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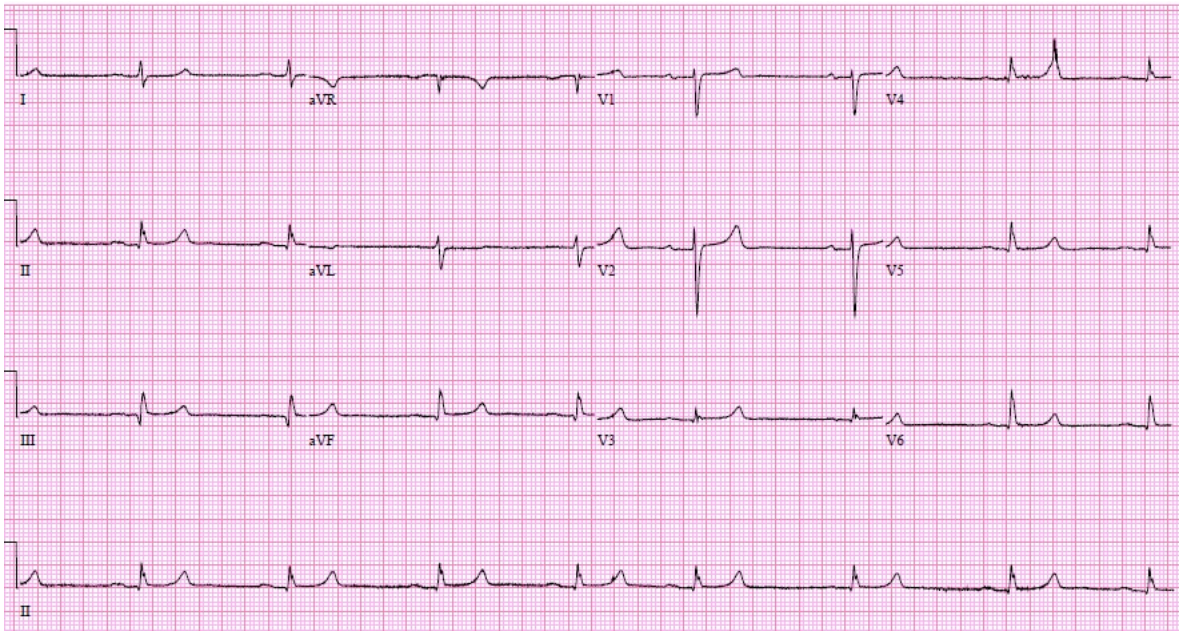
Cast 29 – BRASH Syndrome

80yr old male from home with bradycardia is taken directly to resuscitation cubicle of your regional ED on arrival by ambulance. He had been unwell for 3 days with lethargy, vomiting, diarrhoea and decreased urine output. His comorbidities include T1DM, chronic renal impairment and OSA. His regular medications are aspirin, spironolactone, metoprolol and mirtazapine.

His ECG on arrival is below.



Q1. Describe two (2) abnormalities on this patient's ECG? (2 marks)

- HR: sinus bradycardia rate 48
- Electrical: first degree heart block (PR interval 220ms), narrow QRS 90ms

There is no history or suggestion of accidental or intentional medication overdose.

His vital signs and point of care tests currently are below:

GCS 15 HR 35 BP 75/50 Sats 95% on 2L RR 18 Temp 37	pH 7.20 pCO2 35 Bicarb 12 K 7.0 Lactate 9.6 Glucose 10 Ur 29 Cr 339

You suspect this is a case of BRASH syndrome.

Q2. List the 5 components that make up the definition of BRASH syndrome (5 marks)

- **B**radycardia
- **R**enal failure
- **A**V node blocker drug
- **S**hock
- **H**yperkalaemia

Q3. State five key management steps for his clinical state (5 marks)

- Addressing bradycardia and shock - Trial of Atropine 0.6mg IV followed by Adrenaline 10-20mcg bolus +/-Infusion.
- Hyperkalaemia management - IV Calcium Gluconate 2.2mmol (repeat dose if needed)
- Other adjunctive temporising hyperkalaemia treatment (IV insulin/10 unis actrapid and 50ml of 50% Dextrose, Salbutamol 10-20mg nebulised)
- Careful IVF resuscitation for hypovolemia (titrate to MAP > 65 and urine output). May consider Sodium Bicarbonate (isotonic solution) as an option
- Furosemide once adequately resuscitated and if anuric, for Dialysis.

NOTE: Atropine may not be effective and is likely only a temporary measure while you set up the few treatment steps. Most BRASH patients in shock respond to Adrenaline. The key message is that you need to address several aspects of this pathophysiology simultaneously.

Other potential questions

Q. Outline causes of symptomatic bradycardia.

- **Cardiac**
  - Inferior MI (involving RCA)
  - Sick sinus syndrome
- **Neurocardiogenic/reflex-mediated**
  - Increased ICP
  - Vasovagal reflex
  - Hypersensitive carotid sinus syndrome
  - Intra-abdominal hemorrhage (i.e. ruptured ectopic)
- **Metabolic/endocrine/environmental**
  - Hyperkalemia
  - Hypothermia (Osborn waves on ECG)
  - Hypothyroidism
    - Myxedema coma
  - Hypoglycemia (neonates)
- **Toxicologic**
  - B-blocker
  - Ca-channel blocker
  - Digoxin toxicity
  - Opioids
  - Organophosphates
  - Ethanol
  - Clonidine
- **Infectious/Postinfectious**
  - Chagas disease
  - Lyme disease
  - Syphilis
- **Other**
  - Brash syndrome