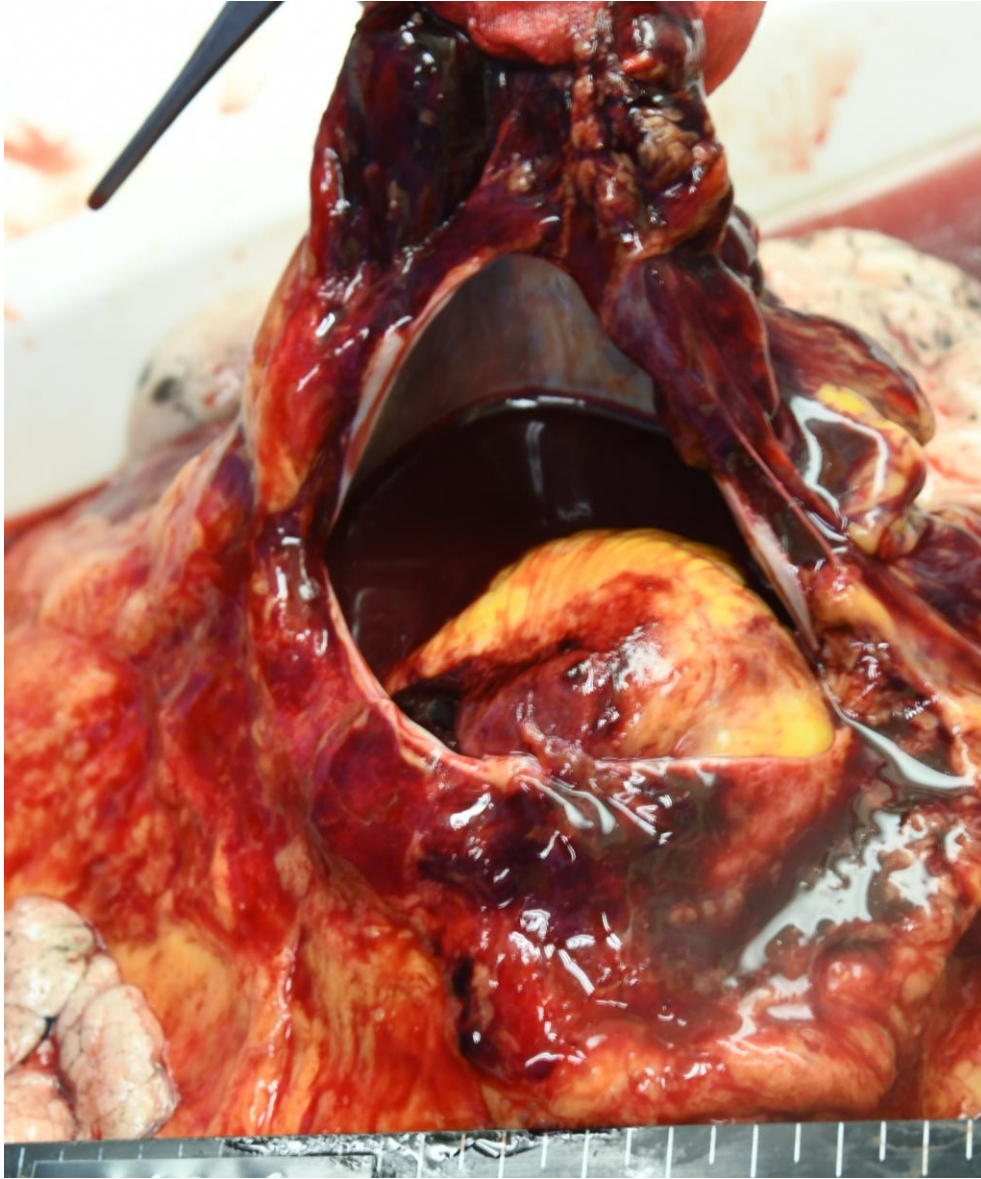


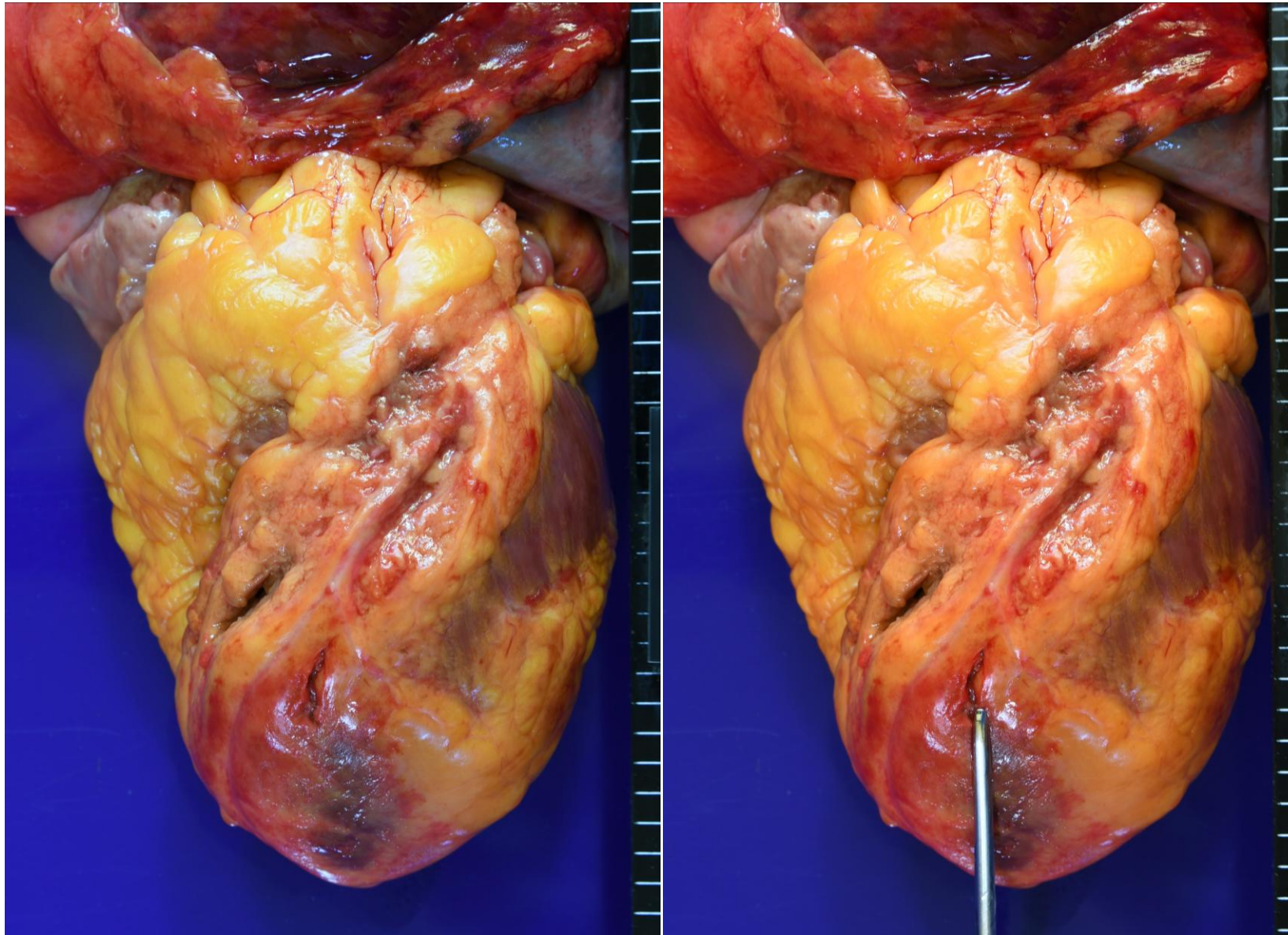
Ruptured acute myocardial infarction

Cardiac rupture is a severe, life-threatening complication of acute myocardial infarction (AMI), including free wall rupture, ventricular septal rupture and papillary muscle rupture. Reportedly, the incidence of cardiac rupture after AMI is as high as 6.2%. With the advancement of percutaneous coronary intervention, the mortality and complication rate of AMI have dropped remarkably. However, the mortality caused by cardiac rupture remains high. The rupture mostly occurs within the first week after the chest pain onset. In nearly half cases, the rupture happens within 24 hours after the chest pain onset. High leukocyte levels after AMI are closely associated with a higher mortality rate, and are closely related to early cardiac rupture (≤ 24 hours).

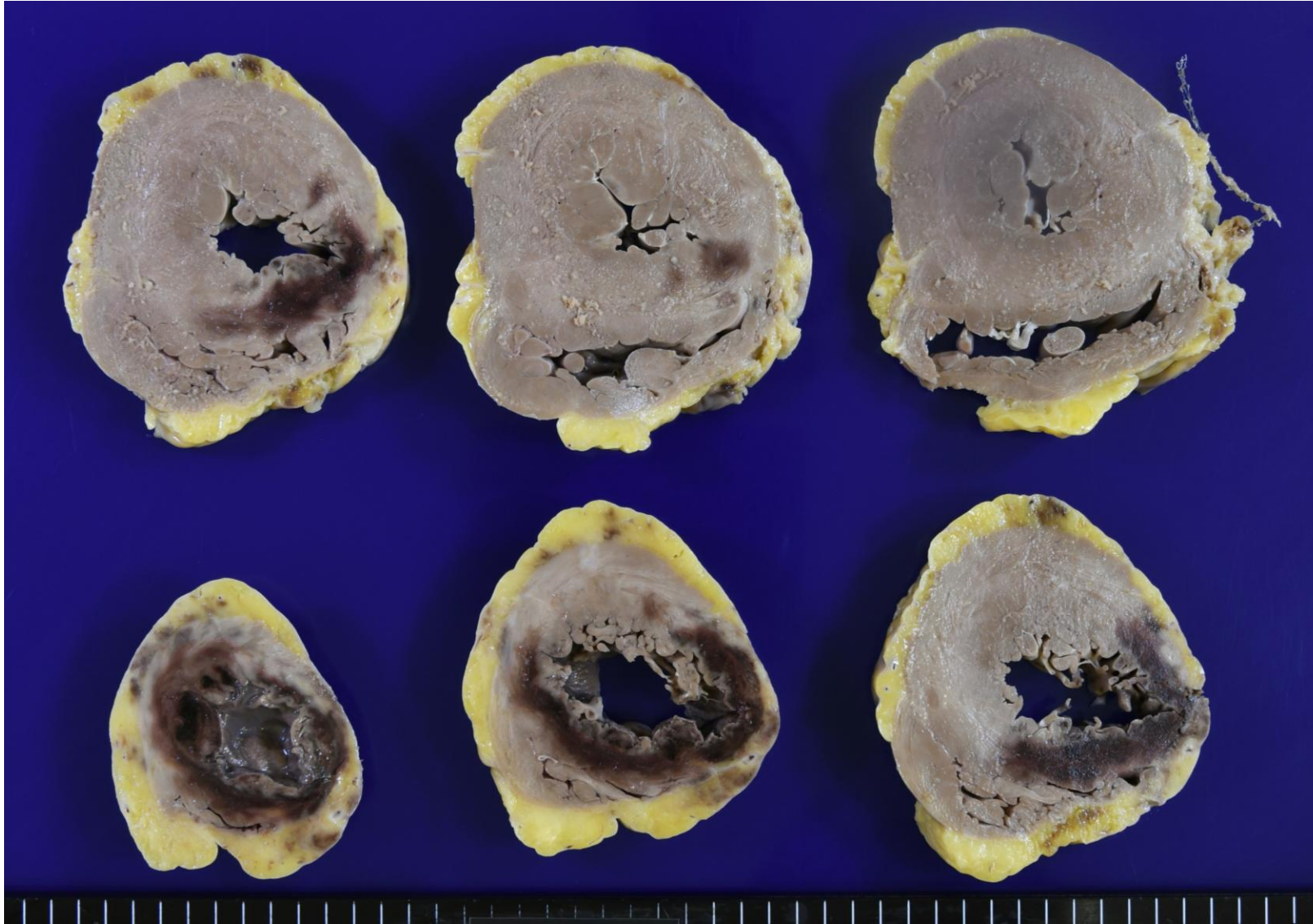
Ref.: Liang C, et al. Time course of cardiac rupture after acute myocardial infarction and comparison of clinical features of different rupture types. *Front Cardiovasc Med* 2024; 11: 1365092. doi: 10.3389/fcvm.2024.1365092



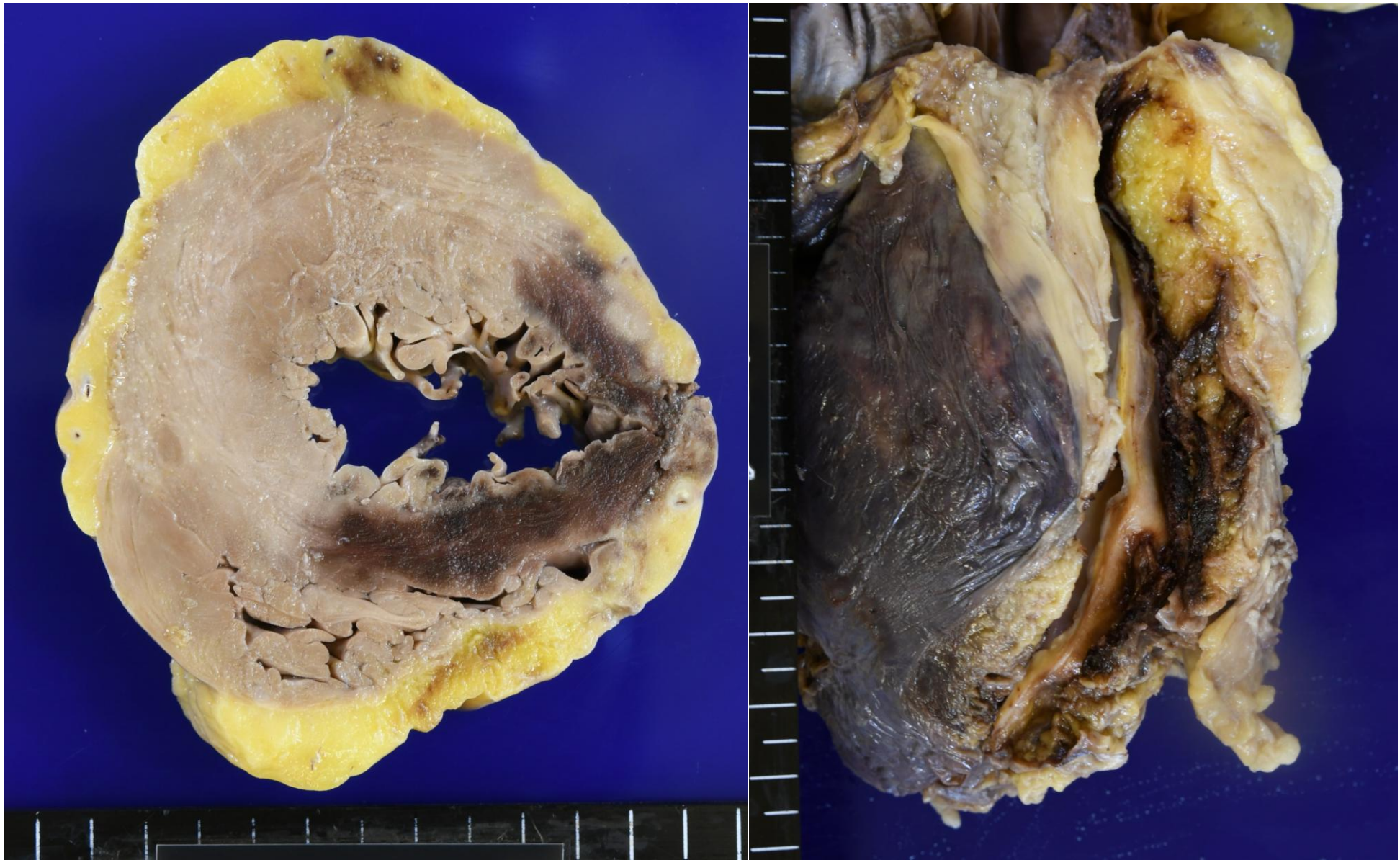
Cardiac rupture 6 days after cardiac pain onset, seen in a 78 y-o male patient. Cardiac tamponade happened through lethal cardiac rupture caused by acute myocardial infarction of the anterior wall. 2,250 mL blood filled the epicardial space.



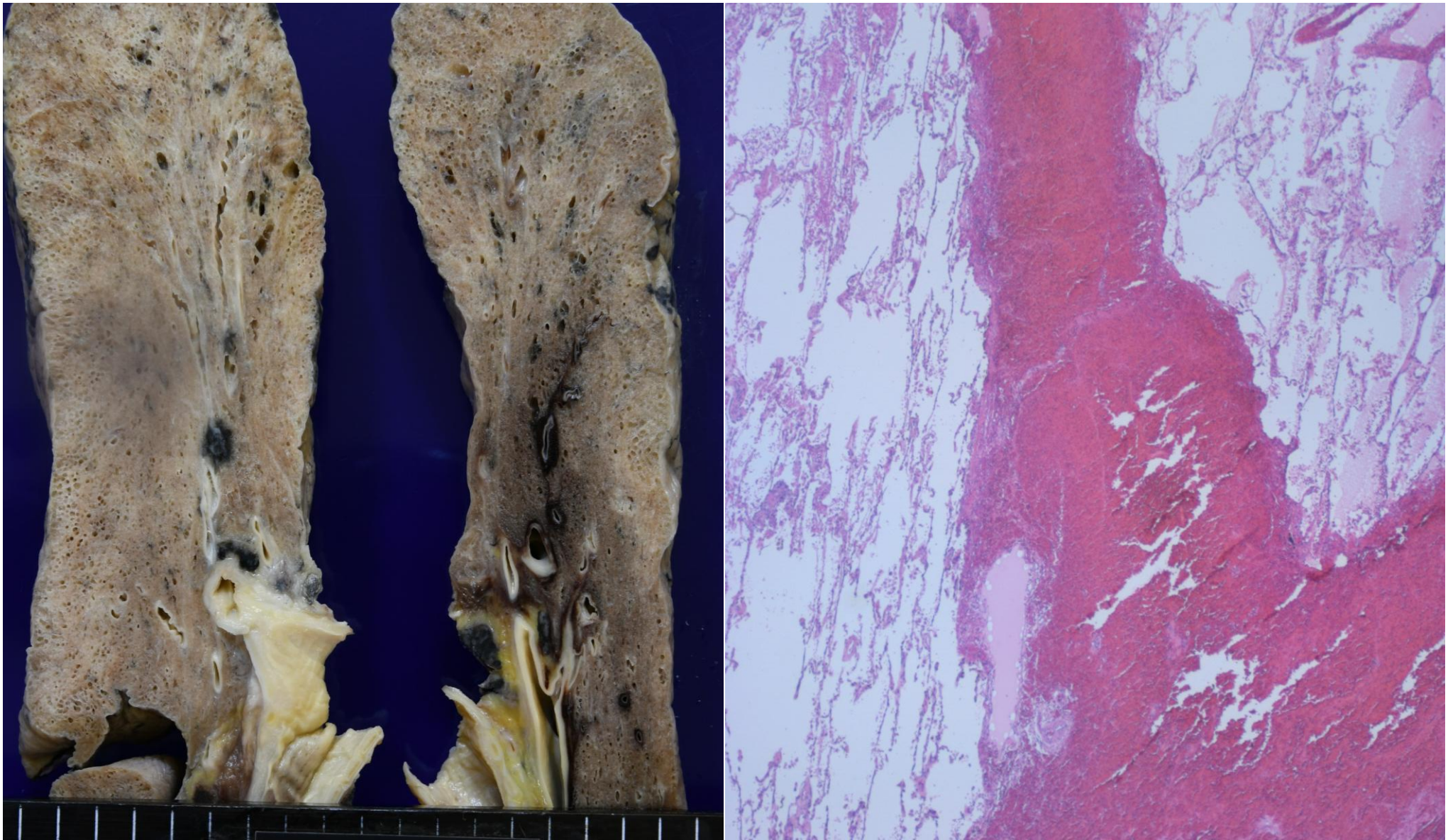
Cardiac rupture 6 days after cardiac pain onset, seen in a 78 y-o male patient. Acute myocardial infarction of the anterior wall caused lethal cardiac rupture. The heart weighs 360 g. A probe is inserted through the ruptured cleft. A stent had been inserted in the left anterior descending artery.



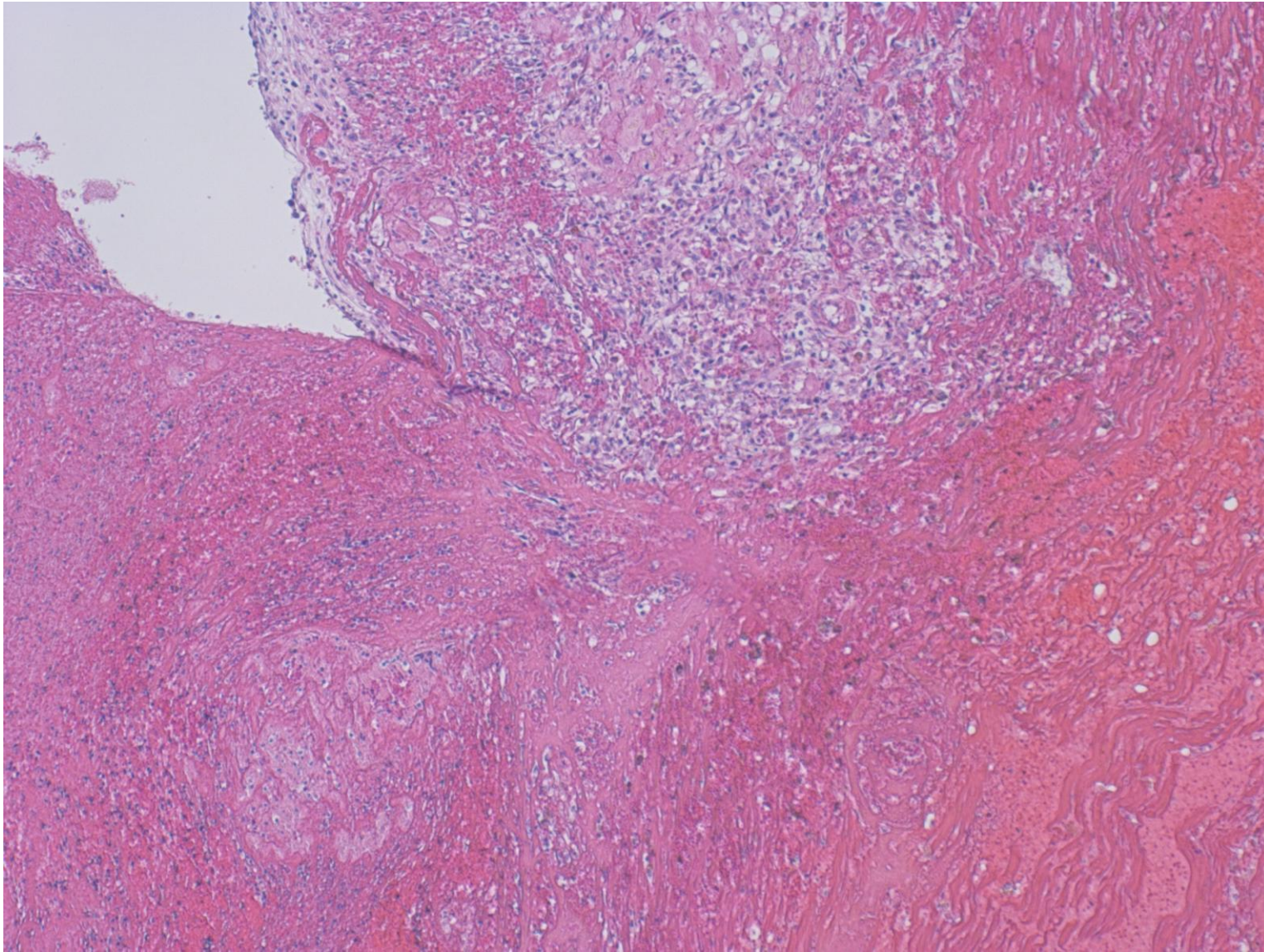
Cardiac rupture 6 days after cardiac pain onset, seen in a 78 y-o male patient. Horizontal cut surfaces of the heart with myocardial infarction of the anterior wall are shown (after formalin fixation). The infarction caused not only lethal cardiac rupture but also circumferential intramuscular hemorrhage.



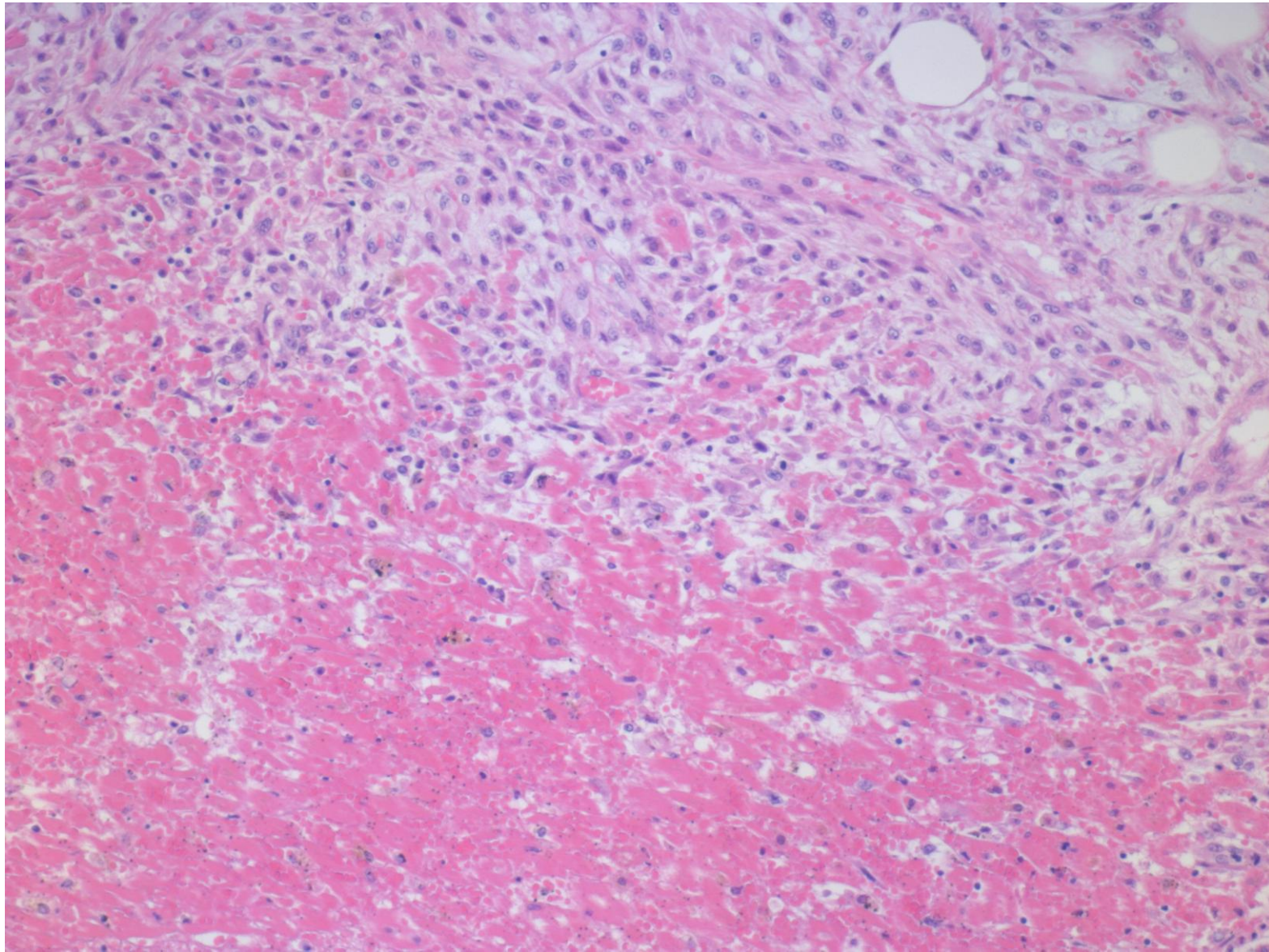
Cardiac rupture 6 days after cardiac pain onset, seen in a 78 y-o male patient. The horizontal cut surface of the heart shows ruptured myocardial infarction with circumferential intramuscular hemorrhage (left). The hemorrhage extends to the adventitia of the ascending thoracic aorta (right).



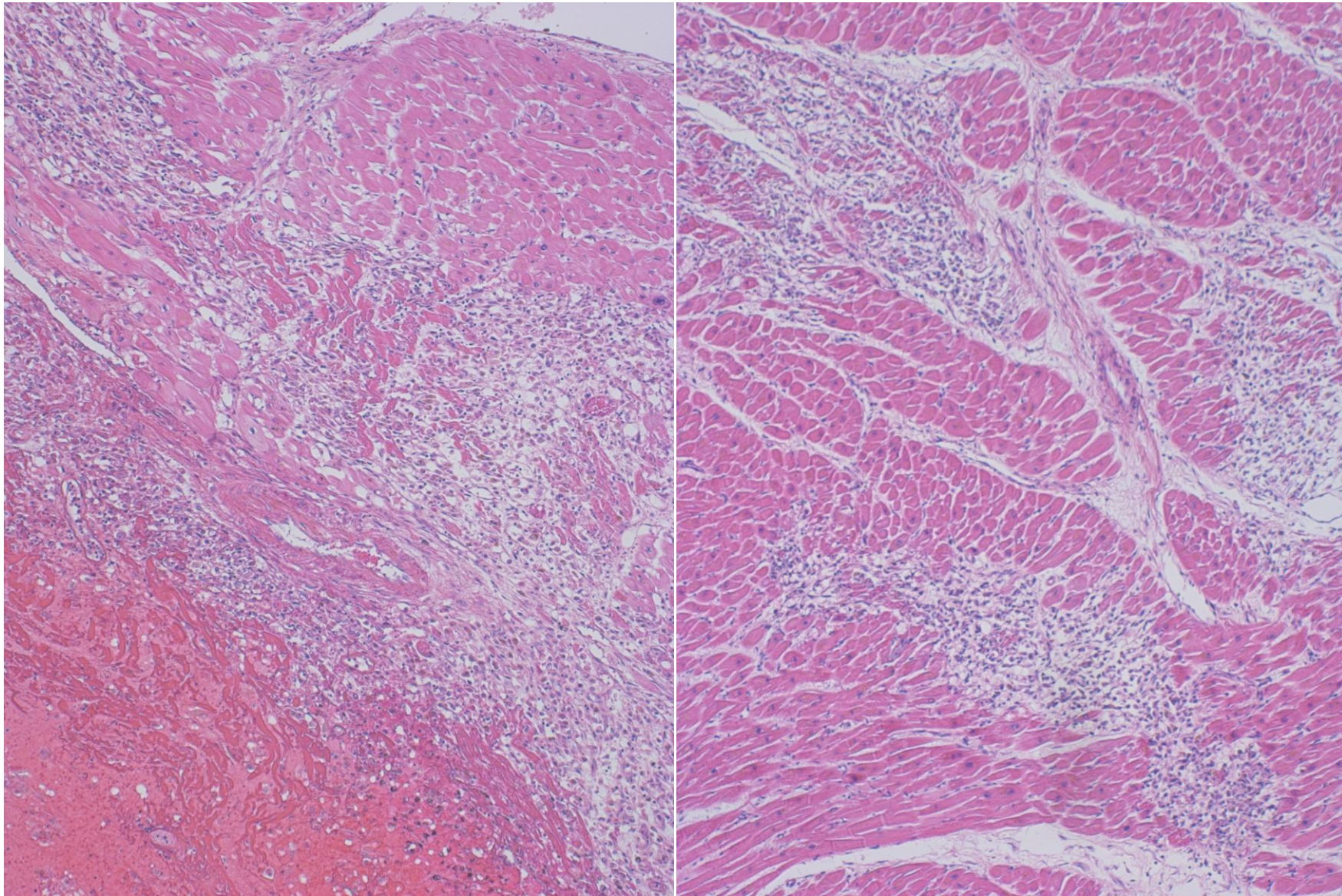
Cardiac rupture 6 days after cardiac pain onset, seen in a 78 y-o male patient. The frontal sections of the lungs show extension of hemorrhage into the hilar connective tissue of the left lung (left). Microscopic features of interstitial hemorrhage in the left lung are shown in the right panel (H&E).



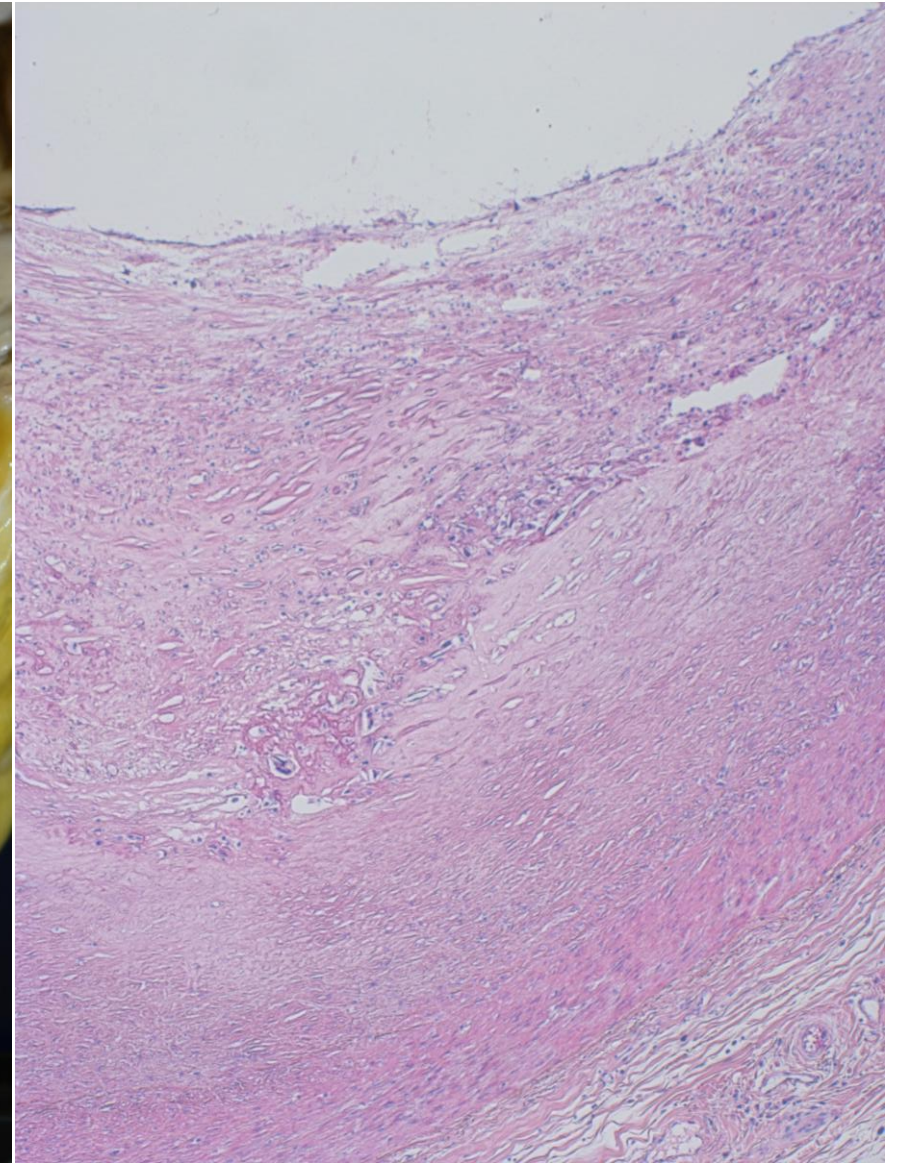
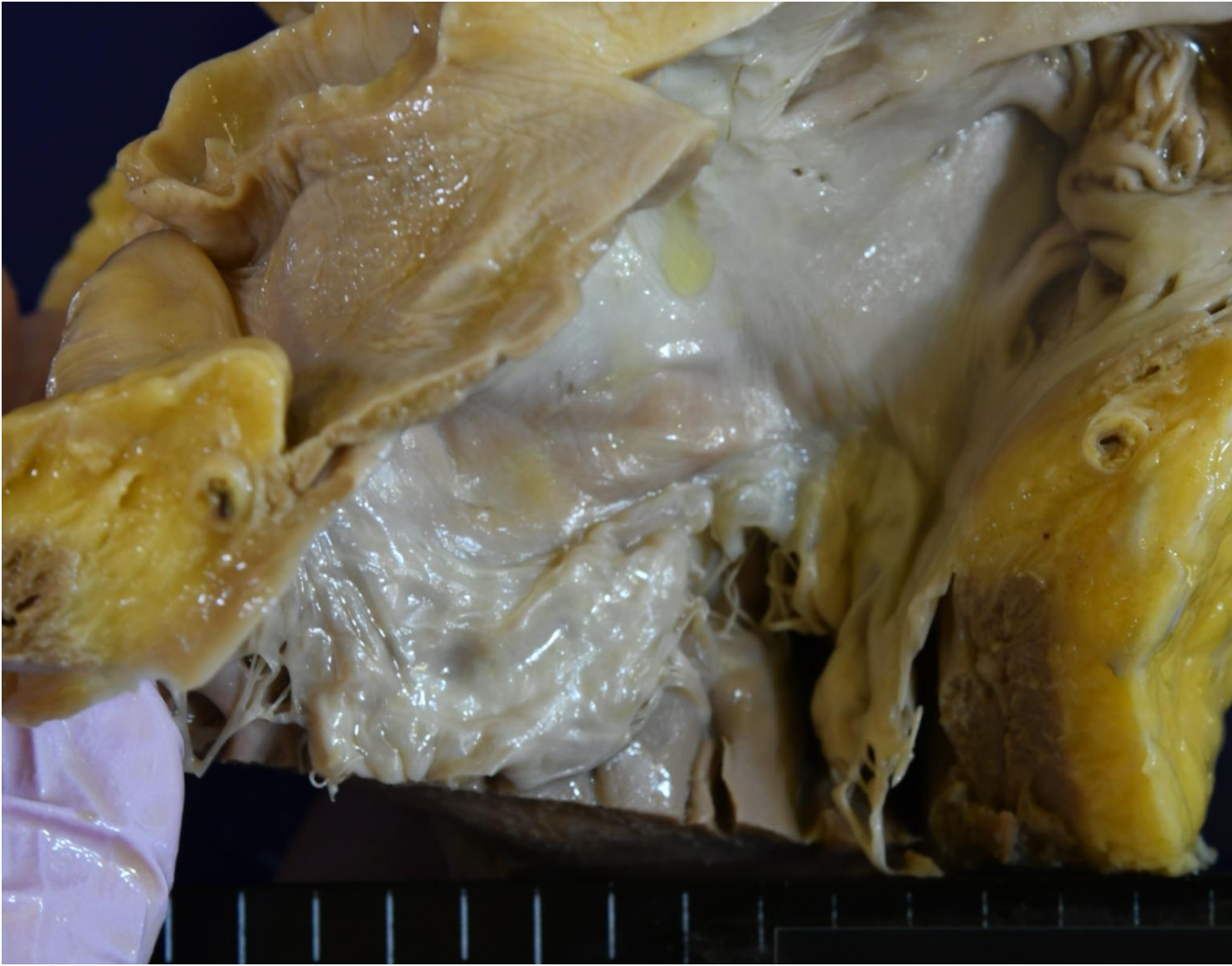
Cardiac rupture 6 days after cardiac pain onset, seen in a 78 y-o male patient. Microscopic appearance of hemorrhagic infarction at the site of cardiac rupture. Neutrophils accumulate in the necrotic area (H&E).



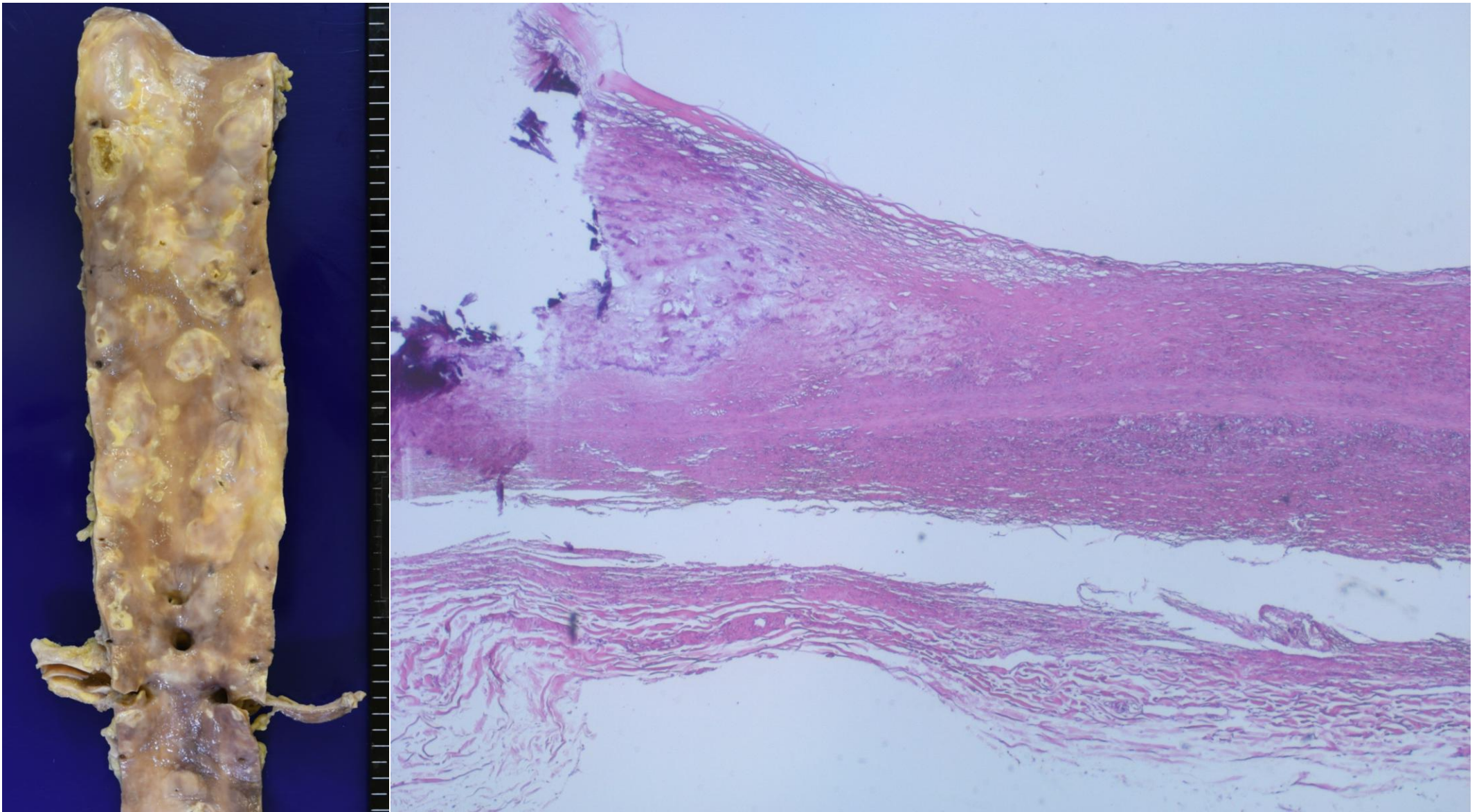
Cardiac rupture 6 days after cardiac pain onset, seen in a 78 y-o male patient. Microscopic appearance of myocardial infarction of the anterior wall is shown. Coagulation necrosis and granulation tissue reaction are demonstrated (H&E).



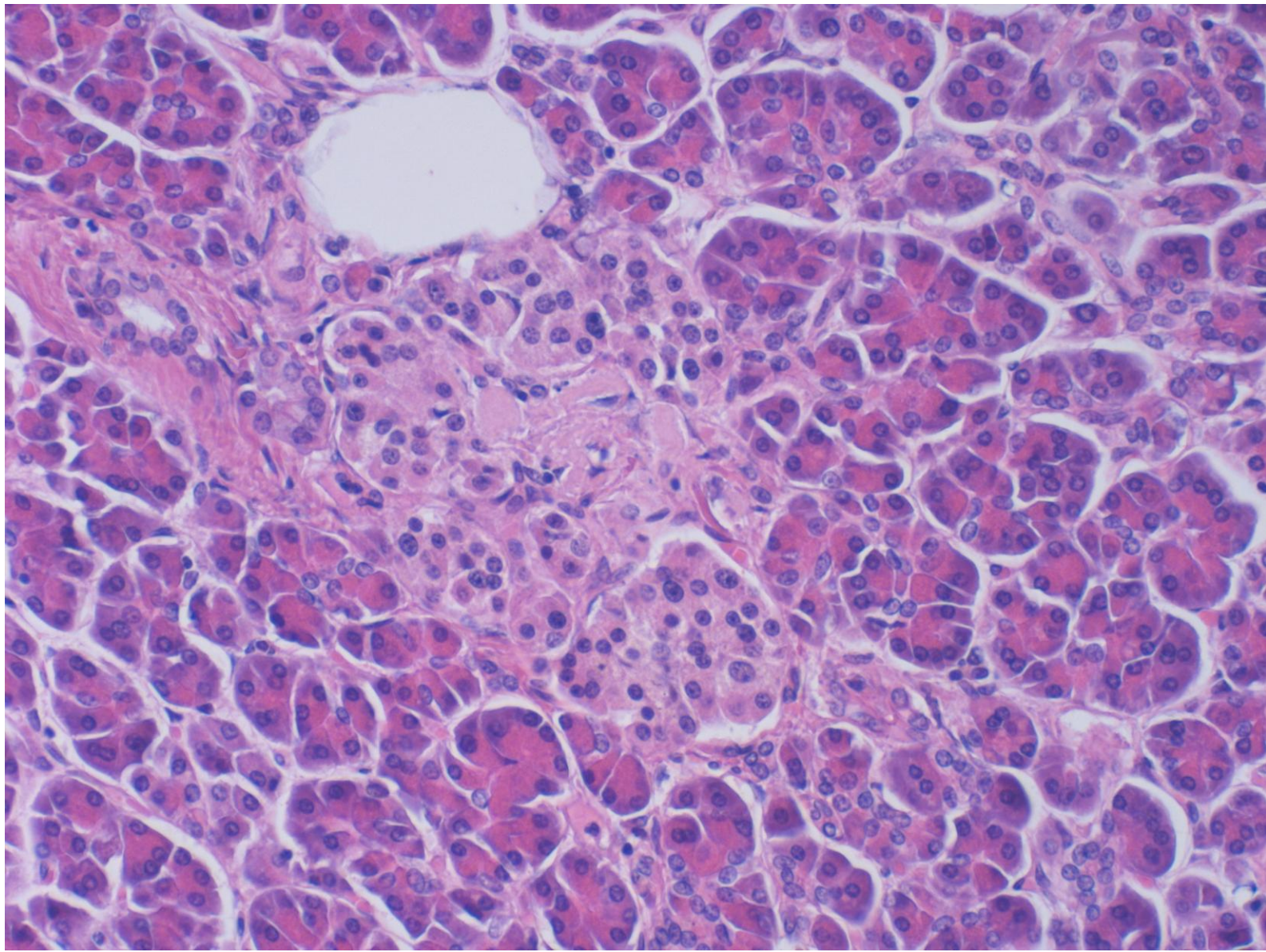
Cardiac rupture 6 days after cardiac pain onset, seen in a 78 y-o male patient. Microscopic appearance of hemorrhagic infarction of the posterior wall of the apex (left) and patchy infarction of the lateral wall (right) is shown. Granulation tissue reaction is observed (H&E).



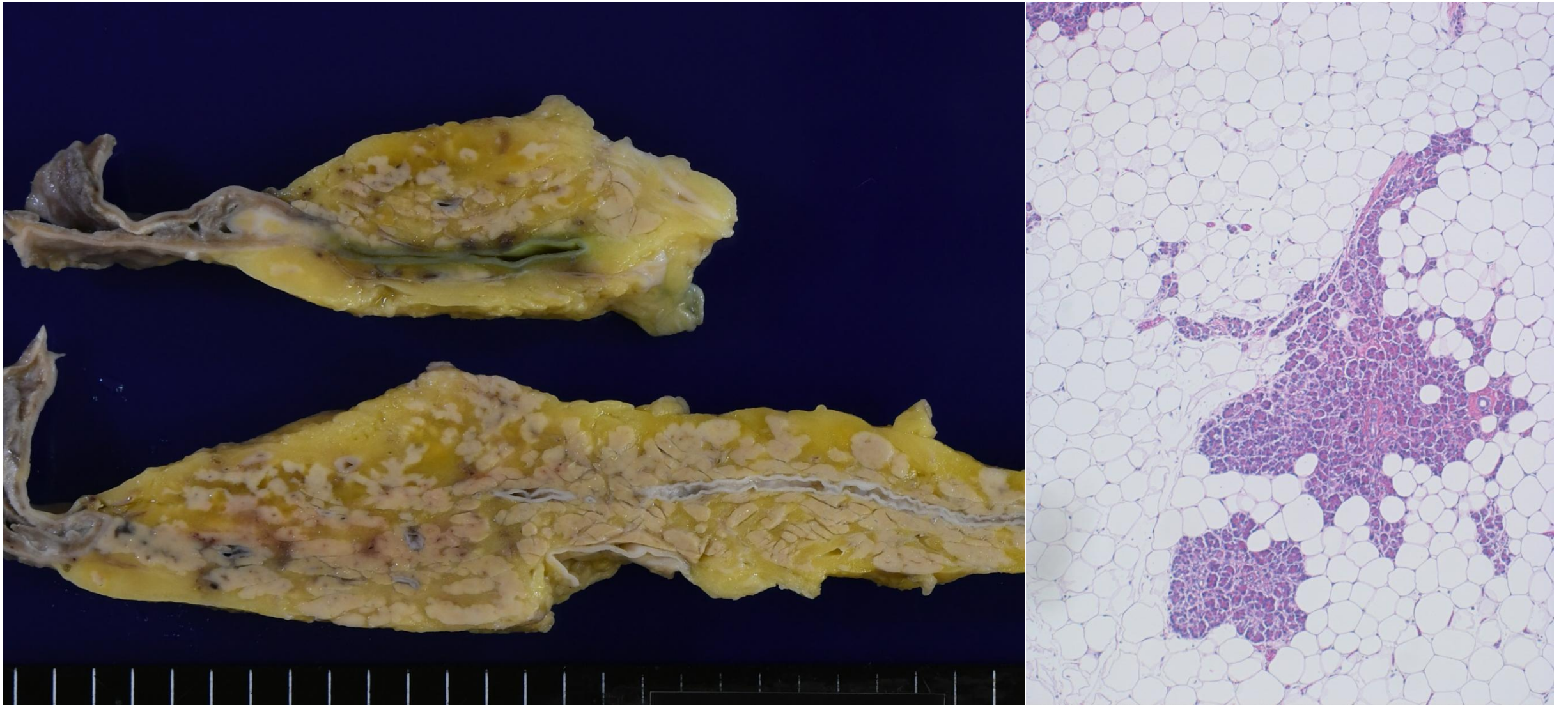
Cardiac rupture 6 days after cardiac pain onset, seen in a 78 y-o male patient. Gross appearance of the stenotic right circumflex artery is shown in the left panel. Microscopic features of stent-inserted left anterior descending artery are shown in the right panel (H&E). The intima is thickened by fibrotic granulation tissue.



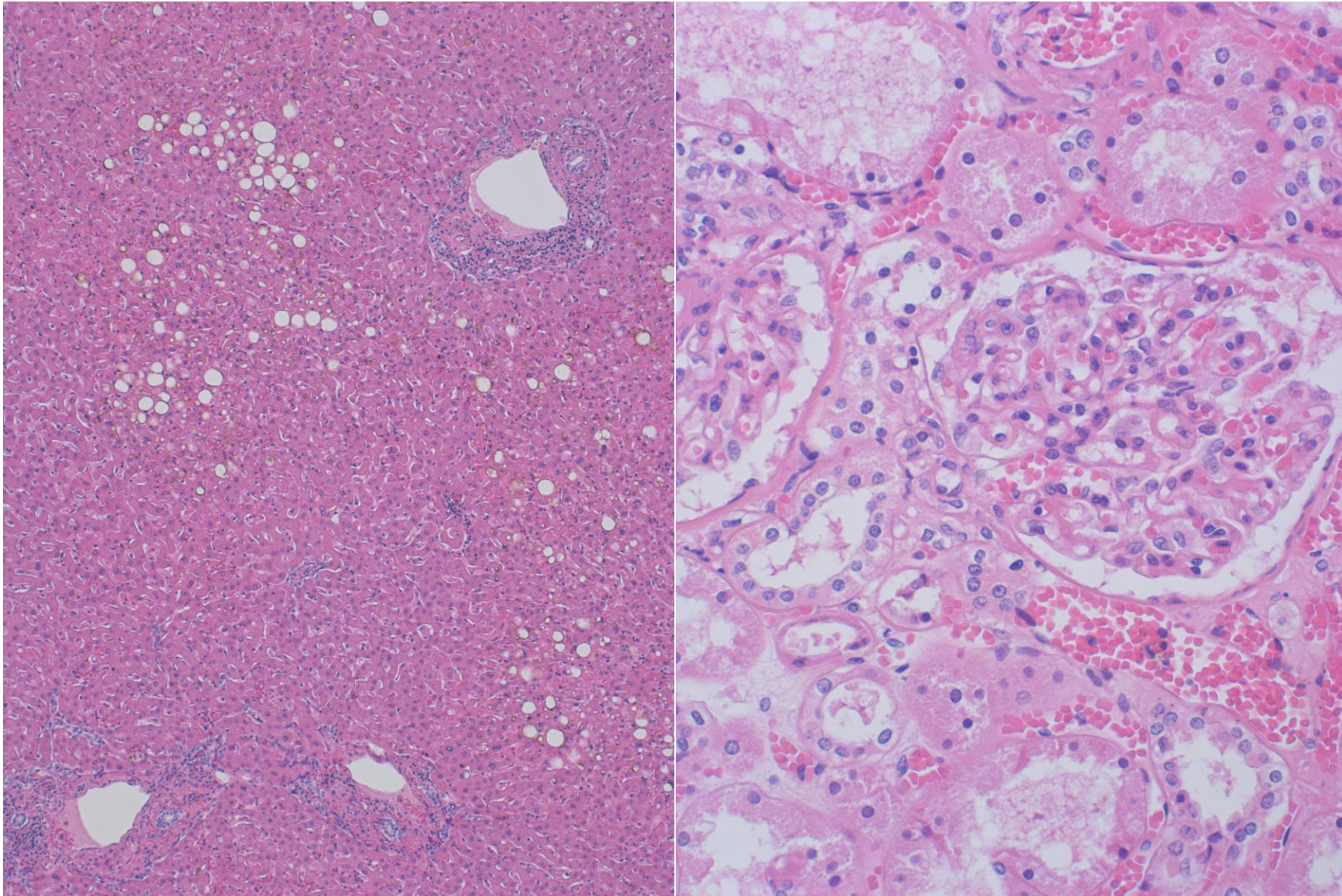
Cardiac rupture 6 days after cardiac pain onset, seen in a 78 y-o male patient. Gross and microscopic features of the aorta. The degree of atherosclerosis is relatively mild (left). A calcified atheromatous plaque is shown in the right panel (H&E).



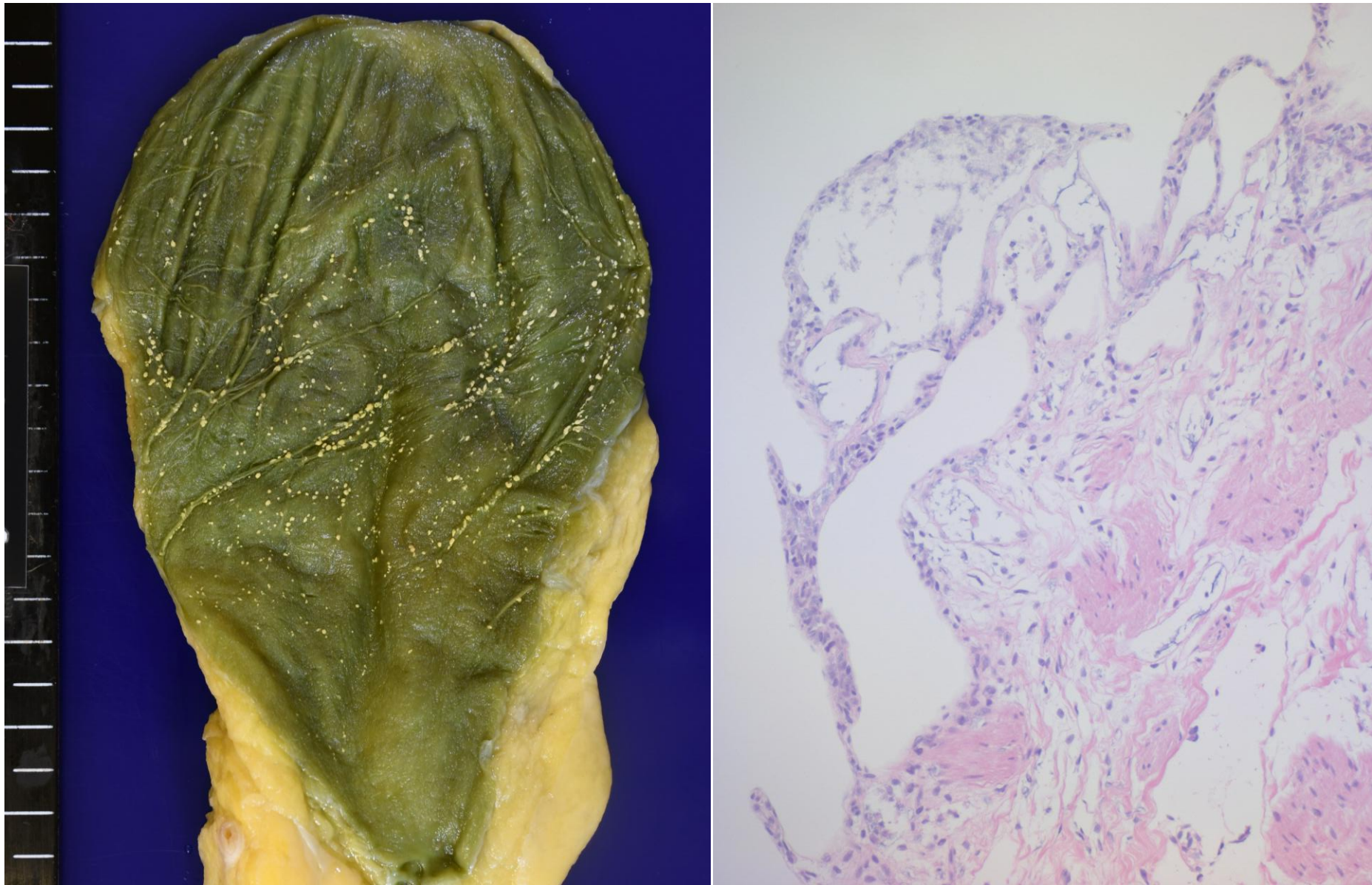
Cardiac rupture 6 days after cardiac pain onset, seen in a 78 y-o male patient. Langerhans islet in the pancreas shows amyloid deposition, indicating the association of type 2 diabetes mellitus (H&E).



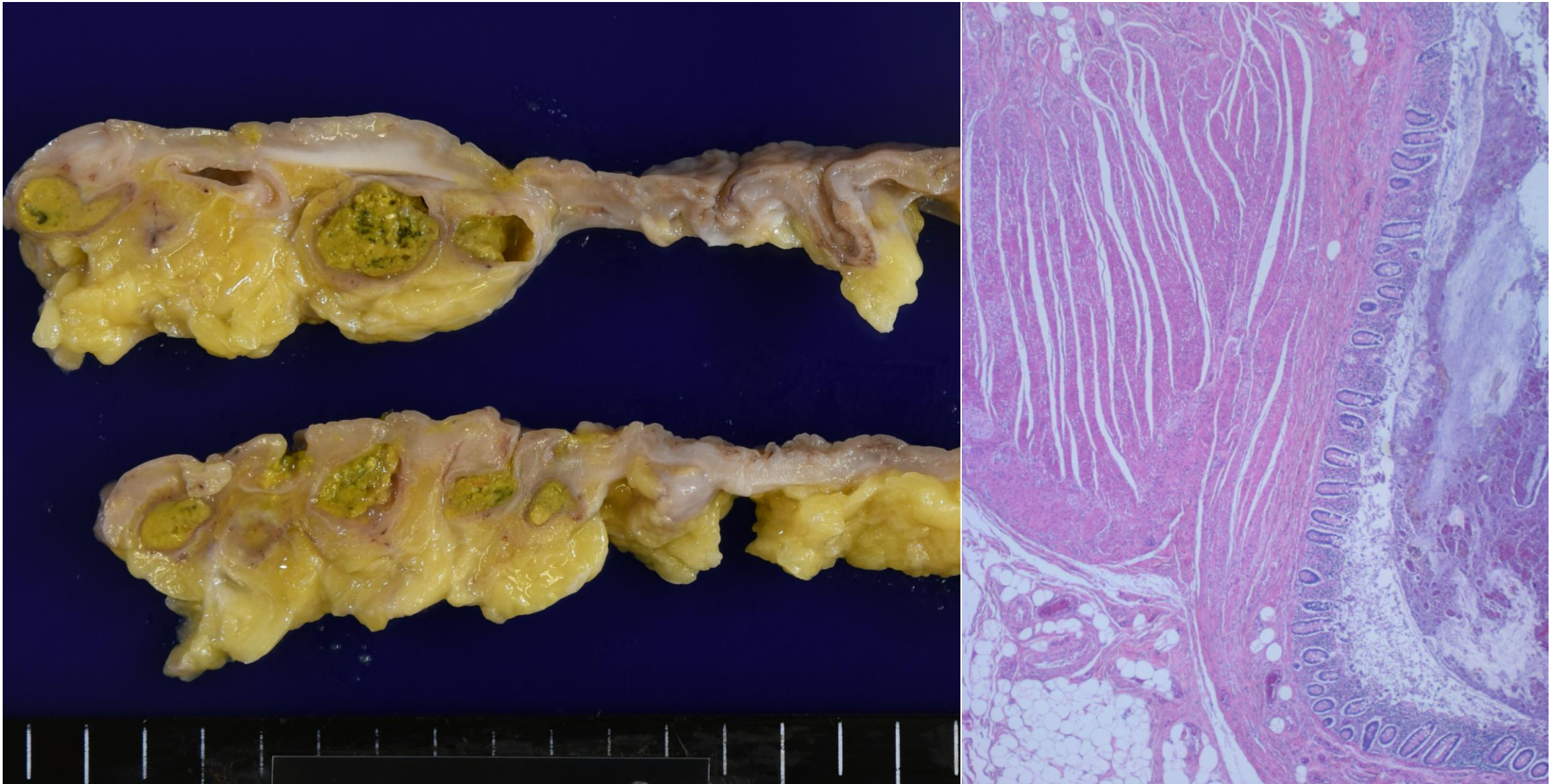
Cardiac rupture 6 days after cardiac pain onset, seen in a 78 y-o male patient.
The pancreas grossly (left) and microscopically (right) shows lipomatosis (H&E).



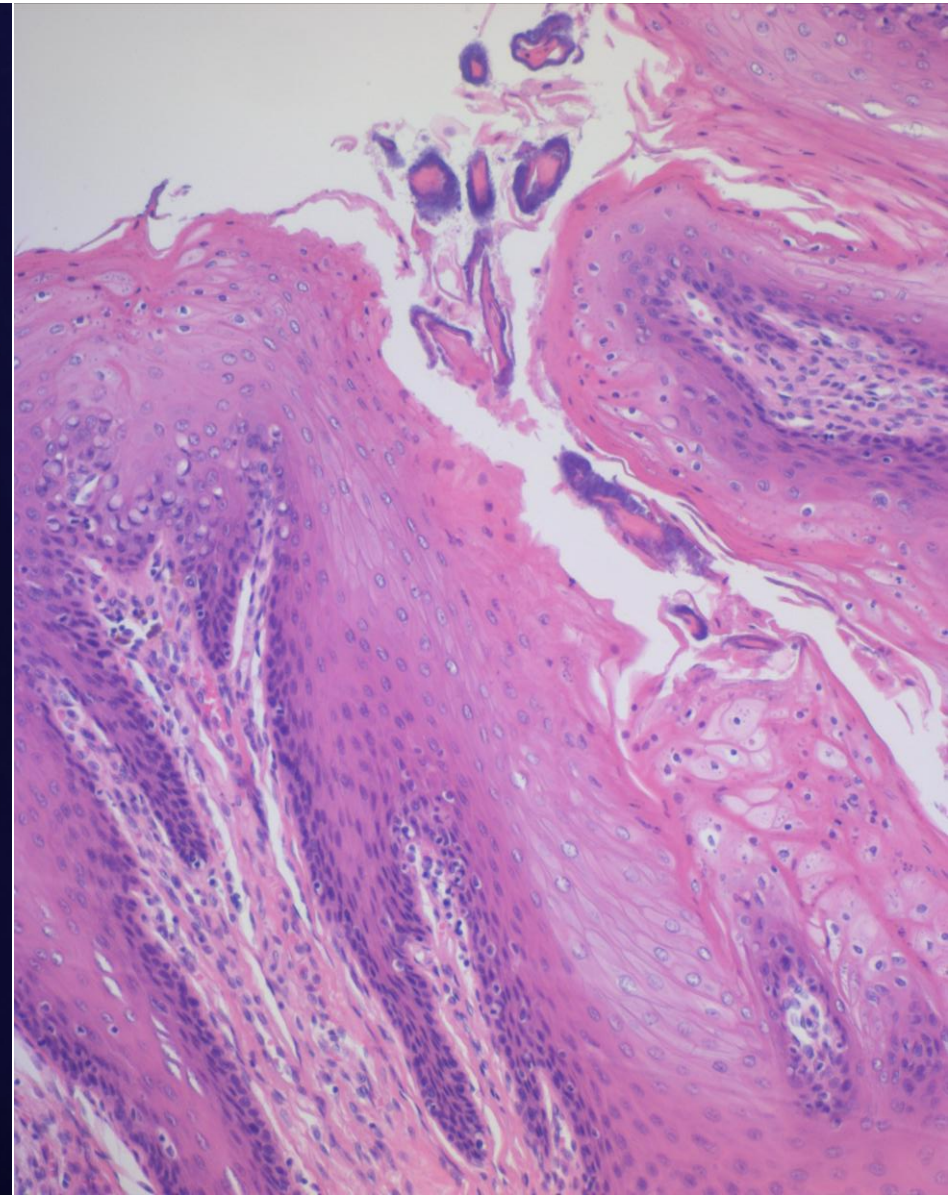
Cardiac rupture 6 days after cardiac pain onset, seen in a 78 y-o male patient. Microscopically, the liver shows mild fatty change in the centrilobular zone (left). No diabetic change is discerned in the kidney (H&E).



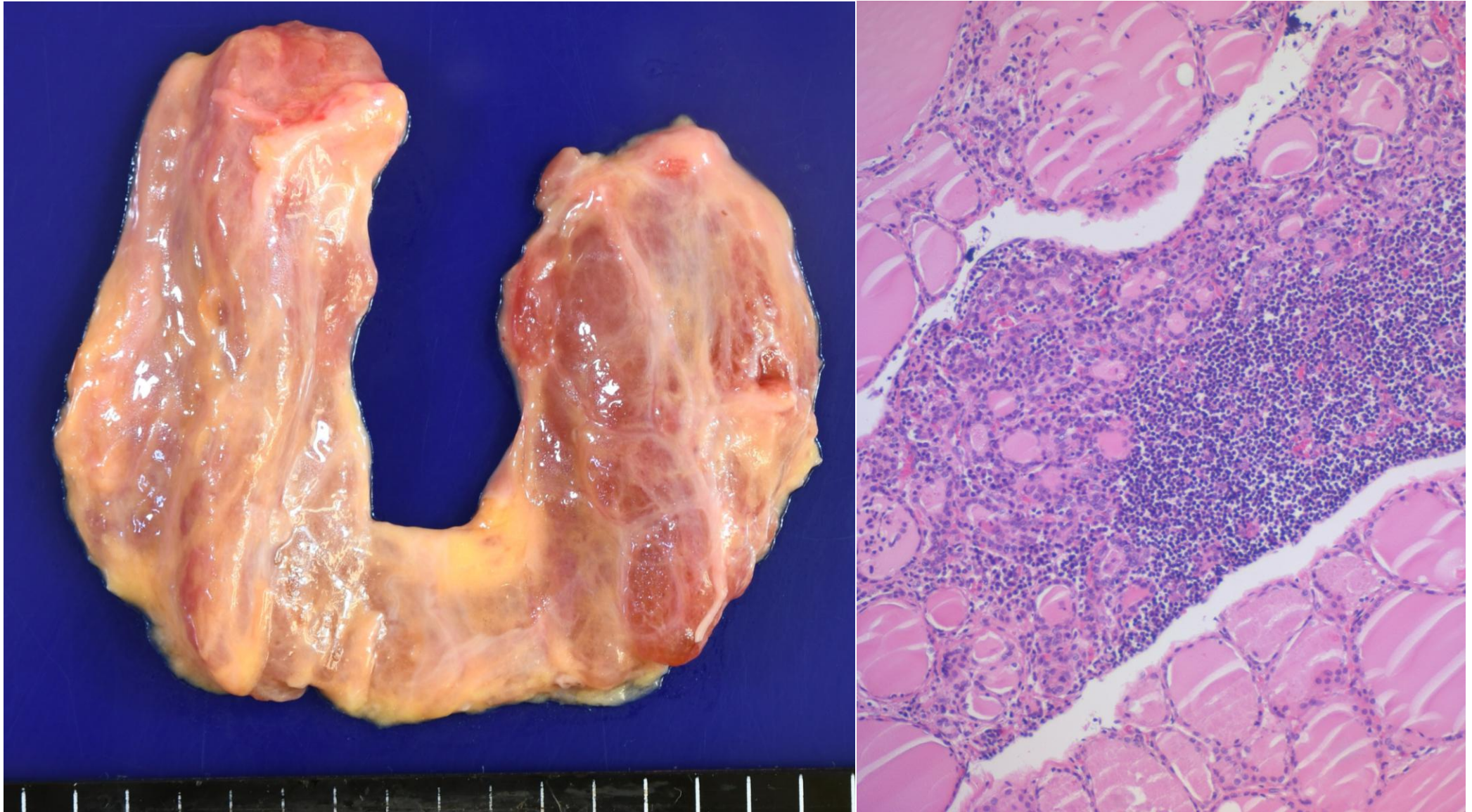
Cardiac rupture 6 days after cardiac pain onset, seen in a 78 y-o male patient. The gallbladder shows mucosal cholesterosis (left: gross finding, right: H&E).



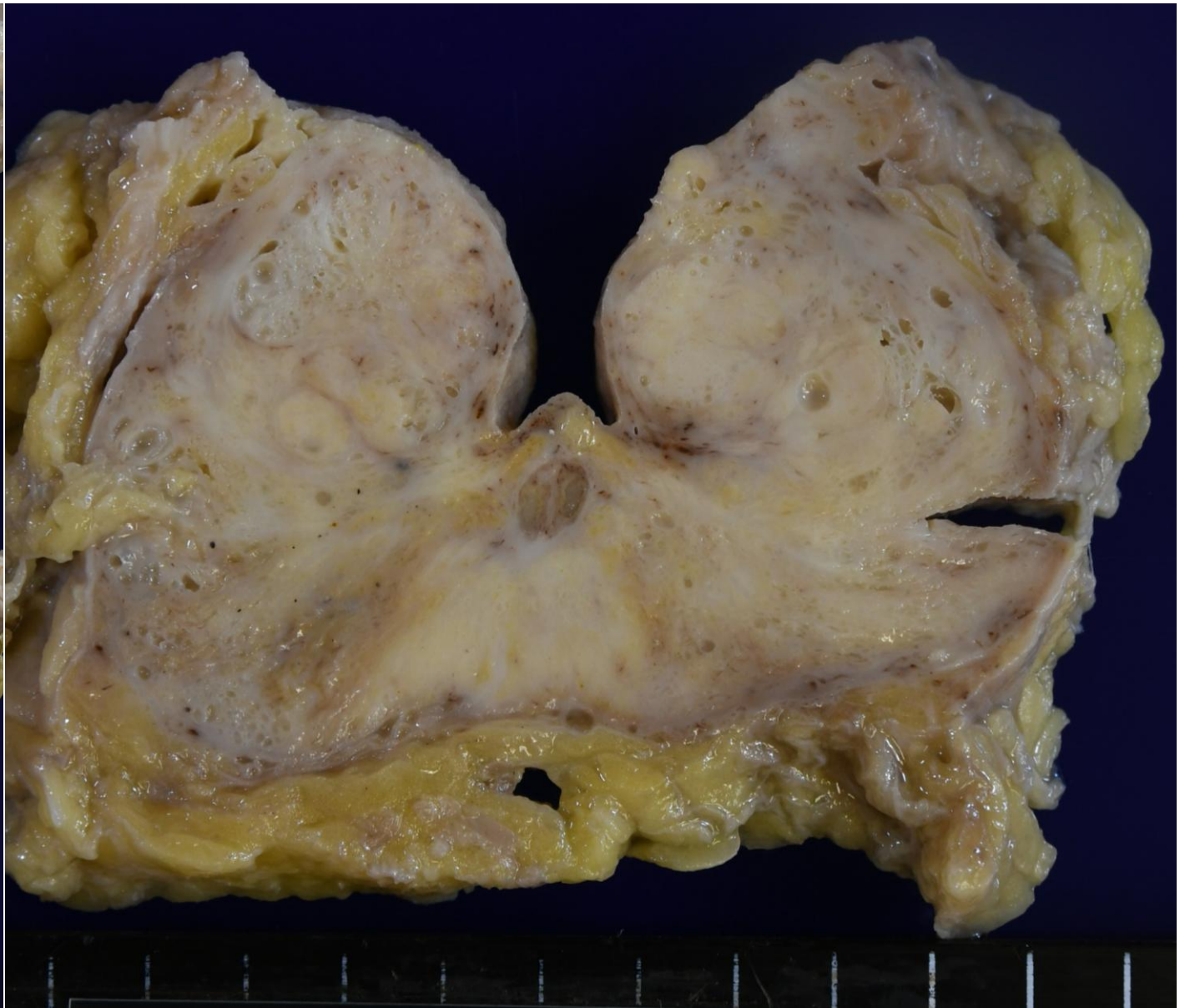
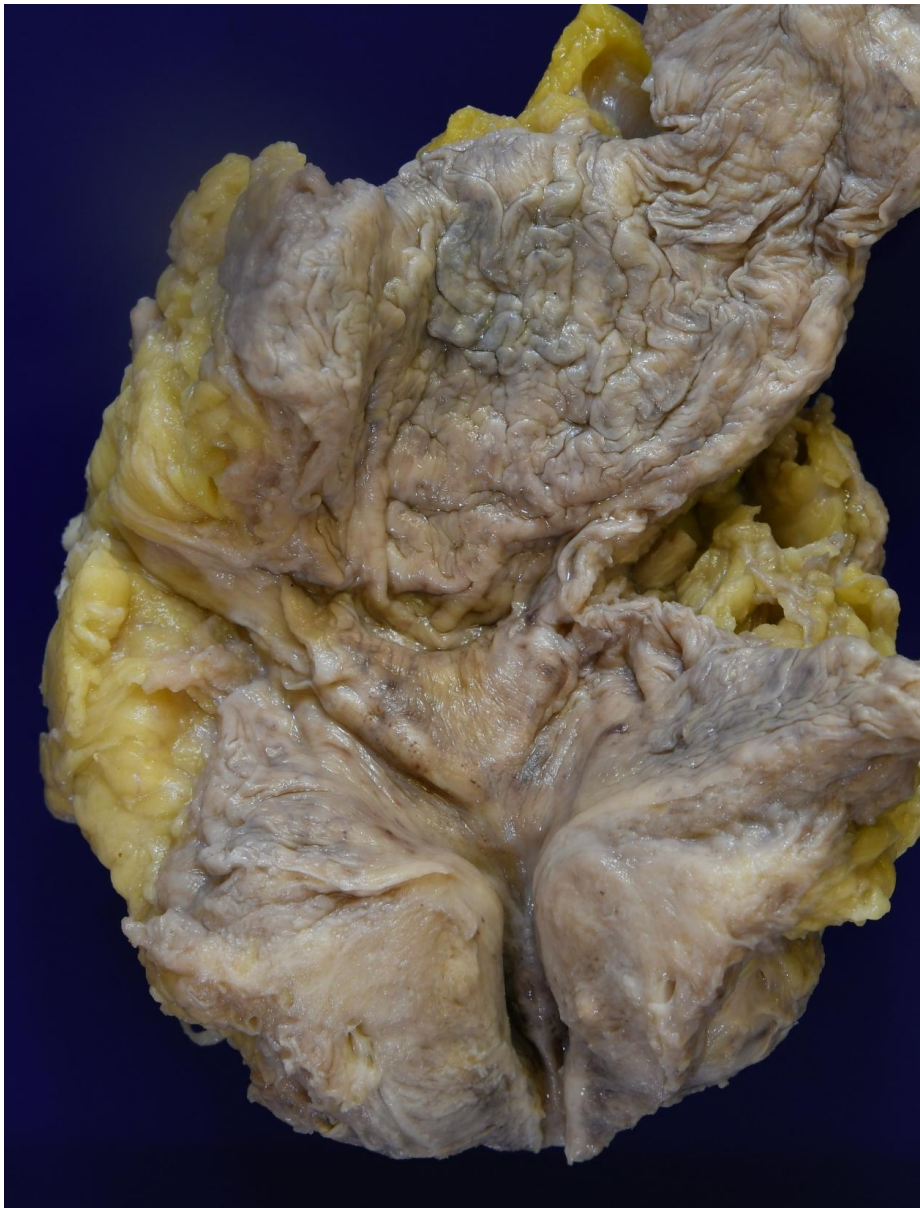
Cardiac rupture 6 days after cardiac pain onset, seen in a 78 y-o male patient.
Diverticulosis of the ascending colon is shown (left: cut surfaces of the colon, right: H&E).



Cardiac rupture 6 days after cardiac pain onset, seen in a 78 y-o male patient. Furred tongue is shown (left: gross finding, right: H&E). Gram-positive cocci are colonized on the parakeratotic surface of the tongue.



Cardiac rupture 6 days after cardiac pain onset, seen in a 78 y-o male patient. Chronic lymphocytic thyroiditis is shown (left: gross finding, right: H&E). Gram-positive cocci are colonized on the parakeratotic surface of the tongue.



Cardiac rupture 6 days after cardiac pain onset, seen in a 78 y-o male patient. Nodular prostatic hyperplasia is shown (left: gross finding including the urinary bladder, right: cut surface after formalin fixation). Nodular hyperplasia is seen in the inner gland.

Final anatomical diagnoses (78 y-o male patient)

Total clinical course: 6 days

1. Acute myocardial infarction (fresh anteroseptal infarction plus small infarcted foci circumferentially)
 - a) Cardiac rupture (anterior wall)
 - b) Cardiac tamponade (epicardial hemorrhage 2,250 mL)
hemorrhage in the stroma of the left lung and the adventitia of the ascending aorta
pleural effusion (left: 300 mL, right: 500 mL)
 - c) Coronary atherosclerosis with calcification
Stent insertion into the LAD and marked stenosis of the right circumferential artery
 - d) No old infarction seen
 2. Type 2 diabetes mellitus
 - a) Amyloid deposition in Langerhans islets + pancreatic lipomatosis
 - b) Fatty liver (centrilobular, mild)
 - c) History of hypertension and brain infarction
 - d) No nephrosclerosis seen
 3. Atherosclerosis of the aorta (relatively mild)
 4. Diverticulosis of the ascending aorta
 5. Nodular hyperplasia of the prostate
 6. Cholesterosis of the gallbladder
 7. Chronic lymphocytic thyroiditis
 8. Furred tongue with Gram-positive cocci colonization
- Direct cause of death: cardiac tamponade