approx. 20 ml/min/100gLV, however, myocardial viscosity increased at the moderate flow reduction of approx. 50 ml/min/100gLV. Therefore, we concluded that the myocardial viscosity played an independent and important role in myocardial ischemia. 1) Y. KOIWA et. al. Am. J. Physiol. 1986 in press.

-147-

VENTRICULAR WALL MOTION AND FUNCTION DURING RIGHT VENTRICULAR FREE WALL ISCHEMIA

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The mechanism of right ventricular (RV) ejection during RV free wall ischemia (RVI) has not been clarified. Therefore, we examined the ventriculogram after right coronary artery (RCA) embolization in six dogs without thoracotomy, and compared them with ventricular wall motion, using ultrasonic crystals to measure a left ventricular and RV septal-to-free wall dimension (LVD, RVD), RV free-wall segment length (RVSL) and apical segment length over RV and LV (ASL), during RCA ligation in seven thoracotomized dogs. With RCA embolization, cardiac output, RV and LV systolic pressure fell 24%*, 6%*, and 13%* respectively. RVD increased 68%* and systolic shortening fell markedly, but RV apical wall motion was preserved. With RCA ligation, the hemodynamic changes were similar to the non-thoracotomized them. In the end-diastole, RVSL, RVD and ASL increased 11%*, 24%* and 3% respectively, and LVD decreased 4%*. The systolic shortening of RVSL, RVD and LVD decreased from 13% to -1%*, from 27% to 16%* and from 11% to 7% respectively, and of ASL increased from 11% to 16%. ASL and its contractility was well kept during RVI. (* $p < 0.05$)

These result suggest that, the myocardial contraction near inter-ventricular sulcus is one of the mechanism of RV ejection during RVI.

-148-

REGIONAL MYOCARDIAL FUNCTION DURING REPEATED CORONARY OCCLUSION-SYSTOLIC AND DIASTOLIC PROPERTIES

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Left ventricular systolic and diastolic properties during repeated coronary occlusion were studied in dogs as a model of unstable angina. In 14 dogs, an occluder was placed around the proximal

portion of left anterior descending coronary artery (LAD). Three ultrasonic crystals were placed in LAD area for measuring the epicardial segment length, endocardial segment length and wall thickness. Postextrasystolic potentiation (PESP) was observed at the end of each reperfusion. As diastolic properties, time constant was derived from the left ventricular pressure curve during isovolumetric relaxation period. LAD was occluded 4 minutes (group A) or 15 minutes (group B) respectively with intervals of 20 minutes reperfusion, and the same procedure was repeated three times. Systolic function (% systolic shortening and % wall thickening) showed a cumulative deterioration in two groups. In group B, systolic function was damaged to almost akinetic state at the first occlusion, therefore it was suggested that the damage on regional myocardial function already extended transmurally at the first occlusion. Time constant gradually lengthened at each coronary occlusion and shortened at each reperfusion. Thus cumulative deterioration of diastolic properties will be suggested. In group A, systolic function observed by PESP recovered to pre-occlusion level at the end of the third reperfusion. On the other hand, it recovered to approximately 50% of preocclusion level even in the akinetic or dyskinetic segment in group B. These results suggest that systolic function by PESP is preserved in comparison with it by sinus rhythm in the period of reversible ischemia.

-149-

HYPERKINETIC CONTRACTION OF A NONISCHEMIC SEGMENT OF ISCHEMIC LEFT VENTRICLE

-DIFFERENCE BETWEEN LEFT ANTERIOR DESCENDING AND CIRCUMFLEX CORONARY ARTERY OCCLUSIONS-

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The mechanisms for the abnormality of regional myocardial function during acute coronary artery occlusion and difference between left anterior descending (LAD) and circumflex (LCX) coronary artery occlusions still remain in dispute. We studied them from the viewpoint of the segment length (SL) - regional myocardial tension (T) relationships.

In left ventricle (LV) of 18 open-chest, anesthetized dogs, either LAD (group I; $n = 9$) or LCX (group II; $n = 9$) was occluded at its middle portion, and SL and wall thickness (WT) were measured using ultrasonic crystals, at ischemic zone (IZ) and nonischemic zone (NIZ). Left ventricular pressure (LVP), aortic pressure (AoP) and intramyocardial pressure (IMP: Millar Mikro-Tip Manometer) were also measured, and T was calculated from WT and IMP.

Mean LV weights, infarct sizes (%LV: NBT staining technique), LVP, AoP and heart rate did not differ between groups.

In group I (LAD occlusion), NIZ became hyperkinetic more markedly and T decreased to a greater degree, while in IZ there is more dysfunction and T became higher than in group II (LCX occlusion). This hyperkineses (increase of percent systolic segmental shortening and velocity of systolic segmental shortening) was observed without the changes of end-diastolic SL