

Bouncebacks

The Case of a 57-year-old Man with Heart Fluttering and Lightheadedness

In *Bouncebacks*, which appears periodically in JUCM, we provide the documentation of an actual patient encounter, discuss patient safety and risk management principles, and then reveal the patient's "bounceback" diagnosis.

Cases are adapted from the book *Bouncebacks! Emergency Department Cases: ED Returns* (2006, Anadem Publishing, www.anadem.com; also available at www.amazon.com and www.acep.org) by Michael B. Weinstock and Ryan Longstreth. The book includes 30 case presentations with risk management commentary by Gregory L. Henry, past president of The American College of Emergency Physicians, and discussions by other nationally recognized experts.

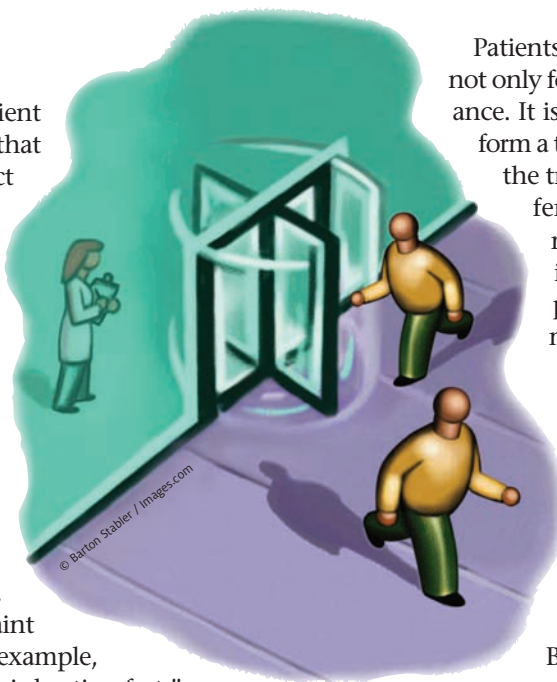
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A 57-year-old Male with Heart Fluttering and Lightheadedness

What happens when our patient so badly wants to be well that they talk us out of the correct diagnosis?

"I think it is my anxiety" was the mantra accepted by the physician in this case.

Though diagnoses are not always clear after the initial encounter, they are not up for negotiation. Patients have a vested interest, due to denial or human nature, in believing that nothing is seriously wrong with them. It can be tempting to accept the theory that is put in front of us, especially when the chief complaint is common and nonspecific; for example, "I am lightheaded and my heart is beating fast."



Patients present to the urgent care center not only for a diagnosis, but also for reassurance. It is our job to stay neutral and perform a thorough evaluation, and to avoid the trap of tunnel vision with our differential diagnosis and management. We must avoid being lulled into a false sense of security—especially when the patient does not want to be sick.

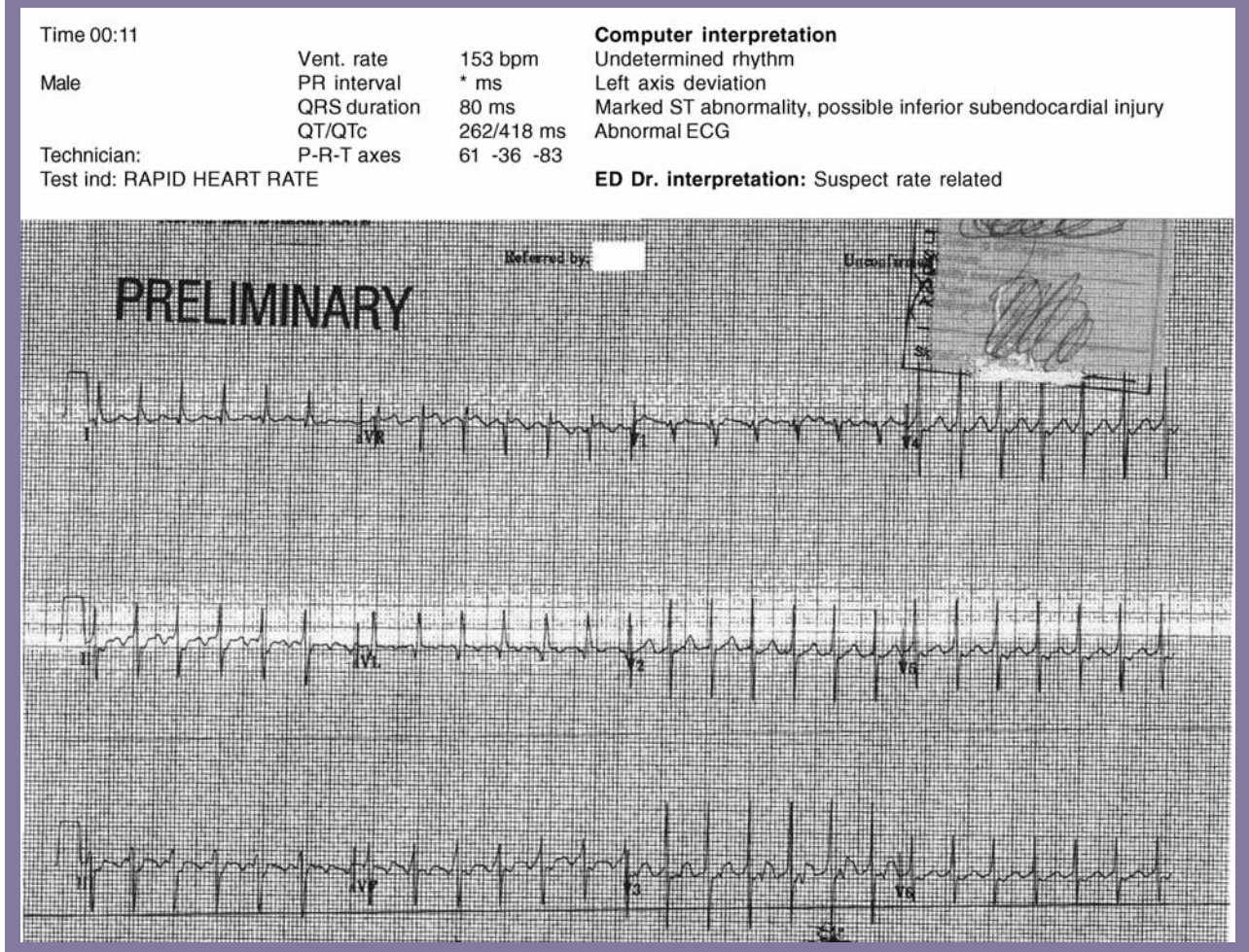
Initial Visit

(Note: The following, as well as subsequent visit summaries, is the actual documentation of the providers, including punctuation and spelling errors.)

CHIEF COMPLAINT: Heart Beat Rapid

Time	Temp (F)	Pulse	Resp	Syst	Diast	O2	sat
Initial	98.3	147	20	176	127	99	
Repeat			114	16	133	68	97

Figure 1



HISTORY OF PRESENT ILLNESS:

Pt. states heart fluttering for 3 days, lightheaded with standing. Has intermittent chest pain which began gradually 3 days ago. The pain is mild with radiation to the left lateral ribs and upper arm. Has tingling left fingers. Hx of panic attacks, did not have any all summer but has been having increasing attacks that have been present the last 3 days with fluttering. No. previous hx of heart problems. Last summer with left upper arm pain, was eval. at another local hospital and had negative stress test done at that time. Denies syncope, peripheral edema, fever, SOB, cough, diaphoresis, abd. pain, nausea. Hx of high triglycerides, no longer on meds for same. Had Hep. C. last summer, resolved. Has had anxiety and panic attacks. Pt is otherwise healthy, watches weight, works out regularly

PAST MEDICAL HISTORY/TRIAGE:

Allergies: NKDA
Current Meds: Unknown to patient
PSHx: Herniorrhaphy
PMHx: HTN, Panic attacks
SHx: D/C ETOH 15 years ago after pancreatitis, pseudocyst. Smokes 3 cigs per day for 15 years
FHx: Father with MI age 70, No hx of HTN, DM, DVT, CVA

EXAM:

General: Well-appearing; Well nourished; A&O X3, in NAD
Neck: No JVD or distended neck veins
Resp: Normal chest excursion with respiration, breath sounds clear and equal bilaterally; no wheezes, rhonchi, or rales

Vigamox®

(moxifloxacin hydrochloride ophthalmic solution) 0.5% as base

DESCRIPTION: VIGAMOX® (moxifloxacin HCl ophthalmic solution) 0.5% is a sterile ophthalmic solution. It is an 8-methoxy fluoroquinolone anti-infective for topical ophthalmic use.

CLINICAL PHARMACOLOGY:

Microbiology: The following *in vitro* data are also available, but their clinical significance in ophthalmic infections is unknown. The safety and effectiveness of VIGAMOX® solution in treating ophthalmological infections due to these microorganisms has not been established in adequate and well-controlled trials.

The following organisms are considered susceptible when evaluated using systemic breakpoints. However, a correlation between the *in vitro* systemic breakpoint and ophthalmological efficacy has not been established. The list of organisms is provided as guidance only in assessing the potential treatment of conjunctival infections. Moxifloxacin exhibits *in vitro* minimal inhibitory concentrations (MICs) of 2 µg/ml or less (systemic susceptible breakpoint) against most (≥ 90%) strains of the following ocular pathogens.

Aerobic Gram-positive microorganisms:

Listeria monocytogenes
Staphylococcus saprophyticus
Streptococcus agalactiae
Streptococcus mitis
Streptococcus pyogenes
Streptococcus Group C, G and F

Aerobic Gram-negative microorganisms:

Acinetobacter baumannii
Acinetobacter calcoaceticus
Citrobacter freundii
Citrobacter koseri
Enterobacter aerogenes
Enterobacter cloacae
Escherichia coli
Klebsiella oxytoca
Klebsiella pneumoniae
Moraxella catarrhalis
Morganella morganii
Neisseria gonorrhoeae
Proteus mirabilis
Proteus vulgaris
Pseudomonas stutzeri

Anaerobic microorganisms:

Clostridium perfringens
Fusobacterium species
Prevotella species
Propionibacterium acnes

Other microorganisms:

Chlamydia pneumoniae
Legionella pneumophila
Mycobacterium avium
Mycobacterium marinum
Mycoplasma pneumoniae

Clinical Studies:

In two randomized, double-masked, multicenter, controlled clinical trials in which patients were dosed 3 times a day for 4 days, VIGAMOX® solution produced clinical cures on day 5-6 in 66% to 69% of patients treated for bacterial conjunctivitis. Microbiological success rates for the eradication of the baseline pathogens ranged from 84% to 94%. Please note that microbiologic eradication does not always correlate with clinical outcome in anti-infective trials.

INDICATIONS AND USAGE: VIGAMOX® solution is indicated for the treatment of bacterial conjunctivitis caused by susceptible strains of the following organisms:

Aerobic Gram-positive microorganisms:

*Corynebacterium species**
*Micrococcus luteus**
Staphylococcus aureus
Staphylococcus epidermidis
Staphylococcus haemolyticus
Staphylococcus hominis
*Staphylococcus warneri**
Streptococcus pneumoniae
Streptococcus viridans group

Aerobic Gram-negative microorganisms:

*Acinetobacter lwoffii**
Haemophilus influenzae
*Haemophilus parainfluenzae**

Other microorganisms:

Chlamydia trachomatis

*Efficacy for this organism was studied in fewer than 10 infections.

CONTRAINDICATIONS: VIGAMOX® solution is contraindicated in patients with a history of hypersensitivity to moxifloxacin, to other quinolones, or to any of the components in this medication.

WARNINGS:

NOT FOR INJECTION.

VIGAMOX® solution should not be injected subconjunctivally, nor should it be introduced directly into the anterior chamber of the eye.

In patients receiving systemically administered quinolones, including moxifloxacin, serious and occasionally fatal hypersensitivity (anaphylactic) reactions have been reported, some following the first dose. Some reactions were accompanied by cardiovascular collapse, loss of consciousness, angioedema (including laryngeal, pharyngeal or facial edema), airway obstruction, dyspnea, urticaria, and itching. If an allergic reaction to moxifloxacin occurs, discontinue use of the drug. Serious acute hypersensitivity reactions may require immediate emergency treatment. Oxygen and airway management should be administered as clinically indicated.

PRECAUTIONS:

General: As with other anti-infectives, prolonged use may result in overgrowth of non-susceptible organisms, including fungi. If superinfection occurs, discontinue use and institute alternative therapy. Whenever clinical judgment dictates, the patient should be examined with the aid of magnification, such as slit-lamp biomicroscopy,

and, where appropriate, fluorescein staining. Patients should be advised not to wear contact lenses if they have signs and symptoms of bacterial conjunctivitis.

Information for Patients: Avoid contaminating the applicator tip with material from the eye, fingers or other source.

Systemically administered quinolones including moxifloxacin have been associated with hypersensitivity reactions, even following a single dose. Discontinue use immediately and contact your physician at the first sign of a rash or allergic reaction.

Drug Interactions: Drug-drug interaction studies have not been conducted with VIGAMOX® solution. *In vitro* studies indicate that moxifloxacin is unlikely to alter the pharmacokinetics of drugs metabolized by these cytochrome P450 isozymes.

Carcinogenesis, Mutagenesis, Impairment of Fertility: Long term studies in animals to determine the carcinogenic potential of moxifloxacin have not been performed. However, in an accelerated study with initiators and promoters, moxifloxacin was not carcinogenic in rats following up to 38 weeks of oral dosing at 500 mg/kg/day (approximately 21,700 times the highest recommended total daily human ophthalmic dose for a 50 kg person, on a mg/kg basis).

Moxifloxacin was not mutagenic in four bacterial strains used in the Ames *Salmonella* reversion assay. As with other quinolones, the positive response observed with moxifloxacin in strain TA 102 using the same assay may be due to the inhibition of DNA gyrase. Moxifloxacin was not mutagenic in the CHO/HGPRT mammalian cell gene mutation assay. An equivocal result was obtained in the same assay when V79 cells were used. Moxifloxacin was clastogenic in the V79 chromosome aberration assay, but it did not induce unscheduled DNA synthesis in cultured rat hepatocytes. There was no evidence of genotoxicity *in vivo* in a micronucleus test or a dominant lethal test in mice.

Moxifloxacin had no effect on fertility in male and female rats at oral doses as high as 500 mg/kg/day, approximately 21,700 times the highest recommended total daily human ophthalmic dose. At 500 mg/kg orally there were slight effects on sperm morphology (head-tail separation) in male rats and on the estrous cycle in female rats.

Pregnancy: Teratogenic Effects.

Pregnancy Category C: Moxifloxacin was not teratogenic when administered to pregnant rats during organogenesis at oral doses as high as 500 mg/kg/day (approximately 21,700 times the highest recommended total daily human ophthalmic dose); however, decreased fetal body weights and slightly delayed fetal skeletal development were observed. There was no evidence of teratogenicity when pregnant cynomolgus monkeys were given oral doses as high as 100 mg/kg/day (approximately 4,300 times the highest recommended total daily human ophthalmic dose). An increased incidence of smaller fetuses was observed at 100 mg/kg/day. Since there are no adequate and well-controlled studies in pregnant women, VIGAMOX® solution should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

Nursing Mothers: Moxifloxacin has not been measured in human milk, although it can be presumed to be excreted in human milk. Caution should be exercised when VIGAMOX® solution is administered to a nursing mother.

Pediatric Use: The safety and effectiveness of VIGAMOX® solution in infants below 1 year of age have not been established.

There is no evidence that the ophthalmic administration of VIGAMOX® solution has any effect on weight bearing joints, even though oral administration of some quinolones has been shown to cause arthropathy in immature animals.

Geriatric Use: No overall differences in safety and effectiveness have been observed between elderly and younger patients.

ADVERSE REACTIONS:

The most frequently reported ocular adverse events were conjunctivitis, decreased visual acuity, dry eye, keratitis, ocular discomfort, ocular hyperemia, ocular pain, ocular pruritus, subconjunctival hemorrhage, and tearing. These events occurred in approximately 1-6% of patients.

Nonocular adverse events reported at a rate of 1-4% were fever, increased cough, infection, otitis media, pharyngitis, rash, and rhinitis.

Rx Only

Manufactured by Alcon Laboratories, Inc.
Fort Worth, Texas 76134 USA

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U.S. PAT. NO. 4,990,517; 5,607,942; 6,716,930
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References:

- Lichtenstein SJ, Dorfman M, Kennedy R, Stroman D. Controlling contagious bacterial conjunctivitis. *J Pediatr Ophthalmol Strabismus*. 2006;43:19-26.
- Data on file. Alcon Laboratories, Inc.

THE CASE OF A 57-YEAR-OLD MAN

Card: Regular rhythm, tachycardia, without murmurs, rub or gallop

Chest: No pain with palpation

Abd: Non-distended; non-tender, soft without rigidity, rebound or guarding, no pulsatile mass

Extremities: Pulses 2+ and equal X 4 extremities, no peripheral edema or calf muscle pain

ORDERS/RESULTS:

ECG (at 00:11)

Orders: Ativan

Labs: WBC: 6.9 (4.6-10.2); **Hgb:** 16.6 (13.5-17.5);

PLT: 220 (142-424), **lytes, BUN/creat – WNL.**

Trop I .06 (.00-.27); fingerstick blood sugar-150

CXR: normal portable chest

Progress Note: I spoke with this patient at length. He says he feels “100% better”. He has been stable throughout his stay. The pressure he described earlier to the physician assistant is not reproducible with exertion. He regularly exercises and does not experience chest pain. He states he does not use cocaine. He had a negative stress test last year. Overall I believe his symptoms are more consistent with anxiety and am very comfortable with sending him home.

DIAGNOSIS:

- Chest pain- atypical
- Anxiety
- Tachycardia-supraventricular

DISPOSITION:

The patient was discharged to home accompanied by spouse. Follow-up with primary care physician in 2 days. AfterCare instructions for anxiety. Prescription for Ativan (lorazepam) 1mg. Sixteen (16).

Discussion of Risk Management Issues at Initial Visit

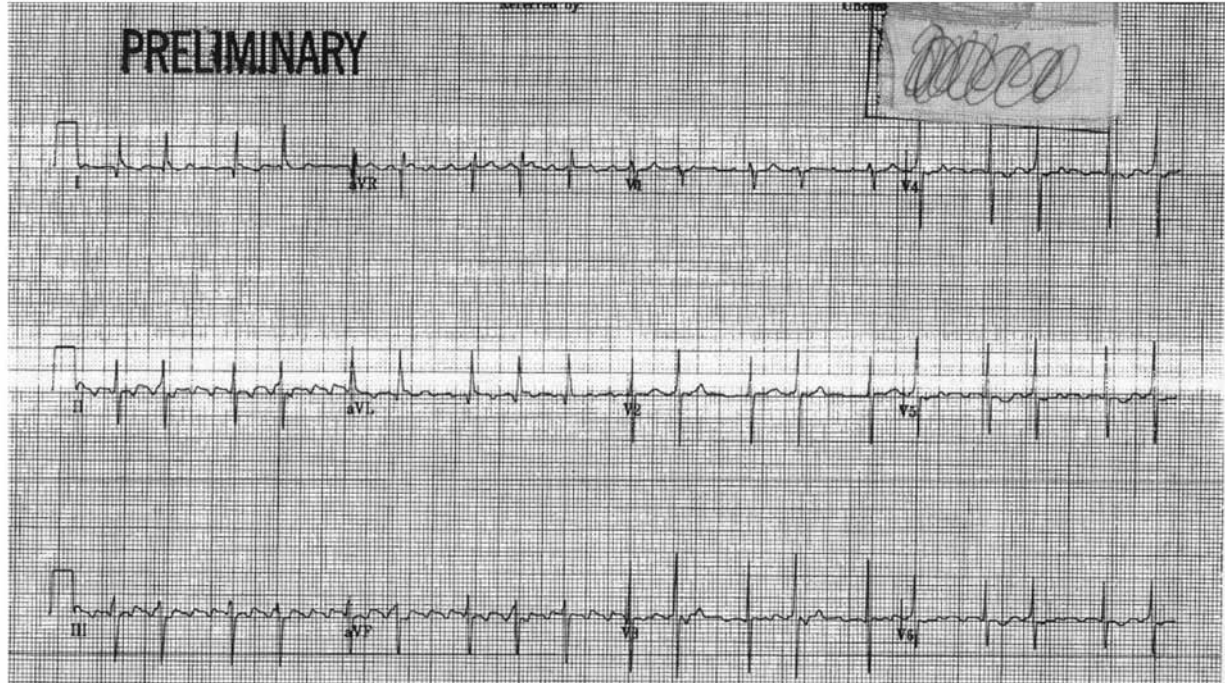
Point 1: Anxiety should be the diagnosis of last resort after an organic cause has been excluded.

Discussion: We need to avoid tunnel vision when a patient suggests a diagnosis. Often, the biggest impediment to establishing a correct diagnosis is a previous diagnosis.

Our patient has a history of “anxiety,” but we do not know how this was determined. Did the patient diagnose himself, or was there an evaluation performed by a physician? Is there a possibly an organic

Figure 2

Time 02:43		Computer interpretation:	
Male	Vent. rate	114 bpm	Unusual P axis, possible ectopic atrial tachycardia with undetermined rhythm irregularity
	PR interval	* ms	Left axis deviation
	QRS duration	78 ms	ST & T wave abnormality, consider lateral ischemia
Technician:	QT/QTc	320/441 ms	Abnormal ECG
Test ind: CP	P-R-T axes	263 -41 -33	
			ED Dr. interpretation: Doubt ischemia—no CP during EKG



cause, such as hyperthyroidism, cardiac arrhythmia, pheochromocytoma, or a drug interaction which is incorrectly being attributed to anxiety?

Maintaining an open differential diagnosis often will keep the practitioner out of trouble, especially when dealing with high-risk chief complaints, such as one that has both cardiovascular and neurologic components.

Point 2: His vital signs and ECG do not support a diagnosis of anxiety.

Discussion: A heart rate of 158 is fast for anxiety to be the culprit. It is impossible to tell from the ECG if this is flutter, or accelerated atrial or junctional rhythm. A lightheaded patient with tachycardia should be considered unstable and a candidate for prompt chemical or electrical rate control.

Point 3: This patient was not correctly risk stratified when

evaluating cardiac causes. He is describing a fluttering of his chest, lightheadedness, and pain radiating to left arm.

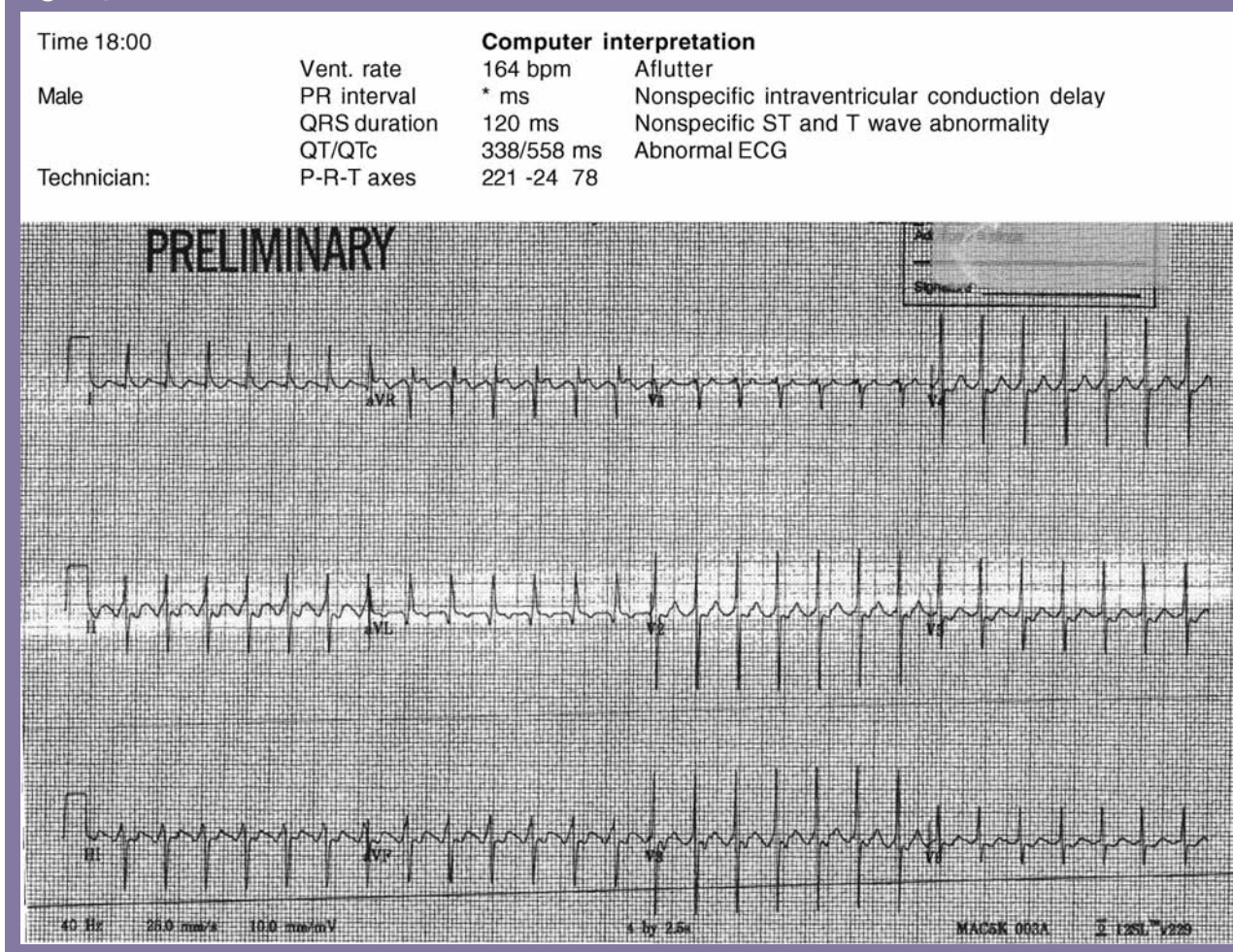
Discussion: The possibility of cardiac ischemia causing an arrhythmia resulting in lightheadedness would not be unusual. The most common cause of death in 50-year-old males is cardiac disease, and there is nothing atypical about mild substernal chest pain radiating to left chest wall and left upper arm.

This male in his late 50s has a past history of heavy alcohol abuse, as evidenced by development of pancreatitis and pseudocyst. Cardiomyopathy, a risk factor for an arrhythmia, should be considered.

An additional cardiac risk factor would be untreated elevated triglycerides.

A history of a recent negative stress test does not rule out acute coronary syndrome (ACS); in fact, the sensitivity of this test is only 70% to 80%.

Figure 3



When a patient has chest pain, the nidus is on us to exclude cardiac disease as an etiology of the symptoms.

Point 4: The ECG was misread—not only by the doctor, but also by the computer.

Discussion: When reading ECGs, look at the tracing first, provide your own interpretation, then see what the computer thinks.

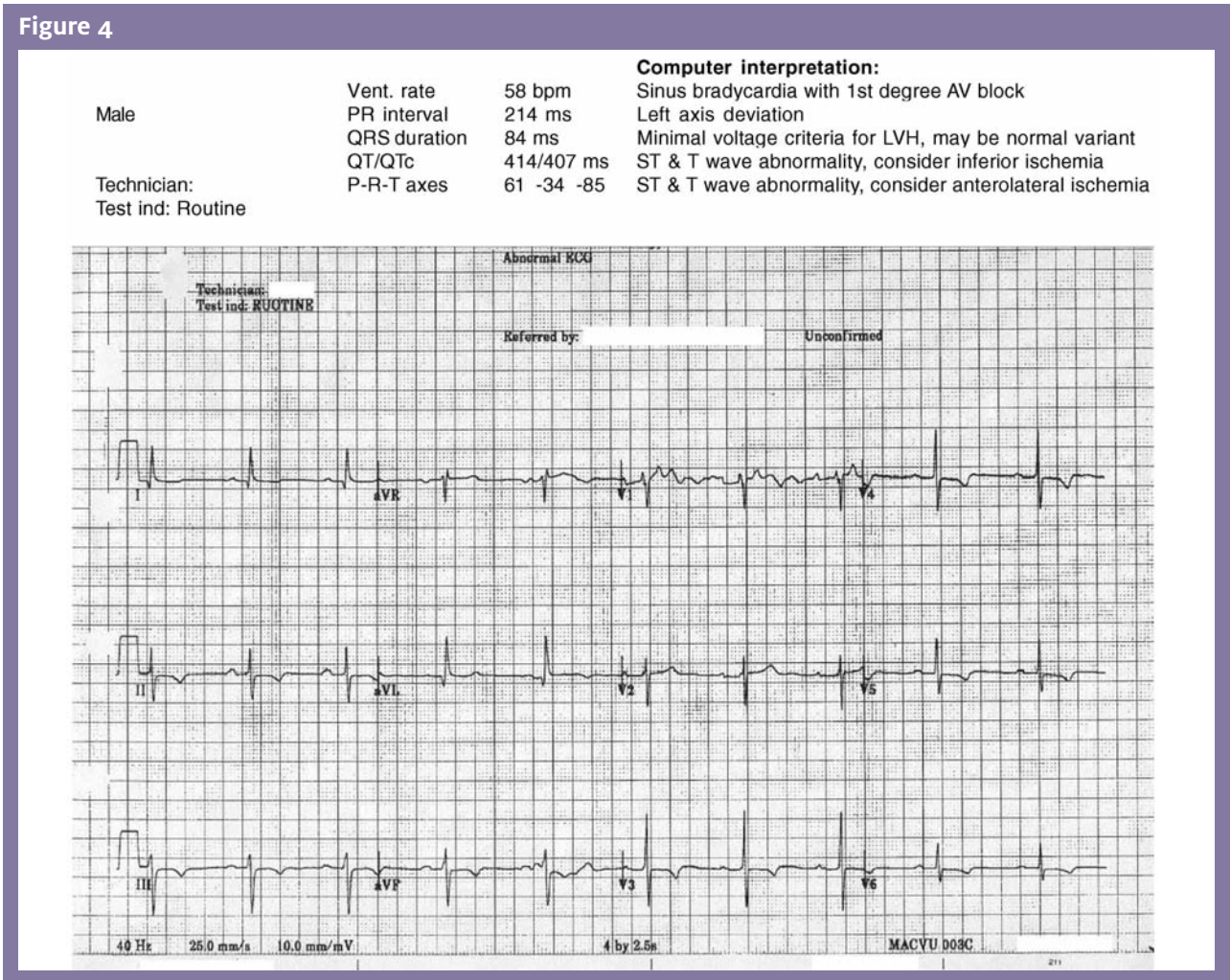
If there was a question about the interpretation, a consult could have been obtained to more accurately integrate this data in light of the patient’s symptoms. Faxing a questionable ECG to a cardiologist or the local ED is usually quick and can lead to valuable information.

Bounceback Visit

Same day the ECG is correctly read by 2nd physician as *atrial flutter* and pt. is sent to the ED.

- To ED at 17:05 with pulse 166, resp 24, BP 157/114, sat 96%
- HPI: Difficult historian, mild intermittent tight left sided chest pain with radiation to left arm for last 6 months but currently pain free. No exertional chest pain. Assoc. diaphoresis but no Dyspnea. No improvement with ativan.
- PE: WNL except tachycardia
- ED course:
- 17:48 Aspirin 325mg PO
- 18:02 Cardizem 20mg IVP, cardizem drip 10mg/hour. Heart rate promptly drops to 90. BP 160/98
- 20:23 Lovenox 1m/kg
- Labs: Thyroid studies and cardiac enzymes WNL
- Diagnosis: New onset atrial flutter with RVR, chest pain

Figure 4



- Admission and cardiology consult

Discussion of Visit and Risk-management Issues

There was a good policy in place for review of ECGs, and the misread was caught and addressed, but not before the patient had over 24 hours of a heart rate 150 beats per minute (BPM).

It is noteworthy that his chest pain did have some atypical features. However, the first physician should not have been deterred from further evaluating this concerning symptom with more definitive tests rather than just relying on history and conjecture alone.

The patient’s normal stress test from the previous year does not protect him from having ACS. In fact, this physician could have completely missed the correct ECG diagnosis (as he did here), and still make the correct disposition decision of admission with a cardiology consult.

Discussion of ECG Interpretation and Management

The first step in evaluating any tachycardia is to categorize it as narrow or wide, and then as regular or irregular.

A narrow QRS duration is 80msec and reflects the activation of the ventricles via the normal His-Purkinje system. Most narrow complex tachycardias other than a-fib and multifocal atrial tachycardia (MAT) are associated with a regular ventricular rate.

The differential diagnosis of narrow complex tachycardia is broad and includes a-fib, a-flutter, and a variety of paroxysmal SVTs such as atrial tachycardia and AV nodal reentrant tachycardia.

It is essential to determine four specific features of the atrial activity:

- the atrial rate
- the p wave morphology (same as sinus, retrograde, or abnormal)

Call for Articles

JUCM, the Official Publication of the Urgent Care Association of America, is looking for a few good authors.

Physicians, physician assistants, and nurse practitioners, whether practicing in an urgent care, primary care, hospital, or office environment, are invited to submit a review article or original research for publication in a forthcoming issue.

Submissions on clinical or practice management topics, ranging in length from 2,500 to 3,500 words are welcome. The key requirement is that the article address a topic relevant to the real-world practice of medicine in the urgent care setting.

Please e-mail your idea to
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Lee Resnick, MD at
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He will be happy to discuss it with you.



THE CASE OF A 57-YEAR-OLD MAN

- position of the p wave in relation to the QRS complex (the RP relationship)
- the relationship between atrial and ventricular rates (1:1 or not)

If the P waves are not easily identified, then maneuvers such as vagal stimulation and adenosine should be considered to further evaluate the characteristic of the abnormal rhythm. Atrial flutter can often be distinguished from other SVTs by its unique “saw-tooth” pattern. Typically, the atrial rate is close to 300 BPM with a 2:1 AV block resulting in a ventricular rate of 150 BPM.

Studies of patients with atrial flutter who are not anticoagulated reveal a left atrial thrombus in 6% to 43% of patients. Cardioversion without anticoagulation results in a 1.7% to 7.3% rate of embolic complications. Generally, if the atrial flutter is present for over 48 hours, anticoagulation is continued for four weeks prior to and four weeks following cardioversion.

Take-home Teaching Points

- Don't fall into the trap of tunnel vision when patients offer explanations for their symptoms (i.e., “My panic attacks have been worse these last few days”). Assume it's not anxiety until proven otherwise. All patients with psychiatric diagnosis will eventually die of an organic illness.
- Be sure the discharge diagnosis is supported by the physical findings and lab results. A heart rate of 150 in a 57-year-old man with chest pain is concerning for acute cardiac syndrome, regardless of the ECG interpretation.
- A regular narrow QRS tachycardia with a rate of 150 to 160 BPM is a classic presentation of atrial flutter.
- If there is difficulty in determining the rhythm because of a fast heart rate, run a rhythm strip at twice the normal paper speed.
- A previous normal stress test does not guarantee anything.
- When in doubt, get a consult.

Follow-up

The hospital course was uneventful. The patient converted to sinus rhythm spontaneously. He underwent a stress echocardiogram which was unchanged from prior studies. He was discharged on metoprolol succinate 50 mg QD with cardiology follow-up. ■

Suggested Readings associated with this article are available at www.jucm.com.