RIGHT VENTRICULAR INFARCTION

PATHOPHYSIOLOGY: Isolated right ventricular infarction (RVI) is extremely rare and it is usually seen as a complication of another infarction. RVI's seldom exist alone and are almost always seen accompanying an inferior infarct. The coronary artery involved is usually an occluded right coronary artery (RCA). Approximately 30-50 percent of inferior wall myocardial infarctions involve the right ventricle. The right ventricle is not designed to provide systemic circulation. Its purpose is to pump blood through the lungs and pulmonary circuit. Thus, the pressures it is required to produce are less, and it has a thinner wall than the left ventricle. Its functional abilities are dependent upon preload or the volume of venous return to the heart. Any reduction in venous return will result in diminished pumping pressure by the right ventricle, diminished pulmonary circulation, diminished left ventricular filling, diminished cardiac output, diminished systemic blood pressure and, if not corrected, possible dysrhythmias, shock, and death.

DIAGNOSIS: Cardinal signs of RVI are unexplained hypotension, distended jugular veins with Kussmaul's sign (increased jugular vein pressure on inspiration) and clear lung sounds. RVI can be diagnosed by the presence of ST-segment elevation in the right precordial lead V_4 ($_rV_4$), in the setting of an inferior wall myocardial infarction. A 12-lead tracing that shows ST segment elevation in any of the inferior leads (II, III, or a VF) or relative ST segment depression in V_2 or V_3, compared with the lead V_1, should immediately trigger the acquisition of a right-sided 12-lead. To obtain a field tracing of a right-sided 12-lead, reposition lead V_4 to V_4R by placing in the fifth intercostals space, midclavicular line, on the right side of the chest. ST segment elevation in V_4R is considered diagnostic for RVI. The T wave in V_4R usually has a convex or "domed" shape when injury is present. RVI is usually present if ST segment elevation in lead III is greater than ST segment elevation found in lead II in the setting of an inferior wall myocardial infarction.