Successful Naloxone Challenge Test in a Patient With Atrial Flutter

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Following opioid detoxification, naltrexone long-acting injection (LAI) (Vivitrol) is an option for maintenance medication to prevent relapse. Naltrexone is an opioid antagonist and can produce prolonged withdrawal in patients who have not fully completed detoxification from opioids. To prevent this prolonged withdrawal, it is recommended that the patient is opioid free for 7 to 10 days before injection.[1] In some instances, that length of time is not feasible. One solution is the naloxone challenge test (NCT).

While useful, the NCT should still be given with caution, as naloxone carries a listed precaution for use in patients with preexisting cardiovascular disease.[2,3] There have been instances of patients suffering from a wide array of cardiovascular complications, ranging from an increase in systolic blood pressure to cardiovascular arrest.[2–7] Despite no particular reports of use in patients with preexisting atrial flutter, these instances have most likely influenced naloxone use in this population as well.

Case Report

A 50-year-old white man presented requesting inpatient detoxification from opiates. The patient reported injecting 1 to 2 grams of heroin daily, with his last use being the day of admission.

The patient's cardiovascular history was positive for hypertension, cerebrovascular accident 4 months prior, endocarditis, atrial flutter, and atrioventricular nodal reentry tachycardia. He also had a mitral valve replacement 2 months prior and 2 ablations 4 months prior. At the time of admission, the patient was stable in regard to his cardiac history. On day 2, the patient began to experience withdrawal symptoms. Withdrawal symptoms were treated on an as-needed basis with various standard medications including clonidine 0.1 mg every 4 hours. Notably, as the admission continued, the patient's heart rate and blood pressure began to increase (Table 1) despite otherwise improving withdrawal symptoms.

Table 1. Cardiac Vital Signs During Inpatient Opiate Withdrawal and Naloxone Challenge Test

Hospital Day	Heart Rate Range (bpm)	Systolic Blood Pressure Range (mm Hg)	Diastolic Blood Pressure Range (mm Hg)
1	47–74	120–153	74–110
2	65–145	139–172	98–119
3	50–147	129–181	65–134
4	90–148	106–149	76–115
5	122–152	127–151	80–115
6	64–74	115–138	67–79
7[a]	61–85	117–160	73–98
8[b]	68	140	84

[a]Day of naloxone challenge test.
[b]Only one set of vitals was reported on day 8 of admission.
Abbreviation: bpm = beats per minute.

On day 5, it was decided to administer naltrexone LAI to the patient. However, he began to experience tachycardia and electrocardiogram (ECG) changes that revealed atrial flutter with 2:1 conduction. The Cardiology Department was consulted and recommended an electrophysiology study that would likely result in ablation. Due to the patient undergoing acute detoxification, the electrophysiology study and ablation were postponed until detoxification was complete. Until that time, anticoagulation with apixaban and rate control with diltiazem were utilized.

On day 7, the patient's heart rate was well controlled, and he reported no cravings for heroin or symptoms of withdrawal. Given recent cardiovascular events, an NCT was given despite his being opioid free for at least 7 days. After 2 doses of naloxone 0.4 mg, the patient had no withdrawal symptoms and experienced no cardiovascular complications.

He developed no new arrhythmias or changes in heart rate or blood pressure during the NCT. The following day, the patient's heart rate was still well controlled but remained in atrial flutter (Figure 1). He was administered naltrexone LAI and transferred for further cardiac workup and ablation. During the patient's admission at the cardiac hospital, he successfully underwent electrophysiology study and atrial flutter ablation with no complications.

Discussion

This case report illustrates the use of the NCT in a patient who received naltrexone LAI for opioid use disorder with cardiac comorbidities. Withdrawal from opioids can lead to development of abnormal cardiac function caused by quick reversal of sympathetic suppression of long-term opioid

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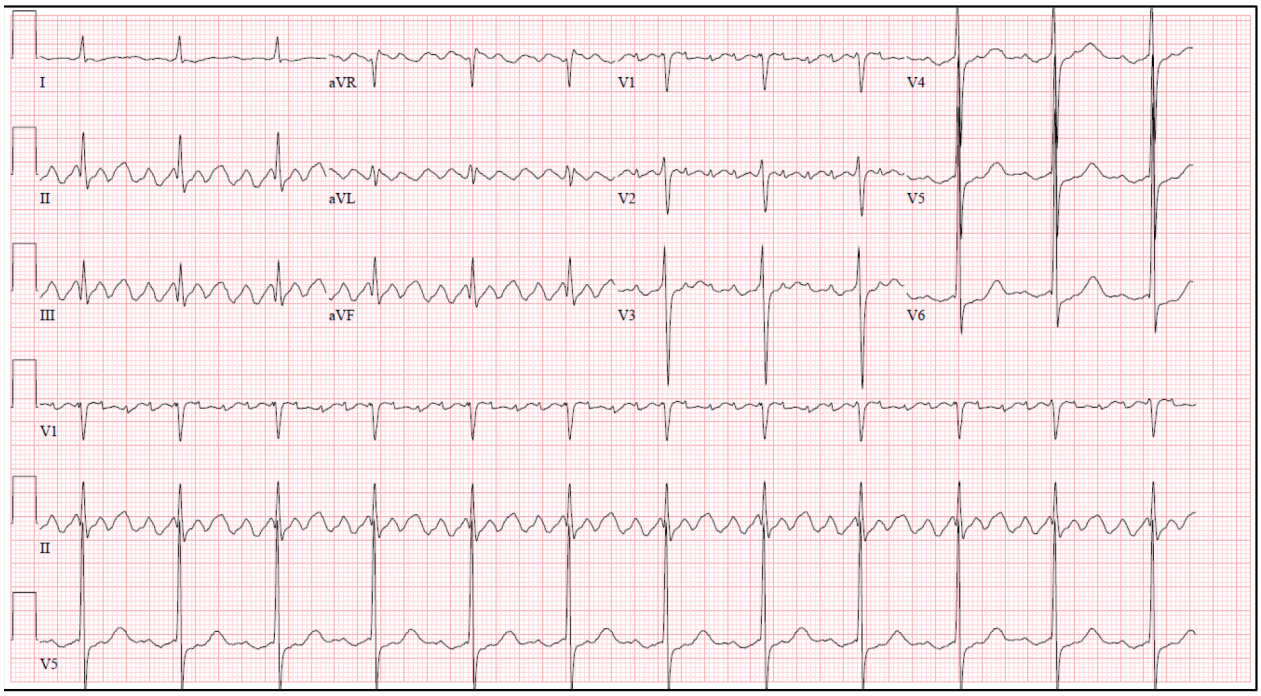
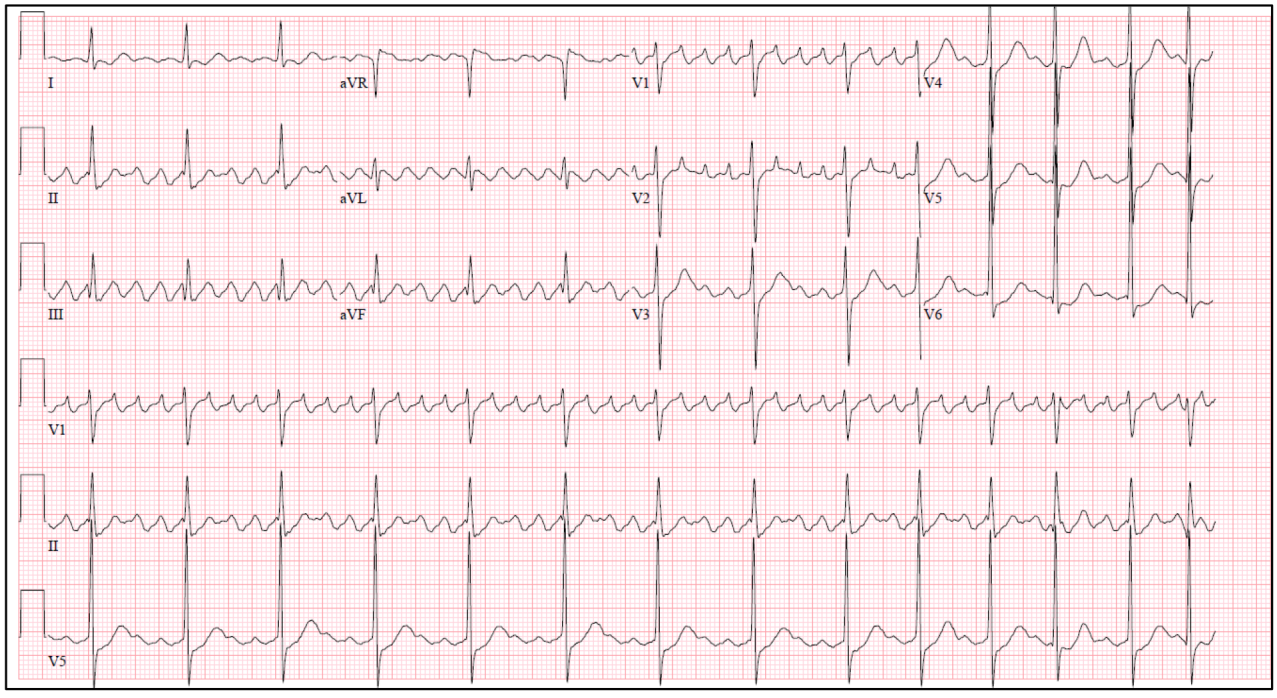
Figure 1. Electrocardiogram Before and After Naloxone Challenge Test (NCT)

A. Immediately Prior to NCT



B. 24 Hours After NCT



abuse.[8] However, in our patient, the NCT was successfully employed to establish safety of use of naltrexone LAI.

Appropriate medical care prior to use of naloxone may also have influenced the results in this patient. In future cases, consultation with cardiology specialists would be warranted prior to a NCT in patients with especially complex cases such as tachyarrhythmias or other forms of unstable cardiodynamics.

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