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## Intentional Flecainide Overdose

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## INTRODUCTION

- 32 year old male with a past medical history of atrial fibrillation and depression presented to the hospital after an intentional overdose with flecainide and metoprolol succinate
- Home medications = flecainide & metoprolol succinate
- Patient was lucid in the Emergency Department (ED) and stated that he took thirty to forty 100 mg flecainide tablets along with an unknown amount of metoprolol succinate



Figure 1: [https://www.huffpost.com/entry/drug-overdose-deaths\\_n\\_7603302](https://www.huffpost.com/entry/drug-overdose-deaths_n_7603302)

## INITIAL WORK UP & EARLY MANAGEMENT

- Vitals in the ED = mild hypotension but otherwise hemodynamically stable
- Lab values = serum K<sup>+</sup> 3.4 mmol/L, Mg<sup>2+</sup> 1.9 mg/dL, and lactate 4.4 mmol/L
- Toxicology was consulted & recommended starting a sodium bicarbonate infusion along with intermittent 3% normal saline boluses (with a goal pH > 7.5) to prevent QRS widening
- Patient was then admitted to the medical intensive care unit (MICU)

## CONTINUED CASE

- In the MICU, patient had a subsequent cardiac arrest
- The initial rhythm revealed ventricular fibrillation (VF) but this quickly degenerated to pulseless electrical activity (PEA) prior to any attempted defibrillation
- Given on-going cardiopulmonary resuscitation (CPR), patient underwent placement of VA-ECMO along with a transvenous pacemaker
- Patient was then transferred to the cardiac intensive care unit (CICU)

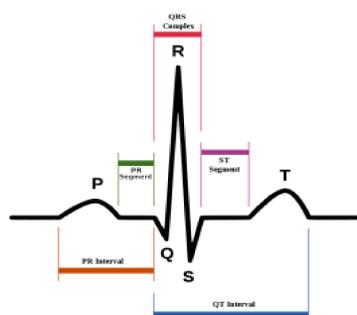


Figure 2: [https://en.wikipedia.org/wiki/PR\\_interval](https://en.wikipedia.org/wiki/PR_interval)

## CASE OUTCOME

- In the CICU, toxicology escalated interventions to include 20% intra-lipid emulsion followed by high dose insulin given escalating vasopressor requirements
- Thirty six hours into the admission, patient had progressed to multi-organ failure
- Exam revealed fixed and dilated pupils, corneal reflexes were absent bilaterally, and gag reflex was absent
- After discussion with family, the decision was made to withdraw care, and the patient passed away

## ELECTROCARDIOGRAPHIC CHARACTERISTICS

- Initial electrocardiographic (EKG) characteristics (two hours after ingestion of flecainide) = wide complex tachycardia (QRS 142 ms) with a PR of 210 ms and QTc of 517
- This will be referred to as hour two (HR2)
- Patient did have an old EKG from 2018 = normal sinus rhythm with normal PR & QRS intervals (reference PR < 200 ms & QRS < 120 ms)
- HR3.5 = Continued widening of QRS (162 ms), PR (224 ms), & QTc (579)
- HR5.5 = Patient developed a Brugada pattern in V1-2, which has been well documented in the literature in regards to flecainide toxicity [1,2,3]
- HR6.0 = Brugada pattern becomes more pronounced & QRS (172 ms) continues to widen; PR (188 ms) & QTc (552) stabilize
- HR7.5 = Immediately prior to cardiac arrest; QRS widens to 180 ms, PR widens to 240 ms, & QTc prolongs to 585
- Shortly thereafter, patient goes into VF arrest & subsequently PEA
- HR13.5 = Status post VA-ECMO placement
- Patient was given 20% intra-lipid emulsion & high dose insulin was initiated given increasing vasopressor requirements
- HR17.5 = Ventricular pacing and QRS widening (218 ms) approaching a sinusoidal pattern; this was the last EKG obtained prior to withdrawal of care

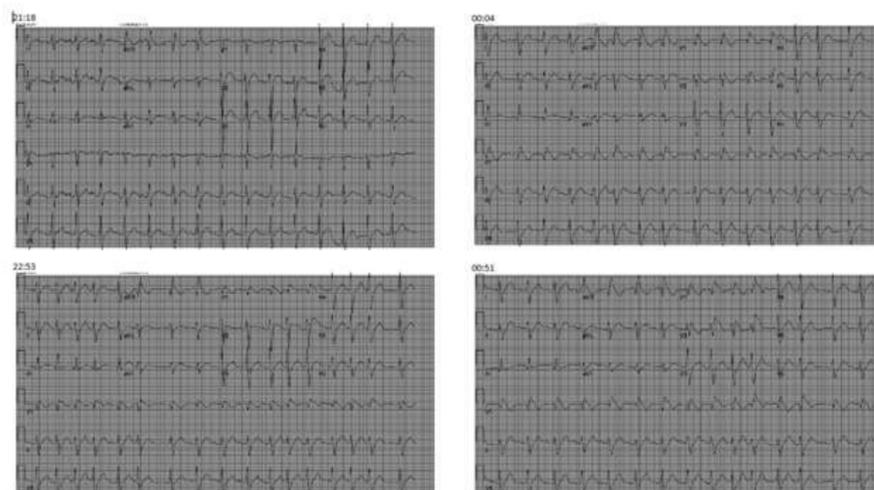


Figure 3: EKG set 1

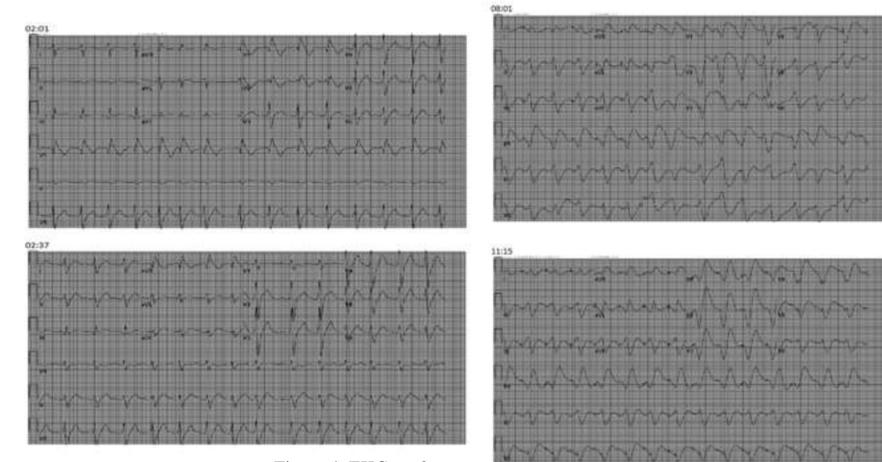


Figure 4: EKG set 2

## FLECAINIDE

- Flecainide acetate is a class 1C antiarrhythmic most often used for supraventricular arrhythmias
- Intentional overdose is rare and life threatening
- Flecainide depresses all conduction pathways, manifesting with prolongation of the PR & QRS intervals on EKG, making these patients highly prone to fatal arrhythmias [4]
- As stated flecainide toxicity has been associated with Brugada pattern
- It has been postulated in a number of case reports that the Brugada pattern seen in flecainide toxicity may actually be underlying Brugada Syndrome unveiled by the sodium channel blockade of flecainide [2]

## MECHANICAL CIRCULATORY SUPPORT

- One large study (systemic review of 21 articles) evaluated EKG characteristics in flecainide overdose along with the subsequent need for mechanical circulatory support (MCS) & mortality
- Study compared patients with QRS ≤ 200 ms & those with QRS > 200 ms
- Patients with a QRS > 200 ms required MCS more often and had higher mortality rates [4]
- Our case demonstrated a poor outcome associated with a wide complex tachycardia (QRS > 200) in a patient who required MCS & eventually passed away

## REFERENCES

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