

Intracardiac Electrogram and Ischemia Alert

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Table 1 Initial Evaluation, Times to Intervention, In-Hospital Treatment, and Discharge Care

	Hispanics (n = 1,654)	Non-Hispanic Whites (n = 38,844)	p Value
Initial evaluation and times to intervention			
Symptom onset to hospital arrival, h	2.0 (1.0-4.5)	1.6 (0.97-3.42)	<0.0001
Ambulance use	41.5%	47.0%	<0.0001
Pre-hospital ECG	32.8%	37.5%	<0.0001
Arrival to ECG, min	8 (4-15)	6 (3-12)	<0.0001
Arrival to ECG <10 min	61.2%	69.3%	<0.0001
Door to balloon, min	74 (55-94)	69 (53-87)	<0.0001
Door to balloon <90 min	69.4%	77.5%	<0.0001
In-hospital treatment during first 24 h			
Diagnostic catheterization	89.1%	88.7%	0.44
Reperfusion therapy	91.5%	93.1%	0.041
Primary PCI	81.6%	80.3%	0.17
Drug-eluting stent	47.9%	49.2%	0.47
Discharge care			
Smoking cessation counseling	96.2%	96.7%	0.44
Diet counseling	95.2%	94.3%	0.16
Exercise counseling	84.6%	88.1%	<0.0001
Cardiac rehabilitation referral	68.9%	82.1%	<0.0001

Values are mean (range) or %.
ECG = electrocardiogram; PCI = percutaneous coronary intervention.

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Letter to the Editor

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In an elegant study, Fischell et al. (1) employed an implantable intracardiac ischemia detection device for continuous surveillance

for ST-segmental shifts as a warning system. During a median follow-up of 1.5 years, shifts exceeding 3 SDs were an accurate marker for thrombotic coronary occlusion, allowing for a median alert-to-door time of <20 min for patients at high risk of recurrent coronary syndromes who typically present with 2- to 3-h delays. The feasibility of such a strategy was earlier established clinically with temporary

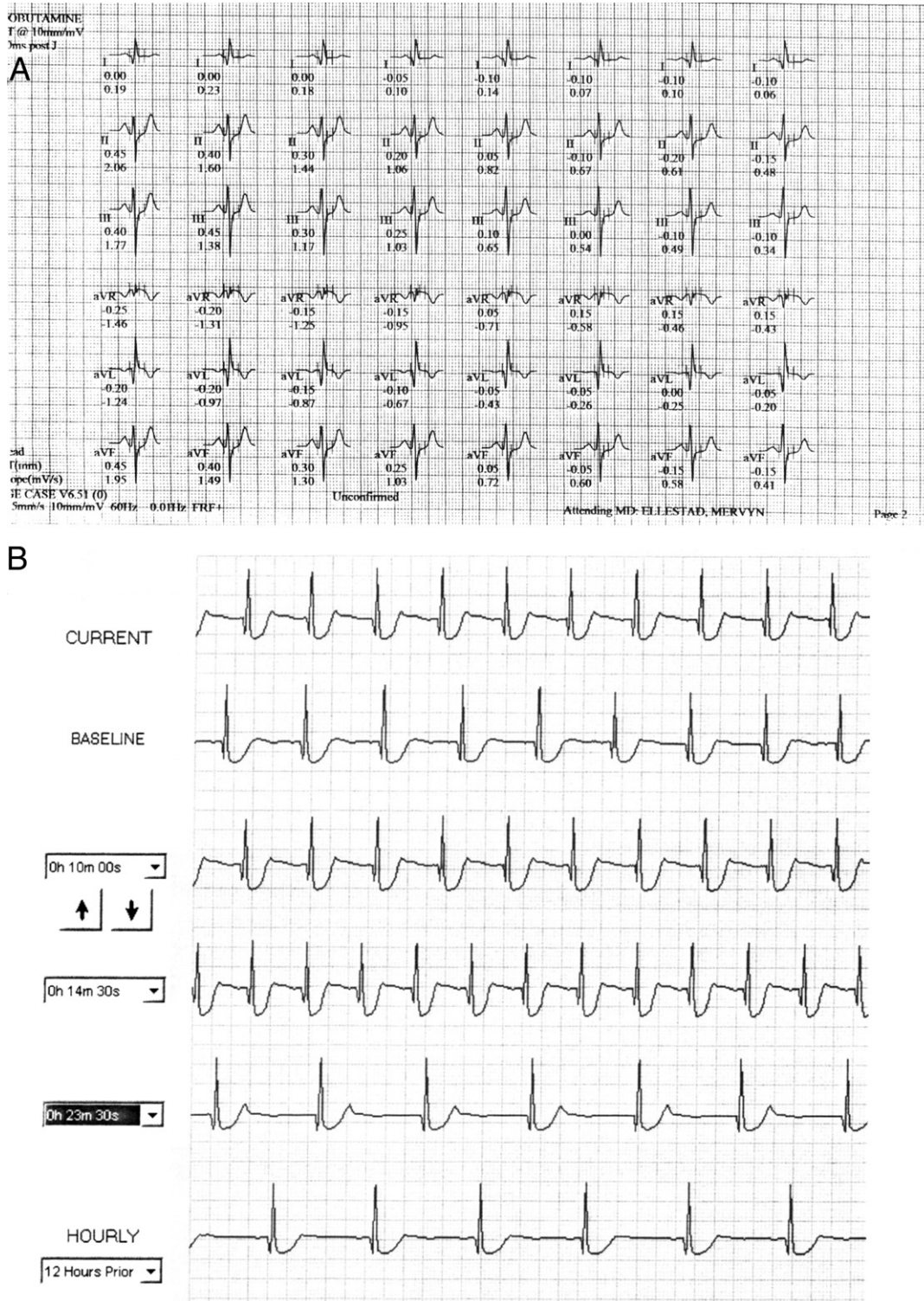


Figure 1 12-Lead Summary and Leads Recorded by an Implanted Electrode During Exercise

(A) 12-lead summary during exercise. (B) Leads recorded by the implanted electrode by the Angel Med system during exercise.

balloon occlusion during a coronary intervention procedure (2), and experimentally with acute or subacute coronary occlusion in ambulatory porcine models (3). We present an anecdotal case that underscores superior efficacy of an intracardiac electrocardiogram.

A 54-year-old woman had an anterior myocardial infarction in 2007, followed by coronary bypass surgery wherein completely occluded left anterior descending coronary artery and circumflex vessels were revascularized. She continued to complain of angina symptoms, and a repeat angiogram in 2008 showed 40% narrowing of the graft to the left anterior descending artery. In December 2009, she developed chest pain during a treadmill stress test at a heart rate of 120 beats/min with equivocal ECG changes. She participated in the ALERTS (AngelMed for Early Recognition and Treatment of STEMI) clinical study (NCT00781118), and received an intracardiac ischemia detection device with an electrocardiographic (ECG) lead placed in the right ventricular apex. The study protocol calls for a stress test 2 weeks after implantation. During the dobutamine stress test, her heart rate increased from 54 to 126 beats/min, and the test was terminated because of chest discomfort. The rest and maximum stress surface ECG strips (Fig. 1A) revealed minor J-point depression and were considered nondiagnostic. The simultaneously recorded ECG from the implanted device (Fig. 1B) demonstrated substantial ST-segment depression.

This case highlights 2 points. 1) Leads recorded from the endocardium are probably more sensitive than standard leads. In experimental simulations, subendocardial ischemia that extended through at least 40% of the heart wall was manifest on the epicardium by ST-segment depression. As such, the lesser extent of ischemia may have resulted in the discrepancy between surface and intracardiac ECGs. 2) A minor upsloping ST-segment depression during exercise testing may not always be benign. Although the Joint Committee on Exercise Testing also describes

J-point depression as normal, we should carefully analyze ECG alterations that accompany stress tests (4).

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