



Use Dependent Drug Induced Brugada Pattern Caused by Bupropion in an Adolescent



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INTRODUCTION

- Drug induced Brugada syndrome is an under-recognized clinical phenomenon.
- Multiple drugs have been implicated in drug induced Brugada syndrome with varying levels of evidence.¹
- We present the first case of bupropion induced Brugada pattern in an adolescent.

CASE PRESENTATION

- 17-year-old female with major depressive disorder treated with bupropion and nortriptyline presented with witnessed 30 second syncopal episode with electrocardiogram (EKG) showing a spontaneous type 1 Brugada pattern (Fig 1). She was slowly tapered off nortriptyline with resolution of the spontaneous type 1 Brugada pattern.
- Through shared decision-making bupropion was continued at 300mg daily given her severe depression and suicidal ideation. At 6 weeks after discontinuing nortriptyline EKG continued to demonstrate no evidence of spontaneous type I Brugada pattern.
- Many Na-channel blockers manifest positive use-dependence therefore an exercise treadmill test was performed which showed development of spontaneous type 1 Brugada pattern at peak exercise and persisting into recovery for 5 minutes before resolving (Fig 2). Bupropion was subsequently discontinued.

CASE PRESENTATION (CONTINUED)

- Intensive cognitive behavioral therapy was effective with minimal depressive symptoms off medications.
- After 3 months a repeat exercise treadmill test showed no recurrence of Brugada pattern at rest or peak exercise (Fig 3).

DISCUSSION

- Evidence suggests nortriptyline induces Brugada syndrome²; however, this is the first case of bupropion monotherapy causing use dependent type 1 Brugada pattern in an adolescent with drug induced Brugada syndrome.
- Children and adolescents with Brugada syndrome show use dependent mutations in SCN5A.³ Variable transcription and conduction velocities of the sodium channel may be responsible for these observations.
- While bupropion does not directly block sodium channels, its effect of gap junction intracellular communication may be synergistic to its effects in use dependent Brugada syndrome and contribute to the type 1 Brugada pattern seen in our patient.⁴
- This case adds to the available literature that young patients with Brugada syndrome should avoid bupropion as it may exacerbate a spontaneous type 1 Brugada pattern.
- This case has important implications for antidepressant and smoking cessation treatment in patients with Brugada syndrome and drug induced Brugada syndrome

CONCLUSIONS

- Children and young adults can show use dependent sodium channel mutations which may be exacerbated by bupropion's use dependent gap junction block.
- We recommend that children and adolescents with Brugada syndrome avoid bupropion.
- We recommend the evaluation of cardiac syncope in patients on bupropion should include an exercise stress test to rule out induction of use-dependent type 1 Brugada pattern.
- We recommend genetic screening for SCN5A mutations.

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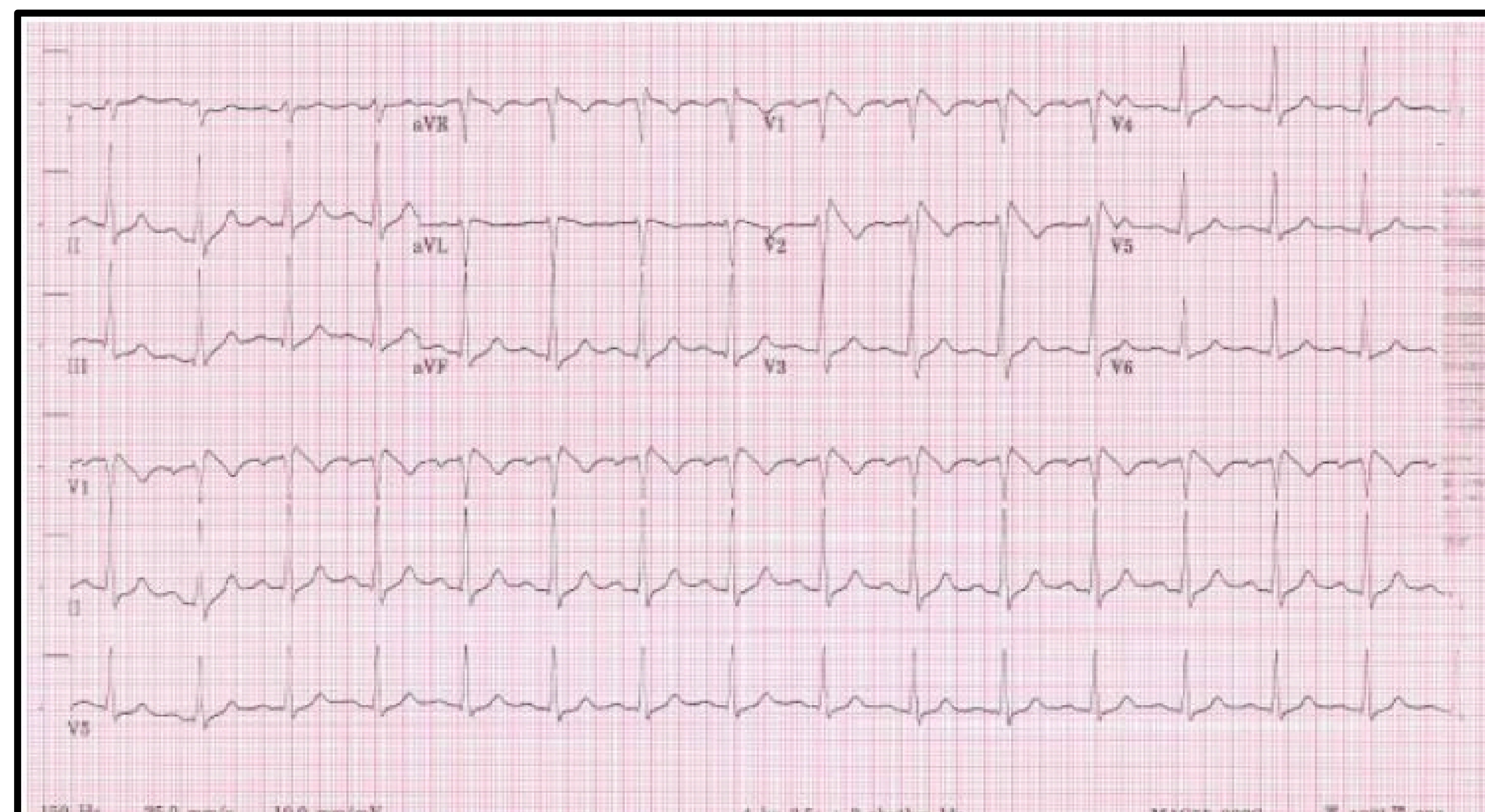


Figure 1: Presenting electrocardiogram showing a spontaneous type 1 Brugada pattern.



Figure 2: Peak exercise electrocardiogram showing a use dependent type 1 Brugada pattern while the patient was taking bupropion only.



Figure 3: Repeat peak exercise electrocardiogram testing showing a resolved Brugada pattern three months after discontinuing bupropion.