

Multiple Choice Questions

1. Which of the following clinical scenario is most likely to be associated with a PVC induced cardiomyopathy?
 - A. 4% symptomatic PVC burden from the anterolateral papillary muscle of the LV
 - B. 8% asymptomatic PVC burden from the posterior fascicle
 - C. 21% asymptomatic PVC burden from the LV summit
 - D. 5% symptomatic para-Hisian PVCs with diurnal variation
 - E. 2% PVC burden from right ventricular outflow with exercise only

Answer: C

Explanation: An asymptomatic status and high burden of PVCs put this patient at the highest risk among other patients. The origin is also likely epicardial and the QRS likely to be widest and this further increases the risk

2. A 62 year old mailman with known history of non-ischemic cardiomyopathy on guideline directed medical therapy presents with recent worsening of LVEF from 44% to 27% over the last 6 months with increasing shortness of breath and pedal edema. He has no history of syncope. EKG reveals sinus rhythm, bifascicular block (right bundle with left axis) with a PR of 200 ms and QRS of 152 ms. Holter reveals monomorphic PVCs with left bundle like pattern with right inferior axis with a burden of 19%. The most appropriate initial step in his management would be
 - A. Flecainide 100 mg twice daily
 - B. Amiodarone 400 mg daily
 - C. Initial loading with Amiodarone followed by 200 mg daily
 - D. Catheter ablation for PVCs
 - E. Biventricular defibrillator implantation

Answer: D

Explanation: The patient has a known history of nonischemic cardiomyopathy where a high burden of PVCs aggravate the cardiomyopathy with a significant fall in the LVEF. The use of Flecainide in NICM and bifascicular block would not be appropriate. The PVC morphology suggests an outflow tract origin with a high likelihood of success with ablation in a young and active male and would likely improve his LVEF and hence would be best to avoid long term use of Amiodarone or resynchronization therapy in this patient with a non LBBB pattern with frequent monomorphic PVCs.

3. A 78 year old retired male with known hypertension, coronary artery disease, and previous large anterolateral myocardial infarction 4 years ago presents with frequent palpitations and worsening heart failure. He has a single chamber ICD for primary prophylaxis of sudden cardiac death due to known persistent severe LV dysfunction with an LVEF of 22% despite optimal medical therapy. Holter reveals new finding of a 17% burden of pleomorphic PVCs with frequent couplets and nonsustained ventricular tachycardia of differing morphologies. EKG reveals sinus rhythm, heart rate of 68 bpm with a PR of 180 ms with a RBBB and QRS duration of 128 ms. Which of the following would be the most appropriate initial management
 - A. PVC suppression with oral Amiodarone
 - B. Upgrade to a dual chamber defibrillator and increase beta blockers
 - C. PVC suppression with oral flecainide
 - D. Upgrade to a biventricular defibrillator
 - E. Catheter ablation for PVCs

Answer: A

Explanation: The patient has Class III symptoms of heart failure from a known ischemic

cardiomyopathy and has PVCs of multiple morphologies in a high burden likely from progressive myocardial stretch and progression of the underlying disease. Suppression of the ectopy and NSVT is likely to improve his heart failure symptoms or even his LVEF but catheter ablation would be difficult given multiple morphologies. Pharmacologic suppression with Amiodarone would be most reasonable. Flecainide is contraindicated due to the ischemic scars and beta blockers are neither likely to improve PVC burden nor likely to be tolerated due to the worsening heart failure. An upgrade to a biventricular defibrillator is not likely to help given the RBBB pattern, ischemic scars and borderline QRS duration.

4. A 21 year old college athlete presents with syncope. He had no previous symptoms till he went to donate blood for a friend. While he was getting up from the bed after donating blood, he had sudden nausea, abdominal pain and diaphoresis and lost consciousness. The surrounding paramedical staff were able to hold him and prevent injuries and he regained consciousness within about 20-30 seconds. EKG revealed sinus arrhythmia, average heart rate of 48 bpm, a QTc of 428 ms without any other major abnormalities. There was a single PVC with a morphology suggesting origin from the right ventricular outflow tract. There is no family history of premature or sudden cardiac death. Echo revealed absence of any structural heart disease with normal left and right ventricular function. A 48 hour holter showed sinus rhythm, nocturnal episodes of sinus slowing with Mobitz type I second degree AV block and monomorphic PVCs predominantly in the night with an overall burden of 3%. Which of the following is the most appropriate management at this time?
- A. Nadolol 20 mg daily
 - B. Reassurance with education for dietary and lifestyle measures
 - C. Disopyramide 150 mg twice daily
 - D. Flecainide 100 mg twice daily
 - E. Catheter ablation for PVCs

Answer: B

Explanation: The patient is a young athlete with features of a high vagal tone as seen by the nocturnal AV block, sinus arrhythmia and resting bradycardia. He has a benign family history and an episode suggesting vasovagal syncope. He has a low burden of asymptomatic PVCs coming from a site commonly seen in patients without any structural heart disease and a normal LVEF. No pharmacologic or catheter based therapy is indicated in this situation. Counseling for dietary and lifestyle measures to avoid vasovagal syncope would be most reasonable.

5. Which of the following predicts a favorable response with ablation in a patient with frequent PVCs.
- A. Right ventricular outflow tract origin
 - B. Epicardial origin of the PVC
 - C. PVC originating from the papillary muscle
 - D. Pleomorphic nature of PVCs
 - E. Male sex

Answer: A

Explanation: The right ventricular outflow tract is an easily accessible area of the heart with a high chance of success with ablation. Patients with PVCs with multiple morphologies, epicardial origin and those from the papillary muscle (very thick and mobile area for ablation) are associated with a lower chance of success. Male sex does not improve the chance of success with an ablation.

6. A 34 year old female presents with palpitations and shortness of breath for 3 months. She has occasional lightheadedness and a single episode of syncope 3 weeks ago. EKG shows

sinus rhythm with a baseline normal QRS but frequent PVCs in a bigeminal pattern with a single couplet. A 48 hour holter shows a 32% burden of PVCs which are monomorphic with EKG features suggesting an epicardial origin from the left ventricular summit. Echo shows a normal sized left ventricle with preserved wall thickness, global hypokinesia with a left ventricular ejection fraction of 38%. CMR imaging shows minimal LV dilatation with an LVEF of 36% with uniformly nulled myocardium and absence of any late gadolinium enhancement with contrast. Which of the following finding is least likely to contribute to a negative outcome for this patient

- A. Epicardial origin of the PVCs
- B. PVC burden of 32%
- C. Absence of LGE on the CMR
- D. LV ejection fraction of 38% on the echocardiogram
- E. History of syncope

Answer: C

Explanation: The patient is a young female with a high burden of PVCs from an epicardial origin. The site or origin is likely to be associated with a lower chance of success with ablation or even antiarrhythmic drug therapy. She already has what appears to be a PVC induced cardiomyopathy which is likely to get worse if the high burden of PVCs are left untreated. Her nonsustained arrhythmias and history of syncope also put her at higher risk of symptoms and hemodynamic compromise. The absence of LGE on CMR is the only comforting fact in the clinical scenario as that would suggest a very low risk of sustained cardiac arrhythmias or sudden cardiac death. In fact, if the PVCs can be successfully ablated, this patient would have a very high chance of reversal of symptoms and cardiomyopathy and likely have a very good long term outcome