

Criteria for Right Ventricular Infarction

As you can see from the material previously, the treatment of an RVI is very different from that of a left ventricular infarction. We refer you to a textbook of Cardiology for a review of the management and treatment principles for RVI patients. In this book, concentrate on the diagnostic criteria. The entire list of criteria is included below. Remember, as in most of electrocardiography, the presence of all of the criteria are not needed on one ECG to make a definitive diagnosis, and this usually does not occur. In other words, we will only see some of these criteria present on most ECGs with the diagnosis. We will discuss each item below:

1. IWMI
2. ST segment elevation greater in lead III than II
3. ST elevation in V_1 (possibly extending to V_5 to V_6)
4. ST depression in V_2 (unless elevation extends, as in #3 above)
5. ST depression in V_2 cannot be more than half the ST elevation in aVF
6. More than 1 mm of ST elevation in the right-sided leads (V_4R to V_6R)

Inferior wall MI

Most RVIs occur in conjunction with IWMI — 97% of them to be exact. This is because they are usually caused by an obstruction in the right coronary artery, which also supplies the inferior wall. They can arise from a blocked left circumflex artery, but this is rare (3% of the time). Make it a habit to check for RVI when you see an IWMI.

ST segment elevation greater in III than in II

The infarct allows the vector from the interventricular septum to pass unopposed. This vector is directed anteriorly, inferiorly, and to the right. Lead III lies directly in its path, which causes the ST segment to be higher in this lead, as referenced in Figures 15-34, *top*, and 15-35.

ST elevation in V_1

The ST segment is elevated in lead V_1 , also because of the unopposed vector and the direction of the injury current. This normally will

elevate V_1 and depress V_2 as it passes by. This vector *can* cause ST segment elevation that extends through V_5 or V_6 ; however, this is uncommon. Remember, if you see ST segment elevation in II, III, and aVF, **as well as V_1** , the most probable explanation is an RVI. It would be very unusual to have an infarct of the right coronary artery (commonly supplies the inferior wall) and the left coronary artery (commonly supplies the anteroseptal area) at the same time. One possible exception is an aortic dissection blocking entry to both coronary arteries, but this is truly a rare occurrence.

ST depression in V_2

Classically, the direction of the vector will produce ST elevation in V_1 and depression in V_2 . This is because the vector path points more towards V_1 and either away, or slightly away, from V_2 .

ST depression in V_2 cannot be more than half the ST elevation in aVF

The amount of ST depression in V_2 is critical. If it is less than half the height of the ST elevation in aVF, then it is a simple inferior-RV infarct. If the ST depression is more than half the height of the ST elevation in aVF, it is consistent with an inferior-RV-posterior AMI. This means that there is a tremendous amount of myocardium at risk and infarcting, a critical point.

More than 1 mm ST elevation in the right-sided leads (V_4R to V_6R)

This is the most specific sign of an RVI. In the presence of an IWMI, if you find 1 mm or more of ST elevation in V_4R , you have made the diagnosis. Sometimes, you will find the elevation in V_6R , so make it a habit to obtain all three right-sided leads.

REMINDER:

Obtain right-sided leads in every inferior wall MI.