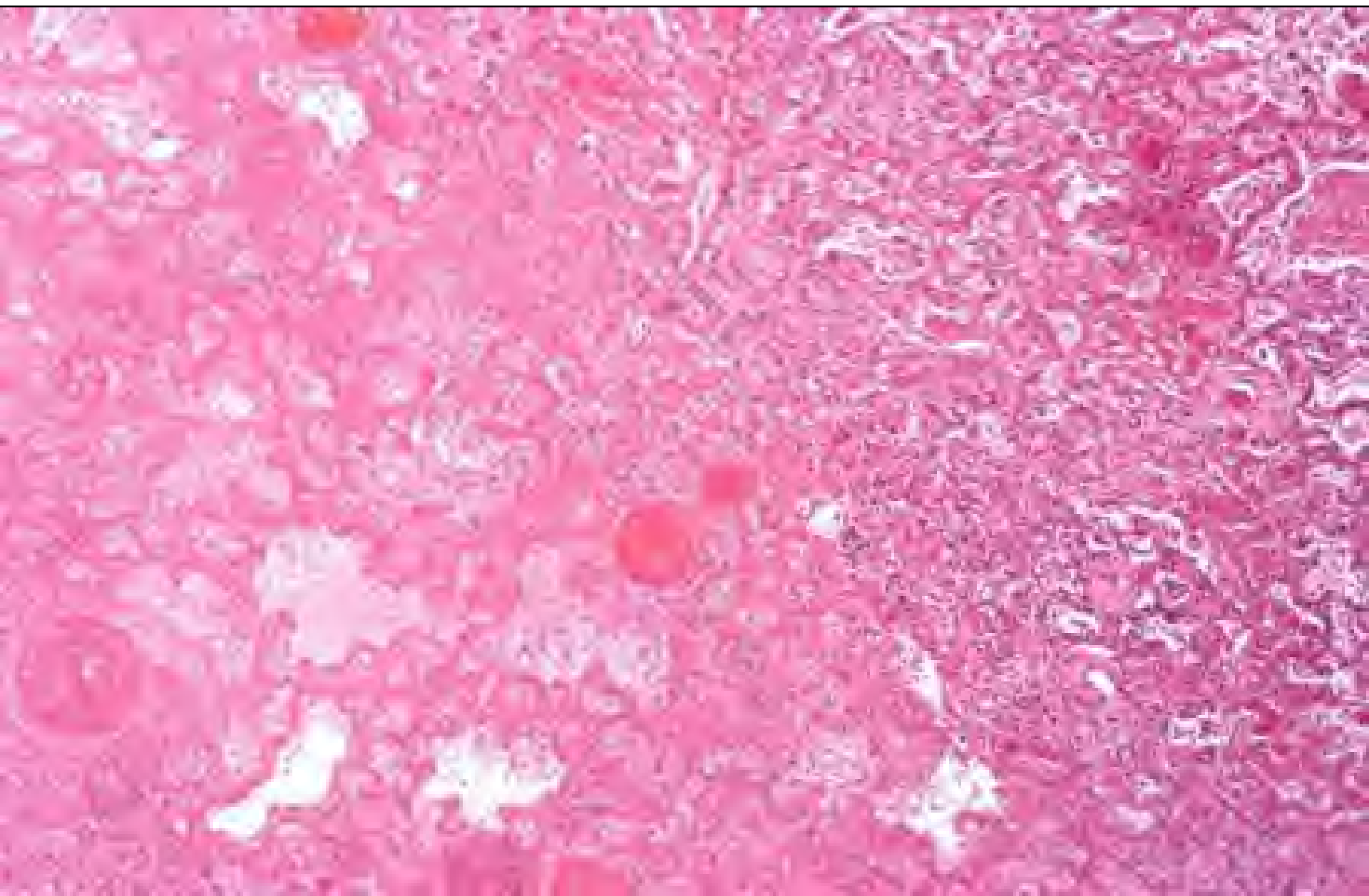
(Refer to lab syllabus for the clinical information)

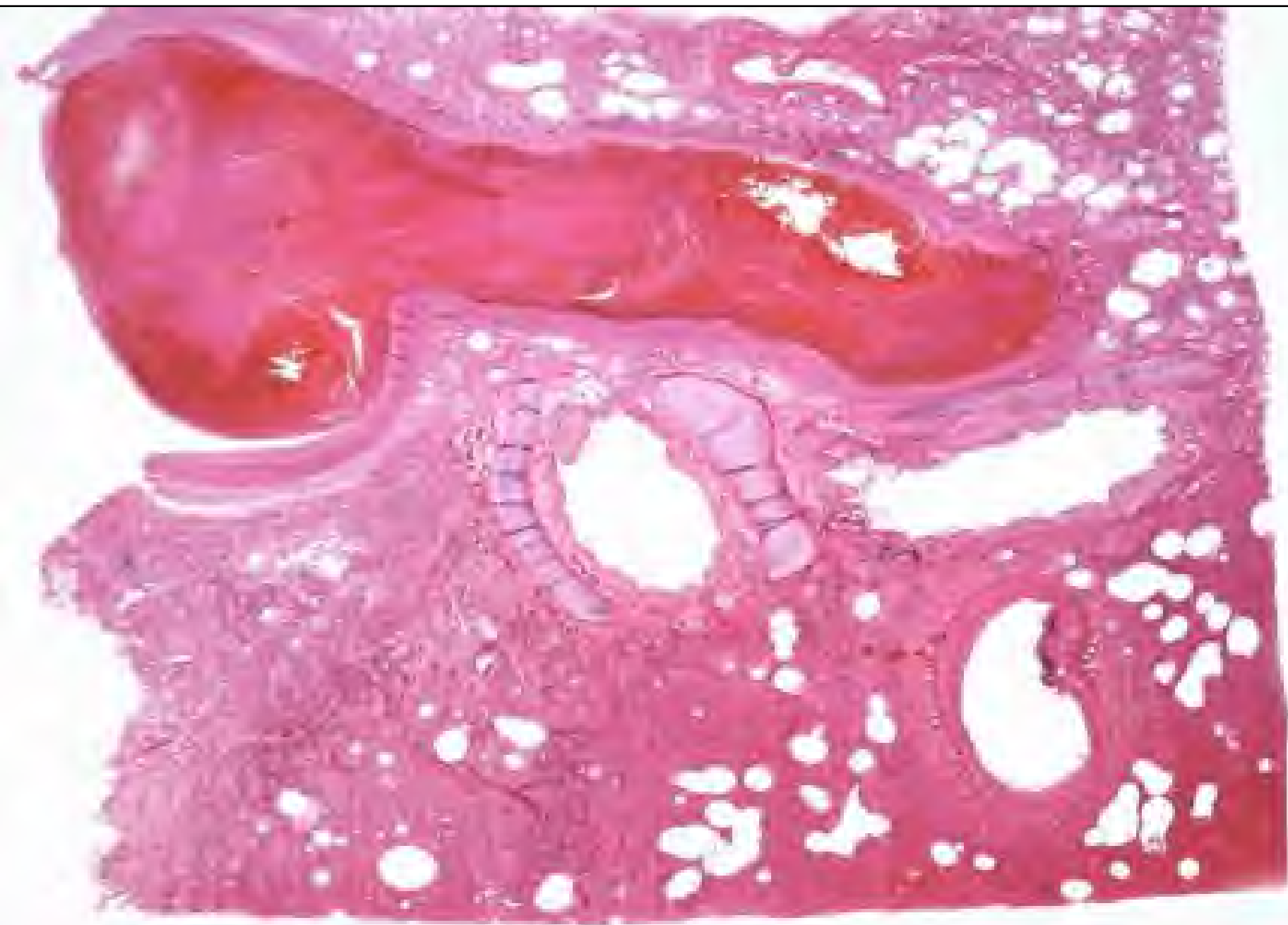
1. Discuss the pathologic findings and offer a diagnosis
2. Why did circulatory collapse occur?
3. What blood test may have aided in the diagnosis of this disorder?
4. What risk factors are associated with this disorder?











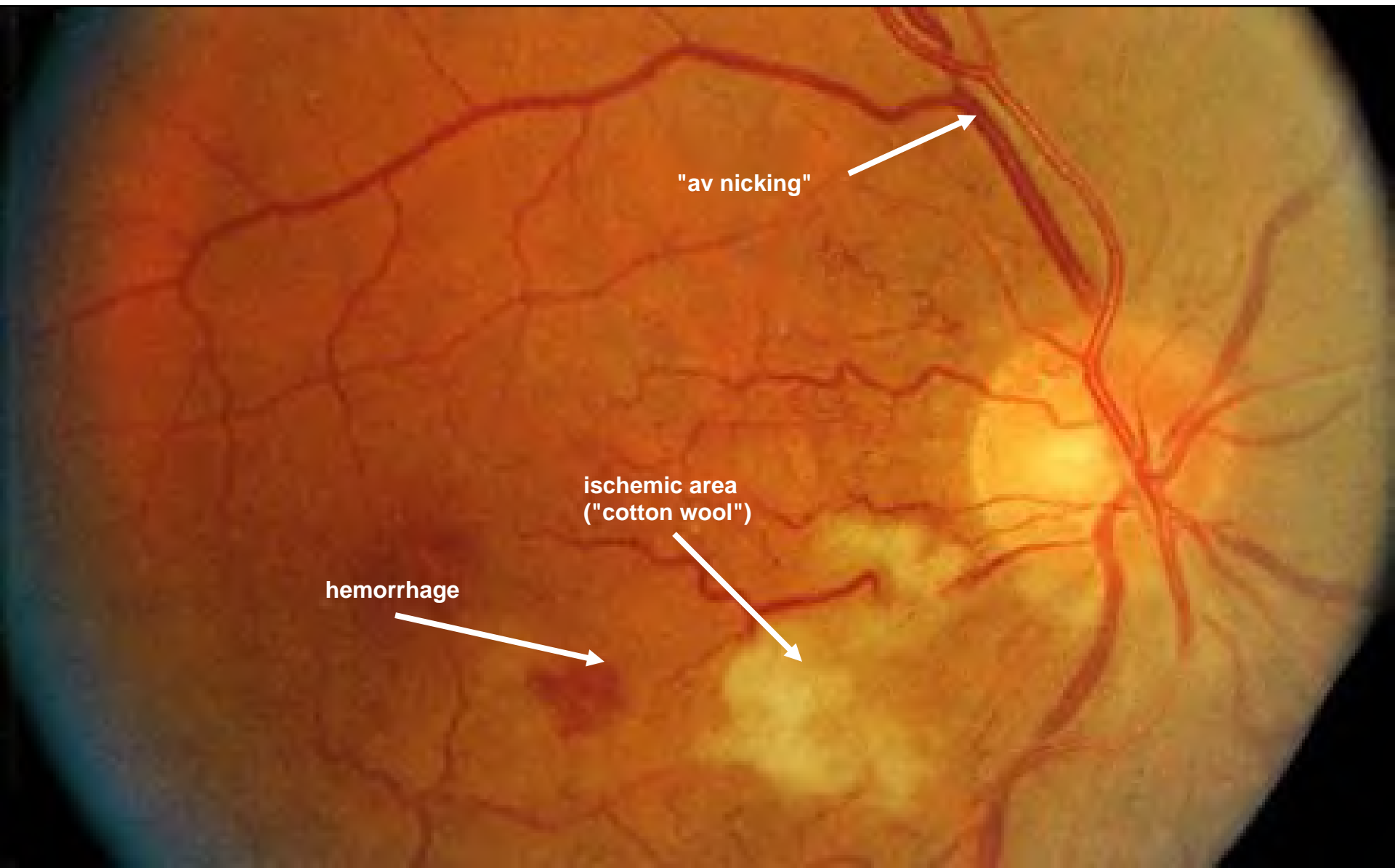
Pulmonary embolus secondary to DVT

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?

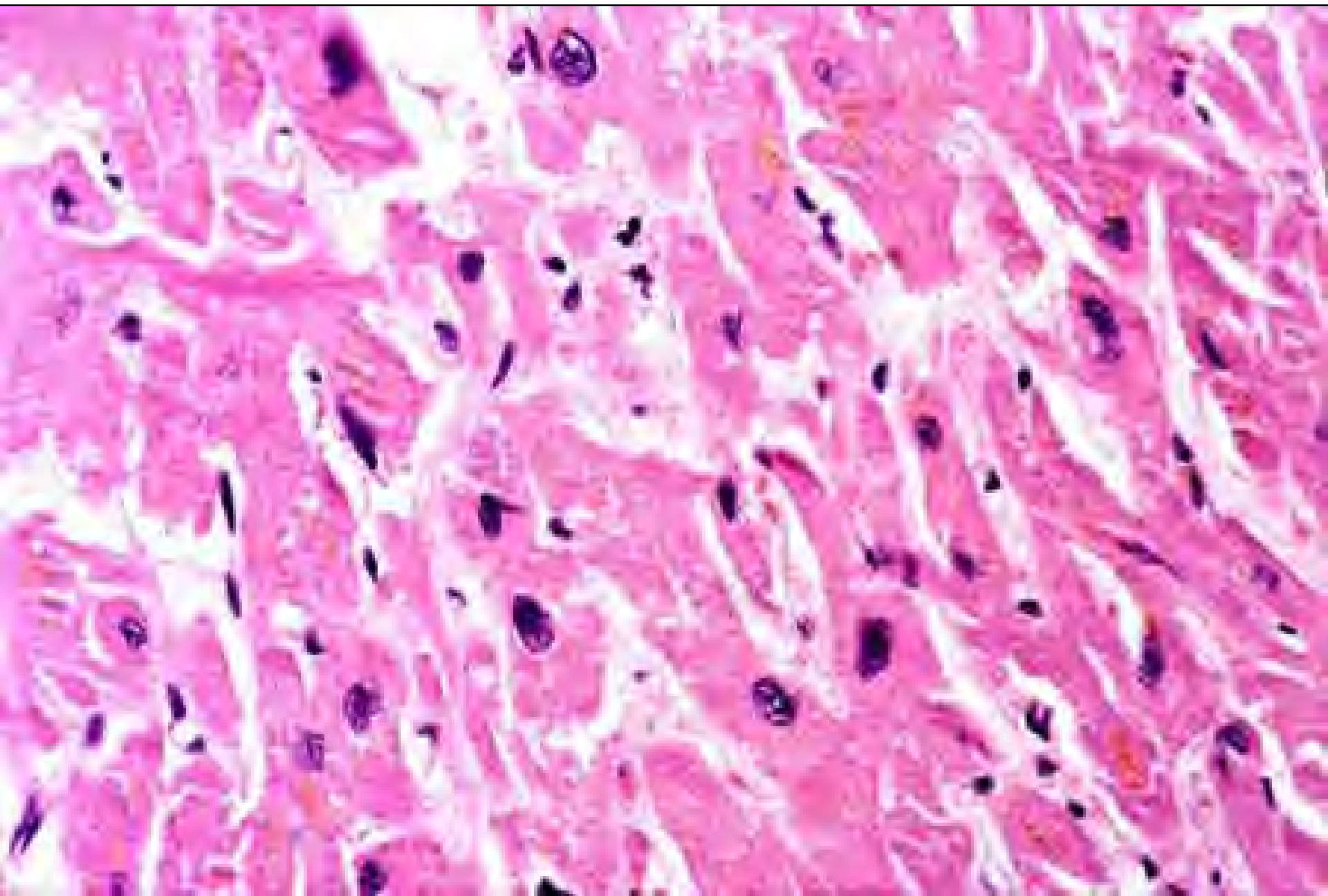


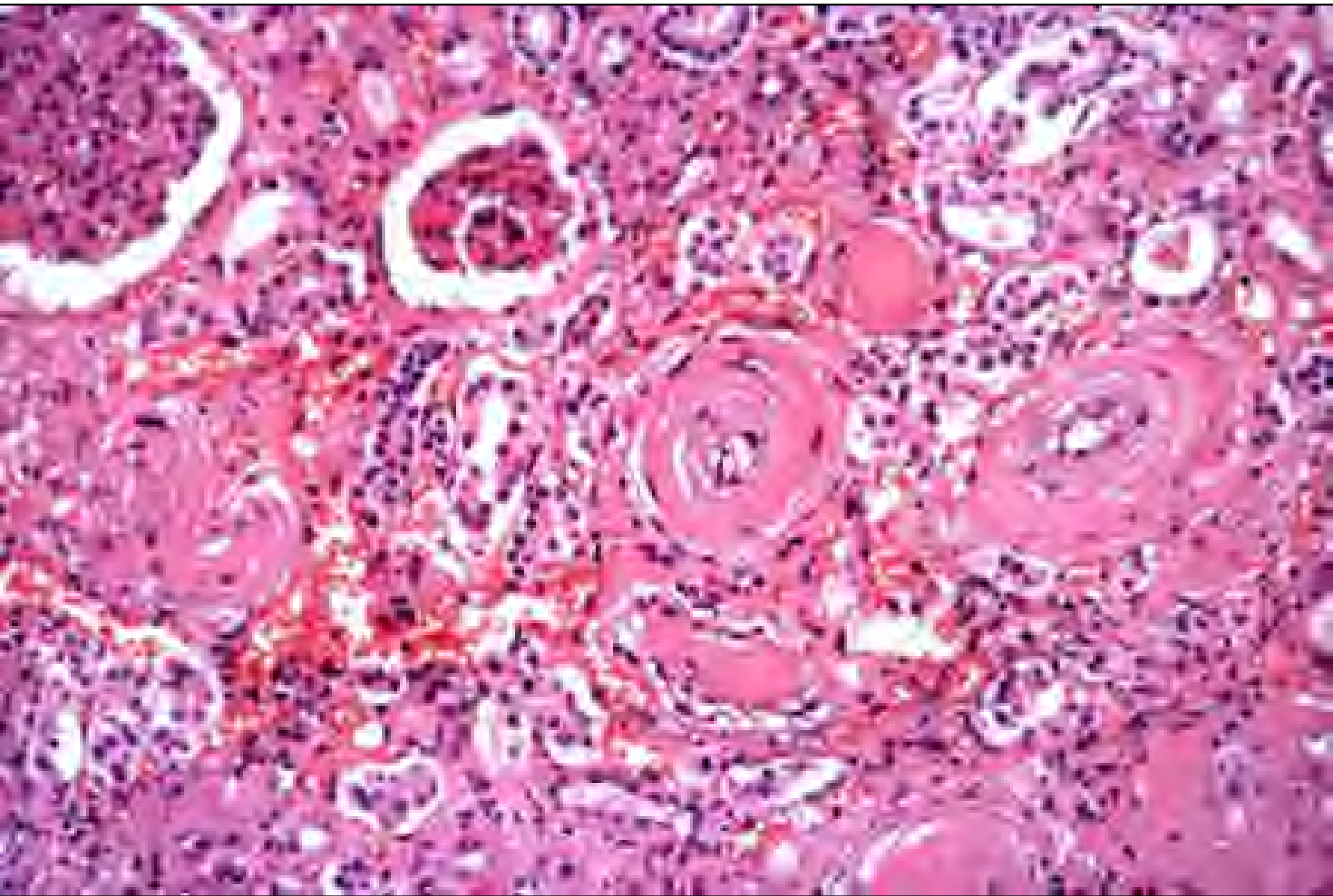
"av nicking"

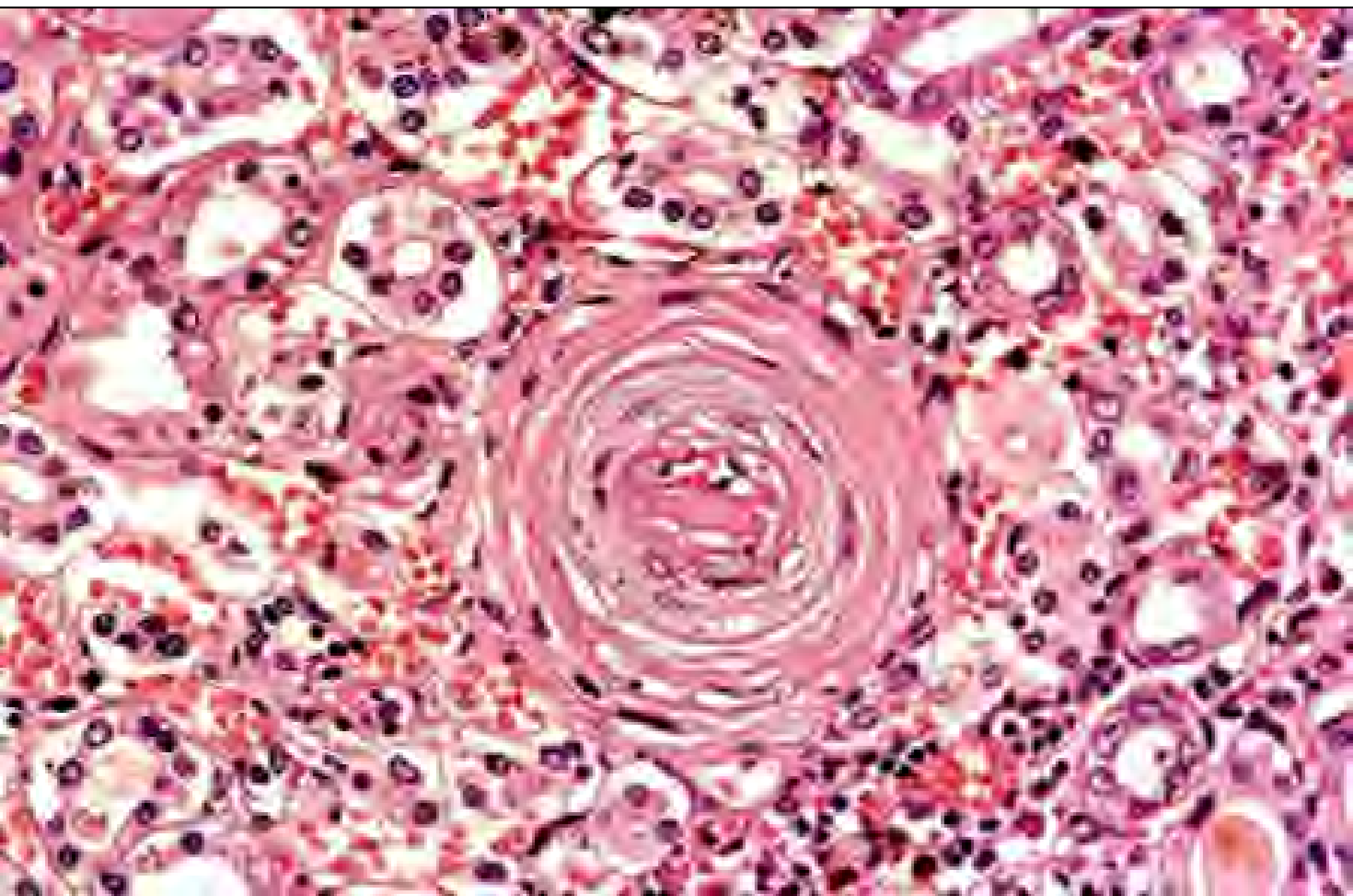
ischemic area
("cotton wool")

hemorrhage









Malignant hypertension

Cardio Lab 5

Case Presentation 3

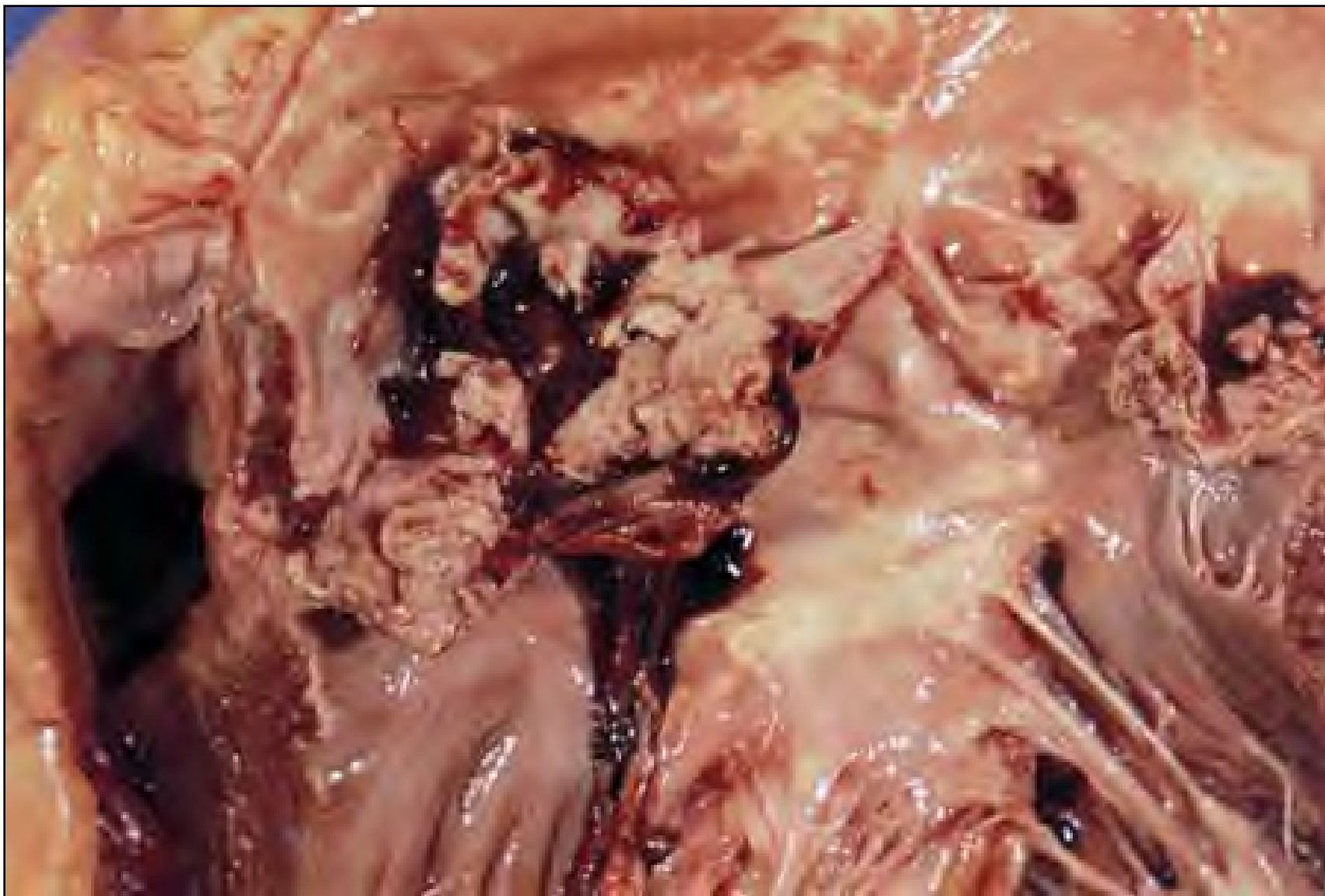
(Refer to lab syllabus for the clinical information)

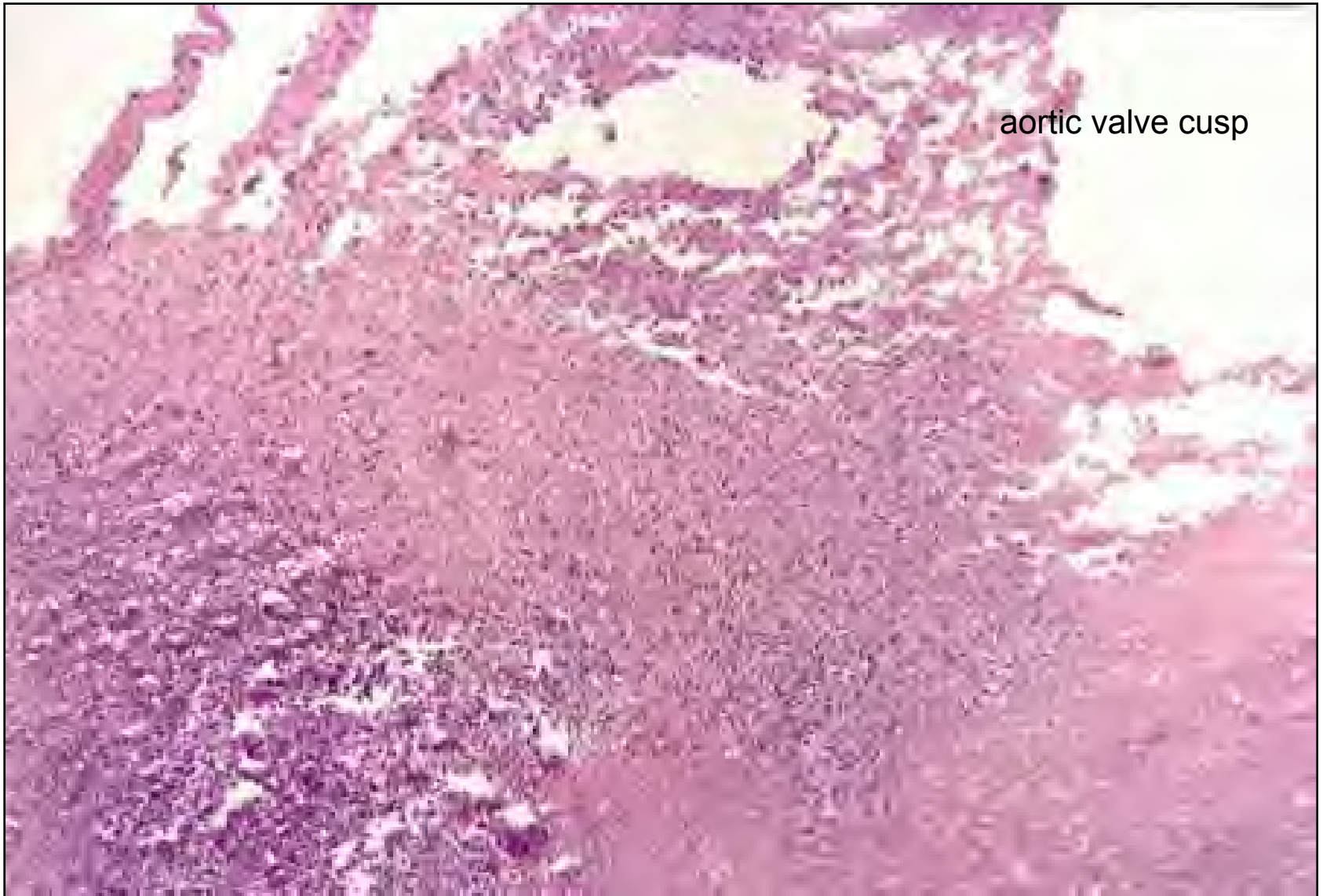
1. Describe the pathologic findings and form a pathologic diagnosis.
2. Discuss or explain the clinical course and physical findings, in light of the pathologic findings



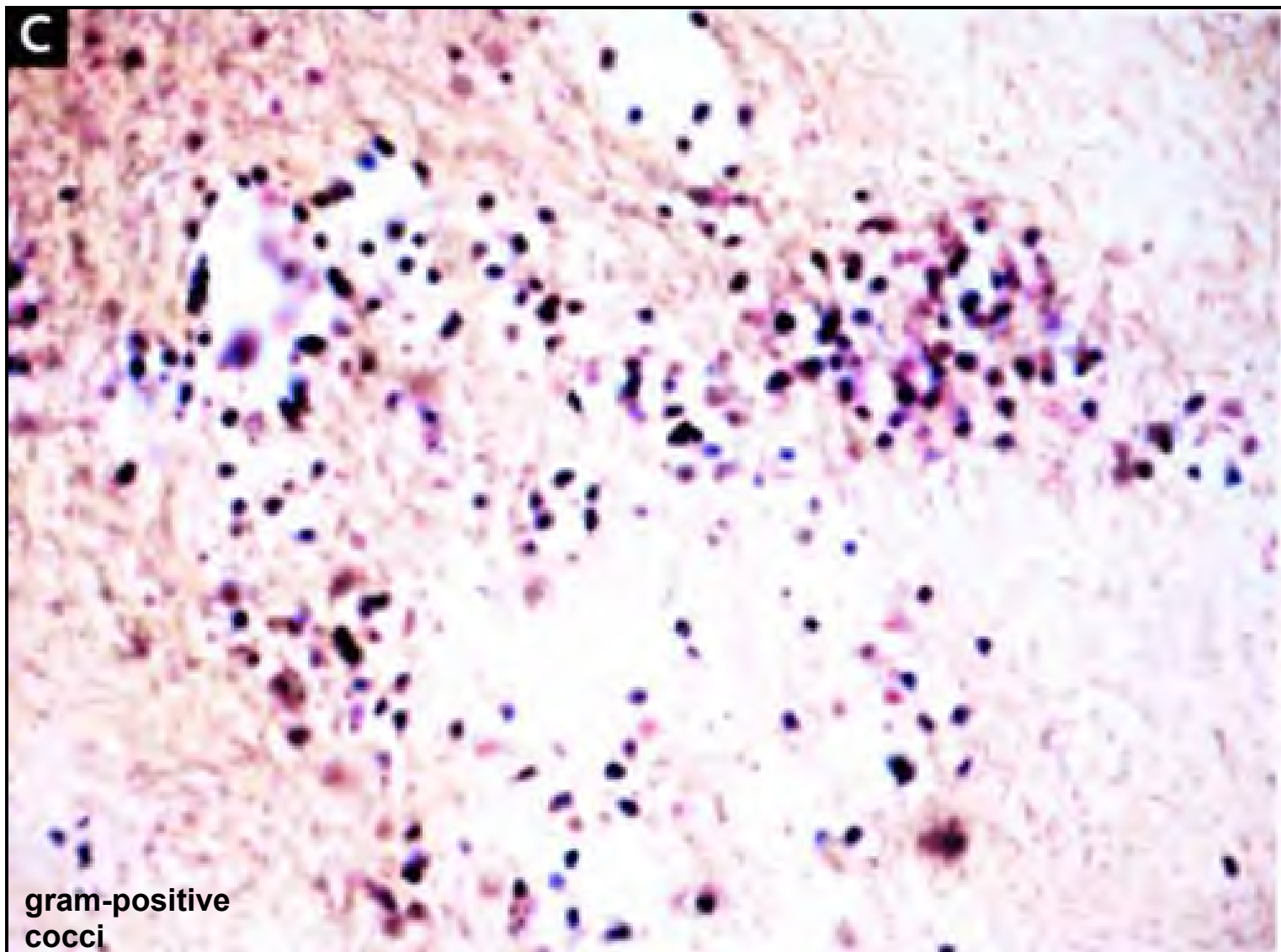


hypopyon





aortic valve cusp



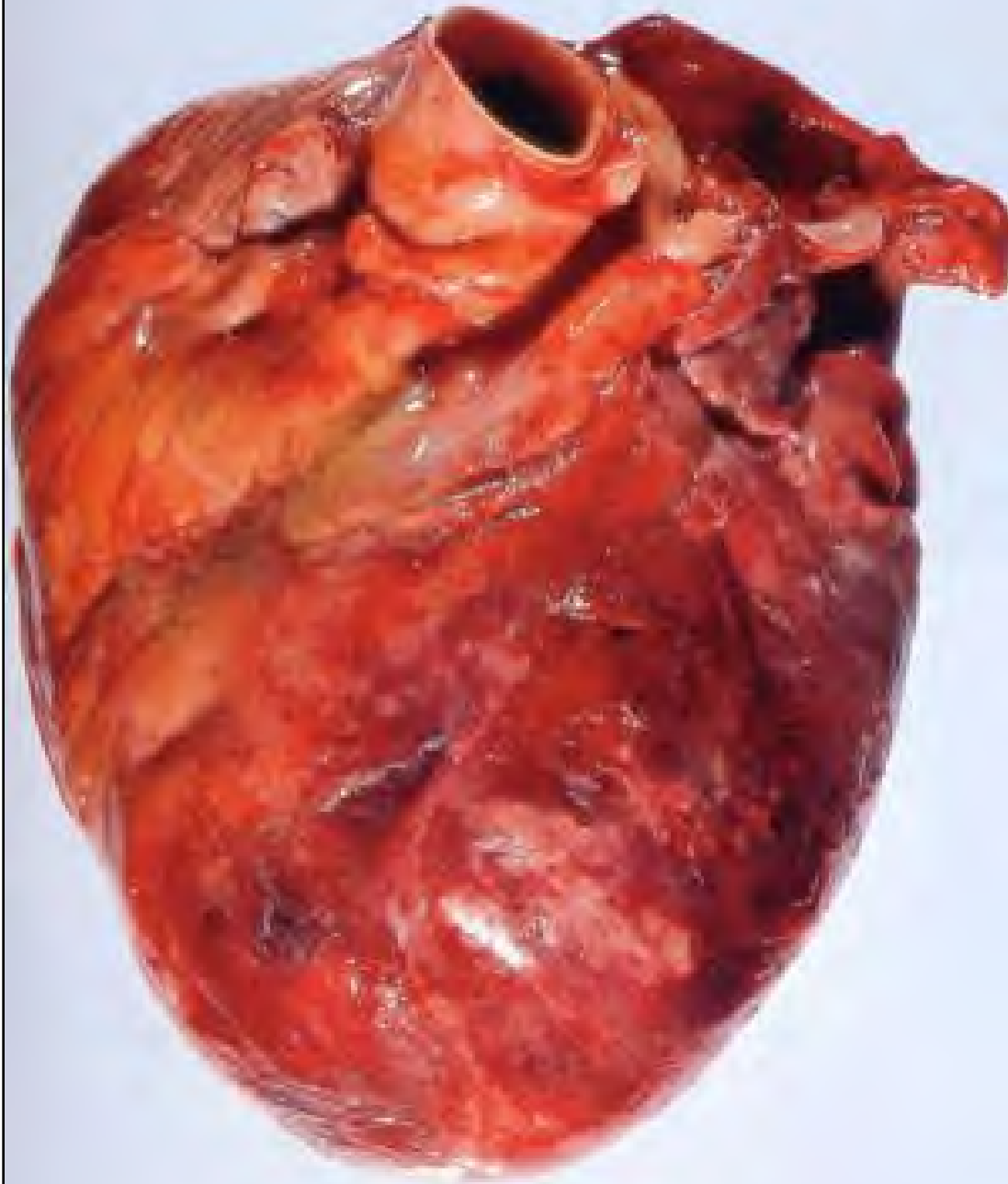
Bacterial endocarditis

Cardio Lab 5

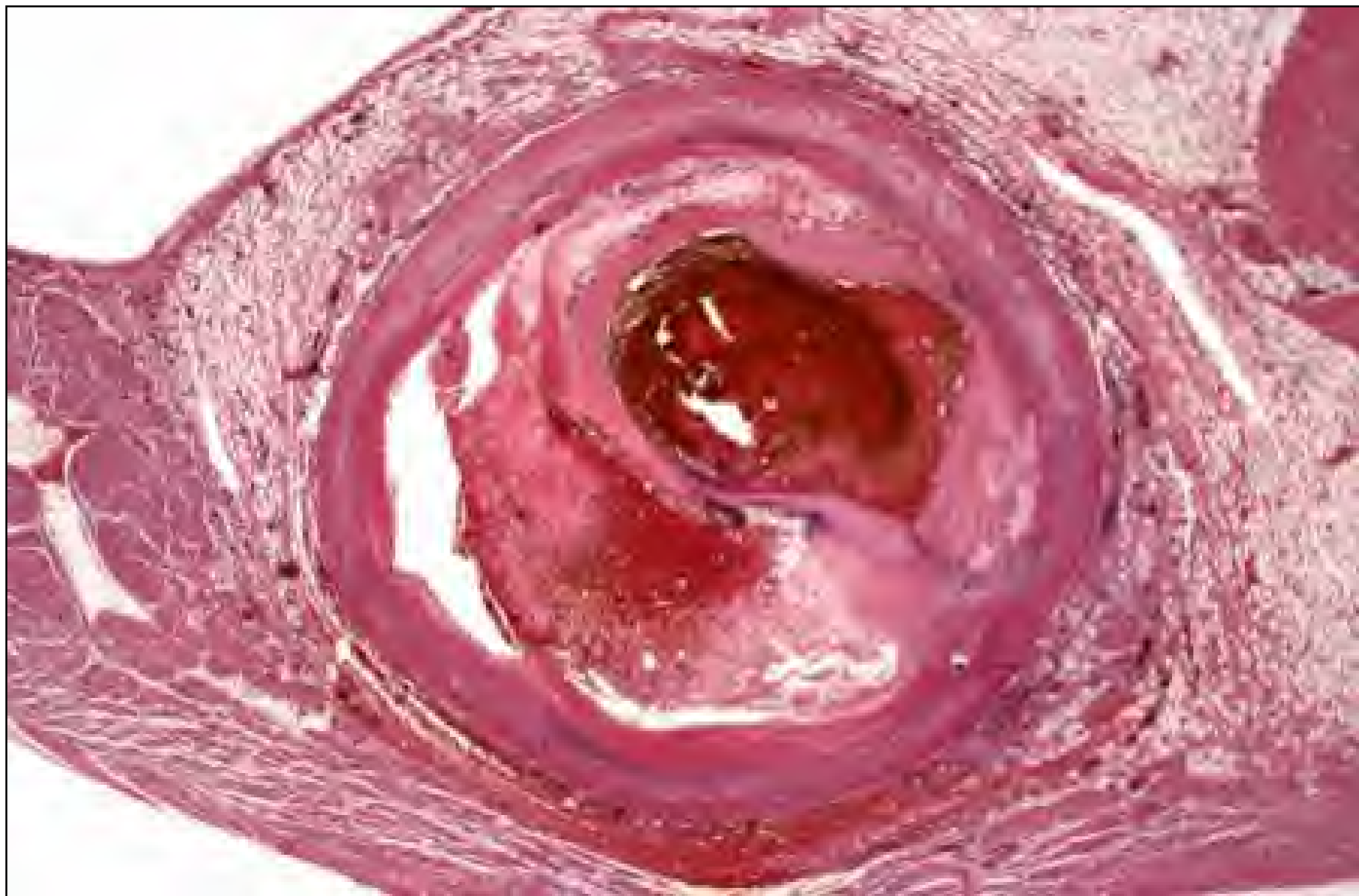
Case Presentation 4

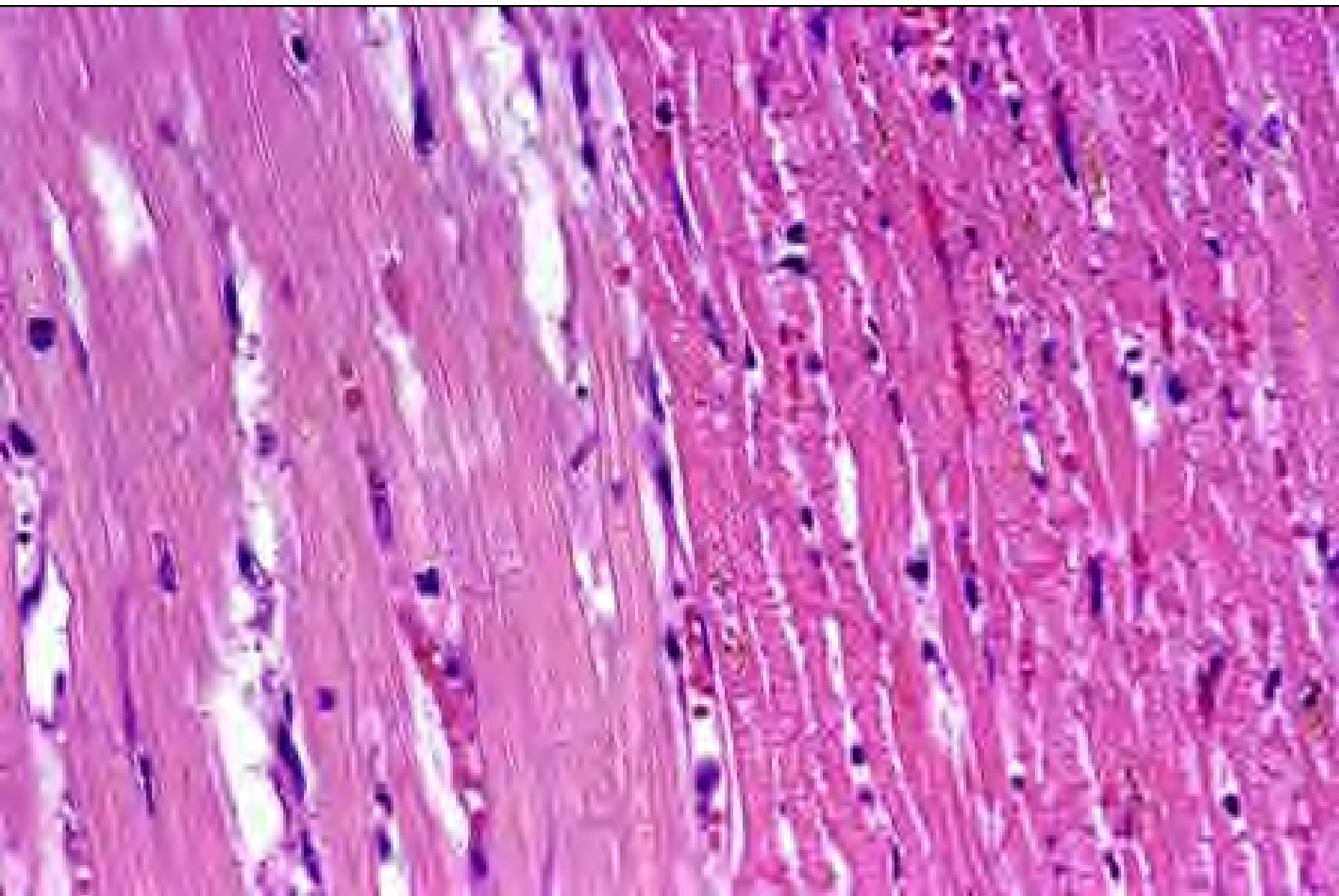
(Refer to lab syllabus for the clinical information)

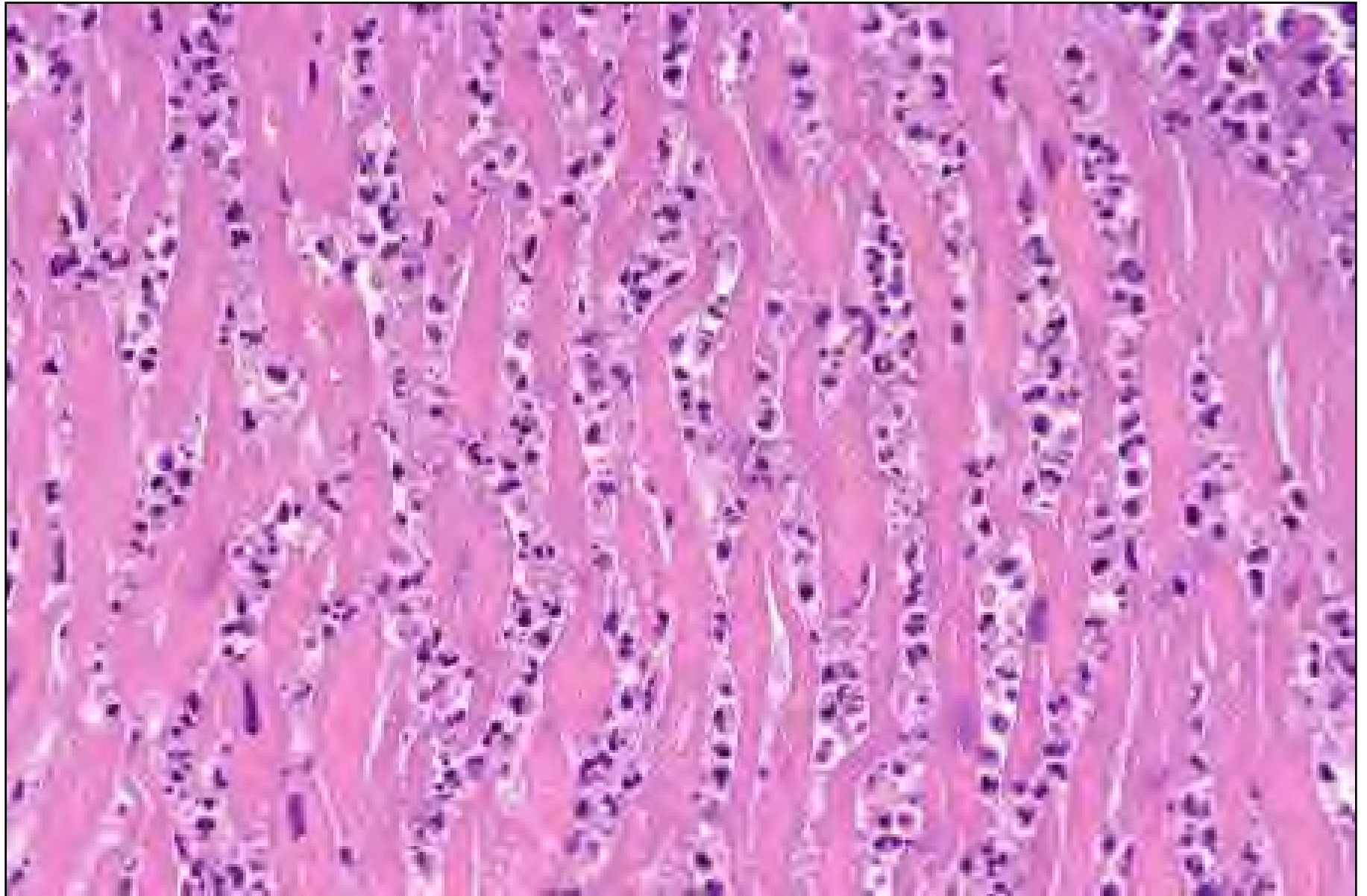
1. Describe the pathologic findings.
2. How do the pathologic findings explain the clinical course, and the clinical and laboratory findings?
3. What additional pathologic feature(s) might have been found in the heart if the patient had died on the 12th hospital day?

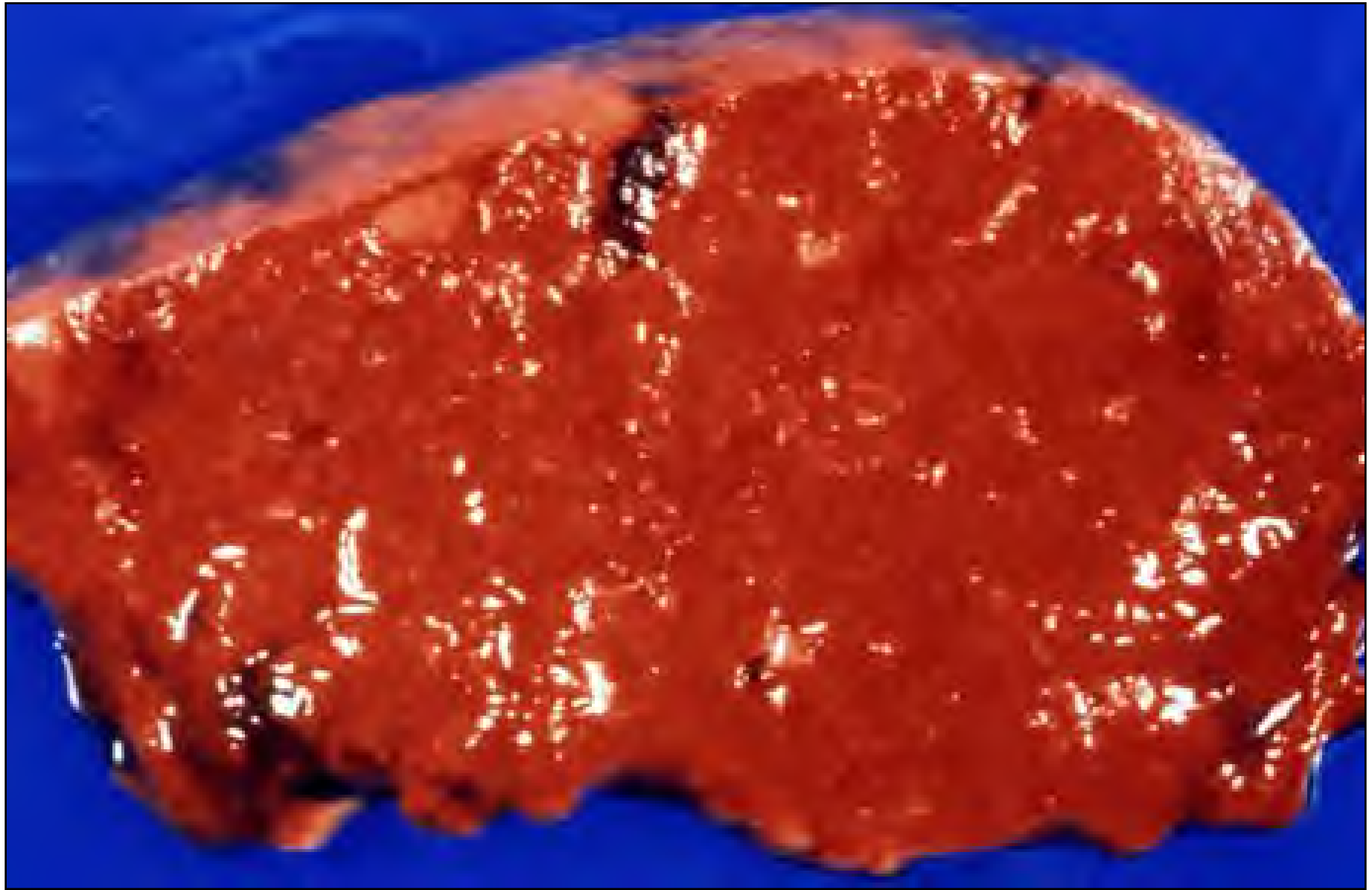


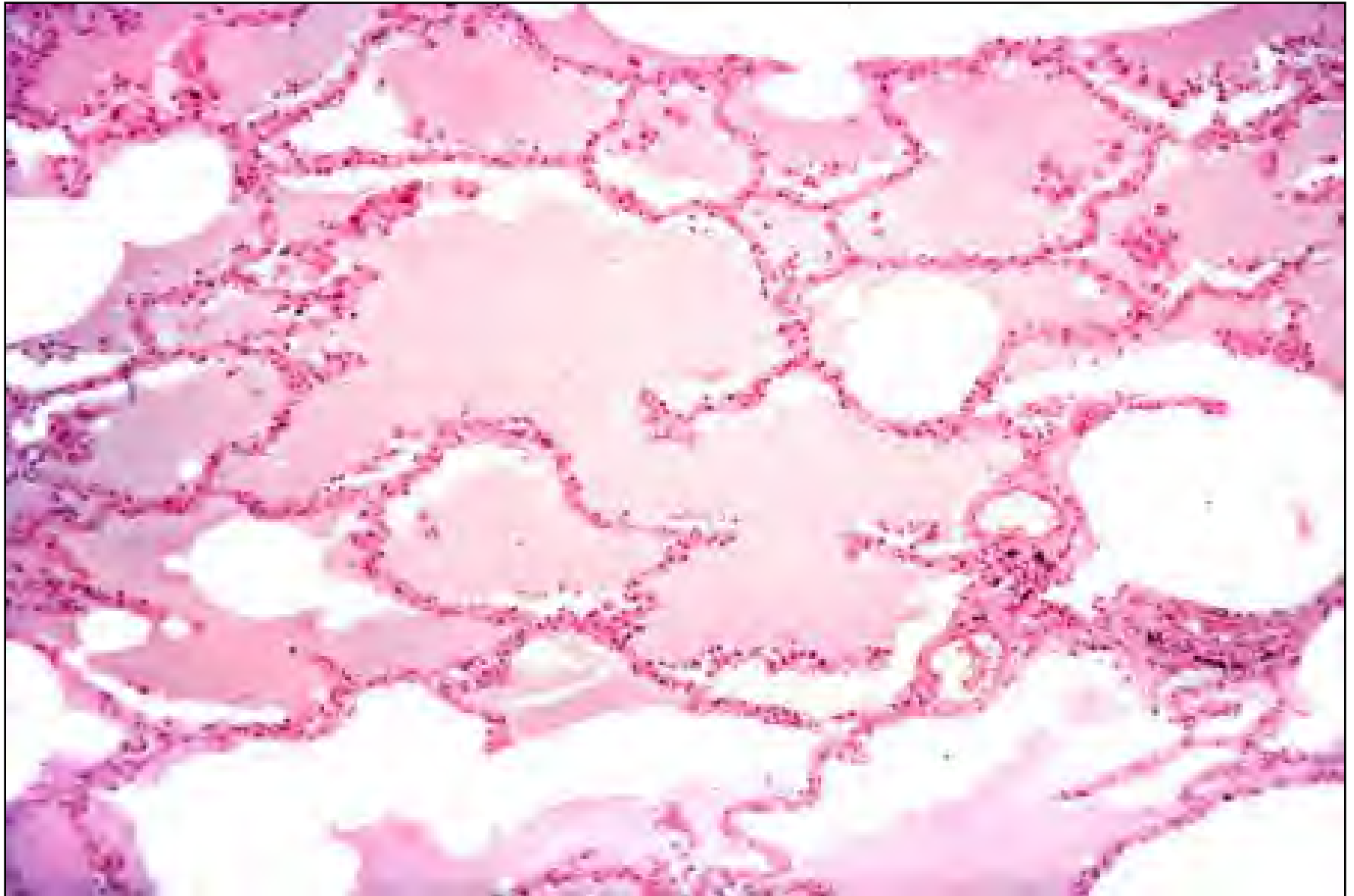


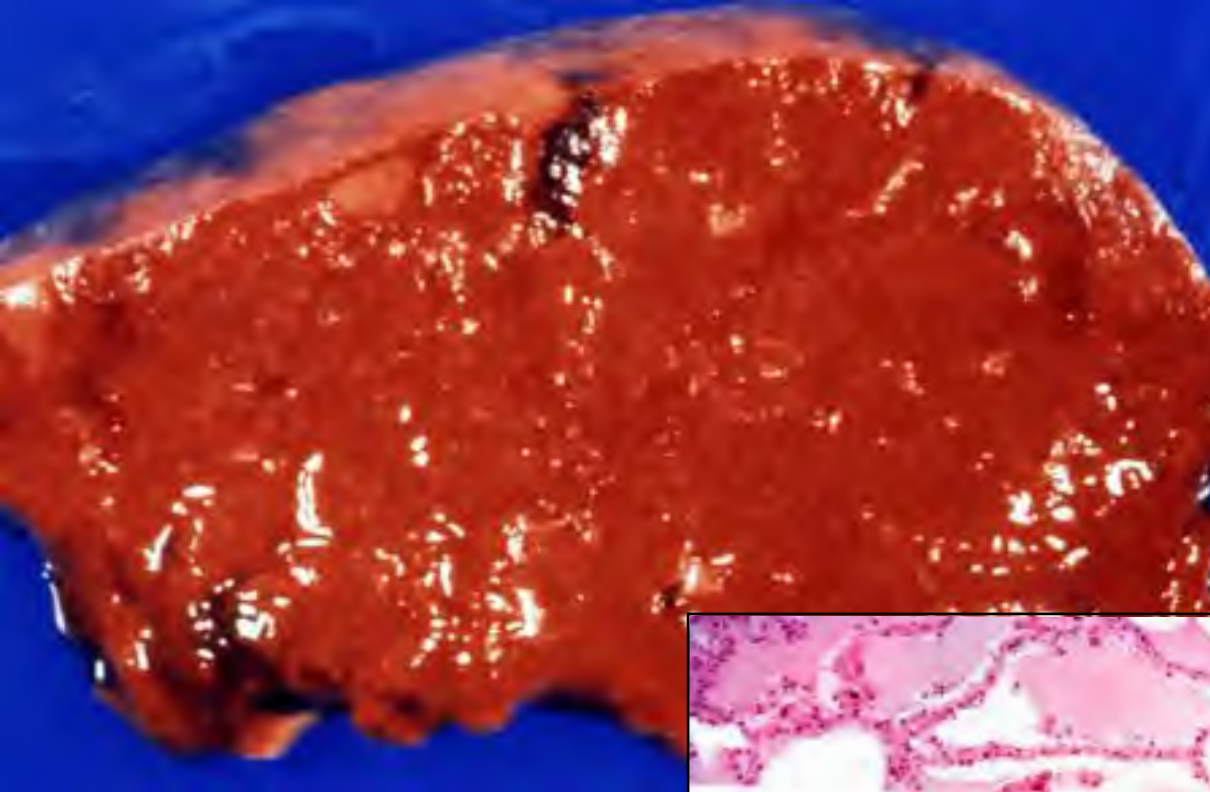




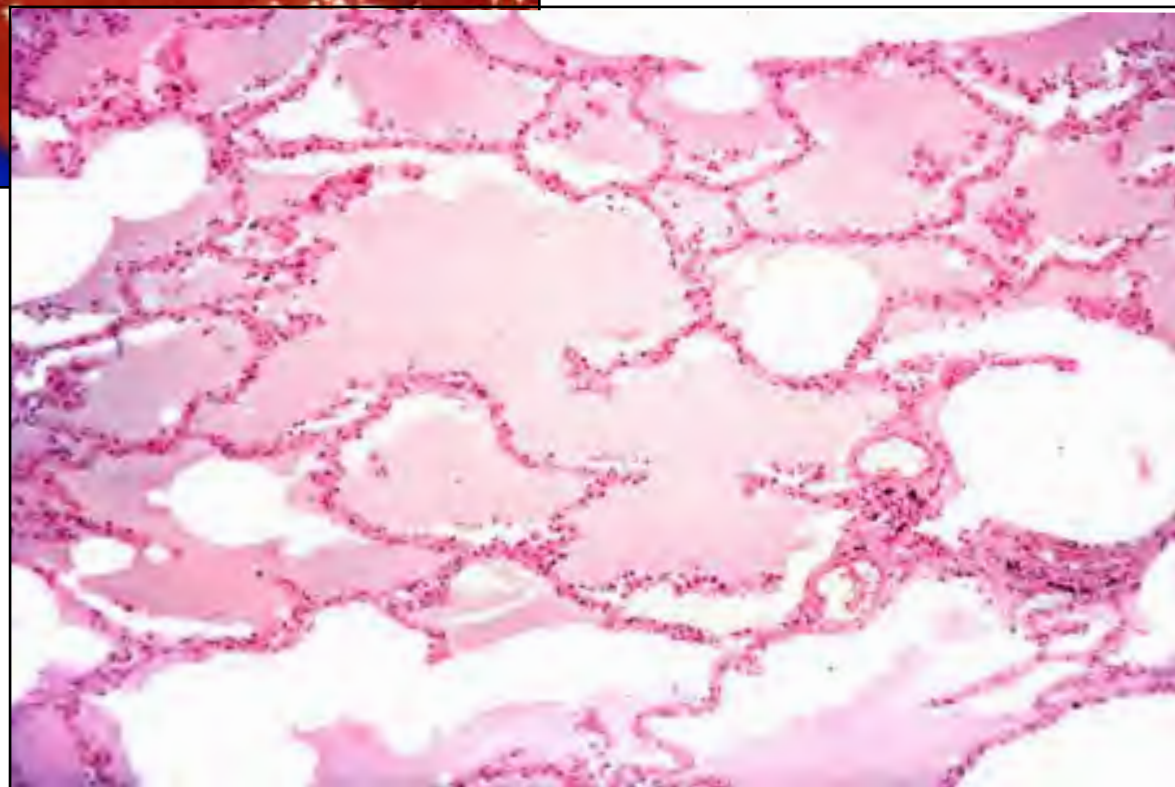




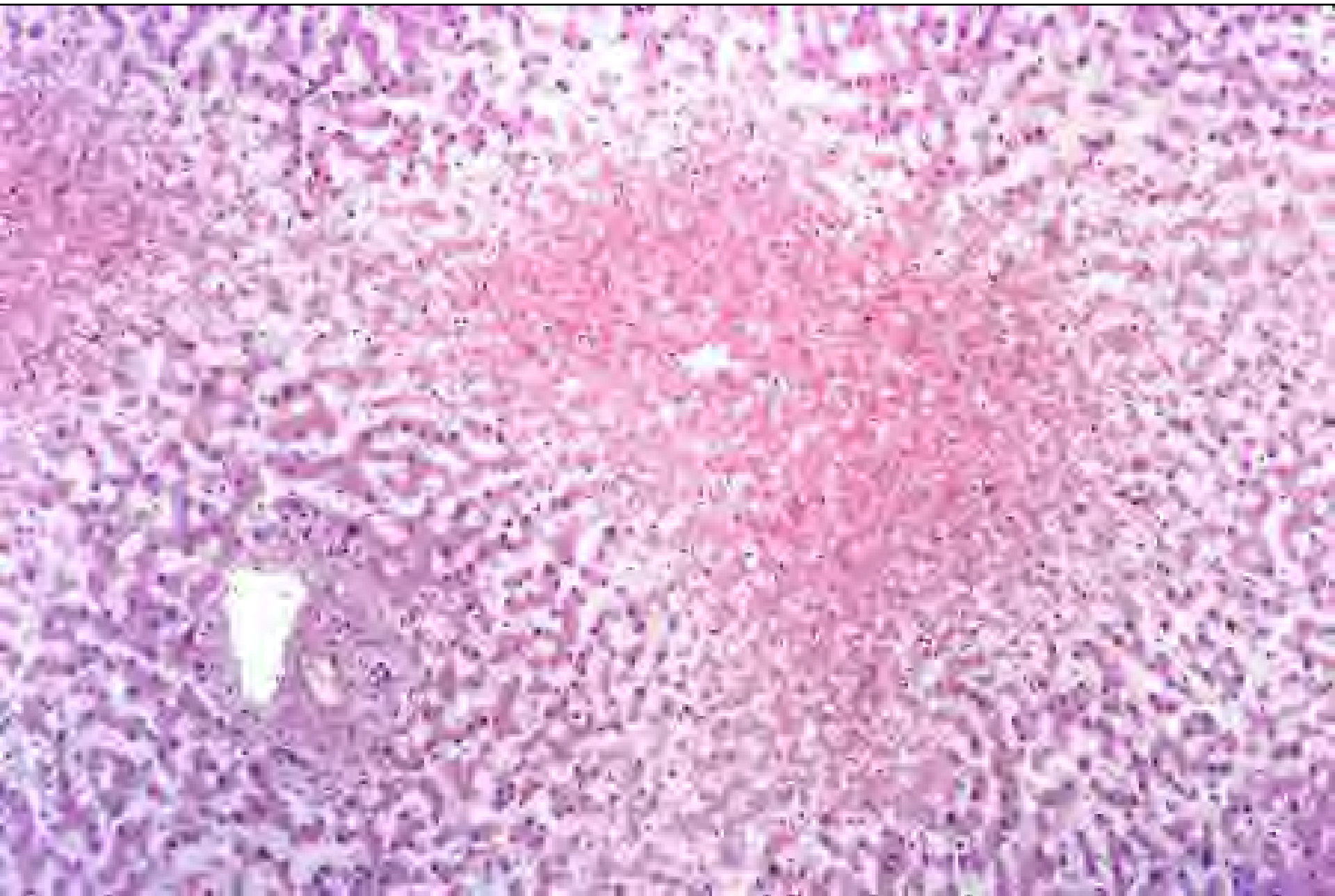


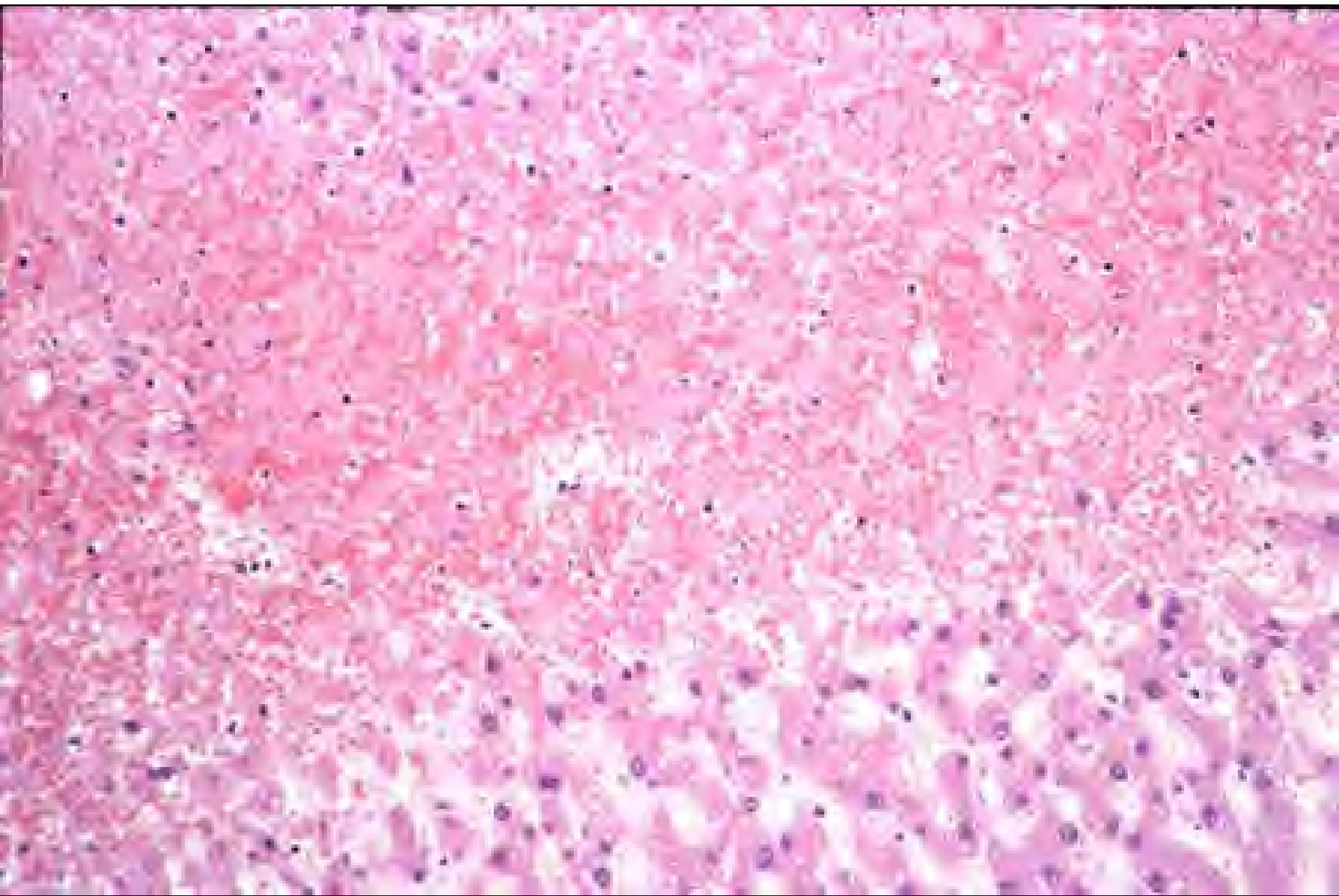


PD-TNCL Source Undetermined



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





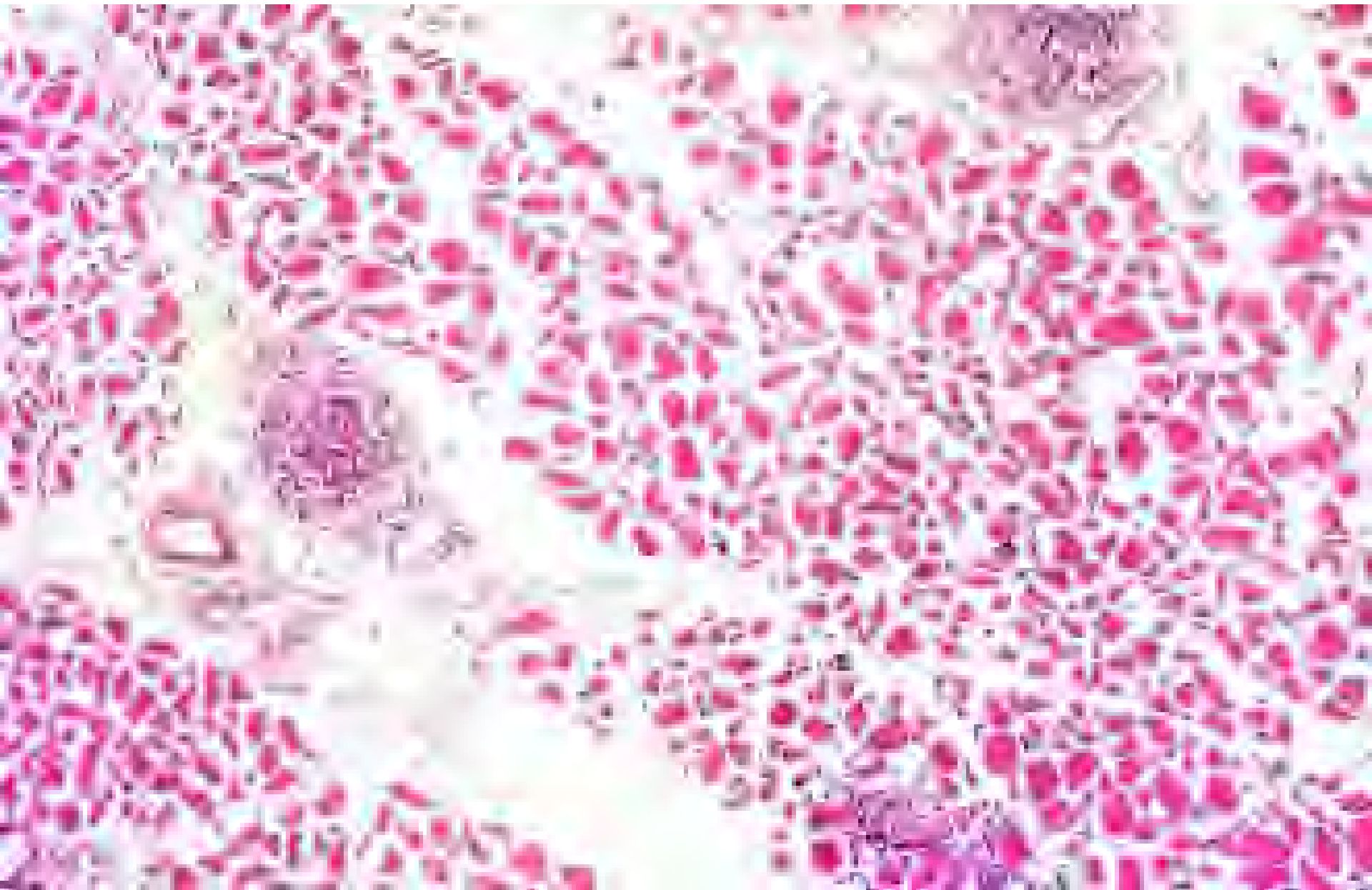
Myocardial infarction

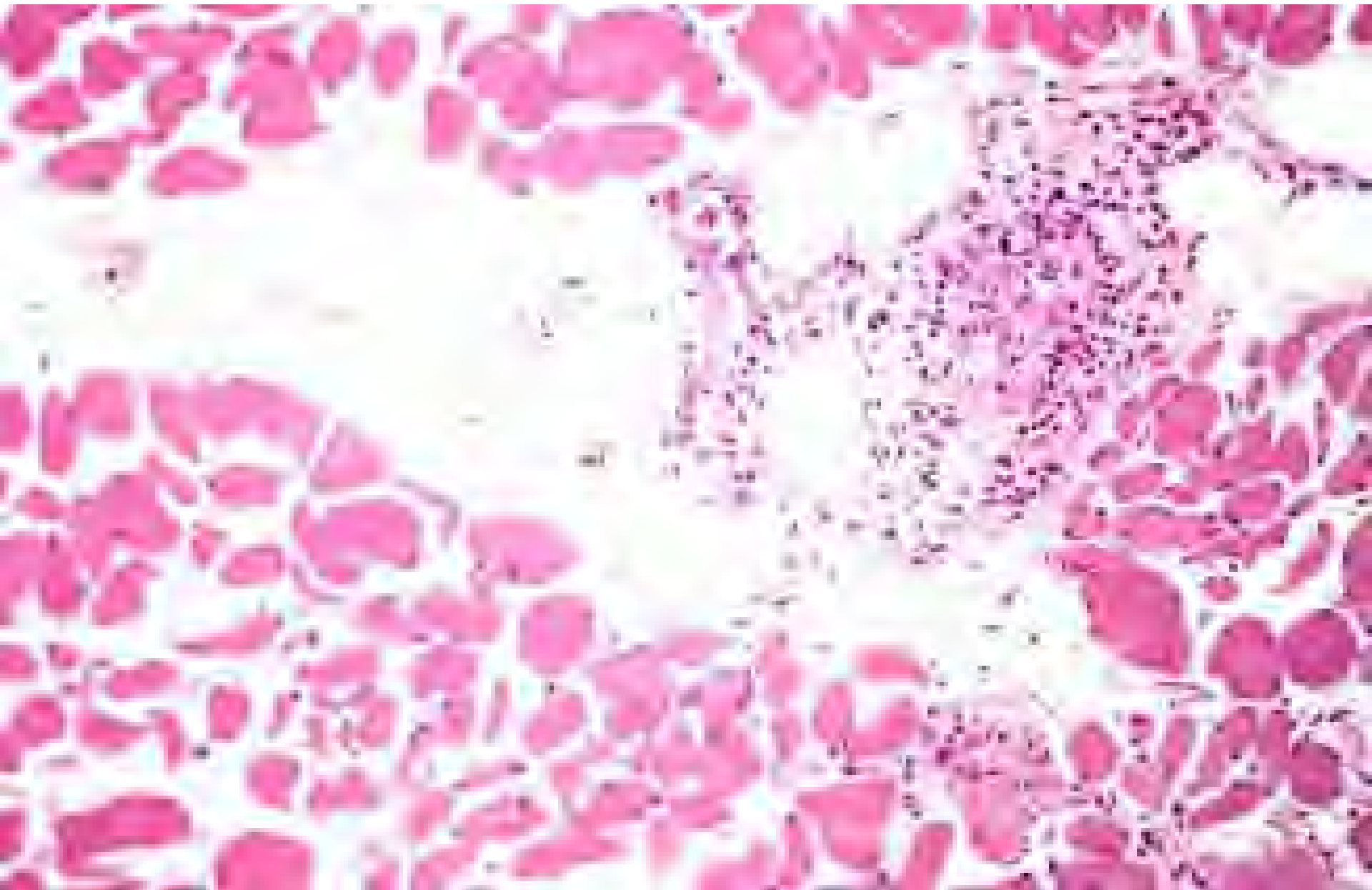
Cardio Lab 5

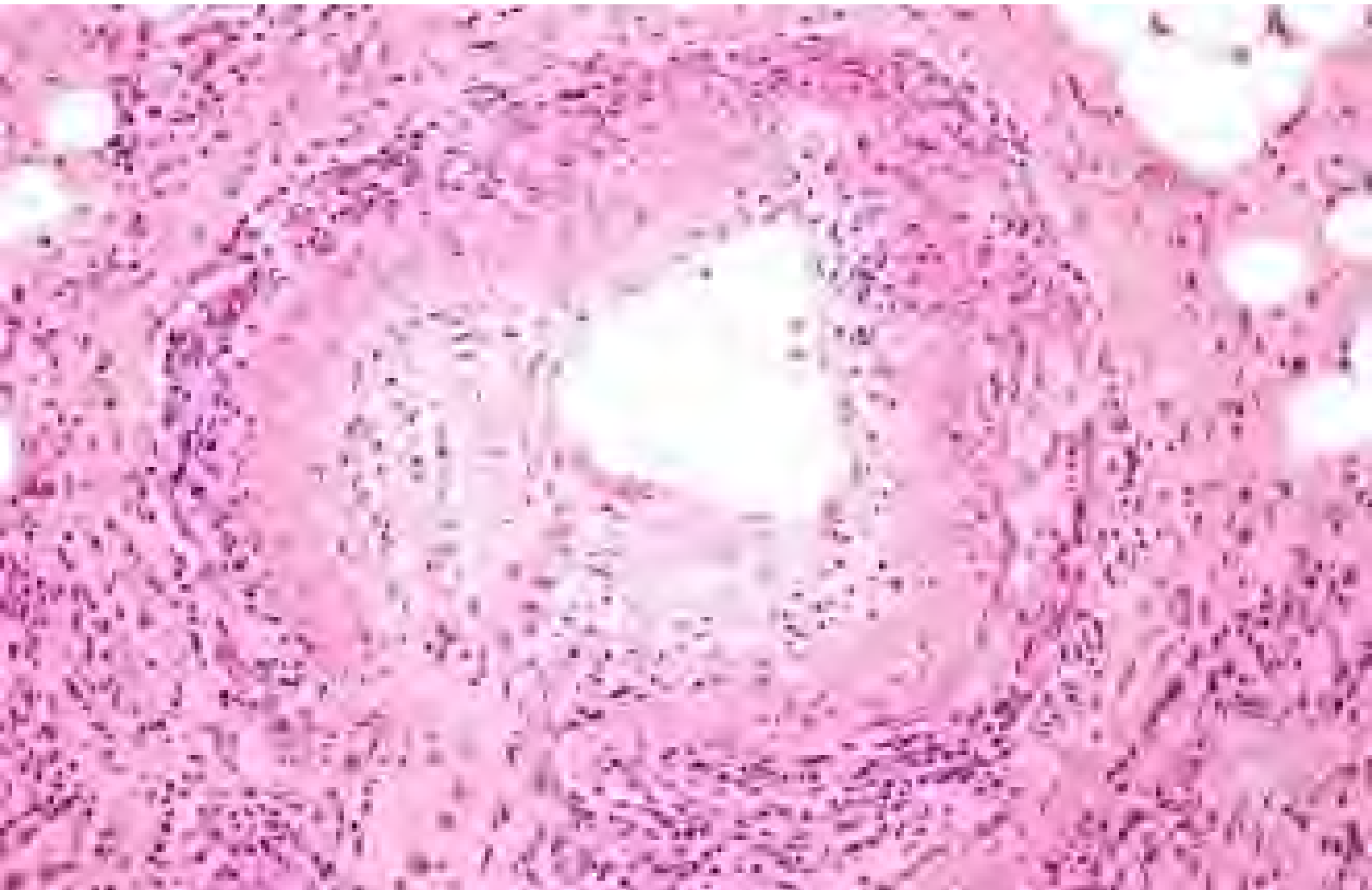
Case Presentation 5

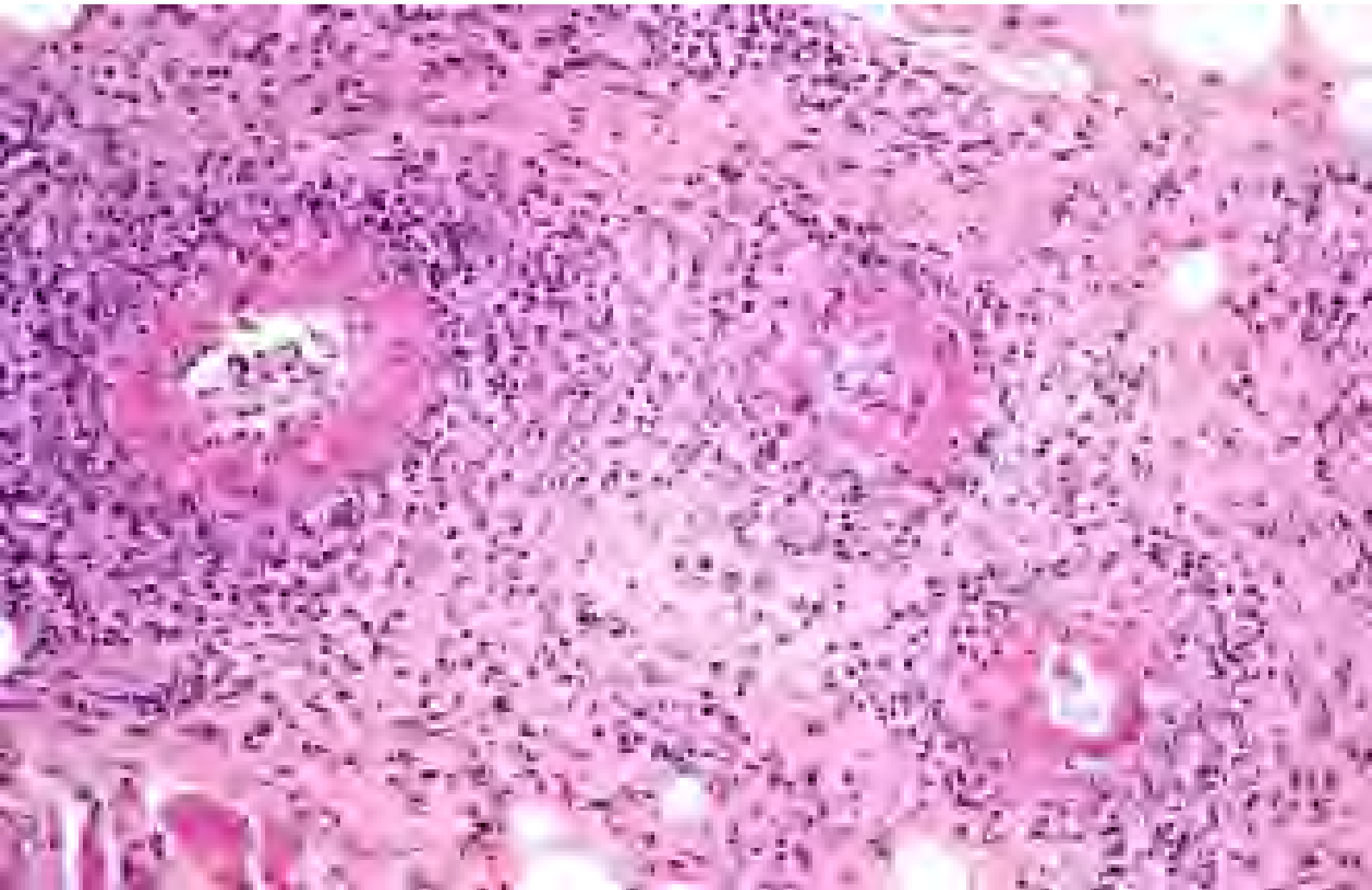
(Refer to the lab syllabus for the clinical information))

- 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?





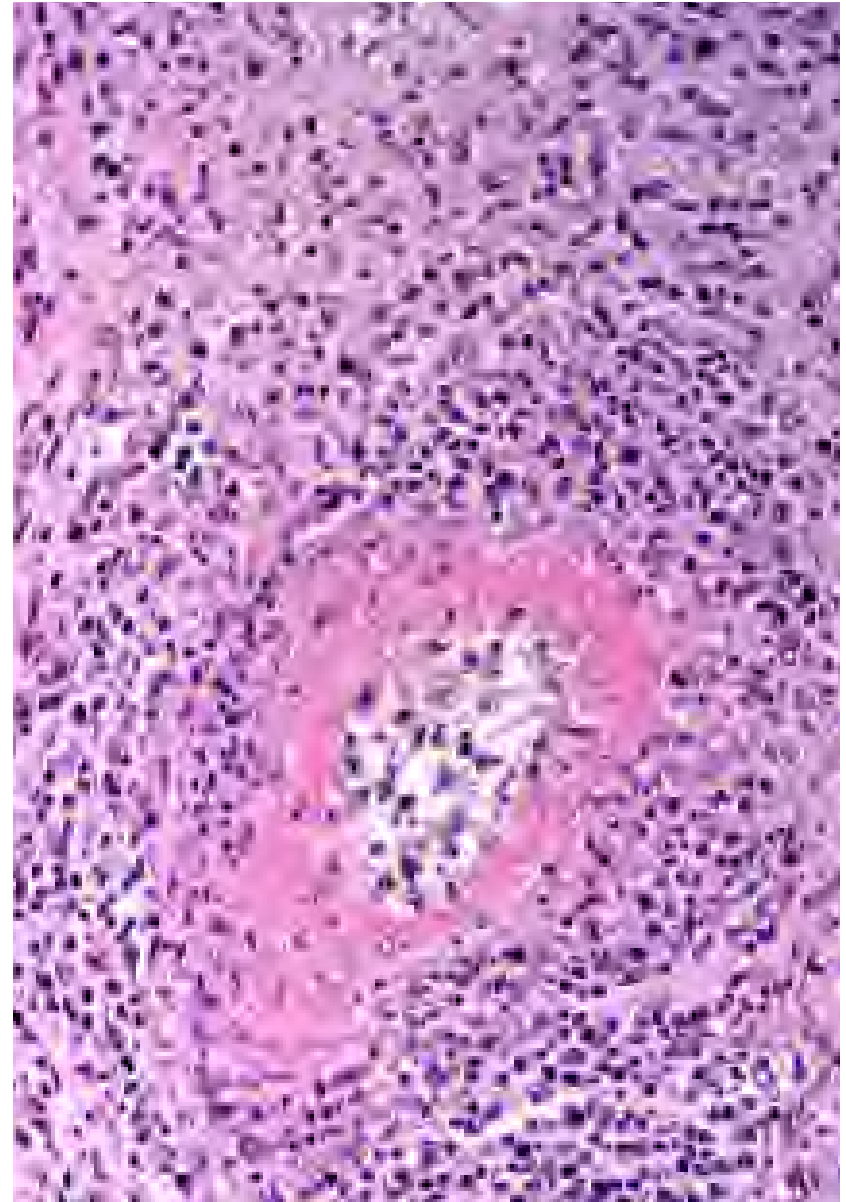
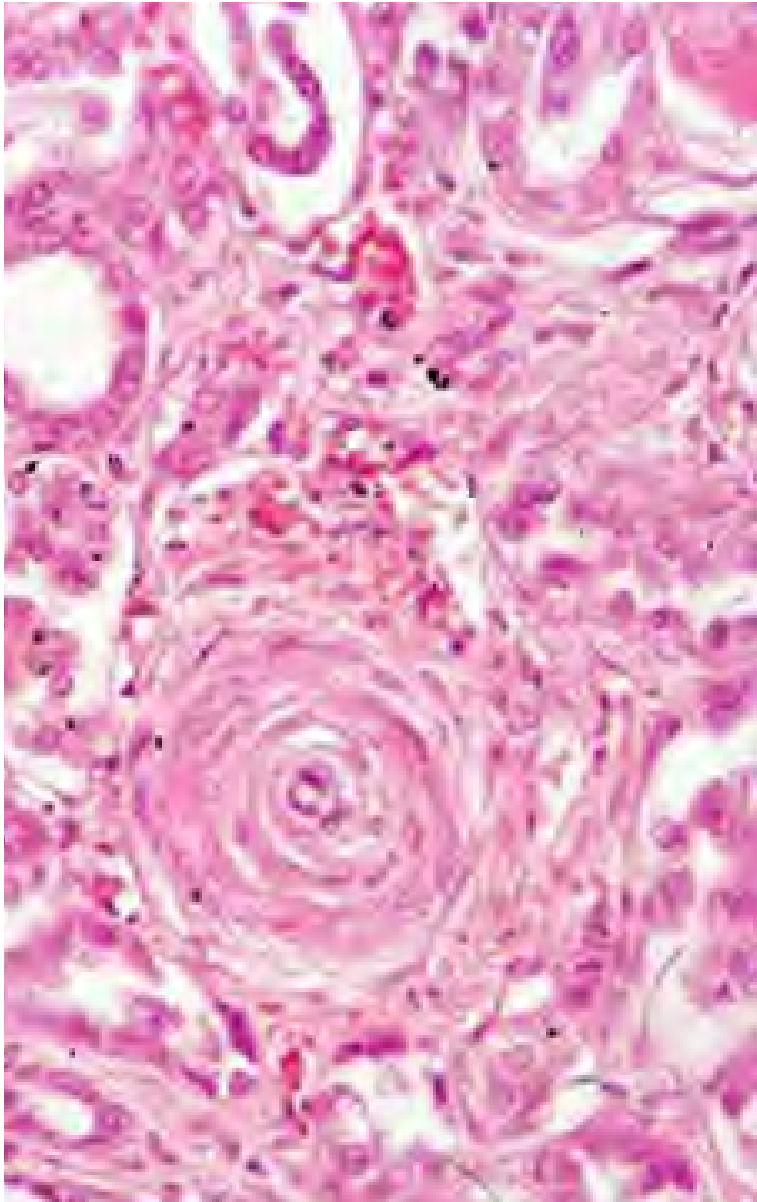


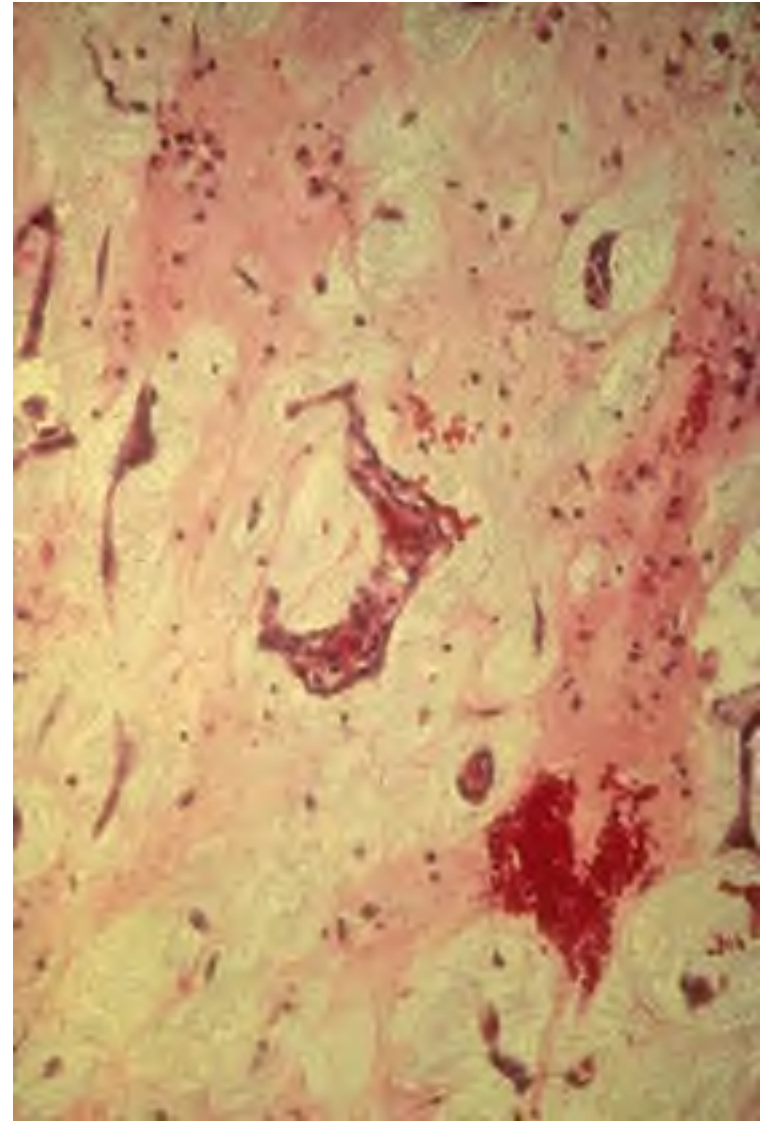
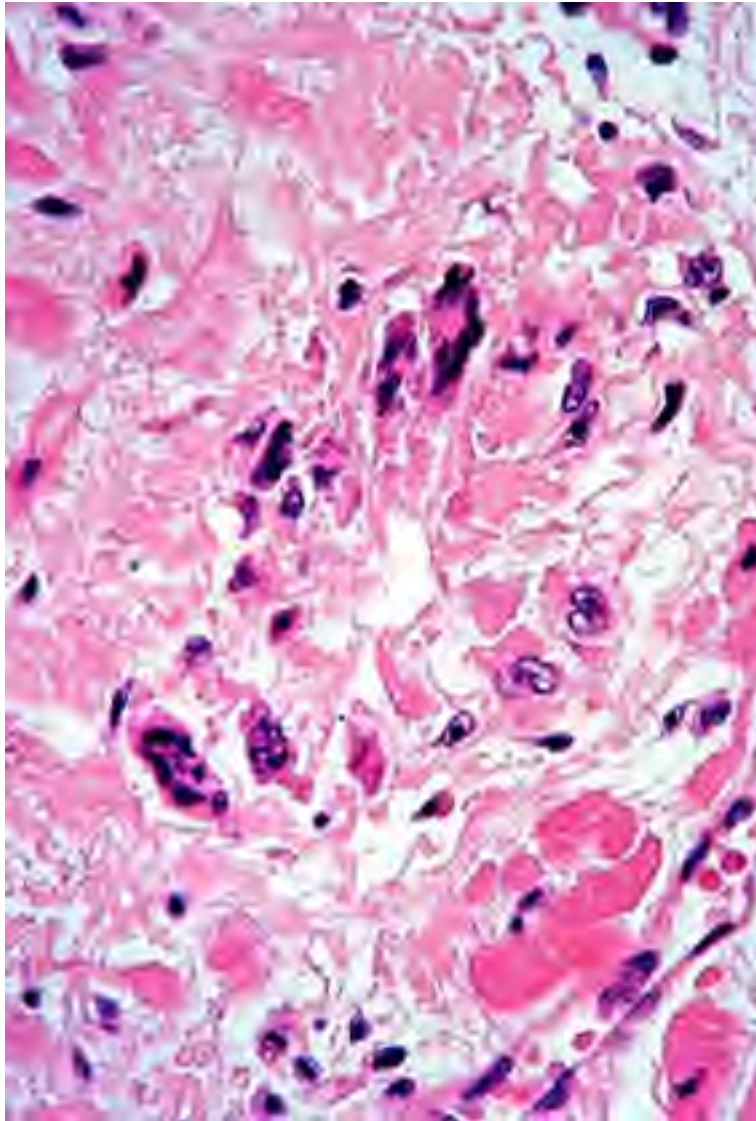



Polyarteritis Nodosa

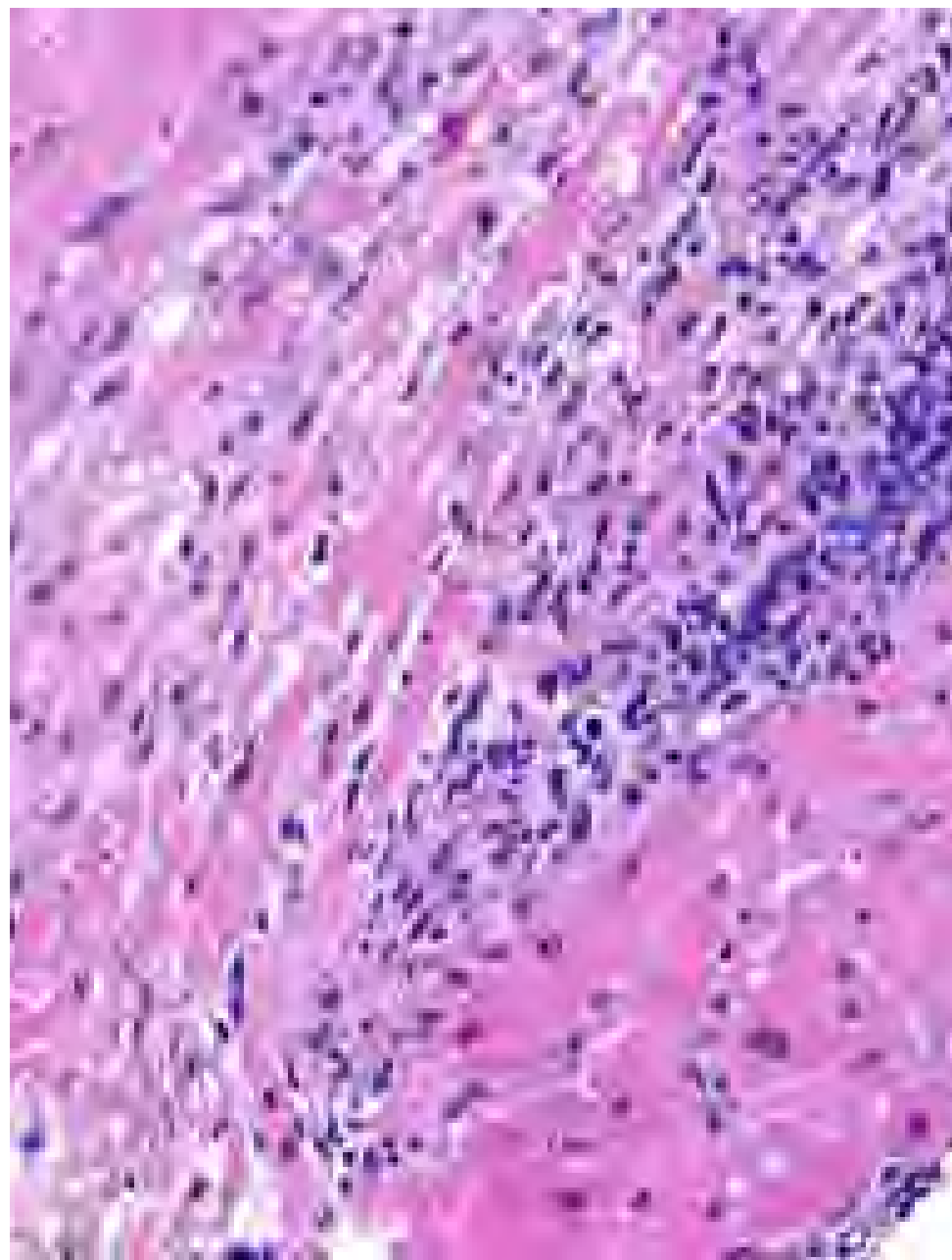
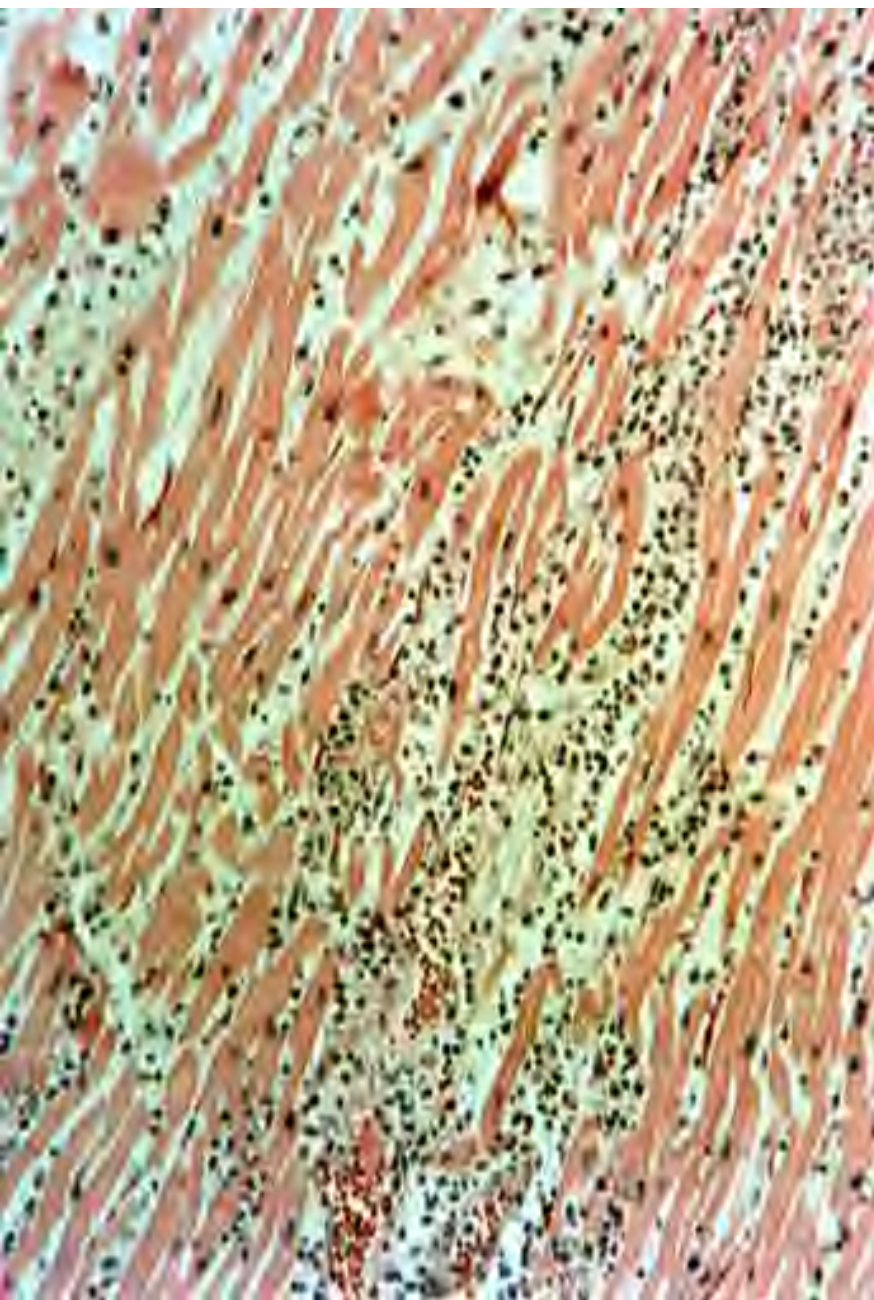


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 PD-INEL G.D. Abrams, University of Michigan Medical School (Both Images)



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Slide 41: G.D. Abrams, University of Michigan Medical School

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Slide 50: G.D. Abrams, University of Michigan Medical School
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