Author: Yonathan Habtemariam, MD Reviewer: Sharon Griswold, MD MPH

Edward A Ramoska, MD, MPH

Case Title: Brugada Syndrome

# Target Audience: med students, nurses, paramedics, residents, other

Primary Learning Objectives: key learning objectives of the scenario

1. Identification of patients with risk factors for dangerous causes for syncope

2. Appropriate interpretation of EKG suggestive of Brugada syndrome

3. Management and disposition of patients with symptomatic Brugada syndrome

Secondary Learning Objectives: detailed technical goals, behavioral goals, didactic points

1. Obtain EKG on all patients with syncope

2. Have a strategy to look for findings that increase the risk for serious outcomes in patients that present with syncope (eg. San Francisco syncope rule)

Critical actions checklist – a list to ensure the educational /assessment goals are met.

* Put patient on cardiac monitor.
* Obtain a 12-lead ECG.
* Identify ECG suggestive of patient having Brugada syndrome.
* Give an antipyretic.
* Obtain immediate cardiology consultation.
* Admit patient to bed with continuous cardiac monitor.

**For Examiner Only**

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**CASE SUMMARY**

**CORE CONTENT AREA**

Cardiovascular

**SYNOPSIS OF HISTORY/ Scenario Background**

41 year old Asian male presents to ER stating that he blacked out for about a minute while sitting on his couch watching Monday night football just prior to arrival. His wife drove him to the hospital. He had subjective fever, dry cough, runny nose, body aches for past 3 days. His 5 year old daughter recovered from a viral illness 4 days ago.

Past medical history: No known medical problems.

Medications and allergies: No medications, including no over-the-counter medications. NKDA.

Family and social history: Father had mild heart attack at age 60, also has hypertension, DM type II. Mother has hypertension. Cousin died in his sleep last year at age 40 (unknown reasons).

**SYNOPSIS OF PHYSICAL**

Initial scenario conditions: 100.6 F Oral, BP 145/85, HR 99, RR 18, Pox 100 % on RA, Accu Check 145.

Patient is in no acute distress, normal physical exam except for nasal congestion and mild pharyngeal erythema (Detailed physical exam in physical exam section).

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**CRITICAL ACTIONS**

**Scenario branch points/ PLAY OF CASE GUIDELINES**

Key teaching points or branch points that result in changes in patient’s condition

1. **Critical Action**

Put patient on cardiac monitor and obtain EKG

Cueing Guideline: I blacked out today.

1. **Critical Action**

Identify EKG suggestive of patient having Brugada syndrome

Cueing Guideline: Does my EKG look okay? I’m kind of scared because my cousin died in his sleep a year ago.

1. **Critical Action**

Give an antipyretic. Among other reasons, fever is known to induce arrhythmias in Brugada patients.

Cueing Guideline: What should I do about this cold? I feel like I have a fever.

1. **Critical Action**

Obtain immediate cardiology consultation.

Cueing Guideline: So are you going to fix my heart?

1. Critical Action

Admit patient to bed with continuous cardiac monitor.

Cueing Guideline: So can I go home and see my family doctor next week?

**SCORING GUIDELINES**

(Critical Action No.)

1. Put patient on cardiac monitor
2. Obtain a 12-lead ECG
3. Identify ECG suggestive of patient having Brugada syndrome
4. Give an antipyretic
5. Obtain immediate cardiology consultation
6. Admit patient to bed with continuous cardiac monitor

**For Examiner Only**

**HISTORY**

**Onset of Symptoms:** I had been feeling sick for past three days, today I blacked out

**Background Info:** I have had cough, runny nose, fever for the past 3 days. My 5 year old daughter has a cold so I figured I caught it from her. Today I was sitting on my couch watching Monday night football on TV and everything went dark. My wife was in the room and says I was out for about a minute.

**Chief Complaint:** I blacked out today

**Past Medical Hx:** None

**Past Surgical Hx:** None

**Habits:** Smoking: Never

ETOH: One drink per night on average (beer or wine)

Drugs: Never

**Family Medical Hx:** Father, Age 70 **–** Hypertension, Diabetes, Mild heart attack at age 60

Mother, Age 65 – Hypertension

Male cousin on maternal side died when he was 40 (died in his sleep for unknown reasons)

**Social Hx:** Marital Status: Married

Children: 2 daughters (Age 5, Age 3)

Education: Master’s Degree in Computer Science

Employment: Computer Programmer, desk job at a big company

**ROS: Pertinent Positives**: Heart felt like it was skipping beats prior to blacking out (now if feels normal), subjective fever, runny nose, dry cough, sore throat 2 days ago but improved today, generalized body aches

**Pertinent Negatives:** No headache, neck pain/stiffness, focal weakness, vision changes, shortness of breath, chest pain, abdominal pain, nausea/vomiting, diarrhea, constipation, urinary symptoms, back pain, leg pain/swelling, rash, no bowel or bladder incontinence, no tongue injuries.

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**PHYSICAL EXAM**

**Patient Name:** Robert Tran **Age & Sex: 41,** Male

**General Appearance:** Well-developed, well-nourished Asian male in no acute distress.

**Vital Signs:** T 100.6 F Oral (101.4 F Rectal), BP 145/85, HR 99, RR 18, Pox 100% on RA,

Orthostatic vitals (if requested): Laying BP 145/85, HR 99; Standing BP 138/80, HR 105.

Accucheck (if requested): 145.

**Head:** Normocephalic, Atraumatic.

**Eyes:** Conjunctiva normal, Sclera normal, PERRLA (4mm to 3 mm).

**Ears:** Normal external exam, normal auditory canal and TM.

**Nose**: Congested.

**Mouth/Throat:** Moist mucous membranes**,** Mild pharyngeal erythema without any exudates or petechiae**,** no injuries.

**Neck:** Supple, full range of motion, no cervical lymphadenopathy.

**Skin:** Normal, no rash.

**Chest:** Normal.

**Lungs:** Clear to auscultation bilaterally, good air movement.

**Heart:** Regular rate and rhythm, no murmurs, rubs or gallops, PMI felt at 5th intercostal space at left midclavicular line.

**Back:** Normal.

**Abdomen:** Normal inspection, normal bowel sounds, soft, no tenderness, no distention, no organomegaly, no pulsating mass.

**Extremities:** Good pulses, no clubbing, cyanosis or edema.

**Rectal:** Good rectal tone, no masses or tenderness, traces of brown stool in rectal vault which is guaiac heme negative.

**Neurological:** AAOX3, CN II-XII normal, strength 5/5 all 4 extremities, normal sensation, normal cerebellar exam, normal reflexes.

**Mental Status:** Normal.

**For Examiner Only**

**STIMULUS INVENTORY**

#1 Emergency Admitting Form

#2 EKG

#3 Chest X-ray

#4 CBC

#5 BMP

#6 Troponin

#7 Urine Drug Screen

**For Examiner Only**

**LAB DATA & IMAGING RESULTS**

**Stimulus #2 EKG Attached –Brugada Syndrome Type 1**

ECG available at <http://en.ecgpedia.org/wiki/Main_Page>. All ECG are posted and can be used in accordance with the Creative Commons License. Retrieved July 31, 2011.

**Stimulus #3 Chest X-ray Attached - normal**

**Stimulus #4**

**Complete Blood Count (CBC)**

WBC 9,000/mm3

Hgb 14 g/dL

Hct 42 %

Platelets 200 /mm3

Differential

Segs 59%

Lymphs 32%

Monos 7%

Eos 2%

**Stimulus #5**

**Basic Metabolic Profile (BMP)**

Na+ 145 mEq/L

K+ 4.3 mEq/L

CO2 24 mEq/L

Cl- 110 mEq/L

Glucose 150 mg/dL

BUN 19 mg/dL

Creatinine 1.0 mg/dL

**Stimulus #6**

**Cardiac Markers**

Troponin < 0.01 ng/ml

**Stimulus #7**

**Urine Drug Screen** Negative

**Learner Stimulus #1**

**ABEM General Hospital**

**Emergency Admitting Form**

Name: Robert Tran

Age: 41 years

Sex: Male

Method of Transportation: Private car

Person giving information: Patient

Presenting complaint: I blacked out today

**Background:** I have had cough, runny nose, and fever for the past 3 days. Today I was sitting on my couch watching Monday night football on TV and everything went dark. My wife was in the room and says I was out for about a minute.

**Triage or Initial Vital Signs**

BP: 145/85

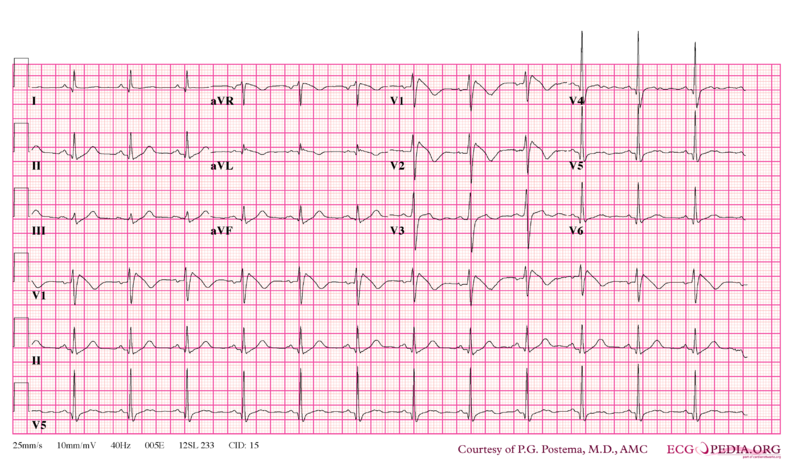
P: 99

RR: 18

T : 100.6 F (oral)

Pox**:** 100 % on RA

**Learner Stimulus #2**



ECG available at <http://en.ecgpedia.org/wiki/Main_Page>. All ECG are posted and can be used in accordance with the Creative Commons License. Retrieved July 31, 2011.

**Learner Stimulus #3**

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**Learner Stimulus #4**

**CBC**

WBC 9,000/mm3

Hgb 14 g/dL

Hct 42 %

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**Basic Metabolic Profile (BMP)**

Na+ 145 mEq/L

K+ 4.3 mEq/L

CO2 24 mEq/L

Cl- 110 mEq/L

Glucose 150 mg/dL

BUN 19 mg/dL

Creatinine 1.0 mg/dL

**Learner Stimulus #5**

**Troponin** < 0.01 ng/ml

**Learner Stimulus #7**

**Urine Drug Screen:** negative

**Feedback/ Assessment Form**

**Brugada Syndrome**

**Candidate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Examiner \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Critical Actions:**

* Put patient on cardiac monitor.
* Obtain a 12-lead ECG.
* Identify ECG suggestive of patient having Brugada syndrome.
* Give an antipyretic.
* Obtain immediate cardiology consultation.
* Admit patient to bed with continuous cardiac monitor.

**Dangerous Actions:** (Performance of one dangerous action results in failure of the case)

* Failure to place patient on cardiac monitor.
* Failure to obtain a 12-lead ECG.
* Discharge patient from the ED.

**Overall Score:**

* Pass
* Fail

**For Examiner**

Date: Examiner: Examinee(s):

Scoring: In accordance with the Standardized Direct Observational Tool (SDOT)

The learner should be scored (based on level of training) for each item above with one of the following:

NI = Needs Improvement

ME = Meets Expectations

AE = Above Expectations

NA= Not Assessed

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Critical Actions** | **NI** | **ME** | **AE** | **NA** | **Category** |
| Place patient on cardiac monitor |  |  |  |  | PC, MK, PBL |
| Obtain bedside ECG |  |  |  |  | PC, MK |
| Recognize Brugada Sydrome pattern on EKG |  |  |  |  | PC, MK, PBL |
| Administer antipyretic |  |  |  |  | PC, MK, PBL |
| Admit patient to monitored floor |  |  |  |  | PC, MK, PBL |
| Initiate appropriate consultation with cardiology |  |  |  |  | PC, MK, ICS |

The score sheet may be used for a variety of learners. For example, in using the case for 4th year medical students, the key teaching points of the case may be the recognition that all patients with syncope should have an ECG performed. Other items may be marked N/A= not assessed.

Category: One or more of the ACGME Core Competencies as defined in the SDOT

PC= Patient Care

Compassionate, appropriate, and effective for the treatment of health problems and the promotion of health

MK= Medical Knowledge

Residents are expected to formulate an appropriate differential diagnosis with special attention to life-threatening conditions, demonstrate the ability to utilize available medical resources effectively, and apply this knowledge to clinical decision making

PBL= Practice Based Learning & Improvement

Involves investigation and evaluation of their own patient care, appraisal and assimilation of scientific evidence, and improvements in patient care

ICS= Interpersonal Communication Skills

Results in effective information exchange and teaming with patients, their families, and other health professionals

P= Professionalism

Manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population

SBP= Systems Based Practice

Manifested by actions that demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value

**Debriefing Materials:** PowerPoint slides attached.

**Keywords for future searching functions:** Brugada syndrome, Syncope, Dysrhythmia.

**Has this work been previously published?** No

**Simulation Equipment Checklist**

**ENVIRONMENT**

This scenario requires (checked boxes):

|  |  |  |  |
| --- | --- | --- | --- |
|  | Simulator  Type: | | |
|  | Standardized Patient | | |
|  | | Non-Invasive BP Cuff | X | | ETT |  |
|  | | 2 lead EKG | X | | LMA |  |
|  | | Pulse Oximeter | X | | Laryngoscope |  |
|  | | Arterial Line |  | | Fiberoptic scope |  |
|  | | CVP |  | | Gum Bougie |  |
|  | | PA Catheter |  | |  |  |
|  | | Temperature Probe |  | | Crash Cart |  |
|  | | Capnograph |  | | Central line set up |  |
|  | | Resp Rate Monitor | X | | Chest tube set up |  |
|  | |  |  | | Ultrasound Machine |  |

|  |  |  |
| --- | --- | --- |
|  | SP for family member |  |
|  | Additional nurse SP |  |
|  | Other SP |  |

**References**

Benito, Begona., et al. (2009). Brugada Syndrome. *Rev Esp Cardiol. 62(11):1297-315.* <http://www.revespcardiol.org/cardio/ctl_servlet?_f=40&ident=13145482>. Retrieved Nov. 29, 2010.

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