

# Loperamide-Induced Ventricular Fibrillation Cardiac Arrest in the Setting of Recently Diagnosed Ulcerative Colitis

Edward Cay, DO<sup>1</sup>, Julie Yam, DO<sup>2</sup>

1. Spectrum Health Lakeland, St. Joseph, MI, 2. Great Lakes Gastroenterology, St. Joseph, MI

## Introduction

**Loperamide** - peripheral mu opioid receptor agonist that inhibits intestinal peristalsis and decreases fluid and electrolyte loss.

While typically used over-the-counter for diarrhea, it may cause cardiotoxicity at higher dosages, leading to arrhythmia and cardiac arrest.

## Case Description

A 36 year-old female with a recent diagnosis of ulcerative colitis, presented with unresponsiveness while eating dinner.

### Emergency Medical Services

- Cardiopulmonary resuscitation was initiated by family, and was found to be in ventricular fibrillation by paramedics.
- Return of spontaneous circulation (ROSC) was achieved after one defibrillation and administration of epinephrine, with increased responsiveness after given naloxone.

### Intensive Care Unit

- Upon admission to the intensive care unit, she soon developed torsades de pointes leading to recurrent ventricular fibrillation cardiac arrest (Figure 2.), requiring 12 defibrillations.
- Esmolol and lidocaine infusions were subsequently started.

### Evaluation

- Computed tomography pulmonary angiogram - unremarkable for pulmonary embolism
- Transthoracic ultrasound - no structural abnormalities, normal ejection fraction
- Cardiac MRI - no evidence of acute myocarditis or infiltrative cardiomyopathy
- Cardiac catheterization - nonobstructing coronary arteries
- For secondary prevention, an implantable cardiac defibrillator was placed.

Upon further discussion after unplanned self-extubation, patient disclosed that she had been overutilizing loperamide at about 16 mg daily to help control her frequent episodes of diarrhea.

## Electrocardiography

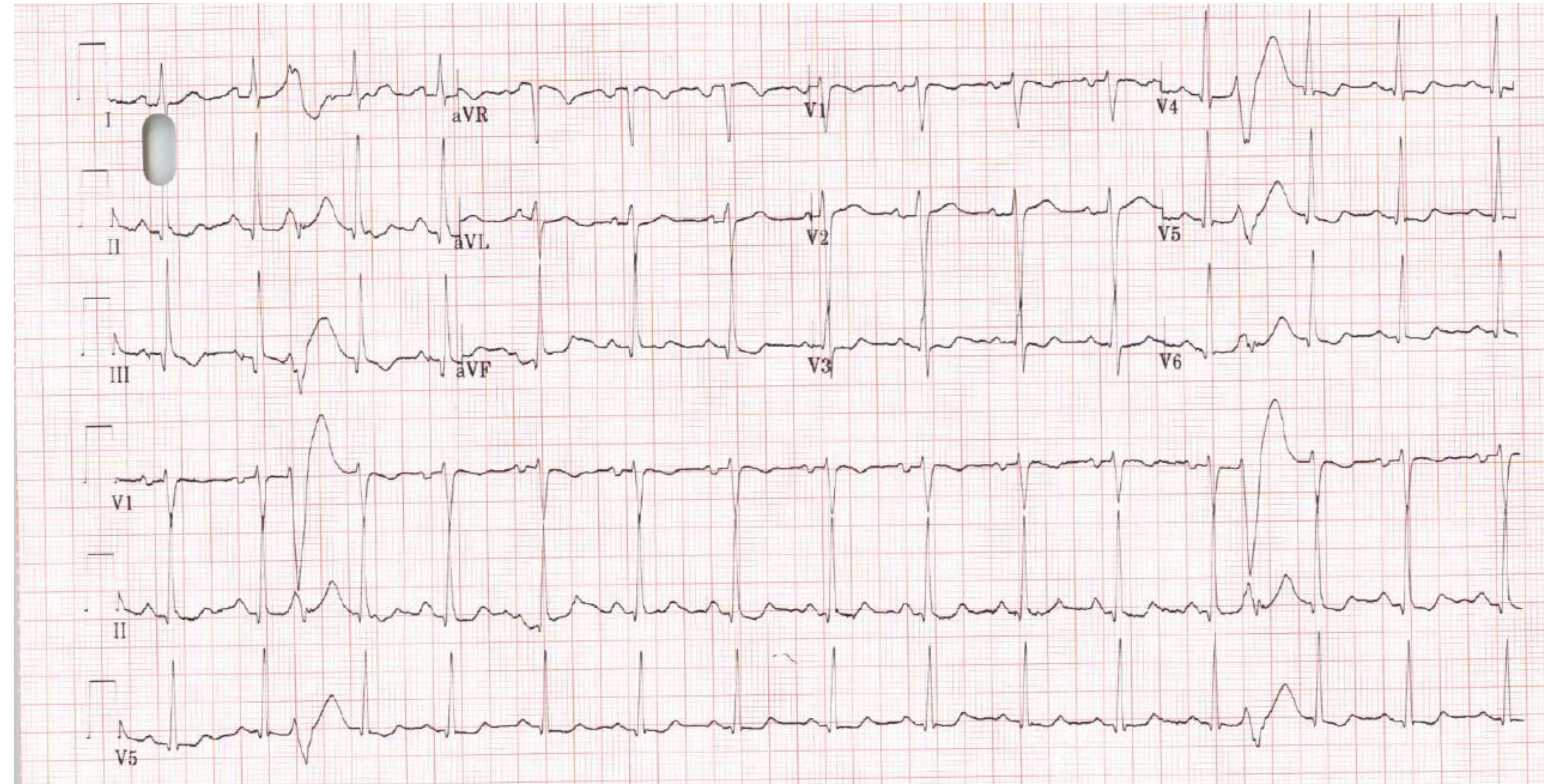


Figure 1. Initial EKG showing sinus tachycardia with premature ventricular complexes (PVCs) and T wave changes.

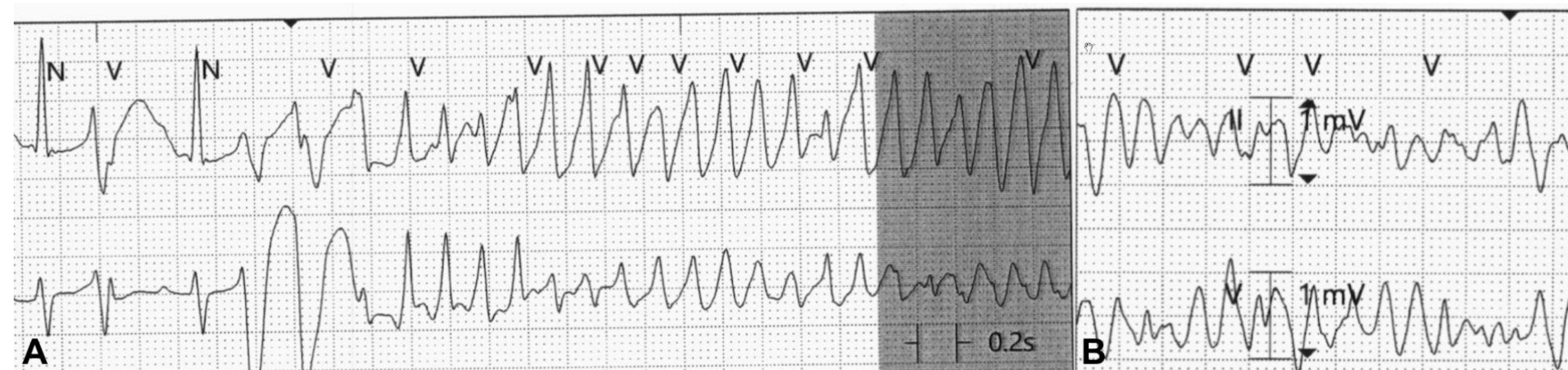


Figure 2. Telemetry strips showing polymorphic ventricular tachycardia (V-tach) (A) inducing ventricular fibrillation (V-Fib) (B).

## Discussion

### Reasons for Loperamide Misuse & Abuse

- Refractory diarrhea
- Opioid-like euphoria
- Relieve symptoms of opioid withdrawal

### Loperamide-Induced Cardiotoxicity

- May act similar to antiarrhythmic medications
- Dose dependent effects causing ventricular instability
- Prolongs the QRS complex to cause polymorphic ventricular tachycardia, which may develop into torsades de pointes, ventricular fibrillation and cardiac arrest.

### Loperamide Absorption

- Typically poor central nervous system penetration, but may cross the blood-brain barrier at very high doses.
- While the half life of loperamide is 9 to 14 hours, it may be greater than 40 hours at 16 mg doses, likely due to decreased peristalsis that slows its rate of absorption.

### Management

- Typical treatment of QTc prolongation arrhythmias due to medications may be refractory, including: sodium bicarbonate, magnesium sulfate, amiodarone and defibrillation.
- Cardiac stabilization may not be obtained for up to 5 days.

While most cases of loperamide-induced cardiotoxicity have been related to alleviating symptoms of opioid withdrawal or causing euphoria, our patient exemplifies an attempt to control symptoms of new onset Ulcerative Colitis.

### References

- Wu, P. E., & Juurlink, D. N. (2017). Clinical review: loperamide toxicity. *Annals of emergency medicine*, 70(2), 245-252.
- Upadhyay, A., Bodar, V., Malekzadegan, M., Singh, S., Frumkin, W., Mangla, A., & Doshi, K. (2016). Loperamide induced life threatening ventricular arrhythmia. *Case Reports in Cardiology*, 2016.
- Mukarram, O., Hindi, Y., Catalasan, G., & Ward, J. (2016). Loperamide induced torsades de pointes: a case report and review of the literature. *Case Reports in Medicine*, 2016.
- Kapaganti, S., Ansari, S. A., Saba, R., Elkhouly, A., & Hassib, M. (2020). A Rare Case of Loperamide-Induced Cardiac Arrest. *Cureus*, 12(7).
- Salama, A., Levin, Y., Jha, P., & Alweis, R. (2017). Ventricular fibrillation due to overdose of loperamide, the "poor man's methadone". *Journal of community hospital internal medicine perspectives*, 7(4), 222-226.
- Leung, G., Altshuler, D., Goldenberg, R., Fridman, D., & Yuriditsky, E. (2016). Conduction disturbances and ventricular arrhythmias associated with high-dose loperamide. *J Clin Toxicol*, 6(3), 309-13.