



Séminaire
Winter Arrhythmia
School
Annual Cardiac Arrhythmia Meeting
Division of Cardiology, University of Toronto

Intracardiac Tracings

Michael Mohareb, MD, FRCPC



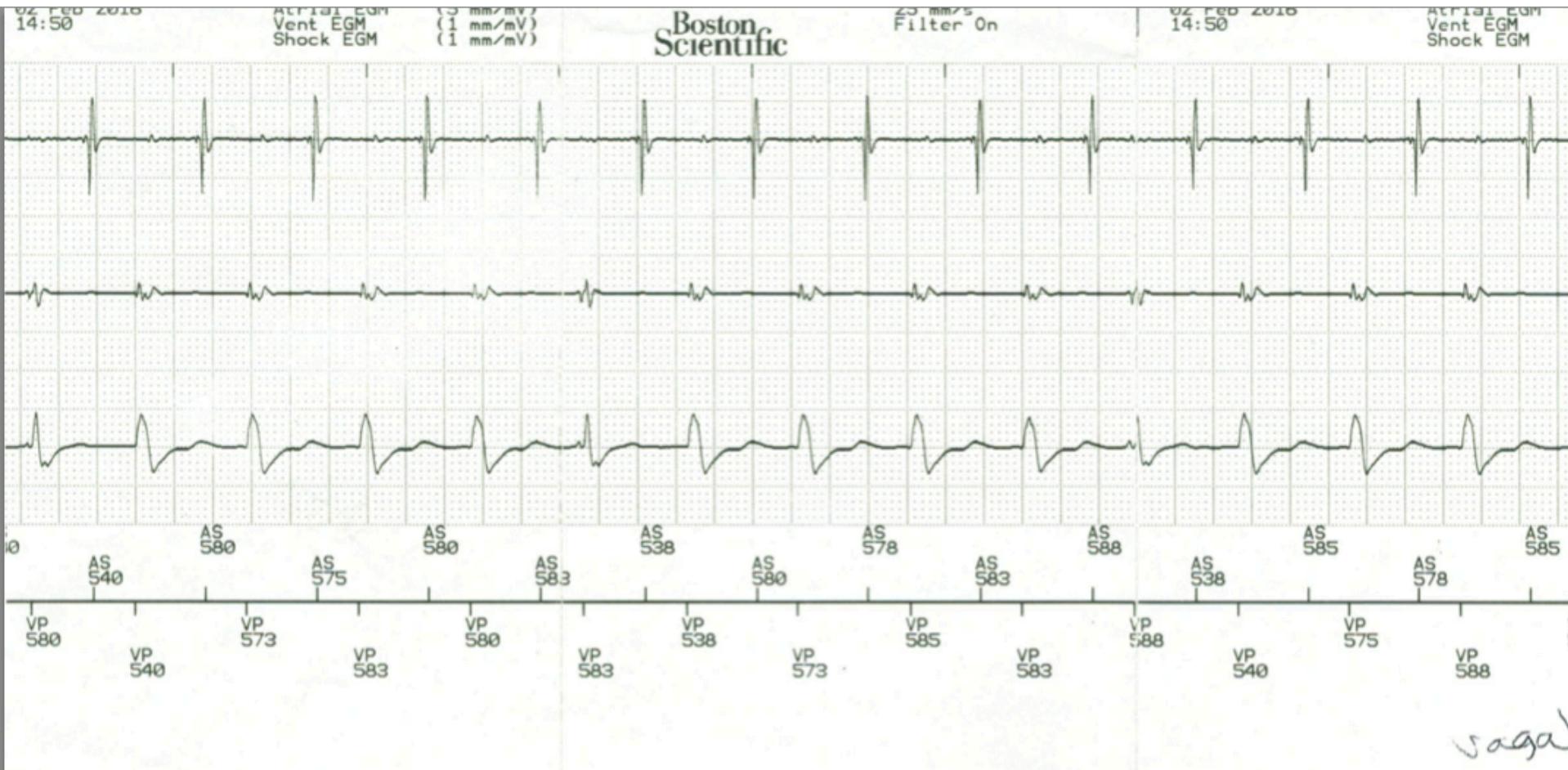
Séminaire
Winter Arrhythmia
School
Annual Cardiac Arrhythmia Meeting
Division of Cardiology, University of Toronto

Case 1

14th Annual
Collingwood, Ontario,
February 10 -12, 2017



Séminaire
Winter Arrhythmia
School
Annual Cardiac Arrhythmia Meeting
Division of Cardiology, University of Toronto



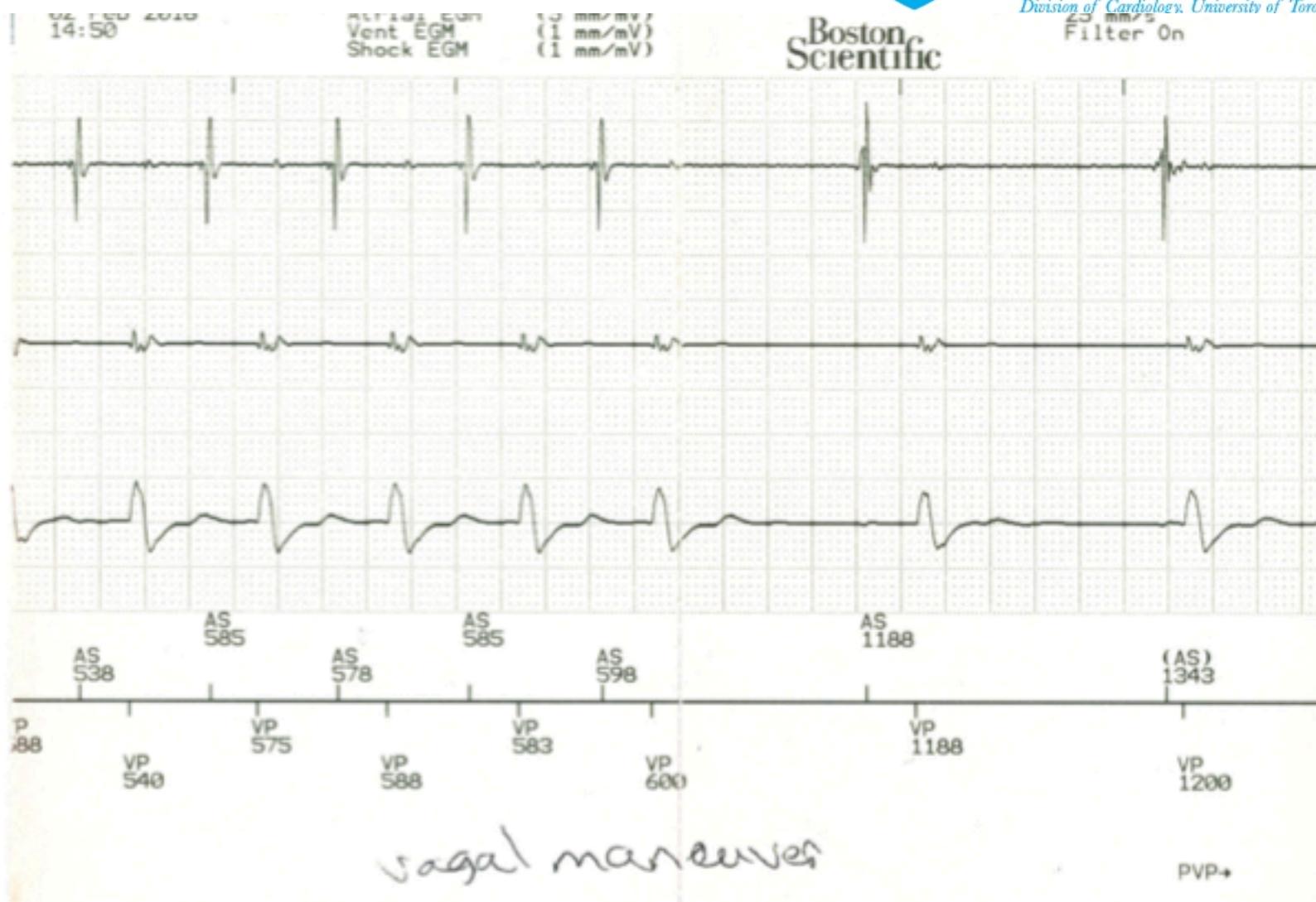
14th Annual
Collingwood, Ontario,
February 10 -12, 2017



Séminaire
Winter Arrhythmia
School

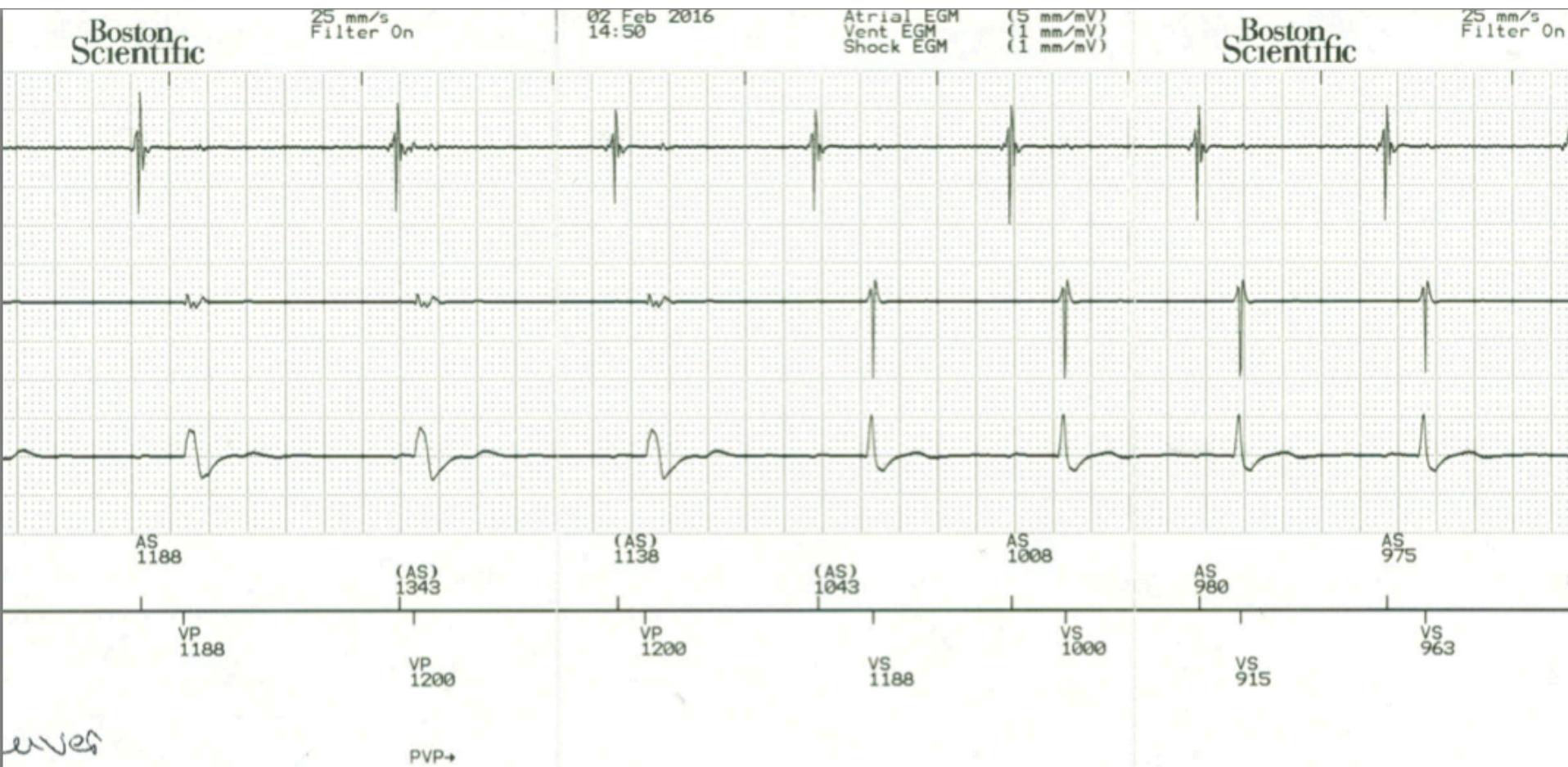
Annual Cardiac Arrhythmia Meeting
Division of Cardiology, University of Toronto
Filter On

Boston
Scientific





Séminaire
Winter Arrhythmia
School
Annual Cardiac Arrhythmia Meeting
Division of Cardiology, University of Toronto



14th Annual
Collingwood, Ontario,
February 10 -12, 2017

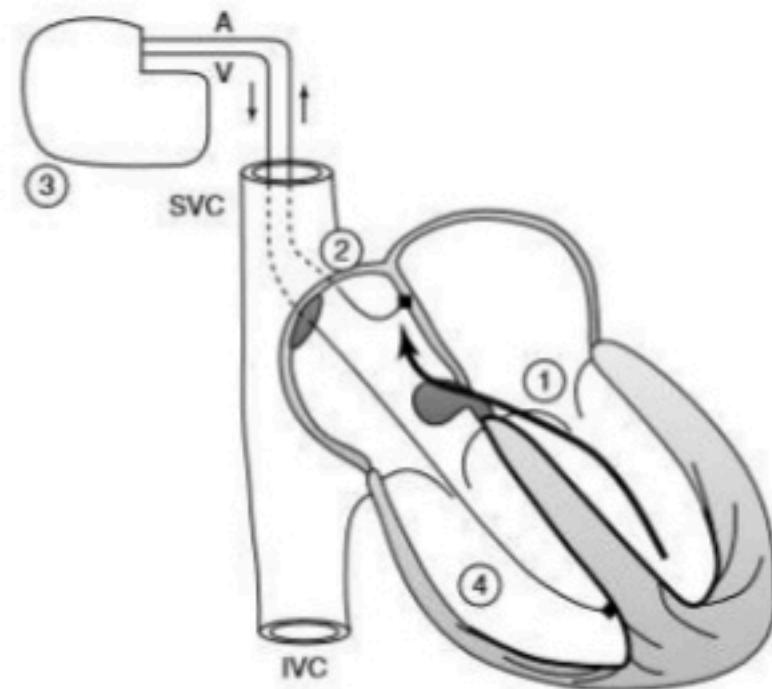


What is the arrhythmia?

- A. Ventricular tachycardia
- B. AVNRT
- C. Sinus or atrial tachycardia with AV tracking
- D. Pacemaker mediated tachycardia (PMT)



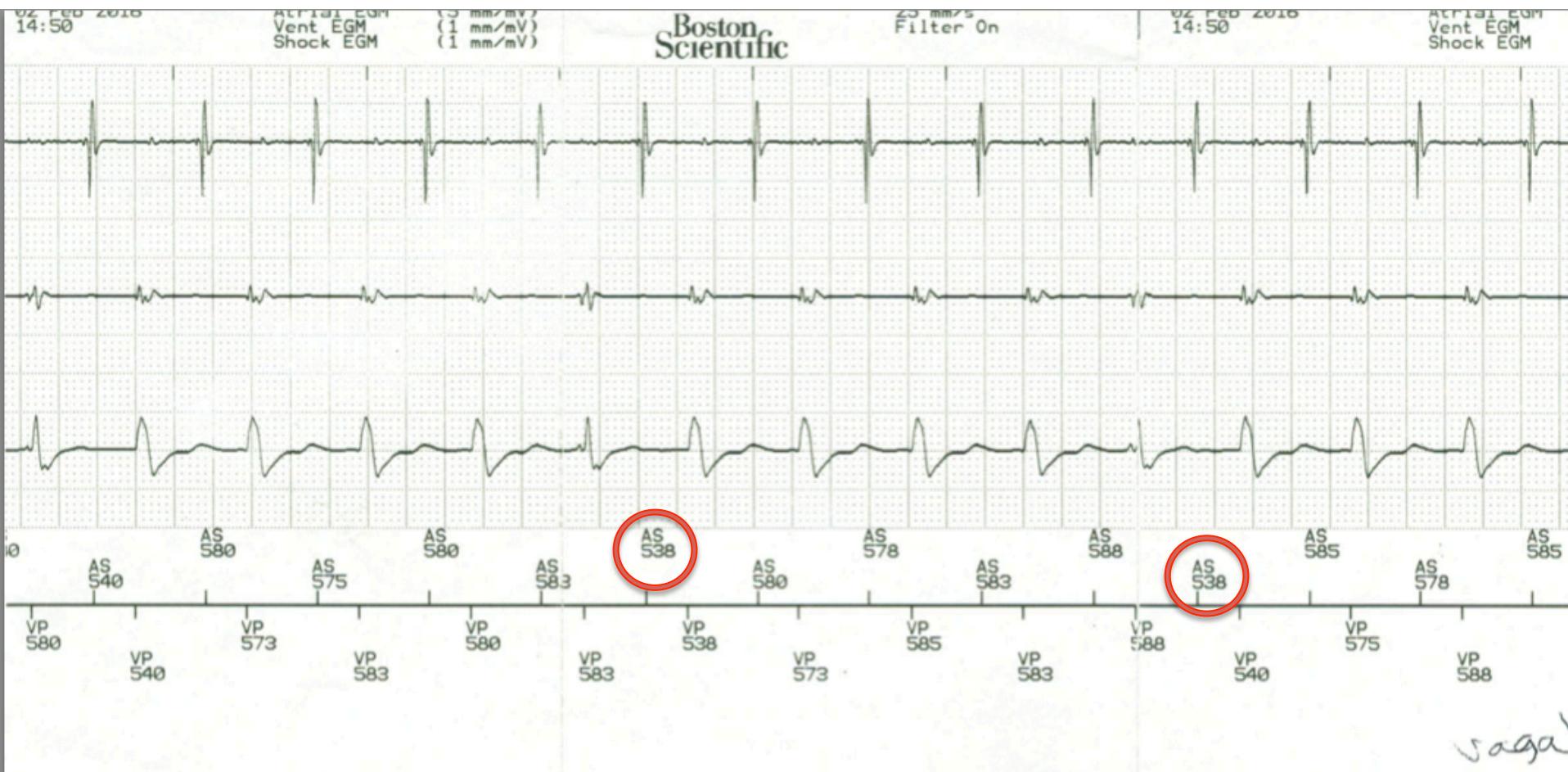
Pacemaker Mediated Tachycardia





Séminaire
Winter Arrhythmia
School

Annual Cardiac Arrhythmia Meeting
Division of Cardiology, University of Toronto



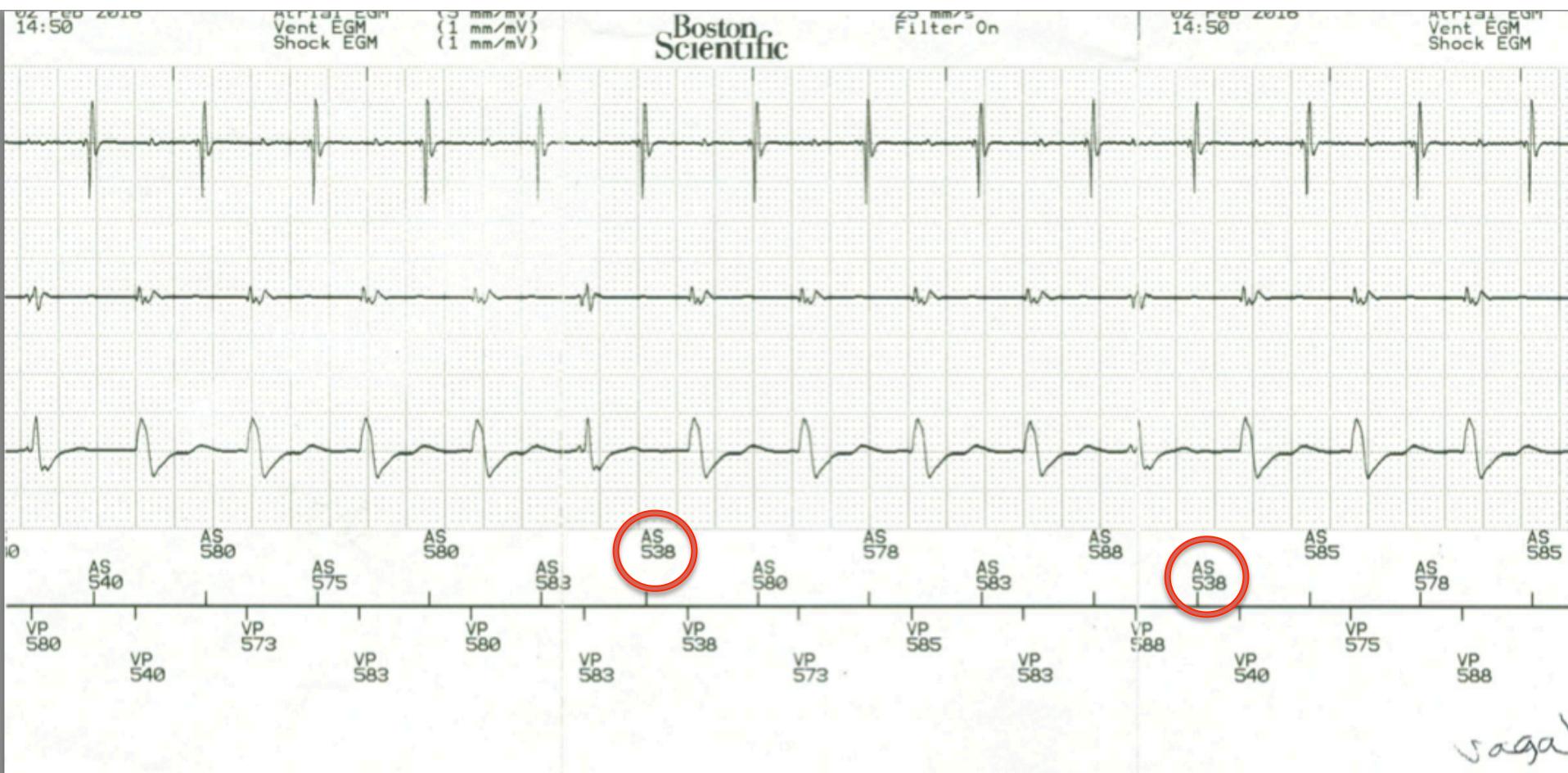


But, there are two atrial beats that come sooner. Why?

- A. Because this is not PMT
- B. Because they are PACs
- C. The marker intervals are sometimes inaccurate
- D. Other



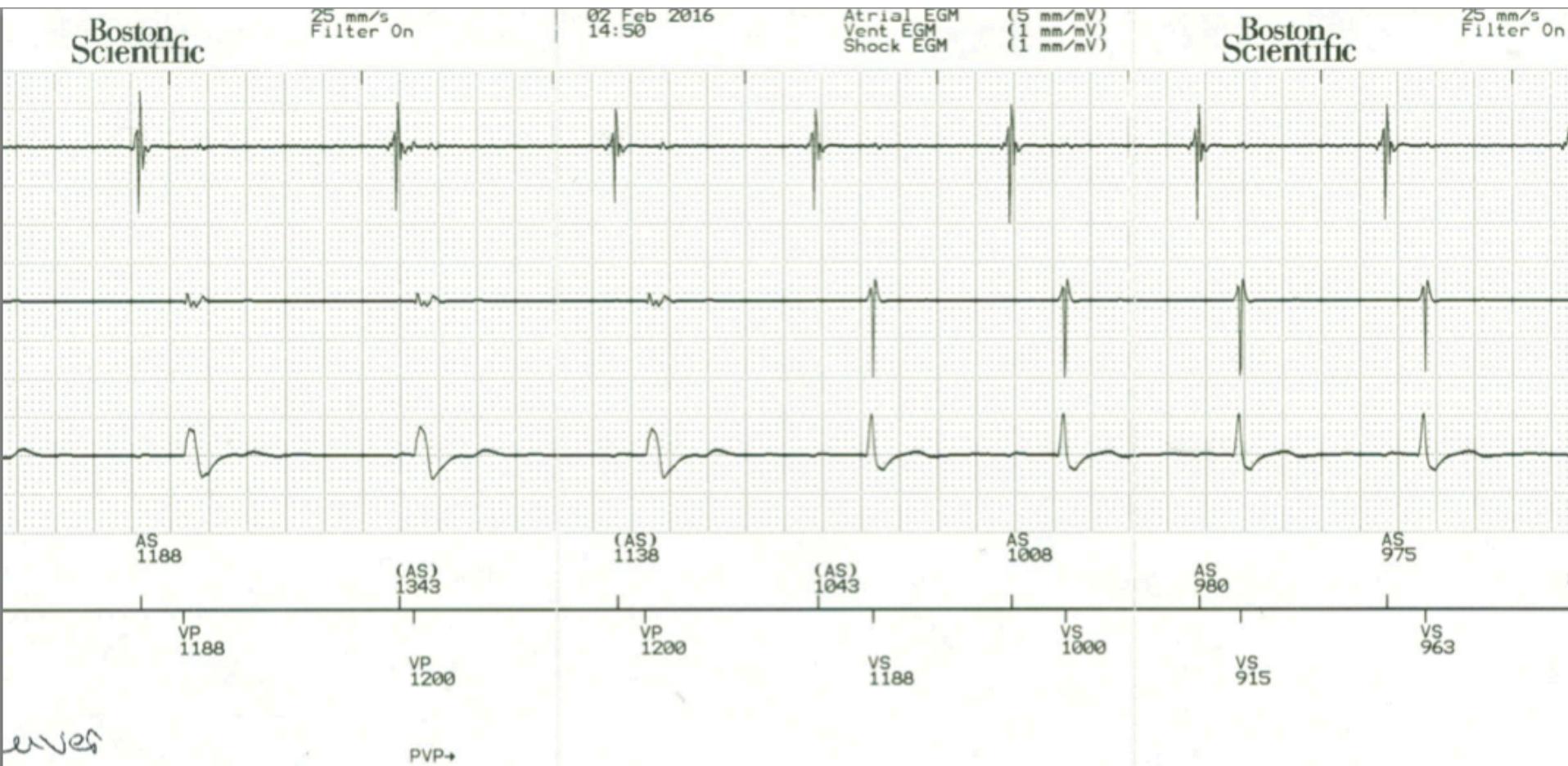
Séminaire
Winter Arrhythmia
School
Annual Cardiac Arrhythmia Meeting
Division of Cardiology, University of Toronto



14th Annual
Collingwood, Ontario,
February 10 -12, 2017



Séminaire
Winter Arrhythmia
School
Annual Cardiac Arrhythmia Meeting
Division of Cardiology, University of Toronto



14th Annual
Collingwood, Ontario,
February 10 -12, 2017



Why are these atrial beats “refractory”?

- A. Ventricular based timing
- B. Something else
- C. Because the device is now in PVP mode
- D. All of the above



Séminaire
Winter Arrhythmia
School
Annual Cardiac Arrhythmia Meeting
Division of Cardiology, University of Toronto

Case 2

14th Annual
Collingwood, Ontario,
February 10 -12, 2017



1: II AutoGain (10,3 mm/mV)

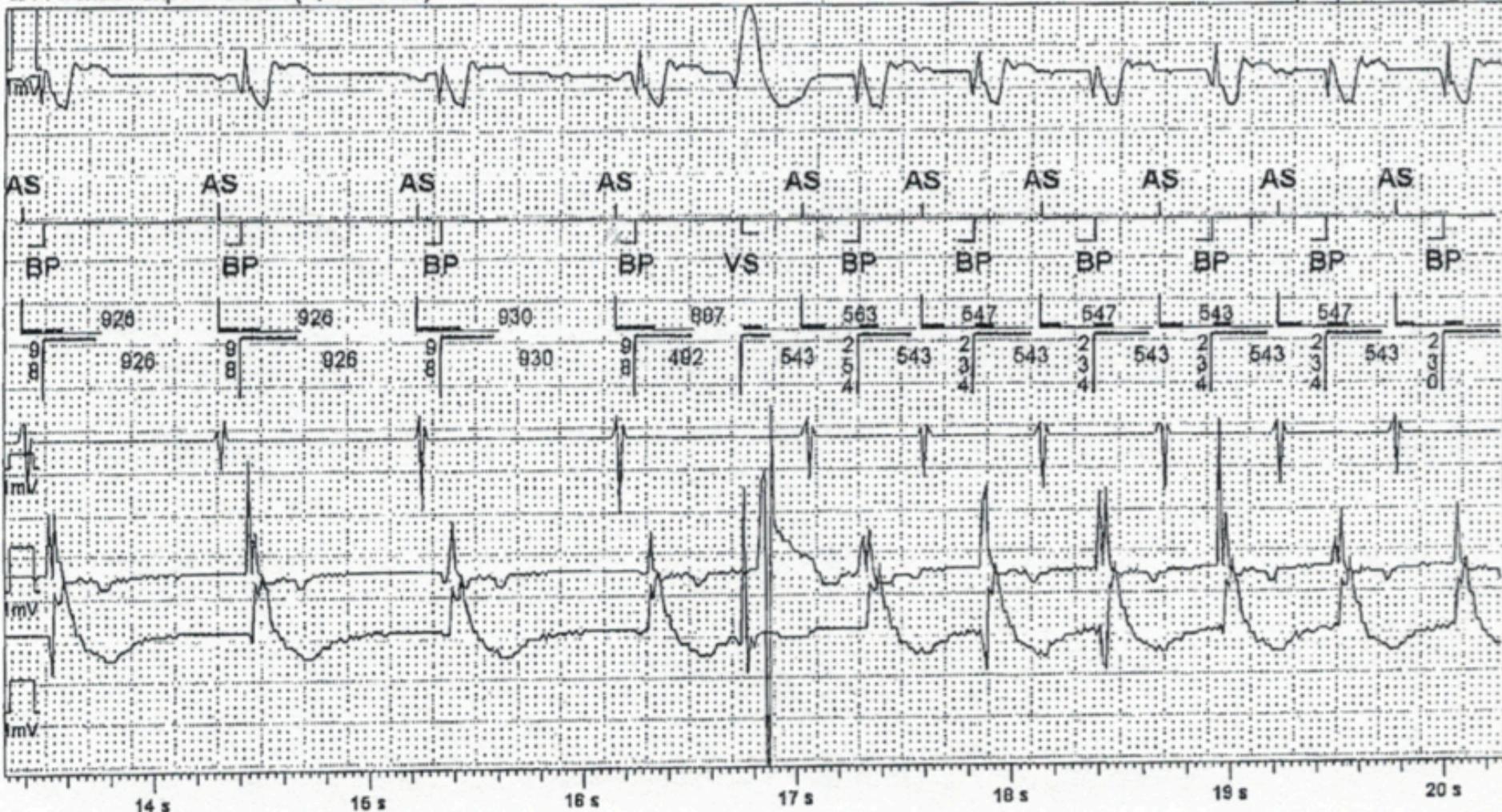
2: Markers

3: A Sense Amp AutoGain (2,0 mm/mV)

4: RV Bipolar AutoGain (5,4 mm/mV)

5: LV Distal tip 1 - Mid 2 AutoGain (4,0 mm/mV)

Sweep Speed: 25 mm/s



14th Annual

Collingwood, Ontario,
February 10 -12, 2017



1: II AutoGain (10,3 mm/mV)

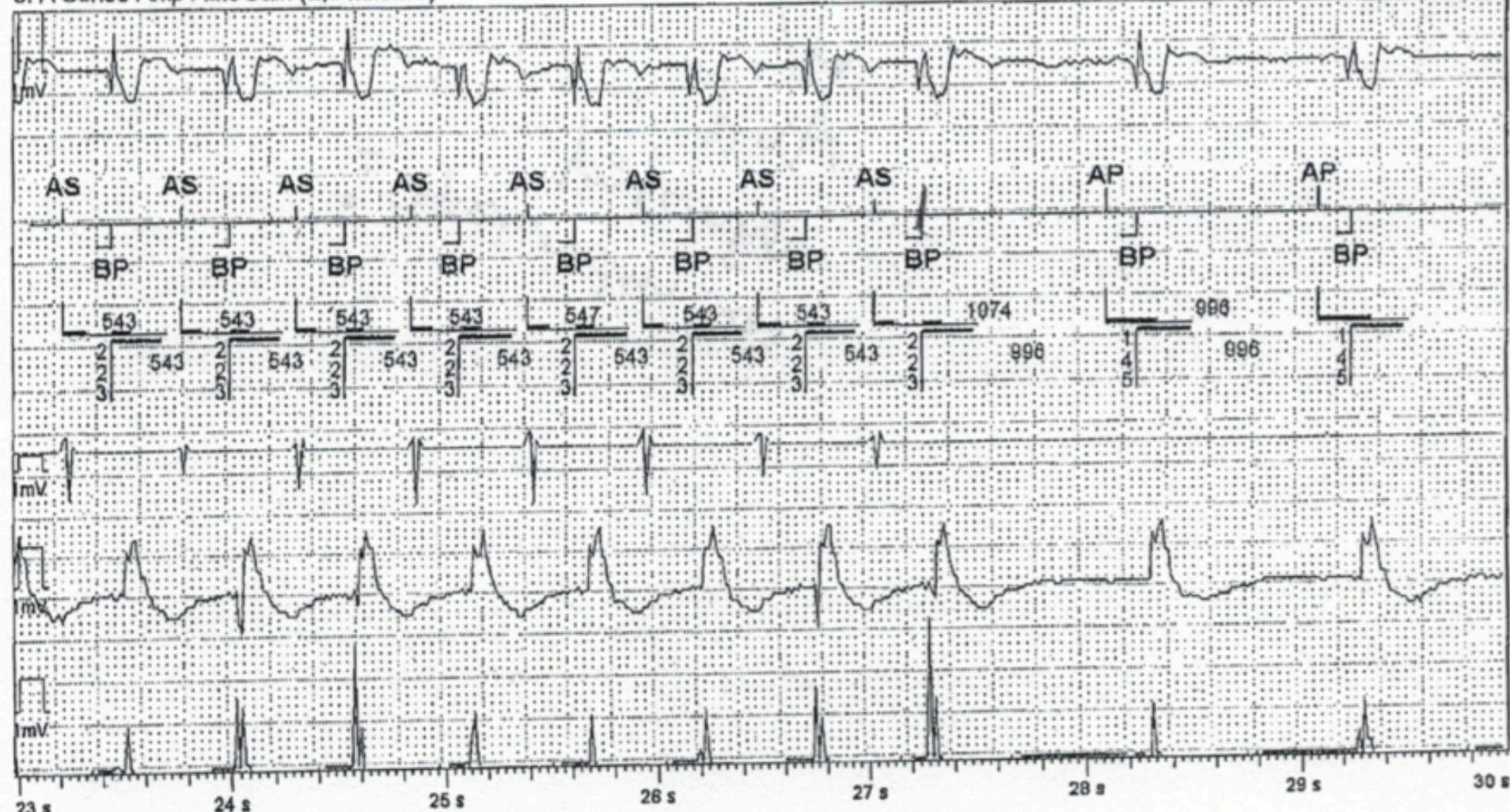
2: Markers

3: A Sense Amp AutoGain (2,0 mm/mV)

4: RV Bipolar AutoGain (5,4 mm/mV)

5: LV Distal tip 1 - Mid 2 AutoGain (4,0 mm/mV)

Sweep Speed: 25 mm/s



14th Annual

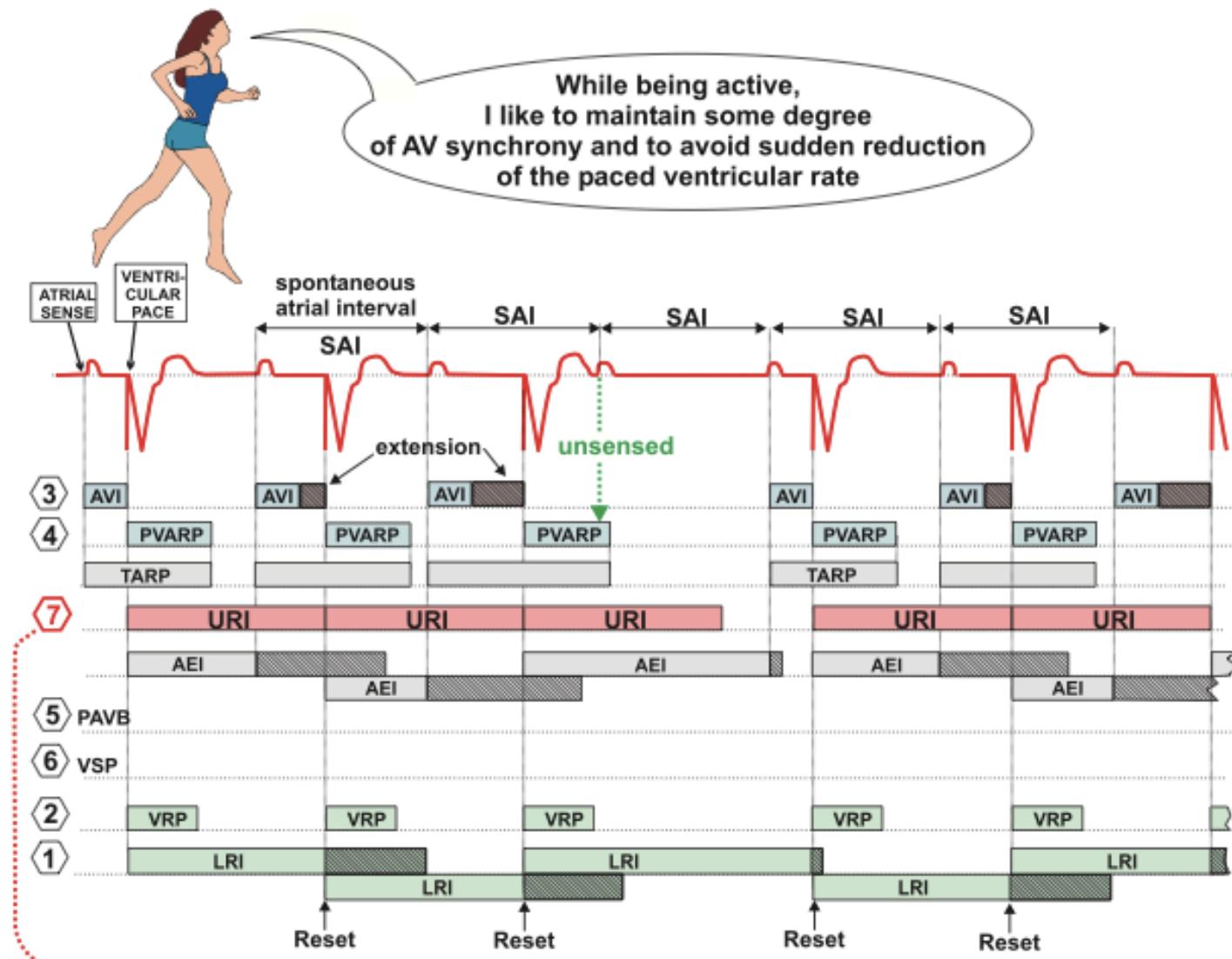
Collingwood, Ontario,
February 10 -12, 2017



Why is the A-V interval different during tachycardia?

- A. Because this is PMT
- B. Because this is an example of upper rate behaviour
- C. Because this is an example of upper rate behaviour AND PMT

ADDITION OF A SEVENTH TIMING CYCLE TO A DDD PACEMAKER TO AVOID ABRUPT 2:1 BLOCK



URI = UPPER RATE INTERVAL (programmable)

A pacemaker Wenckebach upper rate response can only occur if the pacemaker permits an upper rate interval (URI) longer than the pacemaker total atrial refractory period (TARP)



Séminaire
Winter Arrhythmia
School
Annual Cardiac Arrhythmia Meeting
Division of Cardiology, University of Toronto

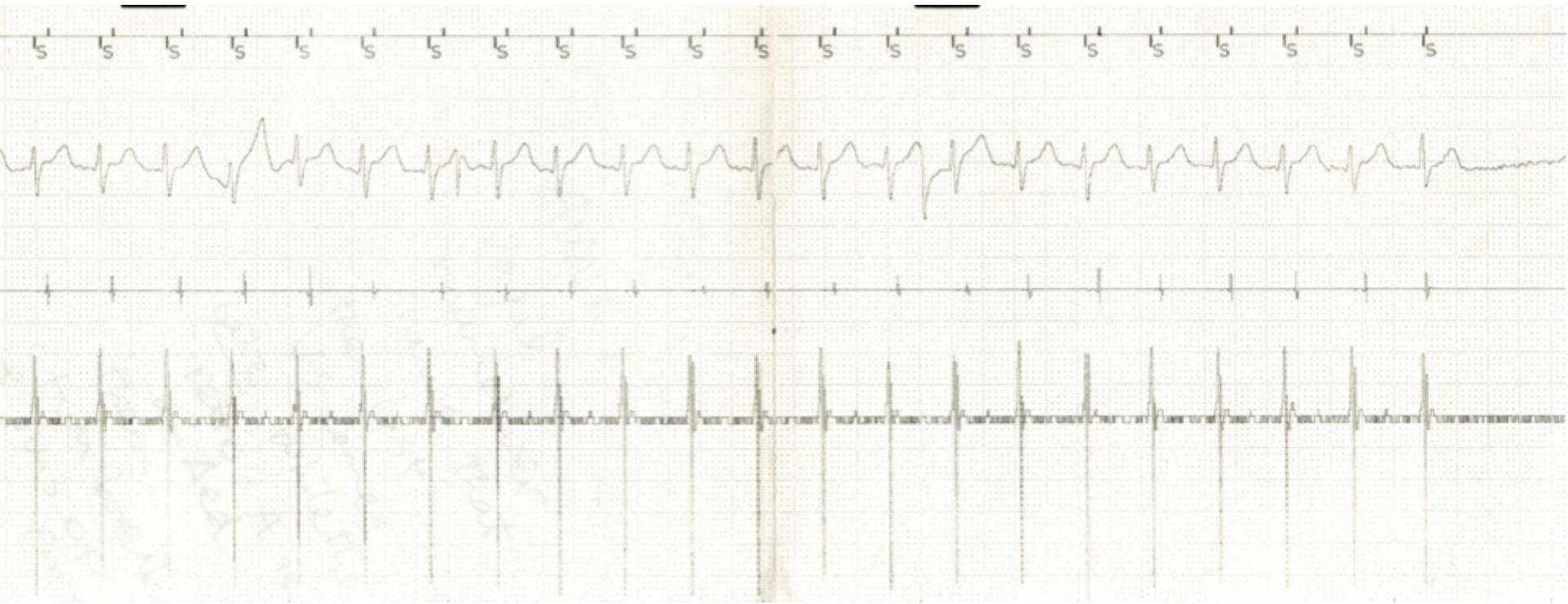
Case 3

14th Annual
Collingwood, Ontario,
February 10 -12, 2017



Séminaire
Winter Arrhythmia
School

*Annual Cardiac Arrhythmia Meeting
Division of Cardiology, University of Toronto*

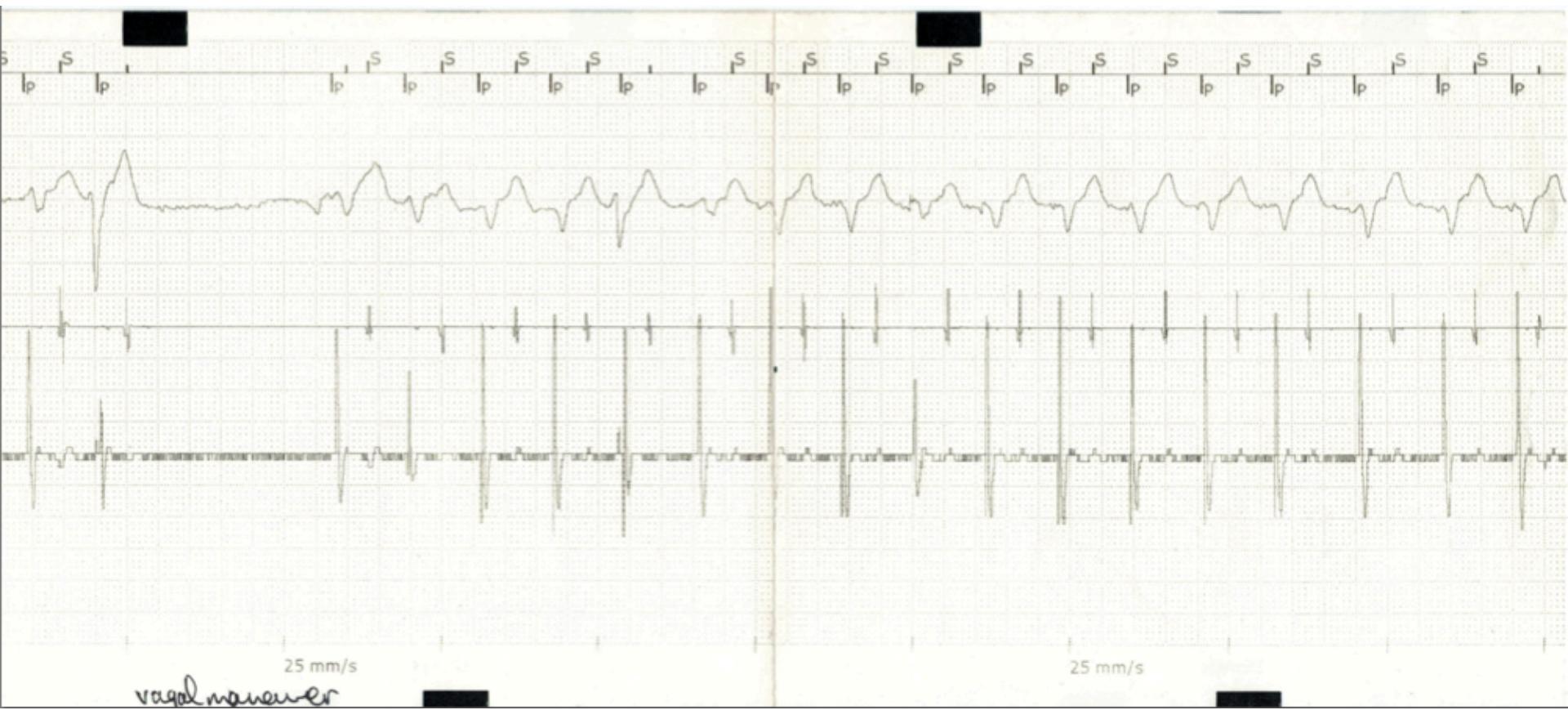


14th Annual

Collingwood, Ontario,
February 10 -12, 2017



Séminaire
Winter Arrhythmia
School
Annual Cardiac Arrhythmia Meeting
Division of Cardiology, University of Toronto



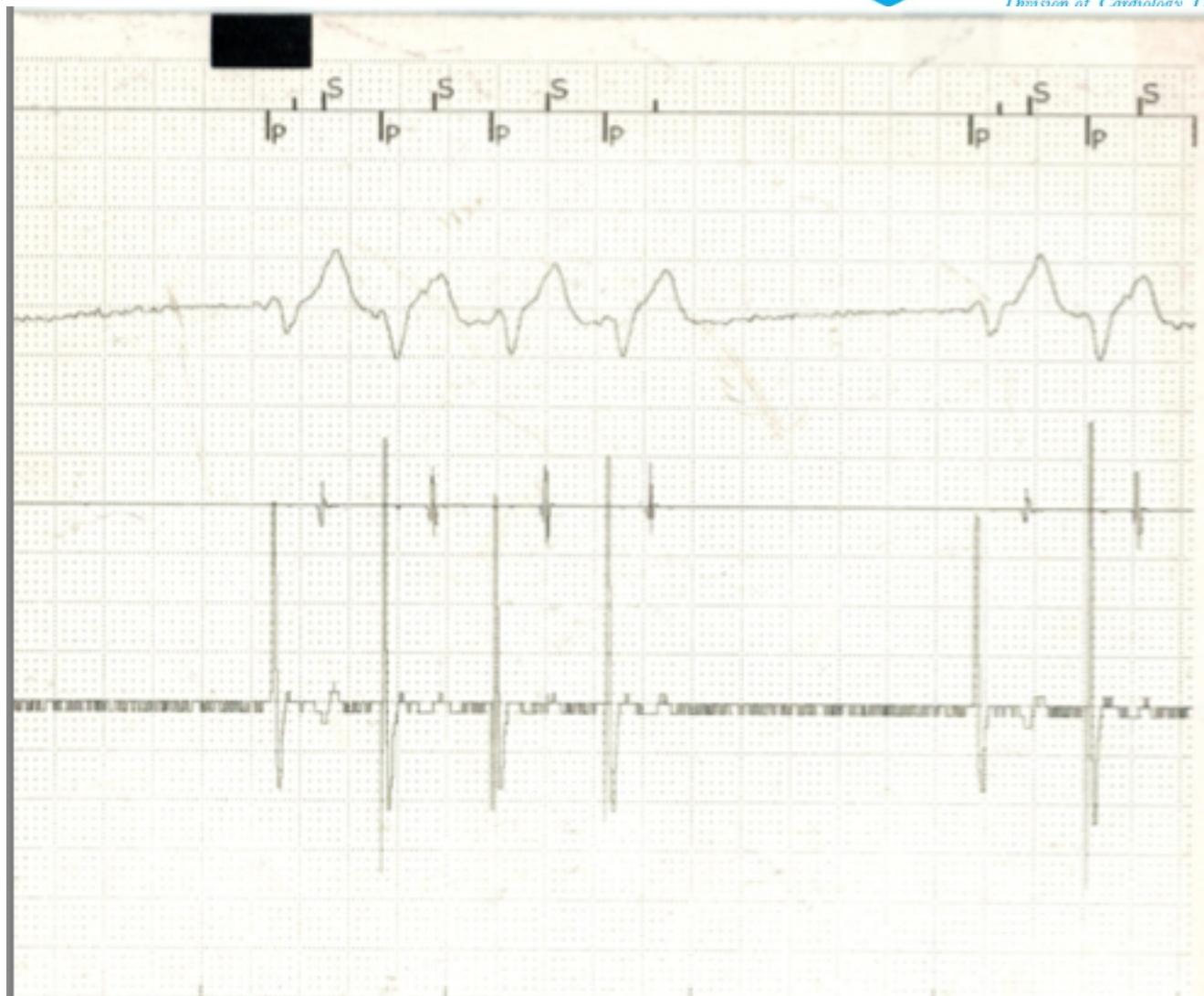
14th Annual
Collingwood, Ontario,
February 10 -12, 2017



Séminaire
Winter Arrhythmia
School

Annual Cardiac Arrhythmia Meeting

Division of Cardiology, University of Toronto



14th Annual

Collingwood, Ontario,
February 10 -12, 2017



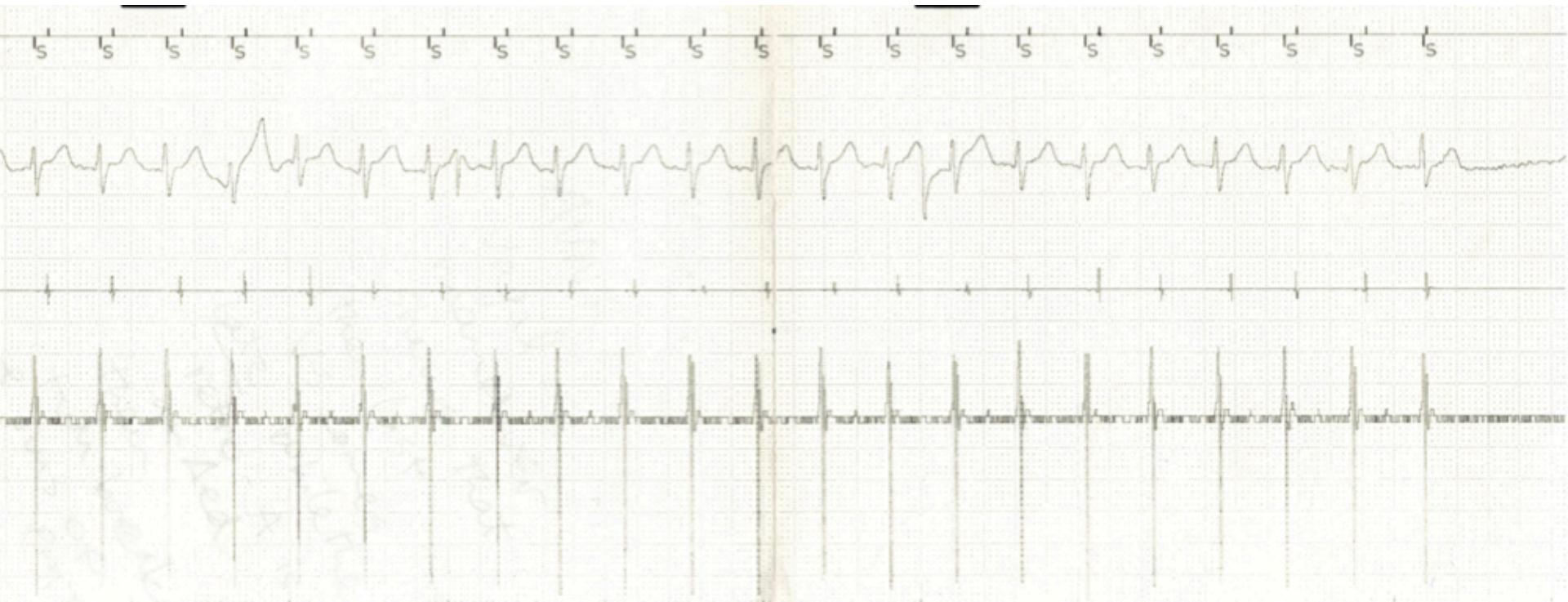
What do we know about the mechanism of the tachycardia?

- A. that this is sinus or atrial tachycardia
- B. that this is avnrt dependent on dual av nodal physiology and that only the antegrade limb is vagally sensitive
- C. only that this is avnrt
- D. none of the above



Séminaire
Winter Arrhythmia
School

*Annual Cardiac Arrhythmia Meeting
Division of Cardiology, University of Toronto*

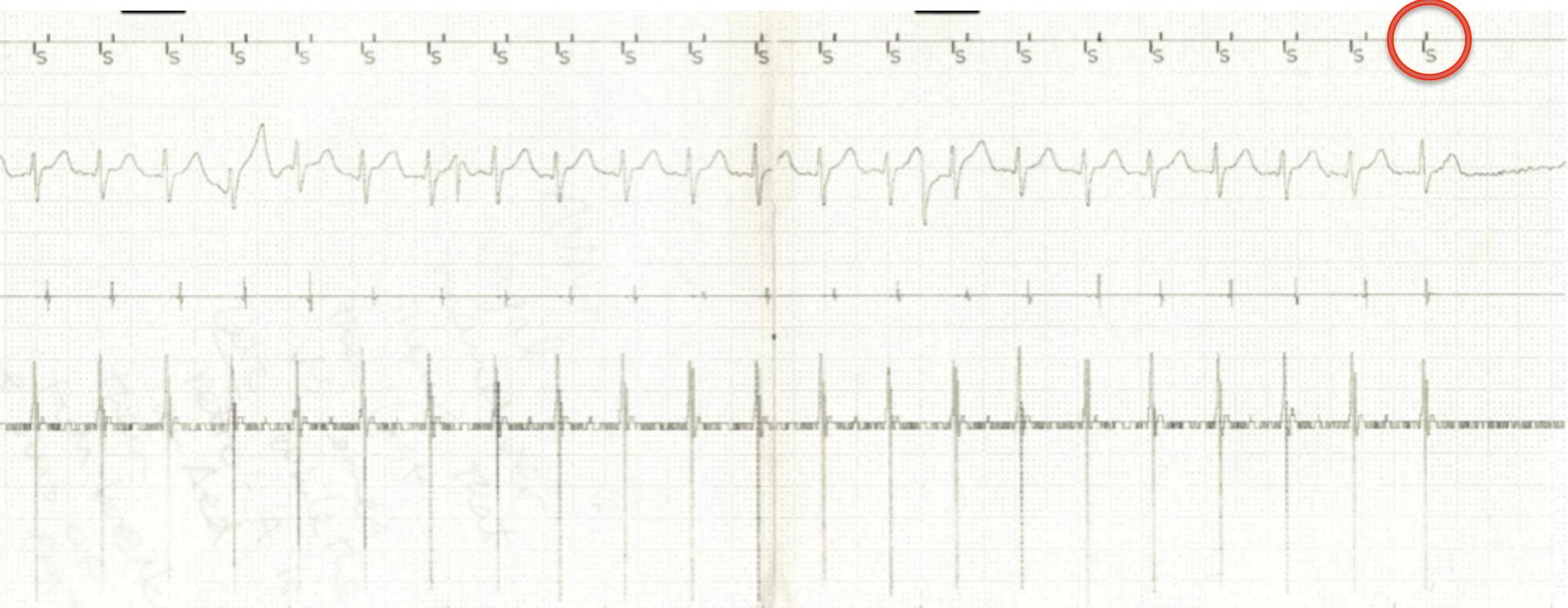


14th Annual

Collingwood, Ontario,
February 10 -12, 2017



Séminaire
Winter Arrhythmia
School
Annual Cardiac Arrhythmia Meeting
Division of Cardiology, University of Toronto

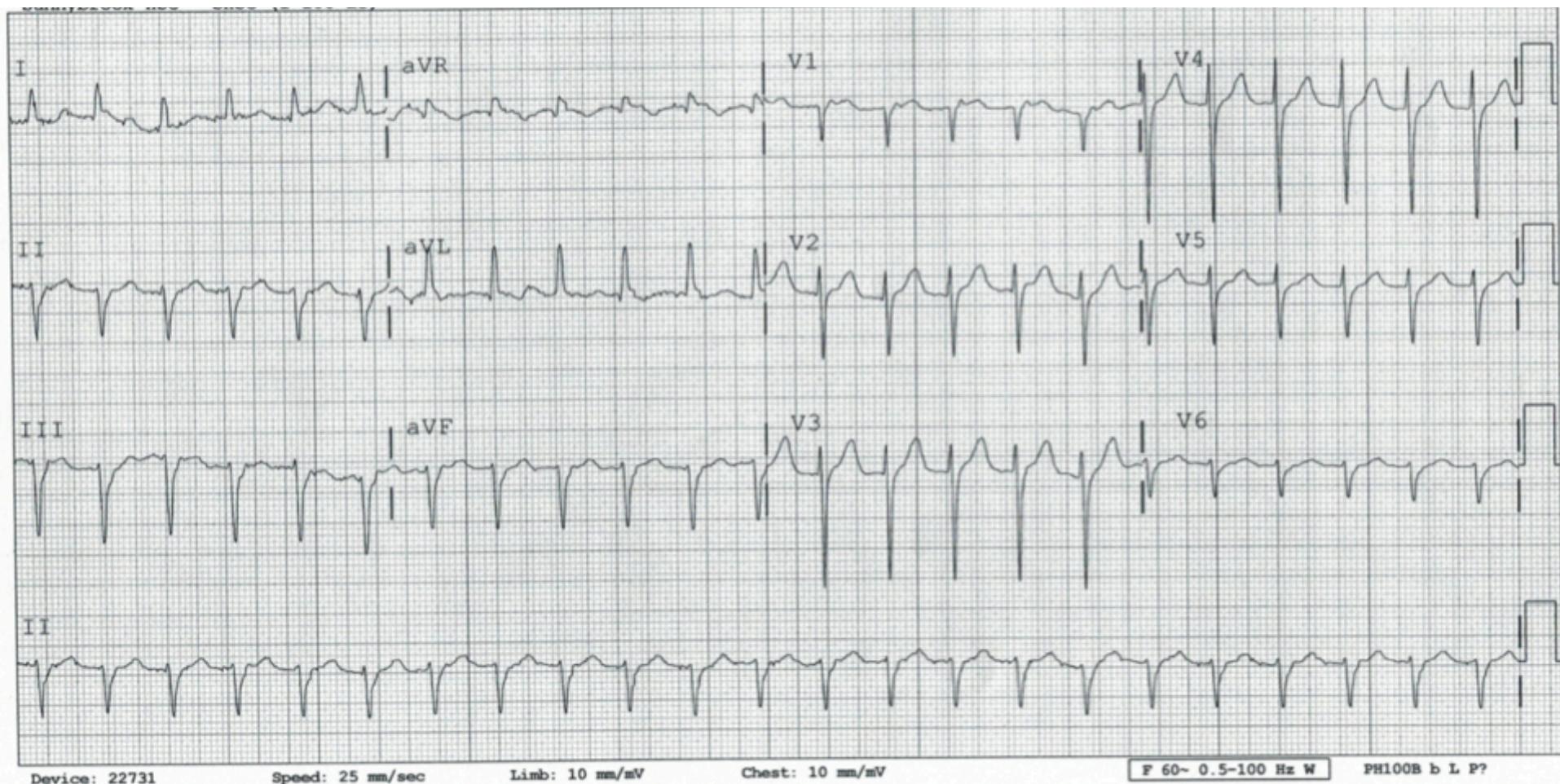


14th Annual

Collingwood, Ontario,
February 10 -12, 2017



Séminaire
Winter Arrhythmia
School
Annual Cardiac Arrhythmia Meeting
Division of Cardiology, University of Toronto



Device: 22731

Speed: 25 mm/sec

Limb: 10 mm/mV

Chest: 10 mm/mV

F 60~ 0.5-100 Hz W

PH100B b L P?

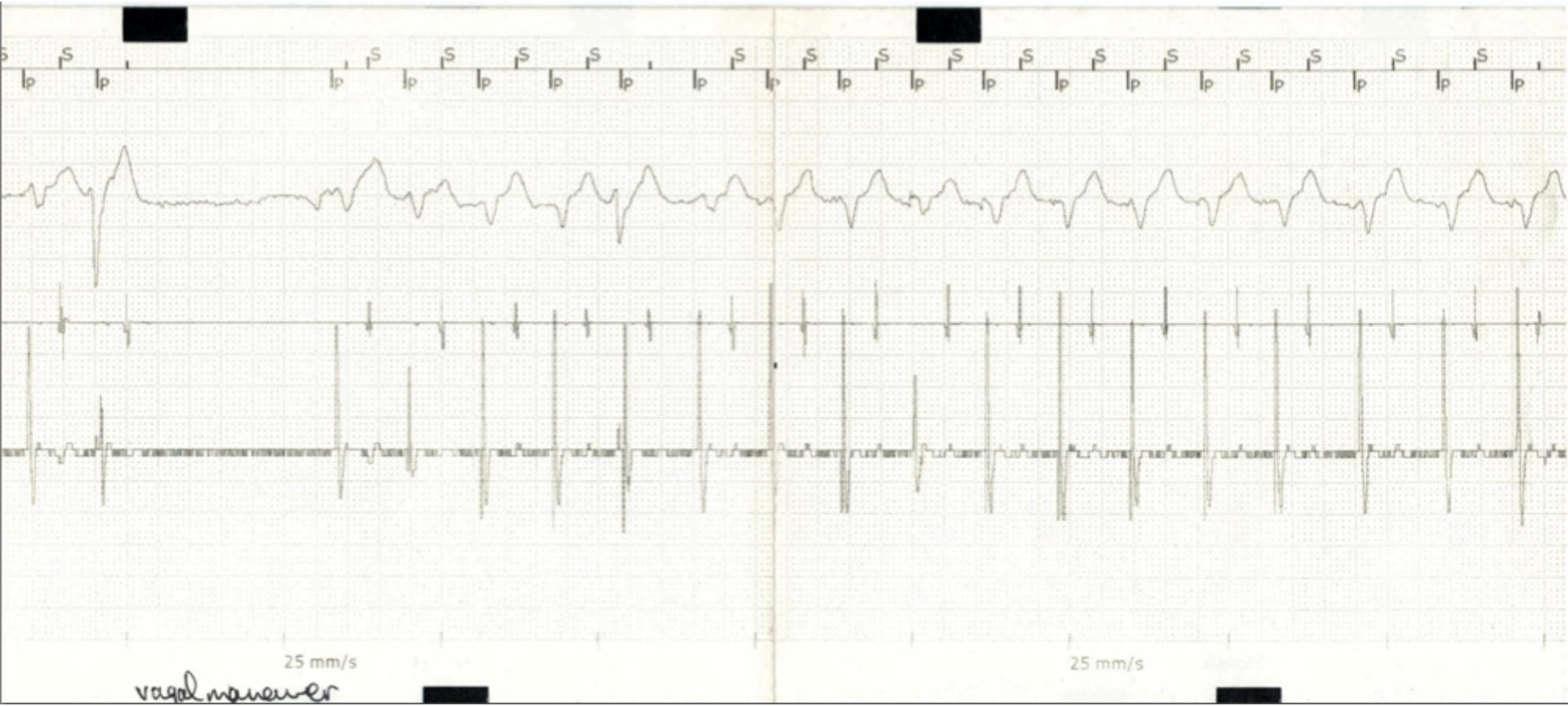
14th Annual
Collingwood, Ontario,
February 10 -12, 2017



What else did you notice about the strip after the vagal maneuver?



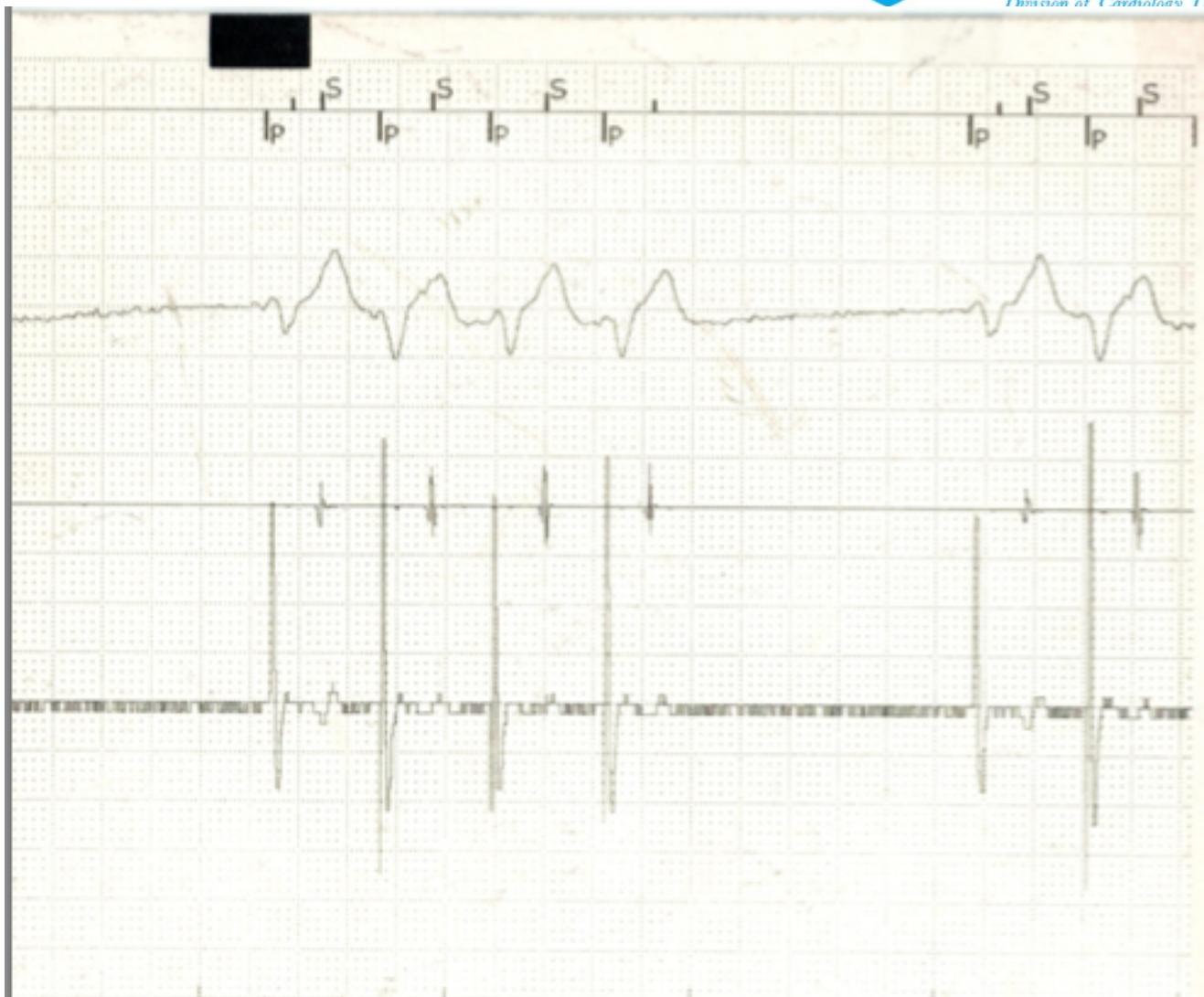
Séminaire
Winter Arrhythmia
School
Annual Cardiac Arrhythmia Meeting
Division of Cardiology, University of Toronto



14th Annual
Collingwood, Ontario,
February 10 -12, 2017



Séminaire
Winter Arrhythmia
School
Annual Cardiac Arrhythmia Meeting
Division of Cardiology, University of Toronto



14th Annual
Collingwood, Ontario,
February 10 -12, 2017



How did this subsequent PMT terminate?

- A. Vagal effect
- B. PVARP extension
- C. PAC
- D. atrial pace



Séminaire
Winter Arrhythmia
School
Annual Cardiac Arrhythmia Meeting
Division of Cardiology, University of Toronto

Case 4

14th Annual
Collingwood, Ontario,
February 10 -12, 2017

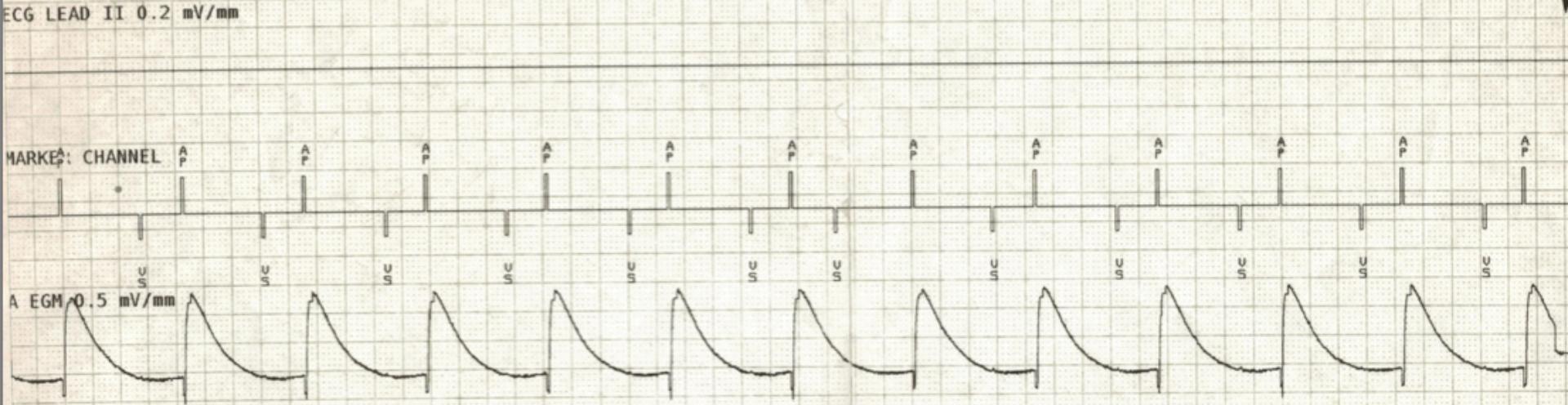


Séminaire Winter Arrhythmia School

Annual Cardiac Arrhythmia Meeting
Division of Cardiology, University of Toronto

Adapta L ADDR1 05/28/14 4:08:09 PM
CHART SPEED 25.0 mm/s

ECG LEAD II 0.2 mV/mm



14th Annual

**Collingwood, Ontario,
February 10 -12, 2017**



What most likely explains the early VS?

- A. a PVC
- B. dual AV nodal physiology
- C. decremental AV conduction
- D. something else



Séminaire
Winter Arrhythmia
School
Annual Cardiac Arrhythmia Meeting
Division of Cardiology, University of Toronto

Adapta L ADDR1 05/28/14 4:08:57 PM
CHART SPEED 25.0 mm/s

ECG LEAD II 0.2 mV/mm

PARKER CHANNELS

A EGM 0.5 mV/mm

14th Annual
Collingwood, Ontario,
February 10 -12, 2017