

Case Report

Early Repolarization as a Predictor of Idiopathic Ventricular Fibrillation in a Young Male

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Background

Early repolarization (ER) is traditionally considered a benign ECG finding, commonly observed in young, healthy individuals.

ER is characterized by:

- J-point elevation
- ST-segment elevation
- Terminal QRS slurring or notching
- Primarily seen in the lateral precordial leads.

Recent studies suggest ER may not be entirely benign and may be linked to:

- Increased risk of idiopathic ventricular fibrillation (VF)
- Sudden cardiac arrest.

Case Presentation

A 19-year-old male collapsed suddenly during a soccer match.

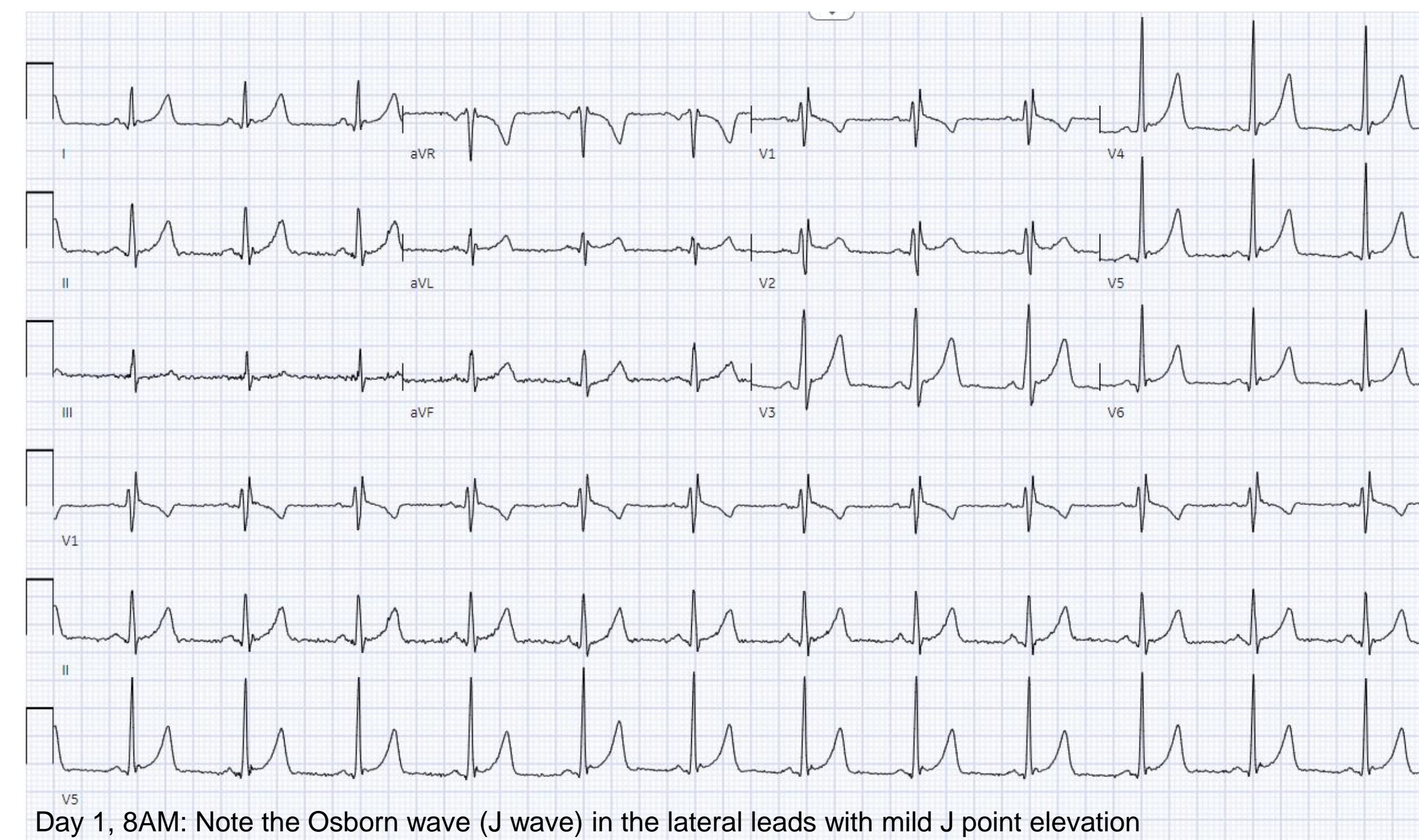
- Two defibrillator shocks for initial ventricular fibrillation.
- 15 minutes of CPR → ROSC.
- Intubated due to confusion and lethargy.
- TTM initiated to improve neurological outcomes post-cardiac arrest.

Family history of multiple "heart attacks" in the paternal grandfather.

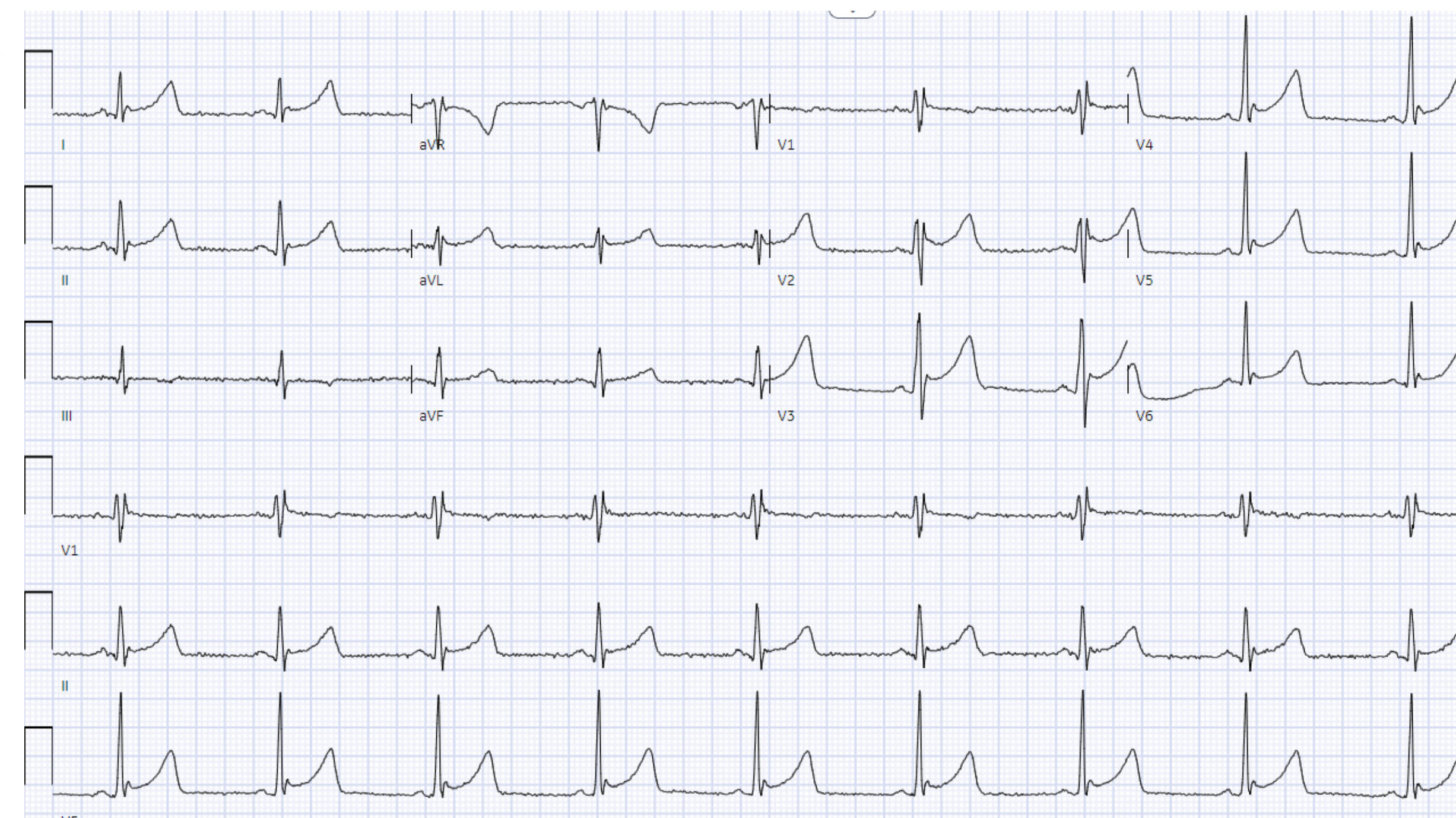
- Electrocardiographic findings:
 - Osborn waves (J waves) in lateral leads with mild J-point elevation.
 - Persistent RV conduction delay (RSR' or QR pattern in V1).
 - Horizontal or descending ST segments.

Diagnosed with early repolarization syndrome (ERS) and monitored for recurrent ventricular fibrillation (VF).

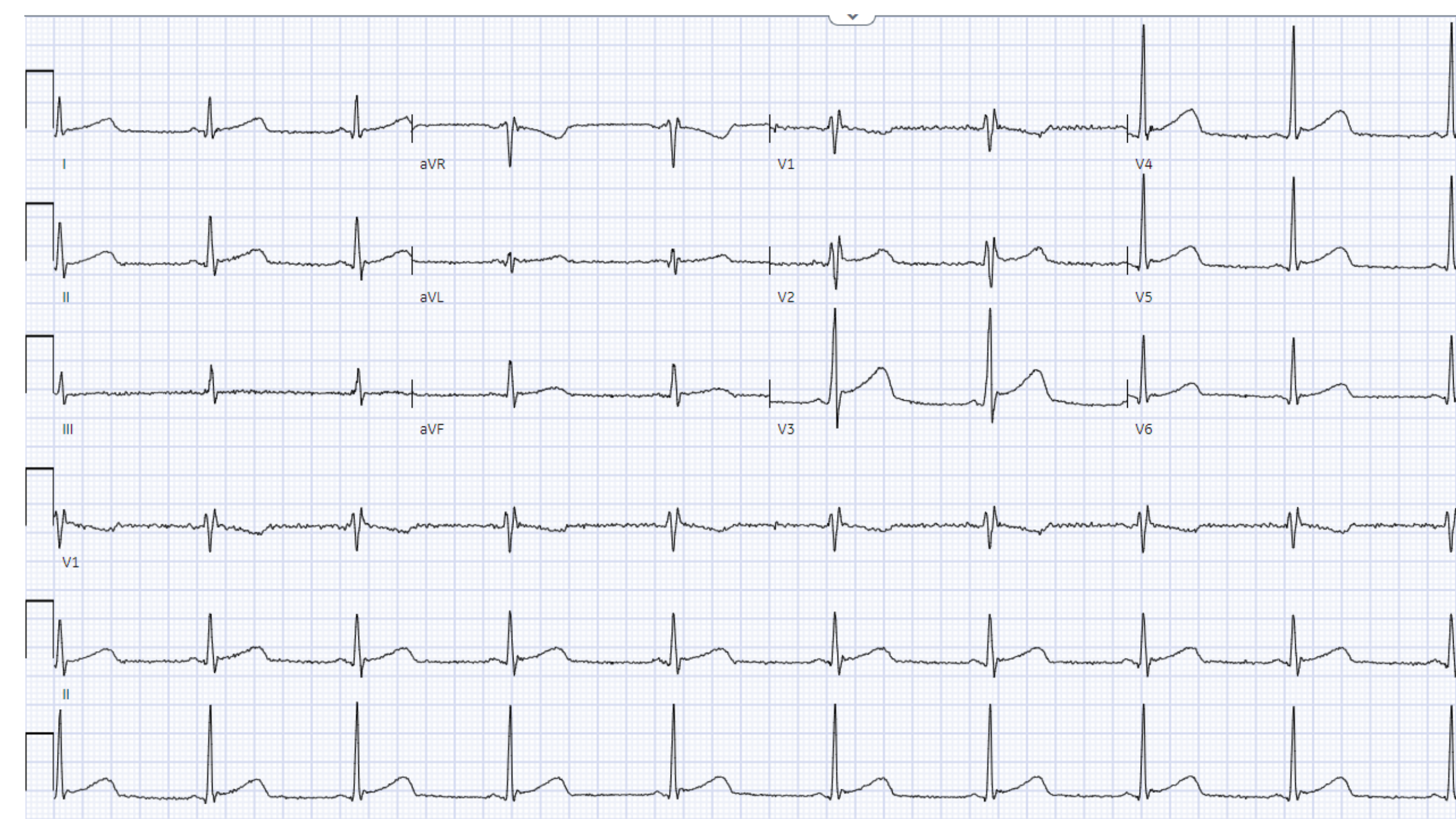
After successful extubation, a permanent pacemaker was implanted to prevent potential recurrent arrhythmic events.



Day 1, 8AM: Note the Osborn wave (J wave) in the lateral leads with mild J point elevation



Day 1, 6 PM, EKG taken at low body temperature



Day 2, 9 AM, At normal body temperature. 9 AM. One mV change was noted from the previous one but morphology is persistently present.



Discussion

- Idiopathic VF is characterized by sudden cardiac arrest without structural heart disease or identifiable channelopathies, typically triggered by short-coupled premature ventricular contractions from the Purkinje system or neighboring structures.
- In 2008, Haïssaguerre et al. linked early repolarization (ER) to idiopathic ventricular fibrillation (VF), coining the term "Le Syndrome d'Haïssaguerre." [1]
- Antzelevitch et al. further classified ER into three types based on EKG presentation and VF recurrence risk [2]:
 - Type 1: Lateral precordial leads, low risk of VF recurrence.
 - Type 2: Inferior leads, moderate risk of VF recurrence.
 - Type 3: Global pattern, high risk of VF recurrence.
- The patient's clinical presentation matches Type 1 ERS, which is:
 - Common in healthy young males.
 - Associated with a relatively lower risk of VF recurrence.

Conclusion

There is a critical need for heightened awareness and evaluation of ER patterns in young individuals, especially those with a family history of cardiac events.

While current guidelines do not recommend extensive testing for asymptomatic individuals with J waves, this case highlights the potential risks and the importance of considering ER.

References

1. Viskin S. Idiopathic ventricular fibrillation "Le Syndrome d'Haïssaguerre" and the fear of J waves. *J Am Coll Cardiol.* 2009;53(7):620-622. doi:10.1016/j.jacc.2008.11.011
2. Antzelevitch C, Yan GX, Viskin S. Rationale for the use of the terms J-wave syndromes and early repolarization. *J Am Coll Cardiol.* 2011;57(15):1587-1590. doi:10.1016/j.jacc.2010.11.038