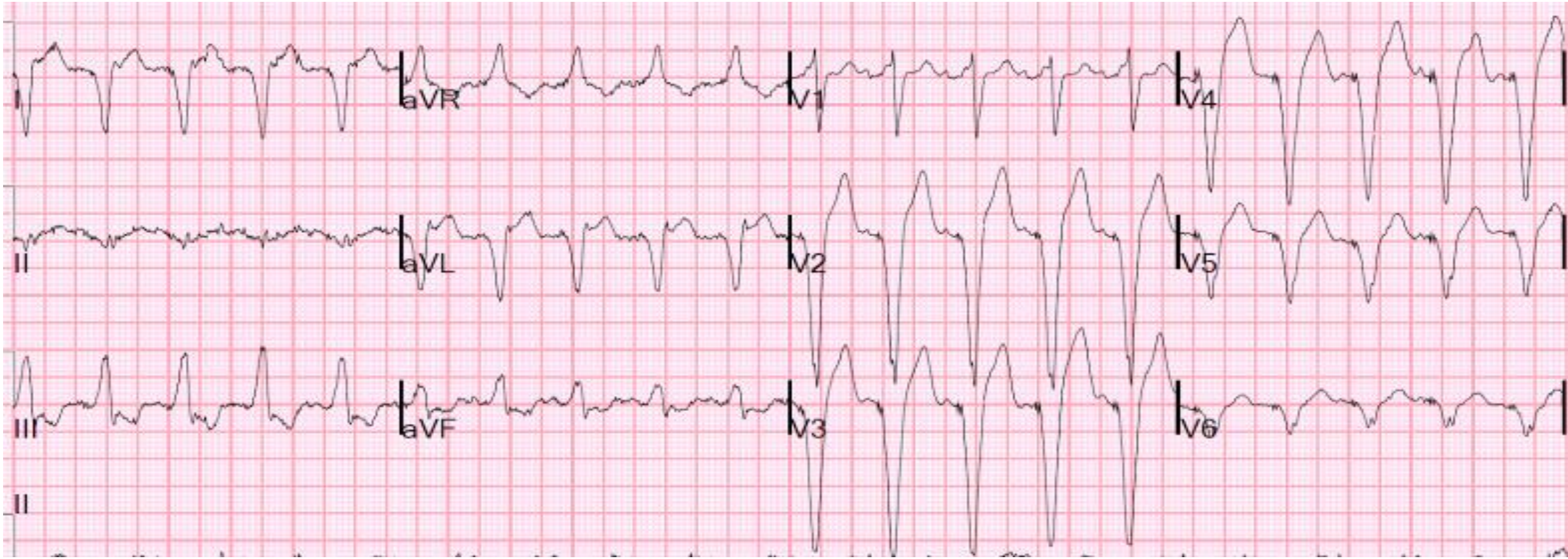
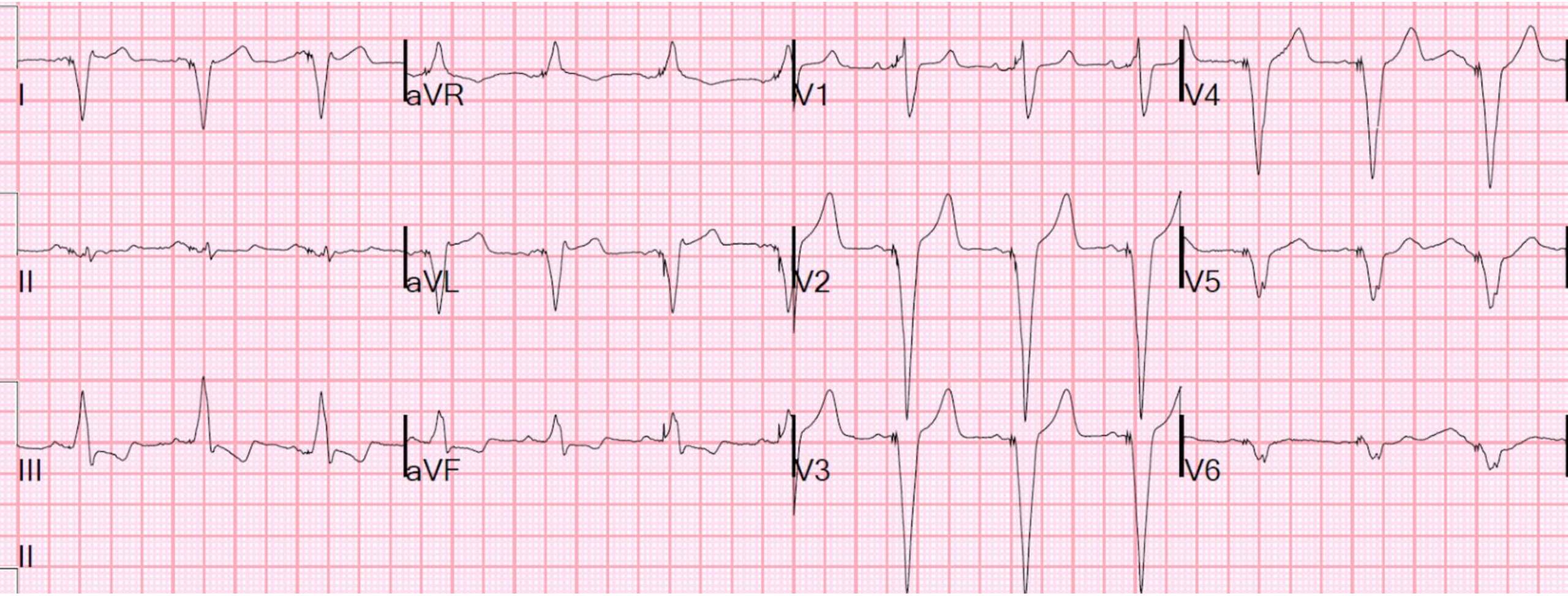
Paced rhythm Is there ischemic STSegment Elevation?

**Case report:** An elderly male with a dual chamber pacemaker and severe dilated non-ischemic cardiomyopathy presented with dyspnea. He had not had an angiogram in 10 years. Although he had severe heart failure, the etiology of ***acute*** dyspnea was not readily apparent. The differential was pneumonia/sepsis, heart failure exacerbation, pulmonary embolism, or possibly ACS. He had an ECG recorded:




There are P-waves but a ventricular paced rhythm. The heart rate is 118. **Is there excessive discordant ST elevation in anterior leads?** ST/S ratios have not been studied for paced rhythm, but we have studied them for LBBB, and perhaps this knowledge can be applied to paced rhythm (?) This is uncertain, but I do it frequently and I think it works. If we do apply these rules, the ST/S ratio is highest in V2 and V3. In these leads, the STE at the J-point is 4 mm in V2 and 4-5 mm in V3, with a 27-28 mm S-wave, for a max ratio somewhere between 0.145 - 0.185. These ratios are a bit higher than normal for a maximal ST/S ratio, but they are not higher than cutoffs of 0.20 (more sensitive, less specific) or0.25 (very specific).

So this is unlikely to represent acute anterior STEMI, but let's compare to a previous ECG:




Should you worry that there is an increase in the ST elevation and ST/S ratio? Normally, yes. But look at the heart rate: the bottom ECG has a heart rate of 79. The precedent ECG one has a rate of 118. Tachycardia results in increased discordant ST elevation in paced rhythm and in LBBB. All of this ST segment shift can be attributed to tachycardia. Outcome: Troponins were mildly elevated (up to 0.176 ng/mL). The patient was diagnosed with acute decompensated heart failure. As the heart failure was managed, and the HR decreased, the ST segments shifted down. There was no wall motion abnormality. Exacerbation of HF can also exaggerate STE in Paced rhythm and LBBB, as demonstrated in this case. Learning Points: 1. Tachycardia can exaggerate the appropriately discordant ST elevation in paced rhythm (and in LBBB) 2. Heart Failure can also exaggerate this STE.