

Management of Tachycardia

Scenario 1

On the afternoon trauma list, you administered a spinal anaesthetic to an otherwise fit 84 year old lady. She was stable throughout surgery (a left DHS). In recovery, however, she develops a tachycardia of rate 140 bpm; her systolic blood pressure is well maintained at 110mmHg. The recovery nurse records a 12 lead ECG (Fig 1)

What does this ECG show?

AF with fast ventricular response.

What is your immediate management?

(Note that BP is well maintained)

Ensure adequate intravascular volume e.g. fluid challenge with colloid 250ml.

Check ABG –

?Hb (aim > 8.0);

?serum potassium (aim 4.5 – 5.0 mmol/l); replace at up to 20mmol/hour.

Check serum magnesium on lab sample (aim > 1.0 mmol/l)

What drugs could be used?

Esmolol – rate control

Intravenous infusion 50 – 200 microg/kg/min

Peak effects within 5 – 10 minutes of administration; no effect within 20 minutes of cessation of infusion.

Metoprolol – rate control

1-2mg/min up to 5mg; repeat after 5 minutes if required; total dose 10-15mg

OR

Digoxin – rate control

500 – 750 microg iv; (max 25 microg/min)

Max effects ~2 hours after intravenous administration

Note increased risk of toxicity in the elderly; with renal impairment; with co-existing hypokalaemia.

Note risk of pharmacodynamic interaction between beta-blockers and digoxin – risk of heart block.

If no response to initial measures, consider

Amiodarone – rate control and chemical cardioversion

300 mg iv over 20 – 60 minutes.

900mg iv over 24 hours.

Again risk of pharmacodynamic interaction between digoxin, beta-blockers and amiodarone.

NB Signs of instability (hypotension, chest pain, cardiac failure) may require urgent synchronized DC cardioversion as per Resuscitation Council guidelines.

Outline further management of this patient

Keep in recovery until rate controlled

Consider admission to HDU environment

Refer to medical team for ongoing management of arrhythmia

Check troponins 12 hour later

Scenario 2

You are anaesthetizing a 75 year old man for a repair of an inguinal hernia. He is somewhat vague about his past medical history, but says that he had a "heart attack" 4 years ago and was fitted with a pacemaker. He denies any current cardiorespiratory symptoms. His wife has given you his list of medications – he is taking aspirin, simvastatin, bisoprolol and ramipril.

Following induction, this rhythm is displayed on the monitor (Fig 2).

What is this rhythm?

VT

What are the salient features on this rhythm strip?

Broad complex tachycardia (QRS duration > 120ms)
Disassociated P waves
Fusion beats
Capture beats

The patient's blood pressure is 100mmHg systolic. You ask the ODP to record a 12 lead ECG (Fig 3).

What features suggest that this rhythm is ventricular in origin?

A wide QRS tachycardia is VT until proven otherwise. Features suggesting VT include:-

- *evidence of AV dissociation (occurs in 25%)*
 - *independent P waves*
 - *capture or fusion beats*
 - *beat to beat variability of the QRS morphology*
- *very wide complexes (> 140 ms)*
- *the same morphology in tachycardia as in ventricular ectopics*
- *history of ischaemic heart disease*
- *concordance (chest leads all positive or negative)*
- *RSR complex in V1 (with positive QRS in V1)*
- *QS complex in V6 (with negative QRS in V1)*

How are you going to manage this arrhythmia?

Postpone elective surgery

If patient is haemodynamically stable:

Amiodarone 300mg iv over 20-30 minutes; then 900mg iv over 24 hours.

If patient is haemodynamically unstable

Synchronised DC shock as per Resuscitation Council guidelines.

You record another 12 lead ECG to clarify your diagnosis. Before you can give any anti-arrhythmic drugs, you observe this on the ECG (Fig 4)

What has happened and why?

The patient is now in sinus rhythm. His pacemaker also has a defibrillator function, which has discharged.