

Electrocardiography
Section II: Infarction and Pseudo-Infarction
Prinzmetal's Variant Angina

Paul A. Levine, M.D., FACC
Professor of Medicine
Loma Linda University School of Medicine



Myocardial Infarction and Ischemia

- Ischemia is tissue receiving insufficient blood supply
- If the ischemia is persistent, it results in the death of the tissue – infarction
- If the ischemia is transient or promptly reversed (angioplasty or thrombolytic agents), there may be very little or no permanent damage



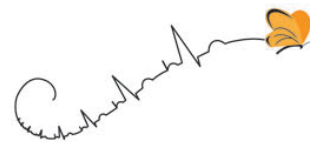
ST-T Wave Shifts

- Whether an event is an infarct or reversible ischemia cannot be identified from an isolated single ECG
- One needs to observe the evolution over time
- Acute interventions with catheterization, angioplasty and stents has reduced the severity of most MI's where the patient has access to a major medical center



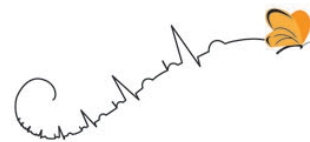
ST-T wave shifts

- ST segment depression represents subendocardial ischemia or infarction
- ST segment elevation represents transmural ischemia or infarction
- There are both STEMI and non-STEMI infarctions

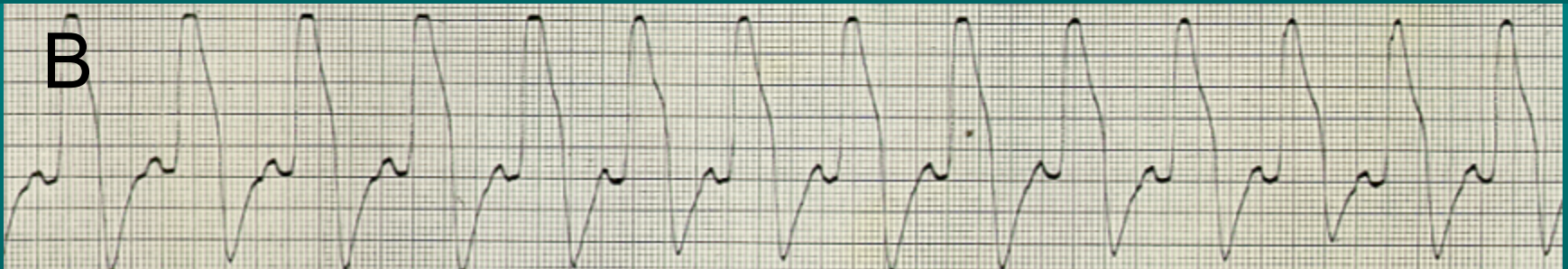
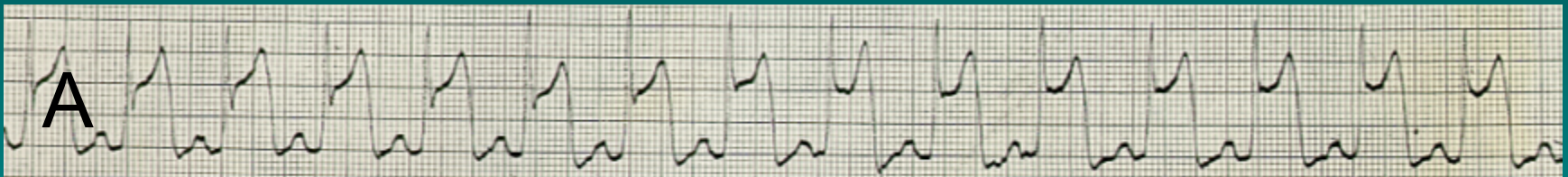


Clinical Presentation

- 48 year old woman with classic ischemic quality chest pain but occurring at rest and not exertion
- Resting ECG when asymptomatic is NORMAL
- Premenopausal, non-smoker, normal BP, negative FH, Total Cholesterol 156, HDL 60
- c/o recurrent 8/10 crushing precordial chest pain – brought to ER during one episode



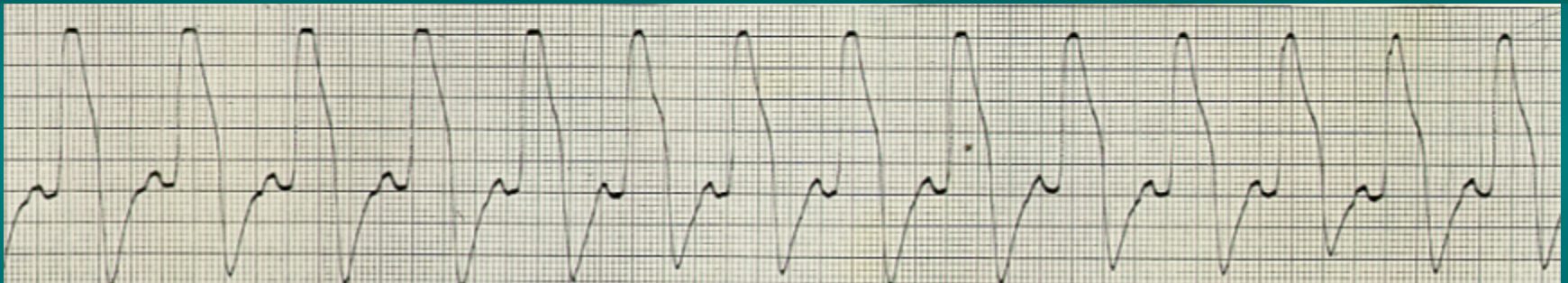
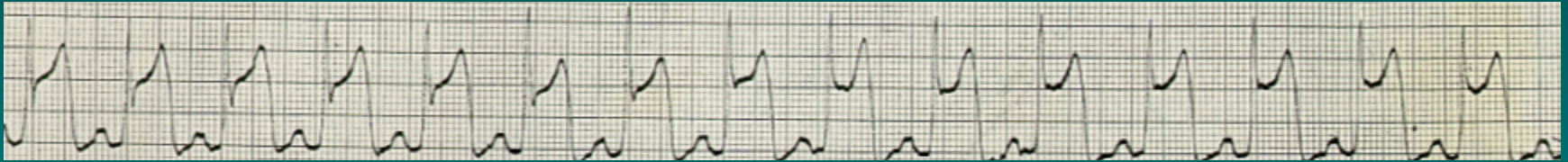
Presenting Rhythm Strip during Chest Pain



Sequential rhythm strips – same lead.

From A to B, the chest pressure markedly increased

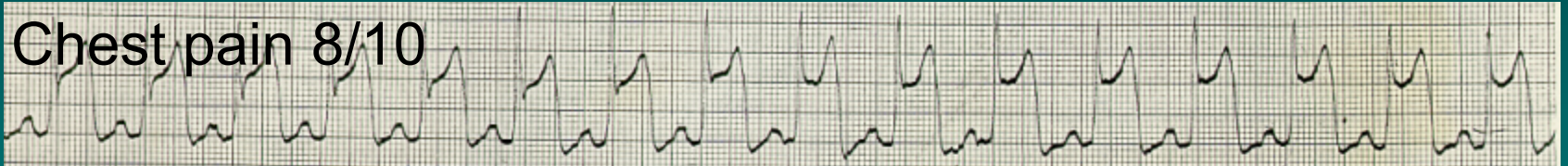
What should be done now?



- A. Emergency cardiac cath and PTCA/Stent**
- B. tPA (thrombolytic therapy)**
- C. Sublingual nitroglycerine**
- D. IV morphine**

Sequential rhythm strips

Chest pain 8/10



Chest pain 10/10



Chest pain 5/10



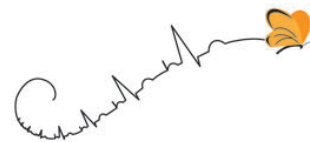
Chest pain 3/10



Total duration from TNG to resolution: 3 minutes!

Diagnosis

- Prinzmetal's Variant Angina (coronary vasospasm)
- Cardiac catheterization
 - Normal LV function
 - Clean coronary arteries
 - LAD spasm induced with ergonovine
- Rx:
 - Sublingual TNG on prn basis
 - Nifedipine (Calcium Channel Blocker)



Lesson

- ST segment elevation simply means transmural ischemia
- The patient's subsequent course determines if this will be an infarct or transient ischemia
- Ischemia resolves with no permanent damage
- Infarct evolves with sequential ST-T changes and development of Q waves



Greenish Blue (female)

Sequoia National Forest

Tulare County, CA

5, 2009

July



Thank You

Questions?