

ECG CASE OF THE MONTH

Confusion and a Slow Heart Rate

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Police found a confused 93-year-old woman wandering the streets and brought her to the hospital where an electrocardiogram (ECG) was recorded (Figure).

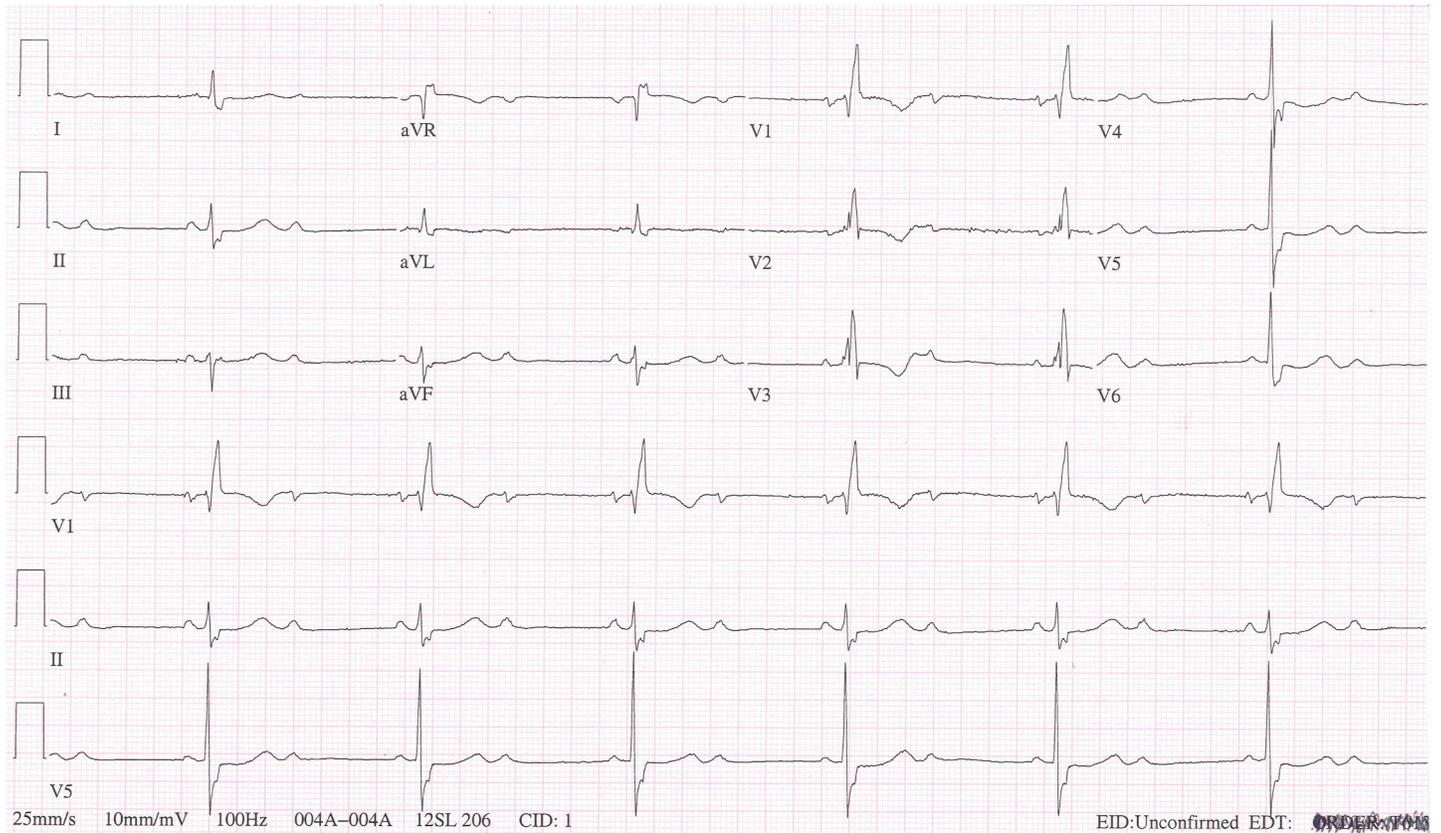


FIGURE: Electrocardiogram in a confused 93-year-old woman. See text for explication.

What is your diagnosis?
Explication is on page 25.

DIAGNOSIS: *Sinus rhythm at a rate of 79 beats/minute with 2:1 second degree atrioventricular (AV) block and ventriculophasic sinus arrhythmia. P waves in lead V1 indicate left atrial enlargement with a terminal negative deflection ≥ 0.1 mV in depth and ≥ 0.04 seconds in duration. QRSs show right bundle branch block with a QRS duration of 0.13 seconds, broad S waves in leads I, II, aVL, V5, V6, broad R waves in lead aVR, and broad R' waves in lead V1.*¹

The AV block is most likely the result of bilateral bundle branch block, with complete block in the right bundle and 2:1 block in the left bundle. A less likely explanation is that the 2:1 AV block is above the bifurcation of the His bundle, e.g., in the AV node, in a patient who also has right bundle branch block.¹ Ventriculophasic sinus arrhythmia may occur with various forms of AV block, but is most typically seen with 2:1 AV block. The sinus arrhythmia is characterized by P-P intervals being shorter when they contain a QRS than when they don't. This difference in P-P intervals is slight, but consistent in this patient's ECG (Figure). A likely explanation for the irregularity is that the P-P interval is prolonged by an increase in parasympathetic tone and a decrease in sympathetic tone resulting reflexly from stimulation of the carotid sinus by systolic ejection. Another explanation is that mechanical pressure on the sinus node by ejected blood causes acceleration in the nodal discharge.²

REFERENCES

1. Kastor JA. Atrioventricular Block. In Kastor JA (editor). *Arrhythmias*. Philadelphia: W.B. Saunders;1994:145-200.
2. Fisch C, Knoebel SB. *Electrocardiography of Clinical Arrhythmias*. Armonk, NY: Futura;2000:6.

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