

**Pro Arrhythmic Atrial Pacing.**  
**How Poor Search AV Delay**  
**Programming Can Trigger**  
**Atrial Flutter**

***Terry Dillon Bart's Heart***  
***Centre***



# Case Study

- **73 M**
- **OOHVF 2011**
- **Boston Scientific Teligen DDDR implanted**
- **Feb 2017 – Routine ICD Clinic F/U**
- **Normal measurements**



# On Interrogation

- **AMS x 6 – previous 3 months**
- **AT x 3 – spontaneous initiation**  
**longest 10 secs**
- **AT x 3 – atrial paced initiation**  
**longest approx 3 days**
- **Similar previous long episodes**
- **Anticoagulated - warfarin**



● A

■ V

Shock

End



AP-Sr 625    PAC 435    AP-Sr 673    AP-Sr 295    (AF) 295    (AF) 258    (AF) 243    (AF) 260    (AF) 318    (AF) 283    AF 238    (AF) 263    (AF) 263    (AF) 268    (AF) 278    AF 250    (AF) 290    AF 265    (AF) 290    AF 275    (AF) 315    AF 265

VP-Sr 625    VP-MT 460    VP-Sr 610    VP-Sr 600    VP-Sr 593    VP-Sr 593    VP-FB 590    VP-FB 600    VP-Sr 603    VP-Sr 613    VP-Sr 613

ATR†    PVP→    ATR†  
ATR† ATR†    ATR-FB



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# Programmed Settings

- **Rate 60 – 130 ppm**
- **AV delays:**
  - Sensed 95- 170 ms**
  - Paced 110 – 200 ms**
- **AV Search delay switched on**



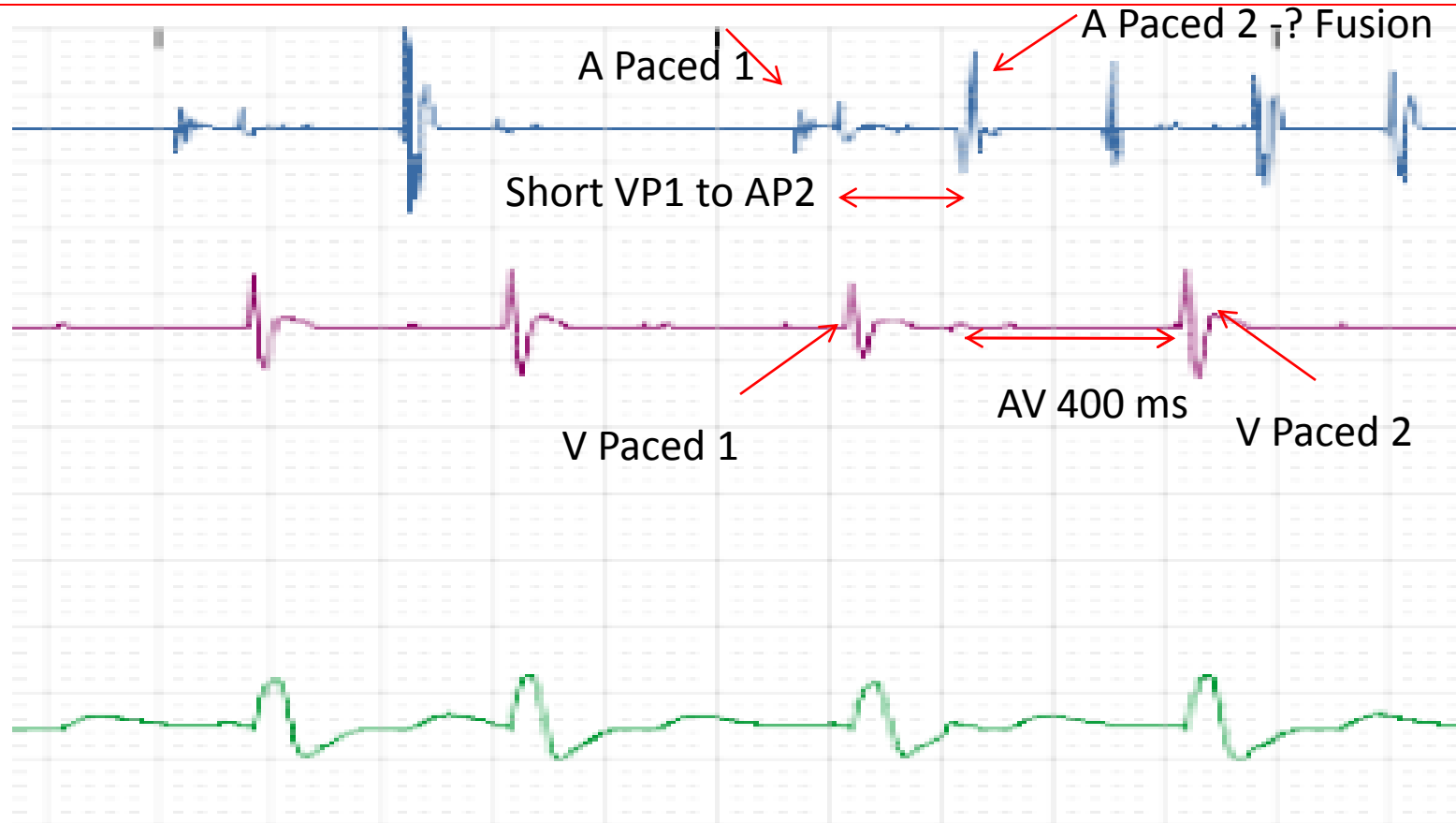
# Further Info

- **ULR – sinus bradycardia PR interval 360 ms**
- **A Pacing - 59 %**
- **V pacing – 56 % (increased from 33 %)**
- **Long PR – Increased prior bisoprolol dosage?**



● A

■ V



Shock

AP-Sr  
625

PAC  
435

AP-Sr  
673

AP-Sr  
295

(AF)  
295

(AF)  
258

(AF)  
243

VP-Sr  
625

VP-MT  
460

VP-Sr  
610

VP-Sr  
600



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# A Tachycardia Onset

- **Why short A pace 1 - A Pace 2 interval?**
- **Long AV delay AP 2 – VP 2**
- **AP2 – AT trigger or Incidental Fusion**
- **EGMs show identical recurrences**





# Search AV Delay

- **AV search - extends AVD 400ms**
- **32 ventricular cycles – followed by 8 AV search cycles**
- **Intrinsic AV conduction occurs – AV search maintained**
- **No intrinsic conduction – AVD normalises**



# Rate Response

- **Rate response – V to V timing**
- **Atrial pacing – fits to V-V interval**
- **Shortened VP to AP interval – accommodates AV delay duration**



# Algorithmic Interaction

- **Rate increase from accelerometer**
- **Short V-V interval**
- **Long extended AV delay**
- **Short paced A-A – short V-A**



# Action

**Search AV delay switched off!**



# Remote F/U July 2017

- **AHR events significantly reduced**
- **Longest episode < 4 mins – no EGM**
- **All others max 10 secs**
- **Histos – AHR 30% reduced to 0%**
- **Susceptible - AT (A Flutter)?.**
- **Extensive AVD duration – likely accentuates condition.**



# Analysis and Conclusion

- **AV search - use with care**
- **Consider PR duration**
- **Identify Wenckebach cycle length**
- **Premature A pacing – functional ectopic**
- **Long AVD / PR interval – diastolic disruption.**



# Thank you!



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