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## “I Have a Lot of PVCs and I Need to See a Cardiologist”

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# “I Have a Lot of PVCs and I Need to See a Cardiologist”

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## CASE REPORT

A 90-year-old female with past medical history of hypertension, hyperlipidemia, chronic diastolic heart failure is referred to the cardiology office after an abnormal ECG. Prior, she presented to the primary care office for routine checkup and reported of occasional feelings of “skipped beats” that occurred several times a week for a few seconds. Symptoms were very mild to the patient, and she has noticed it for the last several months. Electrocardiogram was performed (*Figure 1*).

### Questions:

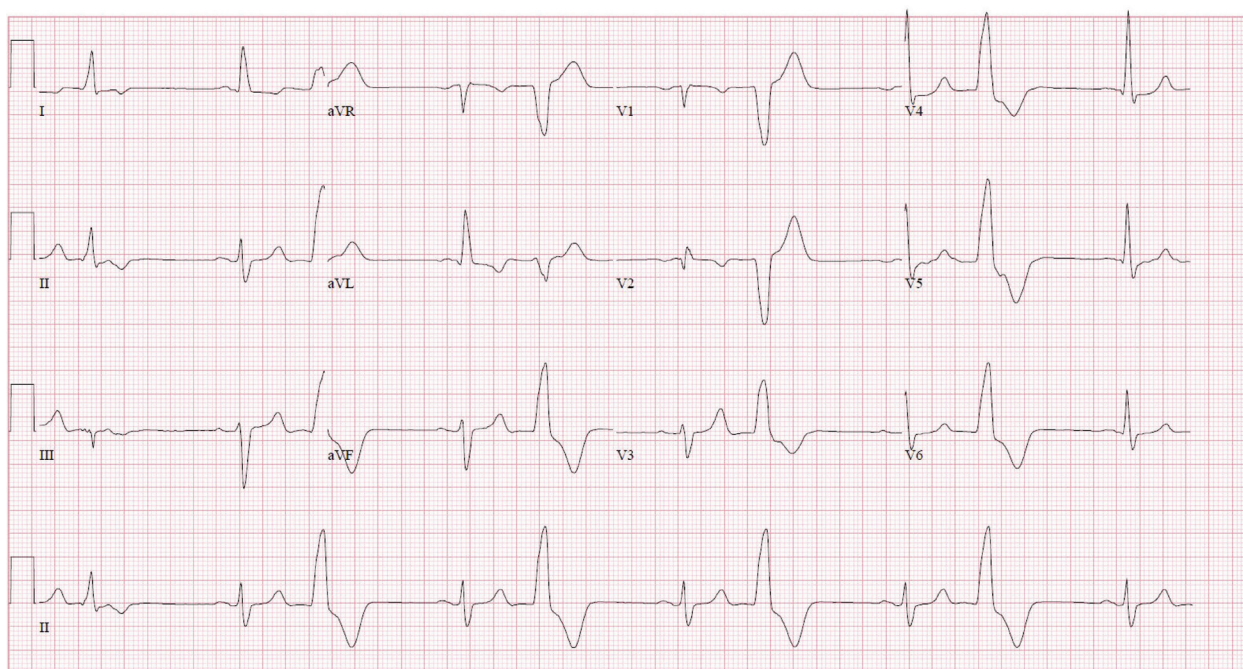
Describe the ECG?

What is the next best step?

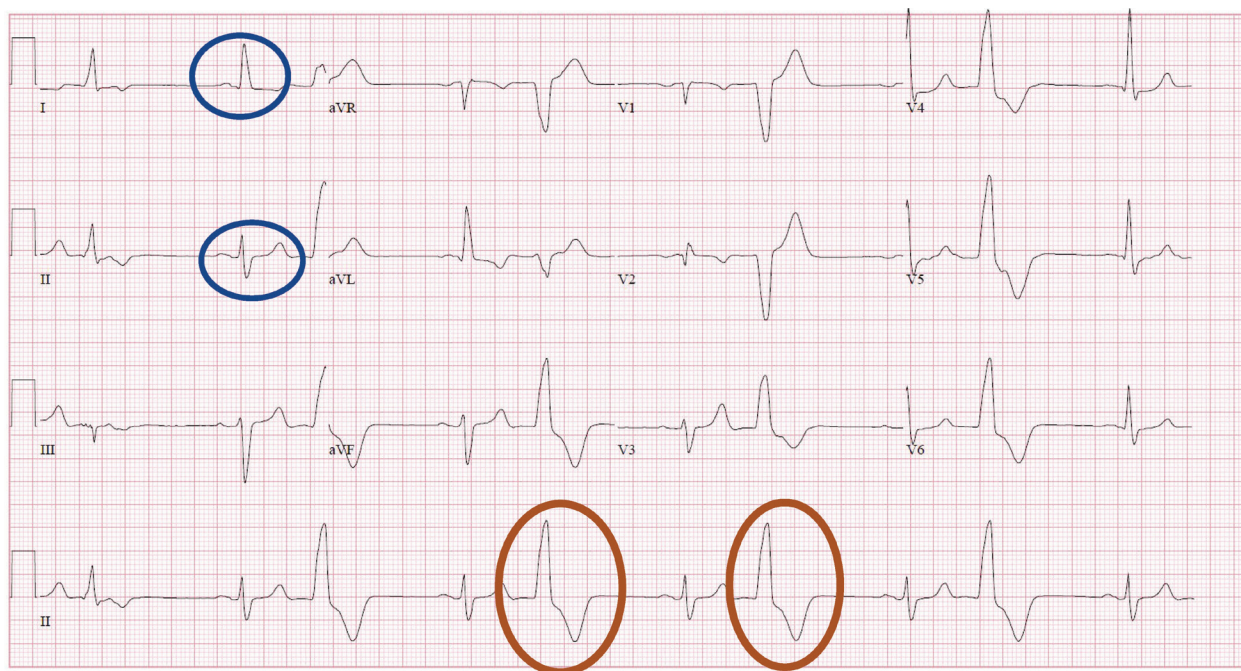
## ELECTROCARDIOGRAM INTERPRETATION

There are two distinct morphologies of QRS complexes that is immediately obvious repeating in an alternating pattern. The narrow complex beat is preceded by a sinus P wave as evident by positive deflection in limb leads I and II (wavefront is traveling from the high right atrium towards the left leg) *Figure 2* blue circles. The alternating beat has a very wide, bizarre looking QRS complex, without a preceding P wave *Figure 2* orange circles. Altogether, there is sinus rhythm with frequent premature ventricular contractions (PVCs) that occur in a bigeminal pattern. The more advanced ECG interpreter would attempt to localize the PVC origination in the myocardium. The PVCs have a left bundle branch block appearance with positive deflection in V6 and negative deflection

**Figure 1.** 12-lead electrocardiogram



**Figure 2.** 12-lead electrocardiogram



in V1 indicating that the impulse is most likely originating in the right ventricle. Additionally, the PVCs are largely positive in the inferior leads indicating the wavefront is traveling from basal to apical likely indicating right ventricular outflow tract PVCs.

### DISCUSSION

The ECG findings demonstrate sinus rhythm with frequent PVCs which is a common finding and is typically benign. The above ECG demonstrates a predictable pattern of alternating native conduction with a PVC beat which is described as bigeminy pattern. Patients often describe feelings of palpitations, skipped beats or strong heartbeat sensation. The symptoms are typically not directly related to the PVC beat but rather due to the native beat immediately after the PVC as there is increased ventricular filling time resulting in greater stroke volume. Often, patients are asymptomatic, and PVCs are incidentally noted on routine ECGs. If patients are asymptomatic and there are only occasional PVCs, no additional workup is generally required. However, in patients with frequent PVCs with symptoms, it is reasonable to undergo further testing with ambulatory monitor (Holter monitor) and transthoracic echocardiogram. The Holter monitor is useful in patients with daily symptoms to quantify the burden of PVCs and monitor for

any other occult arrhythmias. Echocardiogram will identify any evidence of structural heart disease as well as assess for left ventricular function (ejection fraction). Additionally, screening for electrolyte abnormalities including potassium and magnesium should be done as derangements can trigger ventricular excitation and lead to frequent PVCs. The understanding of high burden PVCs is actively evolving, and current understanding is that a PVC burden >10% can lead to PVC-induced cardiomyopathy. PVC-induced cardiomyopathy is the reduction of left ventricular ejection fraction attributed to high burden of PVCs.<sup>1</sup>

### MANAGEMENT

Generally, the management most frequently involves patient reassurance as frequent PVCs is relatively common and mainly benign. Patients who are symptomatic or have an increased burden of PVCs can be treated with first line medical therapy which consists of beta-blockers or nondihydropyridine calcium channel blockers (diltiazem or verapamil).<sup>1</sup> If medical therapy fails or patients are not able to tolerate medications, then catheter ablation is strongly recommended. Catheter ablation has a Class I indication for treatment of PVCs if medications are not tolerated or ineffective.<sup>2</sup> Success of catheter ablation for PVC ablation ranges from 80-95%.<sup>1</sup>

## KEY POINTS

- Frequent PVCs are common and mostly benign
- High burden of PVC, >10% can lead to PVC – induced cardiomyopathy
- Initial work up consists of ambulatory monitor, transthoracic echocardiogram, and routine blood work
- Beta- blockers and nondihydropyridine calcium channel blockers are first line therapy for symptomatic PVCs
- Catheter ablation has Class I indication if medical therapy fails or is not tolerated

## REFERENCES

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