案例・9	Sex：♀	Age：73 year-old

Final anatomical diagnosis：

1. Atherosclerosis of the aorta, moderate.
2. Status-post coronary by-pass surgery and mitral valvuloplasty.
3. Complete fibrosis and occlusion of the by-pass vein.
4. Arteriosclerosis of the coronary arteries, moderate to severe.
5. Absence of left circumflex coronary artery.
6. Fresh and recent myocardial infarcts under the left lateral papillary muscle.
7. Atrophy and fibrosis of the left lateral papillary muscle.
8. Dilatation of the mitral valve, partially sutured.
9. Subepicardial hemorrhage, left ventricle.
10. Severe fibrous adhesion of the pericardium and epicardium with a repair patch.
11. Bloody pleural effusion, bilateral (right 700 C.C. left 200 C.C).
12. Ascites (200 C.C).
13. Bronchopneumonia, right middle lobe.
14. mild congestion, liver and spleen.
15. Arteriolar nephrosclerosis.
16. Surgical scar, bilateral lower extremities.
17. Silicone implants of bilateral breasts, ruptured.

Clinical summary：

A 73-year-old female patient was admitted to our hospital on April. 7, 1995 because of three episodes of severe chest pain on exertion in a week. She had diabetes mellitus and hypertension with medication for 13 years. No chest discomfort was noted before. The physical examination showed hypertension (180/96 mmHg). Laboratory examination revealed hyperglycemia (glucose: 190 mg%) , HbA1C : 8.5% and hypercholesterolemia (cholesterol: 234mg%) chest X-ray showed possible mild cardiomegaly. Electrocardiography at rest reveal non-specific ST change. Echocardiography showed normal heart size, adequate left ventricular performance, mild mitral regurgitation, decreased LV and RV compliance. Thallium-201 myocardial perfusion tomography performed on April. 12, showed no evidence of myocardial ischemia. Coronary arteriography showed three-vessel coronary artery disease. Left main branch had 63% discrete stenosis at its orifice. Left anterior descending branch had 95% stenosis at first diagonal bronch, 90% stenosis at third large diagonal branch and 90% stenosis at middle left anterior descending branch. Left circumflex branch was congenitally absent. Right coronary artery had a 63% discrete stenosis at the first LV-posterior-Lateral branch. She underwent coronary artery bypass graft surgery on April. 19, with saphenous vein to D3 branch and left internal mammary artery to left anterior descending branch. After surgery, normal cardiac performance was evaluated by 2D echocardiography. Diplopia and right hand numbness were complained on April, 24. Cranial CT showed mild senile cortical atrophy and paranasal sinusitis of left ethmoid sinus. She was discharged on May, 3. She was readmitted on May, 6. because of dyspnea, tachypnea and orthopnea for one day. Physical examination showed 38℃ , heart rate : 100/min ,respiratory rate : 28/min . Apical systolic murmur, S4 gallop, rale over right lung field. Laboratory examination showed white cell count 18000/CMM , potassium : 4.8 to 2.7 Meg/L , glucose : 399 mg% , Artery blood gas : PH : 7.304 , PCO2 : 36.9 mmHg , PO2 :54.7 mmHg , HCO3 : 18.3 mmol/L , BE : -7.1 mmol/L , CK-MB was 16 U/L, CPK isoenzyme and LDH had normal pattern on May, 13. CPK isoenzyme done on April, 22. showed slight increase (154 U/L). Chest X-ray showed bilateral pleural effusion. Electrocardiography showed sinus tachycardia and ischemic change of V5-6 . Echocardiography showed pleural effusion and moderate mitral regurgitation on May, 6. Chest CT showed bilateral pleural effusion and cardiac enlargement. Chest echography showed bilateral small amount of pleural effusion. Bronchoscopy revealed that mucosa of orifice of right lower lobe was red. Sputum culture, tip culture and pleura culture were no growth, pus culture grew group streptococcus (moderate) and enterococcus (rare). The impression was congestive heart failure. Digitalis, diuretic, vasodilator and intubation with oxygen were given. She was discharged on May, 20. after improvement. She was admitted on June, 12. because of orthopnea for days. There was no angina. Physical examination showed PO2 : 64.9 mmHg . Chest X-ray reveled acute pulmonary edema and bilateral pleural effusion. Echocardiography showed moderate to severe mitral

regurgitation and large amount of pleural effusion. Acute pulmonary edema improved after medial therapy. She underwent mitral valvuloplasty and intra aortic balloon insertion on June, 20. The operative findings showed flexible mitral valve on systolic phase, anterior leaflet everted to left atrium, severe pericardial adhesion. Insertion of balloon catheter failed. Right ventricle was covered with patch cardiogenic shock occurred during operation. She expired on June, 20. 14:13 PM.

Past history :

She was admitted to our hospital from May to June, 1993 because of dizziness and unsteady gait. Vertebrobasilar insufficiency was diagnosed then.

Previous pathology report :

S83-6210	Sinus, Paranasal maxillary, Right pan sinusotomy	Chronic paranasal sinusitis
S84-1092	Soft tissue, nose, biopsy	Chronic inflammatory
S87-5753	Finger, Right ring, biopsy	Granulomatous, inflammation

Autopsy findings :

(1) Body and external appearance :

A longitudinal suture wound on the sternum measuring 26 CM in length. Bilateral holes measuring 1.5 x 1.0 x 1.0 CM on both lower chest walls. Operative scar measuring 11 CM, 11 CM and 7 CM on left medial thigh and leg. Both breasts contain a silicone capsule containing gelatinous materials with focal hemorrhage and rupture they measure 5 x 5 x 3 CM each.

(2) Body cavities :

Pleural	Hemorrhage effusion	Right : 700 C.C.
		Left : 200 C.C.
Peritoneal	Yellow, 200 C.C. Ascites	
Pericardial	Severe pericardial fibrous adhesion	

(3) Cardiovascular system :

Greater vascular structures	
Gross	Aorta shows mild to moderate atherosclerosis throughout

Heart General :			
Weight	450 GM with pericardium and partial aorta		
Left ventricle	2.5 CM	Mitral valve	7.0 CM
Right ventricle	1.5 CM	Aortic valve	5.0 CM
Tricuspid valve	9.0 CM	Pulmonary valve	5.0 CM

Valves	
Gross	No vegetation, the lateral mitral valves were sutrued
Microscopic Diagnosis	Unremarkable

Epicardium	
Gross	Severe fibrous adhesion with pericardium. A patch of suture material measuring 4 x 2 x 0.5 CM over the surface of right ventricle.
Microscopic Diagnosis	Hemorrhage on the anterior left ventricle

Myocardium	
Gross	Transmural hemorrhagic necrosis at the base of lateral papillary muscle of the mitral valve. The lateral papillary muscle is thinned and atrophic.
Microscopic Diagnosis	Patchy fibrosis with granulation tissue, hemosiderin laden macrophage and mononuclear cells involving the whole thickness with focal fresh infarct and hemorrhage.

Endocardium	
Gross	Fibrotic change at the infarcted areas.
Microscopic Diagnosis	Fibrous adhesion

Coronary arteries	
Gross	Complete occlusion of the bypass vessel, left circumflex branch is absent. The left anterior descending is 90% occluded the right circumflex is narrow but patent.
Microscopic Diagnosis	The bypass vein is totally fibrosed. The right and left coronary arteries show moderate arteriosclerosis with near complete occlusion of the left and 50% of the right.

Lung		
Gross	Weight	Right : 700 GM
		Left : 450 GM
	Consolidation of the right middle lobe	
Microscopic Diagnosis	Right middle lobe shows patchy infiltrates of neutrophils and edema. All the pulmonary arteries are thickened and surrounded by fibrosis.	

(4) Gastrointestinal Tract :

Gastrointestinal Tract	Gross	Microscopic Diagnosis
Pharynx	Unremarkable	
Esophagus	Unremarkable	
Stomach	Unremarkable	
Duodenum	Unremarkable	Unremarkable
Small bowel	Unremarkable	Unremarkable
Large bowel	Unremarkable	Unremarkable
Cecum and appendix	Unremarkable	

Pancreas	
Gross	Weight : 60 GM
	Unremarkable
Microscopic Diagnosis	Unremarkable, Islets are preserved

(5) Hepatobiliary system :

Liver		
Gross	Weight	1050 GM
	Outer surface	Small nodular appearance
	Cut surface	Diffuse small yellow nodular appearance
Microscopic Diagnosis	Mild portal tract fibrosis and mild centrilobular congestion.	

Gallbladder, Bile ducts	
Gross	Unremarkable

(6) Hematopoietic-Lymphoid system :

Hematopoietic-Lymphoid system	Gross	Microscopic Diagnosis
Spleen	Weight : 110 GM	Congestion
	Unremarkable	
Lymph nodes	Cervical nodes enlarged	Congestion

(7) Urogenital system :

Kidney			
Gross	Weight	Right	45 GM
		Left	40 GM
	Unremarkable		
Microscopic Diagnosis	Arteriosclerosis and many sclerosed glomeruli		

Urogenital system	Gross	Microscopic Diagnosis
Ureters	Unremarkable	
Bladder and urethra	Unremarkable	
Uterus／Ovaries	Atrophy of both ovaries	

(8) Endocrine system :

Endocrine system	Gross			Microscopic Diagnosis
Thyroid	Weight	15 GM		Unremarkable
	Unremarkable			
Pituitary	Weight	0.38 GM		Unremarkable
Adrenals	Weight	Right	4.7 GM	Unremarkable
		Left	6.0 GM	
	Unremarkable			

(9) Central nervous system :

Brain

The brain will be cut by visiting neuropathologist in November.

Section Taken and Labeled as :

Labeled	Section Taken
H1	Left ventricle myocardial infarct
H2	Right ventricle artery suture site
H3	Internal mammary artery suture site
H4	Apical hemorrhage
H5	LV + LA
LC	Left coronary artery
RC	Right coronary artery
AO	Aorta
LI	Liver
SP	Spleen
PI	Pituitary
GI	Gastrointestinal
LN	Neck lymph node
TH	Thyroid
PA	Pancreas
GV	Genital
IM	Bypass vessel
BM	Bone marrow
B1-B5	Breast, additional sections
BR , BL	Breast
AR , AL	Adrenal
KR , KL	Kidney
LAD1 , LAD2	Left anterior descending artery
RU , RM , RL , LU , LL	Lung

Labeled	Section Taken
B1	Basal ganglia, one side
B2	Basal ganglia, the other
B3	Temporal lobe
B4	Cortex
B5	Cerebellum
B6	Midbrain
B7	Pon
B8	Medulla
B9	Basilar artery

Final Comments :

The bypass vessel failed because it became totally fibrosed and occluded. The mitral regurgitation was due to the failure of the lateral papillary muscle because of the infarction of the left ventricle at the insertion of left lateral papillary muscle which is the main cause of the heart failure leading to death. Right lung has pneumonia.