Junctional Ectopic Tachycardia (JET) Guidelines

Date Initiated___/___/___

Patient Barcode Label

Notes: (1) This pathway is a general guideline and variations can occur based on professional judgment to meet individual patient needs. (2) This is a quality improvement document and should not be a part of the patient's medical record.

Suspected Junctional Ectopic Tachycardia

- Obtain 12 lead ECG *and* atrial ECG (when atrial wires present)
- Diagnosis of JET generally requires:
  - --Heart rate greater than 170 beats per minute
  - --QRS morphology similar to the sinus rhythm QRS complex
  - --Atrioventricular dissociation
  - --Ventricular rate faster than the atrial rate

-- At risk populations:
- --Infants less than 6 months,
- --Bypass time greater than 75 minutes,
- --Heterotaxy
- --Preoperative/prenatal arrhythmias

--Surgeries with higher incidence of JET:
- --VSD repair
- --AV canal repair
- --TOF repair
- --TAPVR repair
- --Single Ventricle operations (BT shunt and Fontan)

-- Please call cardiology to confirm rhythm is consistent with JET

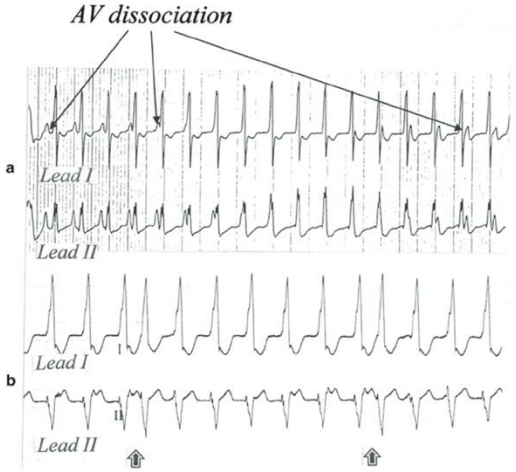

Fig. 53.10 (**a, b**) Junctional Ectopic Tachycardia (JET). (**a**) Rhythm strip demonstrates JET with AV dissociation (*arrows* identify P waves), (**b**) rhythm strip of JET with intermittent short RR intervals (*double arrows*) due to sinus capture beats

Munoz R, et al. Critical Care of Children with Heart Disease. Springer, 2010.

After Diagnosis of JET (*in coordination with cardiology*):

General Initial Management:

- Adequate analgesia and sedation (dexmedetomidine & fentanyl)
- Keep mildly hypothermic (35 – 36° C)
- Ensure patient is euvolemic with adequate RV filling
- Keep electrolytes within normal range including Mg (Mg level of > 2.5 mg/dL)
- Correct acidosis/optimize acid base status
- If possible, reduce catecholamine infusions
- Test and have pacemaker set at bedside for overdrive pacing
    - pace only at "physiologic" rates appropriate for age
        - heart rates well above physiologic rates might impair ventricular filling
- *Please call cardiology if antiarrhythmics are needed*

Antiarrhythmic Medications (*in coordination with cardiology*):

Dexmedetomidine

Dosing:

1. Bolus 0.5 mcg/kg IV x 1-2 times
2. Infusion 0.5 – 2 mcg/kg/hr

Mechanism of Action: α_{2A} Agonist with side effect of bradycardia, decreases release of norepinephrine, increases vagal output

Precautions:

1. Have external pacemaker available for overdrive pacing

Caveats:

1. Infants often require higher dosing than older children
2. Can worsen bradyarrhythmias and third-degree heart block

Amiodarone

Dosing:

1. Bolus: 1 mg/kg IV over 10 min repeated to max 20 mg/kg IV
2. Infusion: 5-20 mcg/kg/min IV

Mechanism of Action: Class III Antiarrhythmic (potassium-channel blocker) – increases AP duration and prolongs refractory period of cardiac muscle

Precautions:

1. Attending present at bedside for administration
2. External pacemaker available for overdrive pacing
3. Volume/additional vasopressors for hemodynamic instability

Caveats:

1. If more than 2 boluses needed, consider infusion
2. Check baseline thyroid function (and consider q2week rechecks for infusion duration > 1 week)
3. Consider vasopressin infusion as an alternative agent to catecholamines for hypotension with amiodarone

Procainamide

Dosing:

1. Bolus: 5 mg/kg IV load over no faster than 10 minutes can repeat x 2
2. Infusion: 10 – 40 mcg/kg/min IV

Mechanism of Action: Class IA Antiarrhythmic – binds to fast sodium channels inhibiting recovery after repolarization

Precautions:

1. External pacemaker available for overdrive pacing
2. Hypotension can be seen during bolus dosing
3. Require Procainamide/NAPA levels sent STAT for titration

Caveats:

1. Monitor QTc prolongation with daily EKG's
2. Can cause bone marrow suppression and lupus-like syndrome

Esmolol

Dosing:

1. No bolus dosing for post-operative patients
2. Infusion: 50-300 mcg/kg/min IV

Mechanism: Class II Antiarrhythmic – β-1 adrenergic antagonist (blocks epinephrine and norepinephrine in myosites)

Precautions:

1. No bolus needed – rapid on/off effect
2. Use with caution in immediate post op patient secondary to negative inotropic effects, decrease in contractility

Caveats:

1. Do not use if patient is requiring epinephrine or norepinephrine infusions for blood pressure management

Overdrive Pacing:

- Nearly all arrhythmia reduction methods will (ideally) reduce the heart rate
- Overdrive pacing allows an increase in the heart rate with AV synchrony, which most often increases cardiac output
- Physiologic appropriate settings should be used for overdrive pacing
- Many patients will tolerate AAI pacing when AV conduction is not delayed. If there is heart block, DDD pacing might be required. *Please consult cardiology to assist with external pacemaker settings.*

Extracorporeal support:

- Please contact CT surgery immediately for hemodynamically significant JET or JET which is NOT responding to amiodarone

References:

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