

# Effort Related Ventricular Tachycardia Incidental Finding or The Tip of The Iceberg?




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# Case Presentation

- 43 year old asymptomatic lady.
- No history of syncope or arrhythmia.
- Several risk factors for coronary artery disease:
  - Hypertension.
  - Hyperlipidemia.
  - Family history of CAD (No SCD).
  - Overweight.

# Life-Style Modification was Undertaken

- Diet
  - A vigorous exercise program.
  - She planned to participate in a triathlon competition with her husband.
  - An exercise test was done as part of the triathlon registration requirements.
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# Exercise Test

Bruce stage 3, 8:42' HR 167 BP 170/90



Two similar VT runs, No significant ST changes, No symptoms.

# Clinical Evaluation

- Physical examination – normal
- ECG Normal.
- Echo – Normal.
- Holter – Normal.
- Cardiac CT was obtained =>
- Gated Myocardial Perfusion Tomography (SPECT) 8:30", 176 BPM, BP 170/80 mmHg. Breast artifacts m/p negative.

# Questions:

- Is the VT related to the coronary anomaly?
- Do we need any more tests?
  - Coronary catheterization with FFR / IVUS?
  - Pharmacological provocation?
  - EPS?
- How to treat:
  - No more triathlons?
  - Beta blockers?
  - Surgery?

# Incidence of SCD related to CAA

**TABLE 2. Incidence of Sudden Cardiac Death Related to Coronary Artery Anomalies**

Group (Age)	No. of Deaths	Deaths Related to Coronary Anomalies, %
Exercising individuals, overall (8–66 y) <sup>18</sup>	550	11
General population (<40 y) <sup>17</sup>	162	0.6
Competitive athletes (mean age, 17 y) <sup>19</sup>	134	23
Joggers and marathon runners (30–46 y) <sup>18</sup>	120	1.6
Exercising individuals, Maryland State <sup>18</sup>	62	0

# Predictive value of stress test

- Unlike effort-related ischemia typical of fixed obstructive lesions, ischemia associated with coronary anomalies occurs only under inconsistent or extreme clinical conditions.
- **Exercise tests**, intended to reproduce symptoms or to induce changes in electrocardiographic or nuclear-imaging parameters, often produce false-negative or confusing results



# Significance of inter-arterial course

- To date, anatomic delineation of a coronary artery course between the aorta and pulmonary artery in a young (less than age 50 years) person remains the greatest known risk for an adverse event, with or without symptoms.
- Catheter-based measurement of flow reserve and coronary intravascular ultrasonography have the potential to delineate mechanisms of potential flow obstruction and are increasingly part of diagnostic and therapeutic algorithms.

Basso et al. JACC. 2000;35:1493;

Angelini P. Circulation 2007;115:1296; Angelini P J Invasive Cardiol. 2003;15:507

# Recommendations for Congenital Coronary Anomalies of Ectopic Arterial Origin

## Class I

3. **Surgical coronary revascularization should be performed in patients with any of the following:**
  - a. **Anomalous left main coronary artery coursing between the aorta and pulmonary artery. (*Level of Evidence: B*)**
  - b. **Documented coronary ischemia due to coronary compression (when coursing between the great arteries or in intramural fashion). (*Level of Evidence: B*)**
  - c. **Anomalous origin of the right coronary artery between aorta and pulmonary artery with evidence of ischemia. (*Level of Evidence: B*)**

# Recommendations for Congenital Coronary Anomalies of Ectopic Arterial Origin

## Class IIa

1. Surgical coronary revascularization can be beneficial in the setting of documented vascular wall hypoplasia, coronary compression, or documented obstruction to coronary flow, regardless of inability to document coronary ischemia. (*Level of Evidence: C*)
2. Delineation of potential mechanisms of flow restriction via intravascular ultrasound can be beneficial in patients with documented anomalous coronary artery origin from the opposite sinus. (*Level of Evidence: C*)