

All Target Specific Anticoagulants are not Created Equal

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Abstract Background: New target specific anticoagulants (TSOACs) are convenient to use and effective management in the prophylaxis against thromboembolic sequela of atrial fibrillation (AF). However, without a test to monitor therapeutic efficacy, non-responders may not be detected until they suffer complications. We present a case where one year of dabigatran treatment failed to prevent development of a left atrial clot in the setting of AF. **Case:** An 84-year-old male with persistent atrial fibrillation presented with anemia of unknown etiology. Workup revealed no acute sources of bleeding, but he was on oral anticoagulation with dabigatran for greater than one year. Anticoagulation had to be discontinued for planned endoscopy. Thus, patient was electrically cardioverted to sinus rhythm. However, 3 days later he presented with a clot in the left femoral artery requiring embolectomy and was back in atrial fibrillation. He was switched to rivaroxaban for anticoagulation. Transesophageal echocardiogram (TEE) 4 weeks later revealed no clot. He was started on the antiarrhythmic amiodarone, then electrically cardioverted to sinus rhythm without complication. **Discussion:** TEE should be performed prior to electrical cardioversion for patients on TSOACs in case patient is a non-responder. Non-responders, should be placed on a TSOAC with an alternative mechanism of action. **Conclusion:** Switching TSOACs may be effective management for certain patients with failure of anticoagulation.

Keywords: atrial fibrillation, target specific anticoagulants, novel oral anticoagulants, failure of anticoagulation

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1. Introduction

Atrial Fibrillation (AF) is the most common heart dysrhythmia, with lifetime risk of 1 in 4 [1]. AF increases risk of clot formation in the left atrium that can subsequently embolize causing stroke. Anticoagulation with vitamin K antagonists has been proven as effective management in the prophylaxis against thromboembolic sequelae of AF. As per currently available data, the new target specific oral anticoagulants (TSOACs) are noninferior to vitamin K antagonists, with decreased bleeding complications and increased convenience [2]. However, the lack of a blood test to monitor therapeutic efficacy makes it difficult to detect nonresponders until a complication occurs. We present a case where one year of oral anticoagulation with dabigatran failed to prevent development of left atrial clot in a patient with atrial fibrillation.

2. Case

An 84-year-old male with history of colon cancer s/p colectomy, hypertension, and persistent atrial fibrillation

on oral anticoagulation with dabigatran, presented with worsening anemia of unknown etiology. Endoscopy was planned for invasive workup, thus patient was referred to cardiology for management of anticoagulation. Patient's medications included metoprolol, lisinopril, furosemide, and dabigatran for the past year. Hemoglobin was 9.7, creatinine 1.7 and potassium 4.9. Electrocardiogram revealed AF with right bundle branch block. Transthoracic echocardiogram was performed which revealed ejection fraction of 60%, dilated left atrium measuring 4.5 cm, with no intracardiac thrombus or mass seen.

As the patient had already received adequate duration of anticoagulation with dabigatran for over one year, he was placed on oral amiodarone and electrically cardioverted with 200 joules. Three days later, he presented to the emergency department with complaints of pain and numbness in the left leg. Noninvasive vascular imaging revealed a clot in left femoral artery, for which successful embolectomy was performed. He was discharged on rivaroxaban, after being bridged in the hospital on heparin. On outpatient follow-up two weeks later he was noted to be back in AF, thus he was brought back four weeks later to have a transesophageal echocardiogram (TEE). It revealed no clot or smoke, hence patient was cardioverted to normal sinus rhythm with 150 joules without subsequent adverse events.

He underwent placement of a loop recorder for long term monitoring of AF burden, while anticoagulation was withheld due to increased risk of bleeding. To date, he has been followed for 15 months and has remained in normal sinus rhythm.

3. Discussion

The case above represents failure of anticoagulation to prevent thrombus formation. Without a blood test available to monitor therapeutic effect of TSOACs, TEE should be performed prior to every cardioversion regardless of the preceding duration of anticoagulation.

Optimal management of treatment failure with TSOACs is unclear, but switching to an alternative anticoagulant, as was done in this case is a proposed option [3]. While we do not have head to head comparisons between dabigatran and rivaroxaban, a recent meta-analysis and adjusted indirect comparison suggests that rivaroxaban is superior in preventing VTE (RR 0.50, 95% CI 0.37–1.64) but carries a higher risk of bleeding [3]. These two TSOAC's target different coagulation factors, as rivaroxaban inhibits factor 10a, while dabigatran inhibits thrombin. Thus, if one TSOAC fails, an alternative with a differing mechanism of action should be attempted.

4. Conclusion

This case brings evidence that switching TSOACs may be effective management for certain patients with failure of anticoagulation

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Full informed consent was taken from patient to conduct this retrospective chart review.

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