Neurally-mediated syncope and structural heart disease

Michele Brignole
Centro Aritmologico, Lavagna, Italy

…how to manage a patient with 2 competing likely diagnosis…

Case report #1

- Male, 75 yrs old
- CAD, no AMI, CABG 10 yrs ago, then asymptomatic, no residual ischemia, normal EF
- No therapy, except aspirin
- 3 syncopal episodes last 2 yrs, 2 of these during sitting position, no prodroms, no triggers, secondary trauma

Initial evaluation

Not diagnostic, suspected cardiac syncope (sitting, no prodroms, history of heart disease)

Case report #1

Investigations (suspected cardiac syncope):

- Standard ECG: SR 75 bpm, narrow QRS, no abnormalities
- 24-hour Holter monitoring: normal SR, min HR 50 bpm during night, 60 bpm during day
- Electrophysiological study: no abnormalities (SNRT=380 ms, HV= 40 ms, negative VPS)

AHA/ACCF Scientific Statement on the evaluation of syncope

Syncope

History, Physical Examination, Electrocardiogram

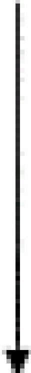
Diagnostic for orthostatic hypotension or neurocardiogenic syncope

Unexplained syncope

Echo, stress test, ischemia evaluation

If found, treat for structural heart disease. For arrhythmia evaluation, consider EPS if there is a history of myocardial infarction. Consider ICD if EF <30% with or without a history of myocardial infarction

Normal



J Am Coll Cardiol 2006;47:473– 84.

AHA/ACCF Scientific Statement on the evaluation of syncope

Syncope

History, Physical Examination, Electrocardiogram

Diagnostic for orthostatic hypotension or neurocardiogenic

Unexplained Syncope

...emia evaluation

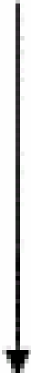
Final diagnosis:

Unexplained syncope

No therapy

If found, treat for structural heart disease and ischemia. For arrhythmia evaluation, consider electrophysiological testing if there is a history of a myocardial infarction. Consider implantable defibrillator if the left ventricular ejection fraction is ≤ 0.30, with or without a history of a myocardial infarction.

Normal



J Am Coll Cardiol 2006;47:473– 84.

Update 2004

Loss of consciousness

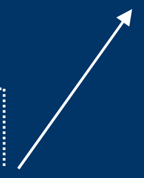
Initial evaluation — History, physical examination, supine&upright BP, standard ECG

Syncope

Certain diagnosis

Suspected diagnosis

- Cardiac likely
  - Cardiac tests
    - +
    - -
- Neurally-mediated or orthostatic likely
  - Neurally-mediated tests
    - +
    - - → Re-appraisal



Unexplained syncope

- Frequent or severe episodes
  - Neurally-mediated tests
    - +
    - - → Re-appraisal
- Single/rare episodes
  - No further evaluation

Non-syncopal attack

Confirm with specific test or specialist's consultancy

Treatment

Treatment

Treatment

Treatment

Case report #1

Investigations (re-appraisal):

- Carotid sinus massage (“Method of Symptoms”): sinus pause 8 sec, syncope
- Tilt test (TNT): positive response, mixed (min HR 65 bpm)
- ATP test: negative

Final diagnosis:

Cardioinhibitory neurally-mediated syncope

Pacemaker implant

Most frequent causes of syncope in pts with structural heart disease

- Neurally-mediated & orthostatic hypotension
- Conduction disturbances
- Ventricular tachyarrhythmia
- Unexplained

Causes of syncope
Data from 3 "Syncope Units"

Alboni et al. JACC 2001; 7: 1921-1928

AHA/ACCF Scientific Statement on the evaluation of syncope

Clinical and ECG features that suggest a neurally-mediated syncope

- Episodes of neurocardiogenic syncope are typically associated with postepisode fatigue or weakness, whereas the absence of a prodrome is consistent with cardiac arrhythmia.

- Syncope precipitated by neck turning, particularly in the elderly, raises the possibility of carotid sinus hypersensitivity.

J Am Coll Cardiol 2006;47:473– 84.

The initial stratification of syncope
Data from 3 "Syncope Units"

Symptoms	Cardiac	Neurally-mediated	Unexplained
Weakness before	**17%**	**20%**	**15%**
Weakness after	**33%**	**36%**	**35%**
No prodroms	**41%**	**33%**	**37%**
Neck turning	**1%**	**4%**	**2%**

Alboni et al. J Am Coll Cardiol, 2001

The initial stratification of syncope
Data from 3 "Syncope Units"

Patients <u>with</u> heart disease

Predictor of neurally-mediated syncope	Sensitivity	Specificity
Pallor (prodrom)	72%	43%
History of presyncope	56%	60%
Abdominal discomfort	8%	99%
Nausea (recovery)	14%	96%
Time between the first and the last syncopal episode > 4 yrs	40%	87%
Diaphoresis	30%	84%

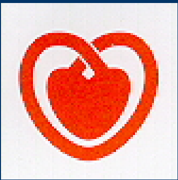
Alboni et al. J Am Coll Cardiol, 2001

The initial evaluation
Diagnostic criteria

- *Vasovagal syncope* is diagnosed if precipitating events such as fear, severe pain, emotional distress, instrumentation and prolonged standing are associated with typical prodromal symptoms.

- *Situational syncope* is diagnosed if syncope occurs during or immediately after urination, defecation, cough or swallowing.

- *Orthostatic syncope* is diagnosed when there is a documentation of orthostatic hypotension associated with syncope or presyncope.



Clinical and ECG features that suggest a neurally-mediated syncope

- Absence of cardiac disease
- Long history of syncope
- After sudden unexpected unpleasant sight, sound, or smell
- Prolonged standing or crowded, warm places
- Nausea, vomiting associated with syncope
- During or in the absorptive state after a meal
- After exertion
- With head rotation, pressure on carotid sinus

Case report #2

- 62-year, woman
- She was up early and she was having breakfast standing in the kitchen; the next thing she could remember was that she was on the floor bleeding from the head wound. She knew where she was and was able to stand up easily
- However in the standing position she passed out again.
- History: several syncopal episodes since her youth triggered by dentist, standing for prolonged period and hot showers
- Positive tilt testing

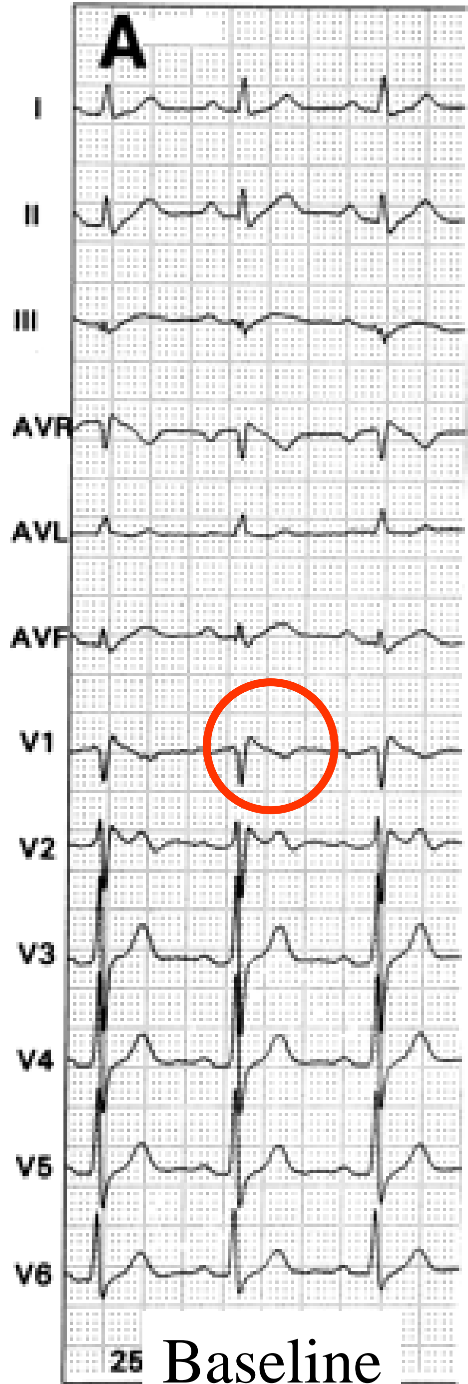
The initial evaluation
Diagnostic criteria

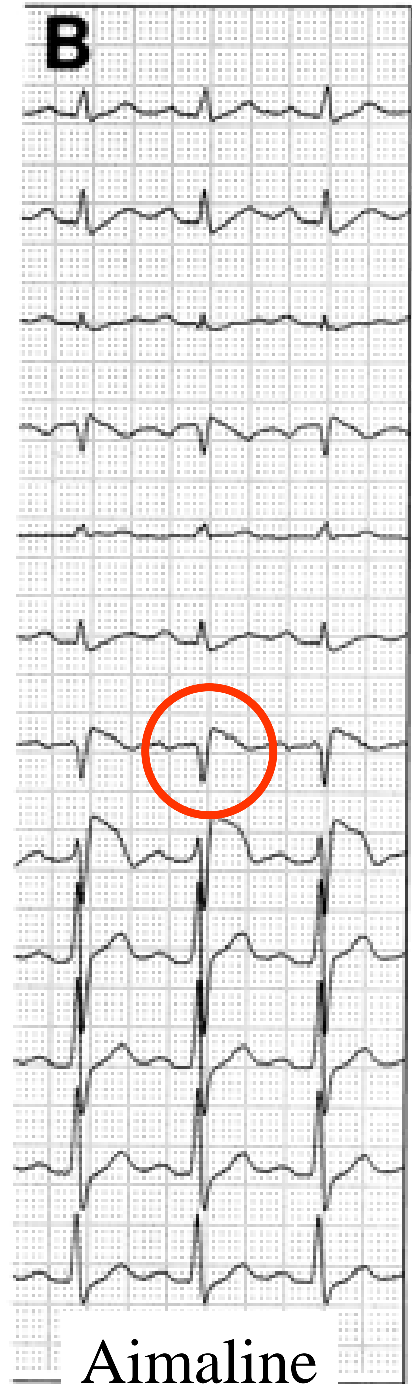
- *Vasovagal syncope* is diagnosed if precipitating events such as fear, severe pain, emotional distress, instrumentation and prolonged standing are associated with typical prodromal symptoms.
- *Situational syncope* is diagnosed if syncope occurs during or immediately after urination, defecation, cough or swallowing.
- *Orthostatic syncope* is diagnosed when there is a documentation of orthostatic hypotension associated with syncope or presyncope.

Case report #2

- 62-year, woman
- She was up early and she was having breakfast standing in the kitchen; the next thing she could remeber was that she was on the floor bleeding from the head wound. She knew where she was and was able to stand up easily
- However in the standing position she passed out again.
- History: several fainting episodes in her youth triggered by dentist, standing for prolonged period and hot showers
- Positive tilt testing

Final diagnosis:
Vasovagal syncope


A
I
II
III
AVR
AVL
AVF
V1
V2
V3
V4
V5
V6
25
Baseline


B
Aimaline

Brugada syndrome

Patients with Brugada syndrome who present with syncope have a 2-year risk of sudden cardiac death of approximately 30%; hence, implantable defibrillator therapy typically is recommended.

J Am Coll Cardiol 2006;47:473– 84.

Brugada Syndrome

Class	I	IIa	IIb
Risk stratification	•VF - VT	•Syncope •Familiar hyst of SD	• Inducibility sustVT - FV

……cardiac arrest survivors and patients with a history of syncope should receive an ICD.

Priori et al. Eur Heart J 2001;22:1374-1450

ACC/AHA/ESC guidelines for management of ventricular arrhythmias and the prevention of sudden death

Eur Heart J 2006; 27: 2099-2140

Brugada Syndrome

- An ICD is reasonable for spontaneous Brugada syndrome with or without mutations ***who have had syncope***
- SCD is caused by rapid polimorphic VT/VF frequently occuring at rest and during sleep.

Case report #2

- **62-year, woman**
- **She was up early and she was having breakfast standing in the kitchen; the next thing she could remeber was that she was on the floor bleeding from the head wound. She knew where she was and was able to stand up easily**
- **However in the standing position she passed out again.**
- **History: several fainting episodes in her youth triggered by dentist, standing for prolonged period and hot showers**
- **Positive tilt testing**

Final diagnosis:
Vasovagal syncope &
"*asymptomatic*" ECG Brugada pattern

Case report #2

Final diagnosis:

Vasovagal syncope & "*asymptomatic*" ECG Brugada pattern

No therapy

Structural heart disease & syncope

Key message

Identify the mechanism of syncope and prescribe mechanism-specific treatment

J Am Coll Cardiol 2006;47:473– 84.

AHA/ACCF Scientific Statement

AHA/ACCF Scientific Statement on the Evaluation of Syncope

From the American Heart Association Co… on Clinical Cardiology, Cardiovascular Nursing, Cardiovascular … the Young, and Stroke, and the Quality of Care and Ou… Interdisciplinary Working Group; and the Am… Cardiology Foundation

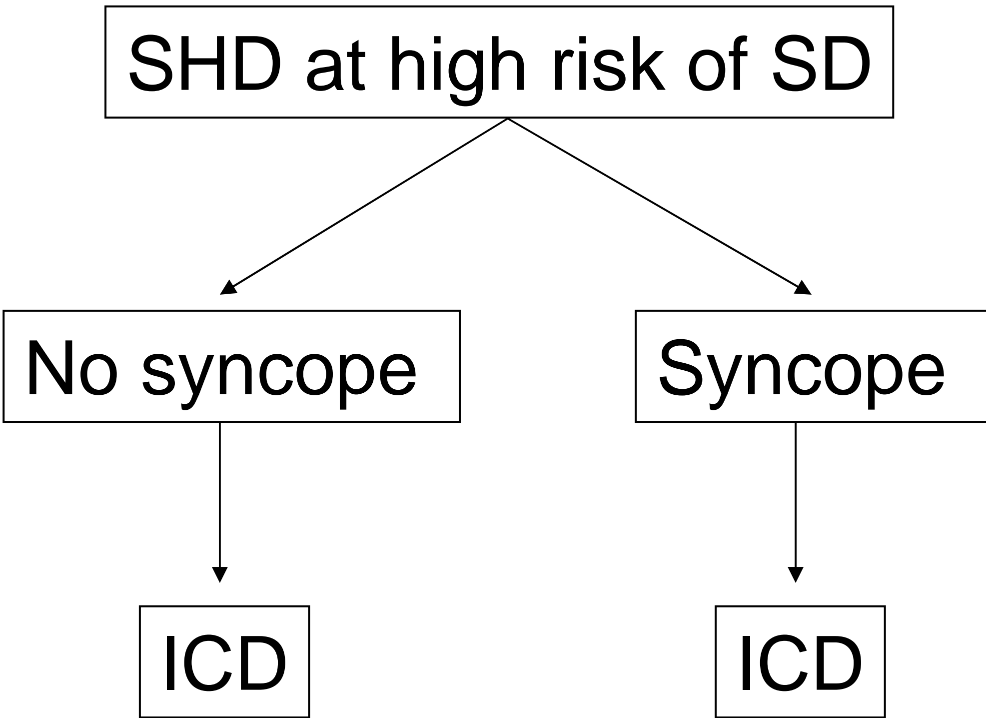
In Collaborati… …art Rhythm Society

En… …ican Autonomic Society

Errors to avoid

S. Adam … Woodrow Benson, MD, PhD; Italo Biaggioni, MD;
David J. Callans… …hen, MD; Kenneth A. Ellenbogen, MD; Andrew E. Epstein, MD;
Paul Friedma… Goldberger, MD; Paul A. Heidenreich, MD; George J. Klein, MD;
Bradley P. Knight, … …los A. Morillo, MD; Robert J. Myerburg, MD; Cathy A. Sila, MD, FAHA

AHA/ACCF Scientific Statement on the evaluation of syncope



J Am Coll Cardiol 2006;47:473– 84.

J Am Coll Cardiol 2006;47:473– 84.

AHA/ACCF Scientific Statement

AHA/ACCF Scientific Statement on the Evaluation

Structural Heart Diseases

From the American Heart Association Councils on Clinical Cardiology, Cardiovascular Nursing, Cardiovascular Disease in the Young, and Stroke, and the Quality of Care and Outcomes Research Interdisciplinary Working Group; and the American College of Cardiology Foundation

In Collaboration With the Heart Rhythm Society

Endorsed by the American Autonomic Society

S. Adam Strickberger, MD; D. Woodrow Benson, MD, PhD; Italo Biaggioni, MD; David J. Callans, MD; Mitchell I. Cohen, MD; Kenneth A. Ellenbogen, MD; Andrew E. Epstein, MD; Paul Friedman, MD; Jeffrey Goldberger, MD; Paul A. Heidenreich, MD; George J. Klein, MD; Bradley P. Knight, MD; Carlos A. Morillo, MD; Robert J. Myerburg, MD; Cathy A. Sila, MD, FAHA