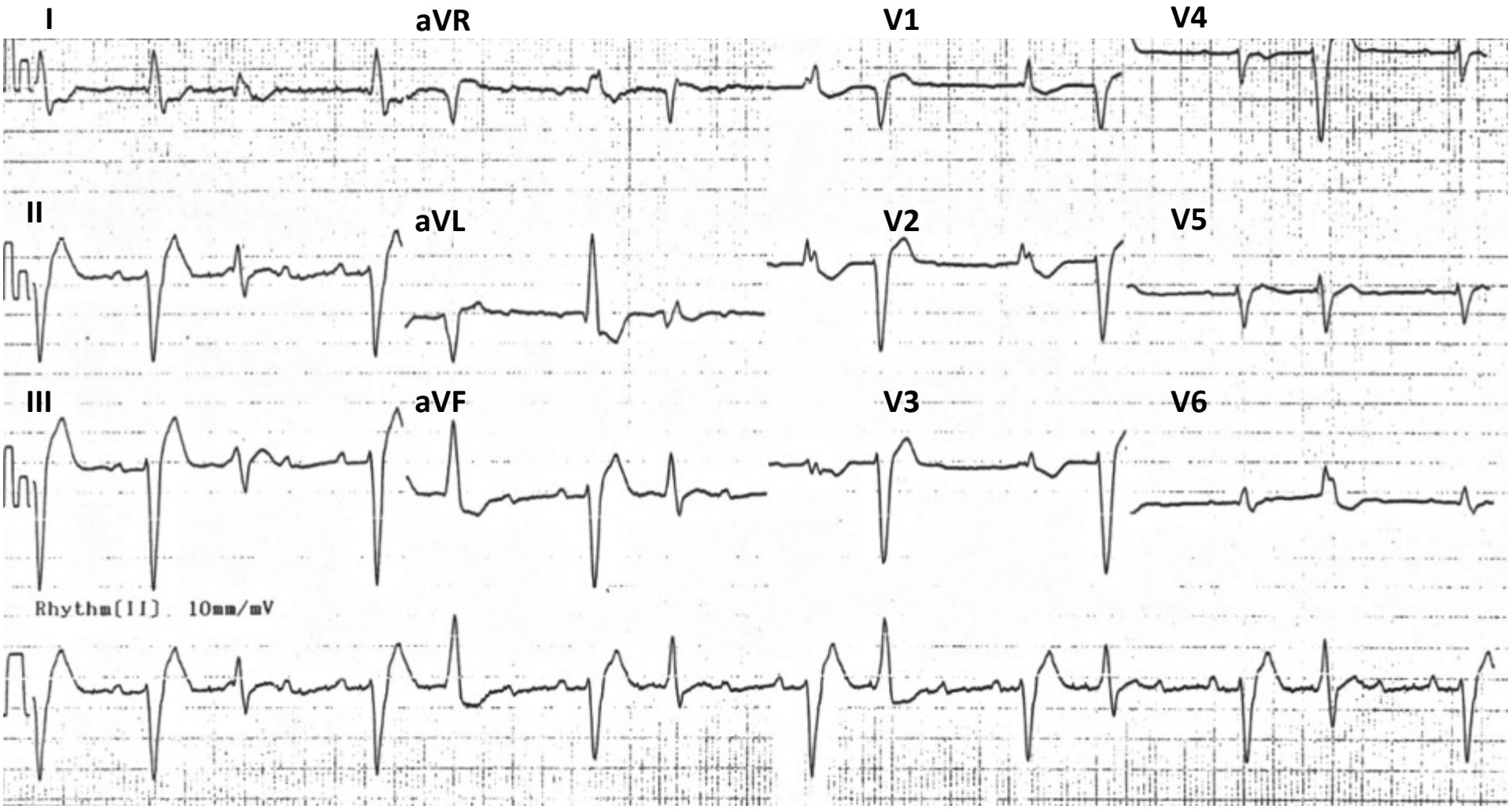
Triage EKG—Unit 11, Case 43



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Unit 11, Case 43—Digoxin Toxicity

What is your interpretation of the EKG?

History/Clinical Picture—Young child with GI symptoms and ectopy. Patient is visiting his grandfather who may have toxic medications in the home.

Rate—Ventricular rate is 96

Rhythm—atrial or sinus tachycardia with a high grade 2nd degree AV block with frequent PVCs

Axis—Left Axis (I positive, aVF negative, II negative)

P Waves—Present at a rate of 150, normal morphology

Q, R, S Waves—RBBB morphology present (RSR' in V1/2)

T Waves—TWI V1-3

U Waves—Difficult to assess but none obvious

PR Interval—Difficult to assess but appears to be approximately 240ms

QRS Width—Difficult to assess but appears to be approximately 120ms

ST Segment—Difficult to assess with degree of ectopy

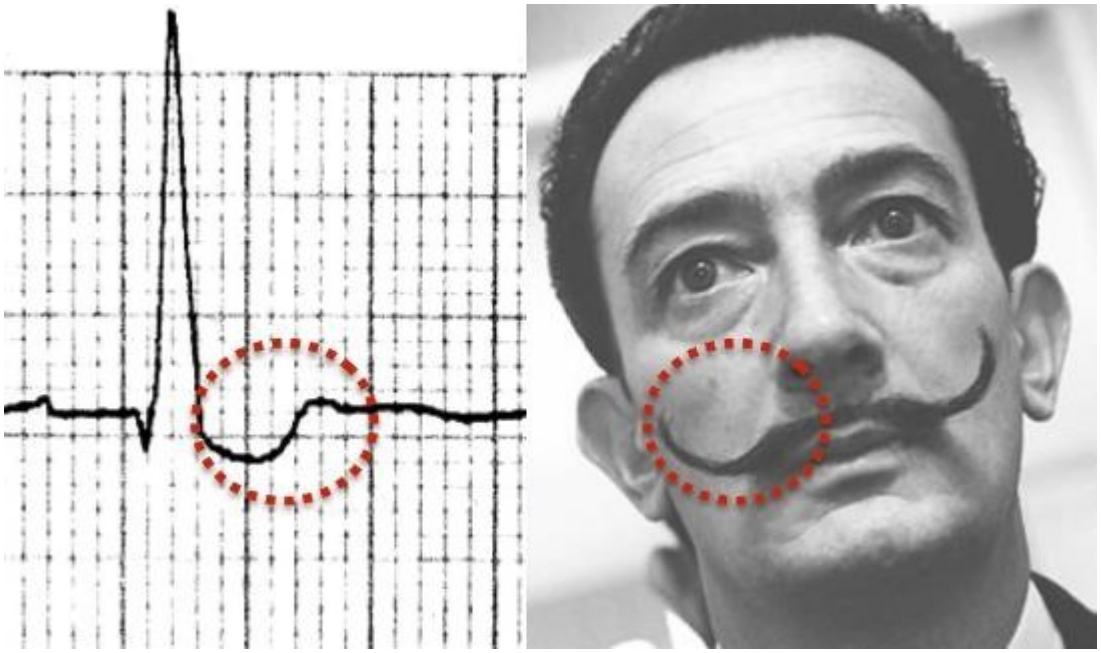
QT Interval—Very difficult to assess with degree of ectopy as essentially every beat is followed by a PVC

Diagnosis: Atrial tachycardia with high grade 2nd degree AV block and frequent PVCs, very suggestive of digoxin toxicity.

Discussion: This patient presents with digoxin toxicity, likely an acute overdose of his grandfather's medication. Digoxin is a Na/K ATPase inhibitor with positive inotropic and negative chronotropic effects that is commonly used to treat atrial fibrillation and congestive heart failure. It has a narrow therapeutic index and symptoms of toxicity include GI upset, unstable tachy– and brady– dysrhythmias, visual disturbances, and altered mental status. Classic ECG changes of digoxin are due to increased automaticity leading to supraventricular arrhythmias and delayed AV node conduction leading to a slow ventricular response. Atrial fibrillation or atrial flutter with a bradycardic ventricular rate are classic. Frequent PVCs, high grade AV blocks, and VT (particularly bidirectional VT) are also seen in digoxin toxicity. Immediate labs include a stat potassium level, creatinine (as digoxin is primarily cleared by the kidneys) and serum digoxin level. Definitive therapy for digoxin toxicity is the administration of digoxin-specific antibody Fab fragments (tradename Digibind). Indications for Digibind in acute toxicity include: cardiac arrest or life threatening dysrhythmia, serum K > 5 mEq/L, >10mg ingested (adult) or >4mg ingested (child), or serum digoxin level > 12 ng/mL. Indications for Digibind in chronic toxicity are slightly different.

Resource Links: Life in the Fast Lane — great overview Dr. Steve Smith's Blog – good case

Digoxin Effect



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Digoxin commonly causes ST wave changes and most frequently causes sloping ST depression and slurring of the T wave which is called **digoxin effect**. The morphology of this change is frequently referred to as the Salvador Dali Moustache which is demonstrated very well by the picture from Life in the Fast Lane above. It is very important to note that ST wave changes do not mean a patient necessarily has digoxin toxicity. Other possible changes include prolonging the PR interval, T wave peaking, and tall U waves.

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