

Flecainide

PROVOCATION TEST

1 Aim

The flecainide provocation test entails the intravenous administration of flecainide under close 12-lead ECG monitoring and recording, with the aim of unmasking Brugada syndrome.

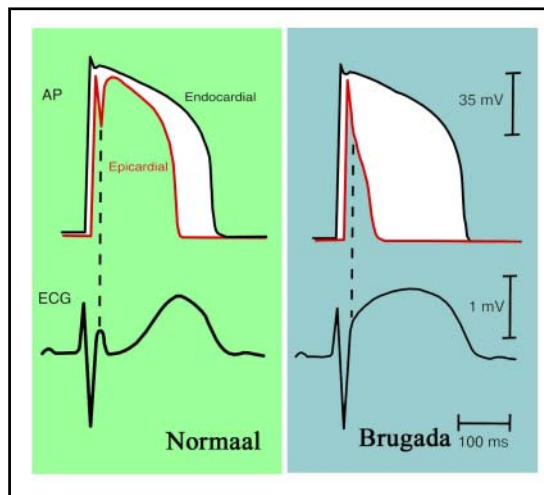
2 General information

Brugada syndrome is an inherited disease (usually inherited in an autosomal dominant mode), that is associated with ventricular fibrillation and sudden death. To uncover/clarify covert/ambiguous Brugada syndrome, its pathognomonic ST segment elevations may be elicited by flecainide infusion.

A positive test is defined by the occurrence of so-called coved-type elevation (≥ 2 mm) in at least 2 right precordial leads (see below). Coved-type ST elevation is characterized by an elevated take-off point, descending into a negative T wave with little or no isoelectric separation.

Flecainide slows conduction through the heart by blocking sodium inward current into the myocytes.

Proposed pathophysiology of Brugada syndrome:

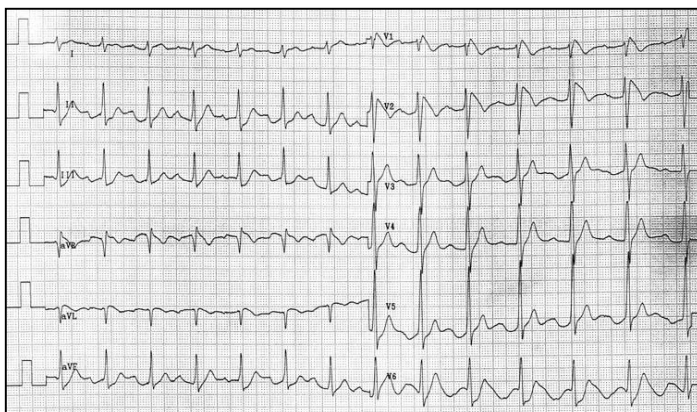


When sodium current is reduced, calcium inward current (responsible for the action potential plateau) is overwhelmed by potassium outward current. This results in premature action potential repolarization of epicardial myocytes. However, endocardial myocytes do not repolarize prematurely. The difference in action potential plateau causes a potential gradient and results in ST- elevations in right precordial ECG leads. Furthermore, these gradients may elicit reentrant tachyarrhythmias.

Flecainide should not be conducted in the following:

- Children under the age of 12 years.
- Previous myocardial infarction.
- Impaired sinus node function, atrial conduction disorders, second or third degree AV block, bundle branch blocks, distal blocks.
- Severe congestive heart failure

ECG signs:

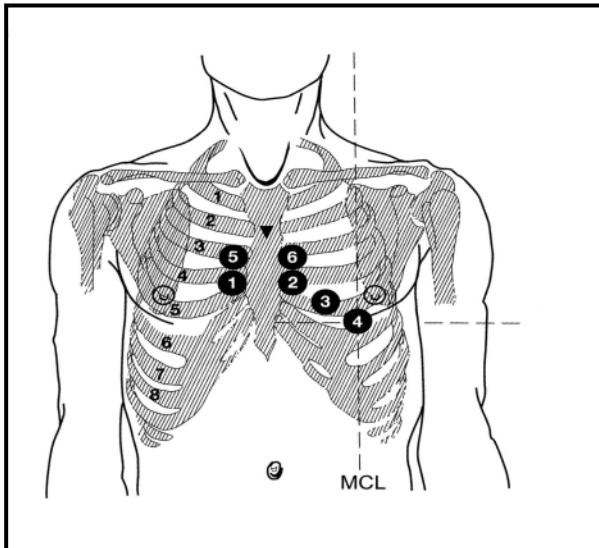


- ST-elevations in V₁ and V₂.
- Structurally normal heart.
- ST-elevations may vary: reduced during exercise, enhanced during hyperthermia, spontaneous variation.

- ST-elevations enhanced by class I antiarrhythmic drugs, e.g., flecainide, ajmaline, procainamide.

3 Preparation

- The patient is required to be in the fasting state for at least 6 hours (because of the possibility of resuscitation).
- Intravenous access.
- 12 lead ECG, measure QRS width (maximum).
- Reposition elektrodes:



V₁-V₄ remain unchanged, elektrodes V₅ en V₆ are positioned over the 3rd intercostal space, cranially from V₁ and V₂. Indicate on the ECG that V₅ and V₆ have these different positions.

Standard flecainide solution (15ml =150mg). Per kilogram Body weight 2mg flecainide with a maximum of 150 mg.

- Connect a glucose 5% i.v. drip.
- Prepare defibrillator.
- Connect patient to a monitor.

Flecainide dose:
< 75 kg: 2 mg/kg
≥ 75 kg: 150 mg

4 Execution

- Physician administers 1 ml (10 mg) flecainide every minute, with maximum of 15 ml (150 mg).
- Nurse records ECG every minute, prior to administration of next flecainide dose.
- Blood pressure recording every 2 minutes.
- Monitor ECG for ST- segment shifts, conduction slowing and/or arrhythmias.
- Stop administration at the following:

1 Onset of ventricular arrhythmias

2 QRS-widening >50%

3 Establishment of the diagnosis

- Record a follow-up ECG 15 and 60 min after completion of the test.

Prepare antidote isoproterenol and administer as follows:

- With frequent ventricular ectopic beats.
- If VF or VT occurs.

Antidote isoproterenol: 1 µg per minute.

Dissolve 2 mg isoproterenol in 500ml NaCl 0,65%.

Draw 50ml for the perfusor pump.

This yields a concentration of 1 µg per 0,25 ml.

1 µg per minute = 0,25ml x 60min. = 15ml per hour (= setting 15).

Depending upon the heart rate, a maximum of 4 µg per minute may be administered (= setting 60).

5 Evaluation

The reported elimination half-life of flecainide is about 20 hours. It is eliminated by the renal route.

Side effects of flecainide may include: headaches, dizziness, nausea and vomiting, blurred vision/diplopia, tremor, paresthesia, flushing.

If no specific ECG changes are elicited, the patient may be released. If specific ECG changes have occurred, the patient may have to be observed for up to 24 hours at the physician's discretion.

When releasing the patient, give him/her the telephone number of the cardiac emergency room to allow for advice over the telephone, should problems arise.

6 Literature

1. Alings M, Wilde A. "Brugada" Syndrome: Clinical data and suggested pathophysiological mechanism. *Circulation* 1999;99:666-673.
2. Brugada P, Brugada J. Right bundle branch block, persistent ST segment elevation and sudden cardiac death: A distinct clinical and electrocardiographic syndrome. *J Am Coll Cardiol* 1992;20:1391-1396.