כאב בחזה בילדים

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קרדיולוגית ילדים
המרכז הרפואי הדסה ירושלים

The problem

- Chest pain accounts to 650,000 physician visit per year in the USA
- 0.25% of outpatient/emergency room visits
- Mean age at presentation 9-14 years

Driscoll DJ, Moss and Adams, 2008

Chest pain in Children

- Overwhelmingly benign
- 70% of adolescents had restricted their own activity secondary to the chest pain
- Activities stopped until further testing is completed or the child is evaluated by a subspecialist
  - Parents
  - Coaches
  - primary care physicians

Chest pain in childhood

- Cardiac

- Non cardiac

Noncardiac causes of chest pain in children and adolescents

- Idiopathic
- Musculoskeletal
- Trauma
- Costochondritis
- Precordial catch syndrome
- Slipping Rib Syndrome
- Psychogenic
- Respiratory
  - Asthma
  - Pneumonia
  - Pneumothorax / Pneumomediastinum
  - Chronic cough

Other non-cardiac causes

- Gastrointestinal
  - Gastroesophageal reflux
  - Esophagitis
  - Gastritis
- Miscellaneous
  - Breast mass
  - Sickle cell disease
  - Thorasic tumors
  - Herpes zoster
  - Pleurodynia

Cardiac causes of chest pain in children and adolescence

- Coronary artery disease
  - Anomalous origin of coronary artery
  - Kawasaki disease, post Kawasaki disease
  - Hyperlipidemia/early coronary artery disease
  - Cocaine abuse
  - Post surgery
- Dysrhythmias
- Inflammatory
  - Pericarditis
  - Myocarditis
- Hypertrophic cardiomyopathy
- Aortic stenosis
- Mitral valve prolapse

Causes of chest pain in children

	% Different studies						average
Idiopathic	—	13	46	55	28	—	21	40%
Musculoskeletal	—	16	13	—	15	45	15	20%
Costochondritis	—	9	16	2	10	23	9	15%
Asthma	64	12	—	3	4	—	7	10%
Psychogenic	—	9	—	—	—	—	9	5%
Trauma	—	7	3	—	4	—	9	5%

Driscoll DJ, Moss and Adams, 2008

Percentage of causes of chest pain

	Different studies						
Respiratory	—	11	—	—	6	12.5	10
Pneumonia	—	6	—	—	2	—	4
Hyperventilation	—	—	23	—	—	—	—
Cardiac disease	—	4	—	6	—	—	4
Mitral prolapse	—	—	1	—	—	—	—
Arrhythmia	—	—	—	—	3	—	—
GI disease	—	3	3	2	7	—	4
Sickle cell disease	—	3	—	—	—	—	2

10%

3%

3%

5%

Non-cardiac chest pain

Non-specific (idiopathic) chest pain

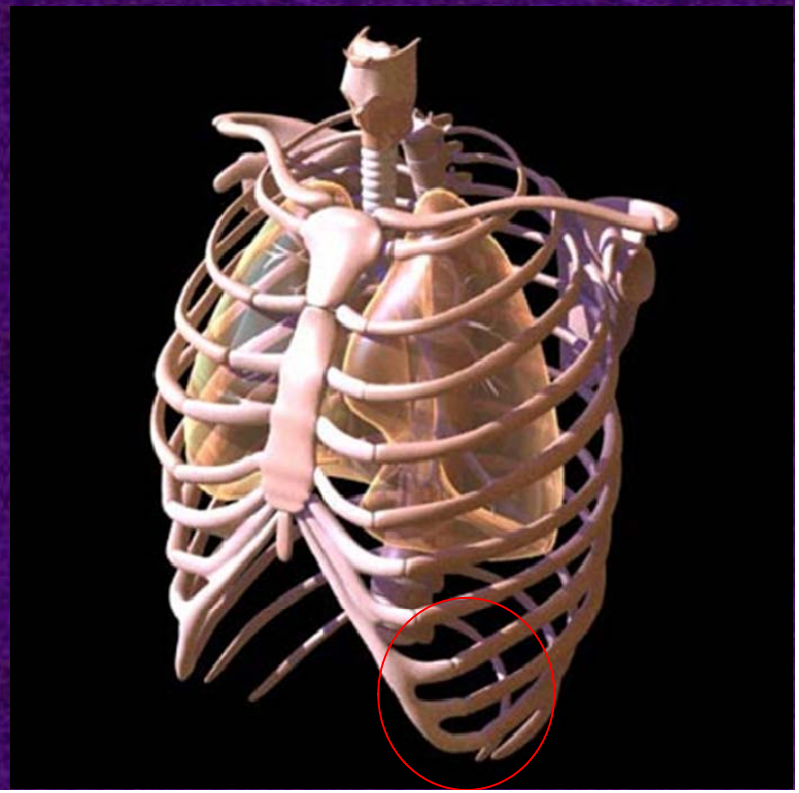
- Probably the most common chest pain in children
- Sharp
- Location: center of the chest or billow the left nipple
- Duration: seconds-minutes
- Exacerbated by deep breathing
- No tenderness

costochondritis

- Usually unilateral
- Usually sharp pain
- Seconds to minutes
- Exacerbated by deep breathing
- Tenderness
- No signs for inflammation

Slipping Rib Syndrome

- Rare
- Intense pain
- Usually 8th, 9th, 10th ribs



Precordial catch syndrome

- Exact etiology is unknown
- Localized, Sharp pain
- Usually at rest
- A split second onset taking the patient by surprise
- Duration: seconds to minutes
- Worse with deep breathing
- Tend to breath shallowly or hyperventilate
- May sit straight up to help relieve the pain
- Physical examination is normal, no tenderness

Trauma

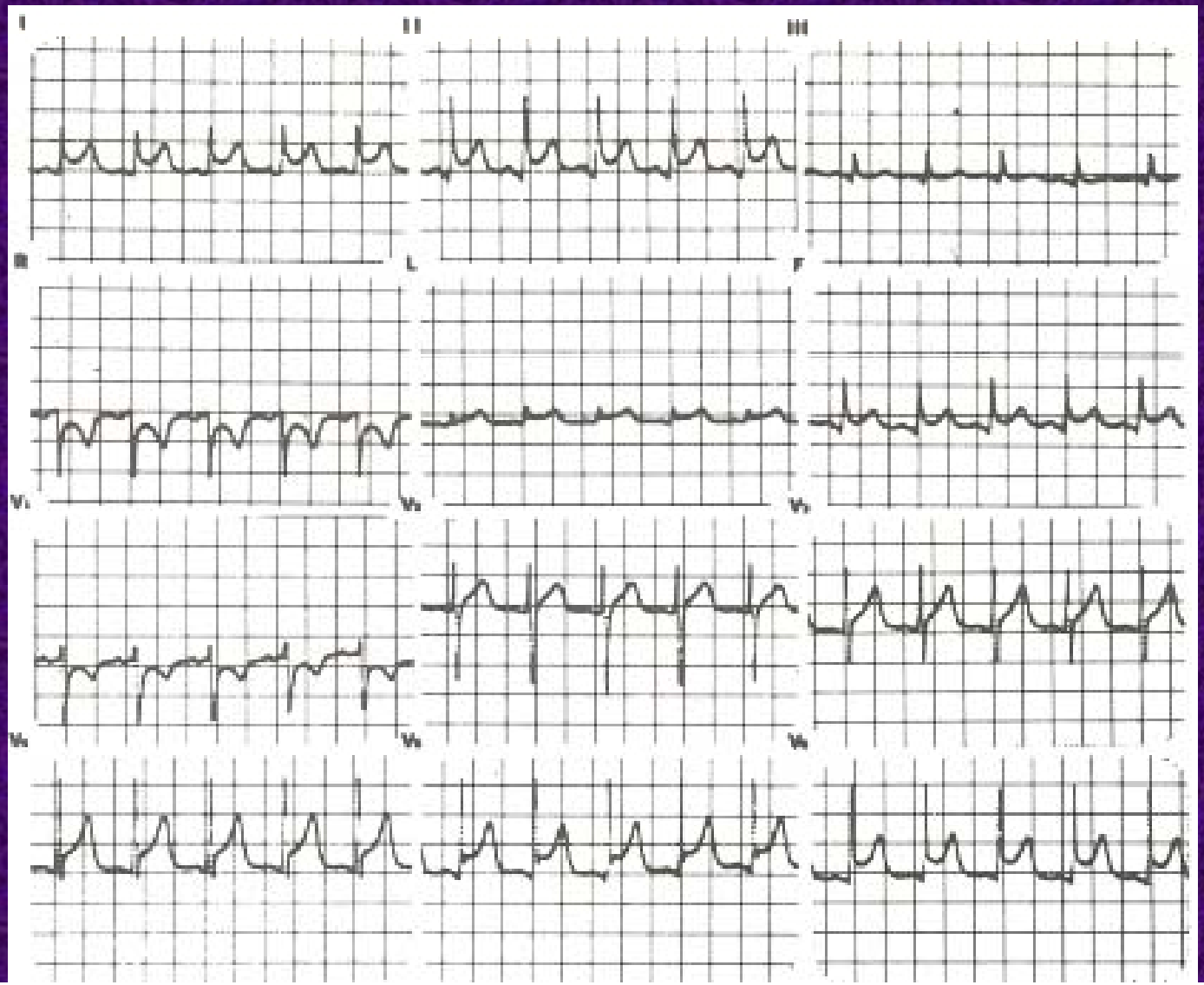
- History
- Tenderness
- Danger for
  - myocardial contusion
  - hemopericardium

Cardiac causes

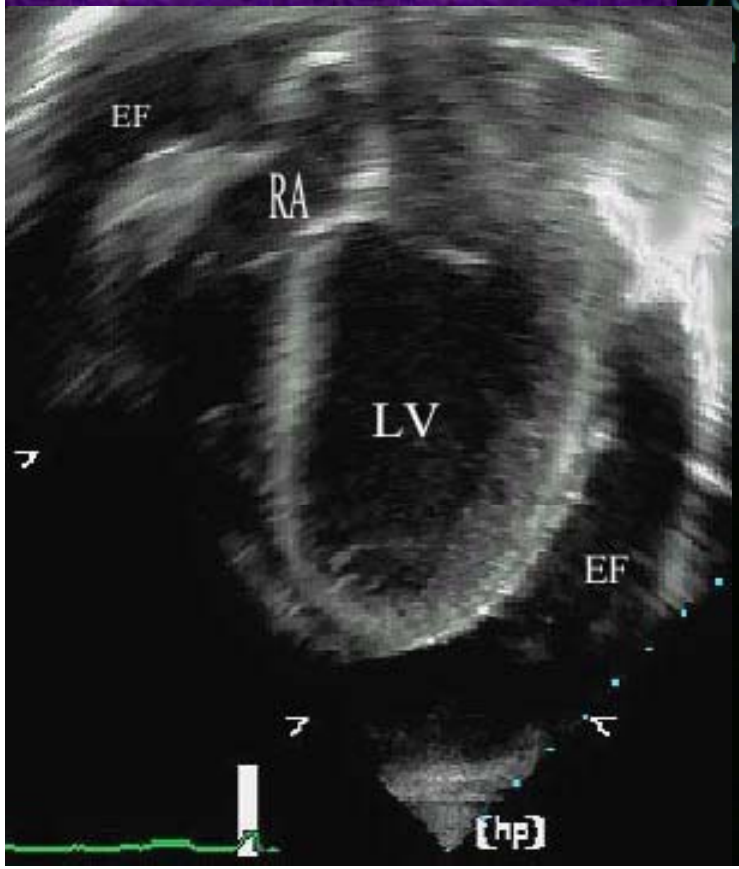
pericarditis

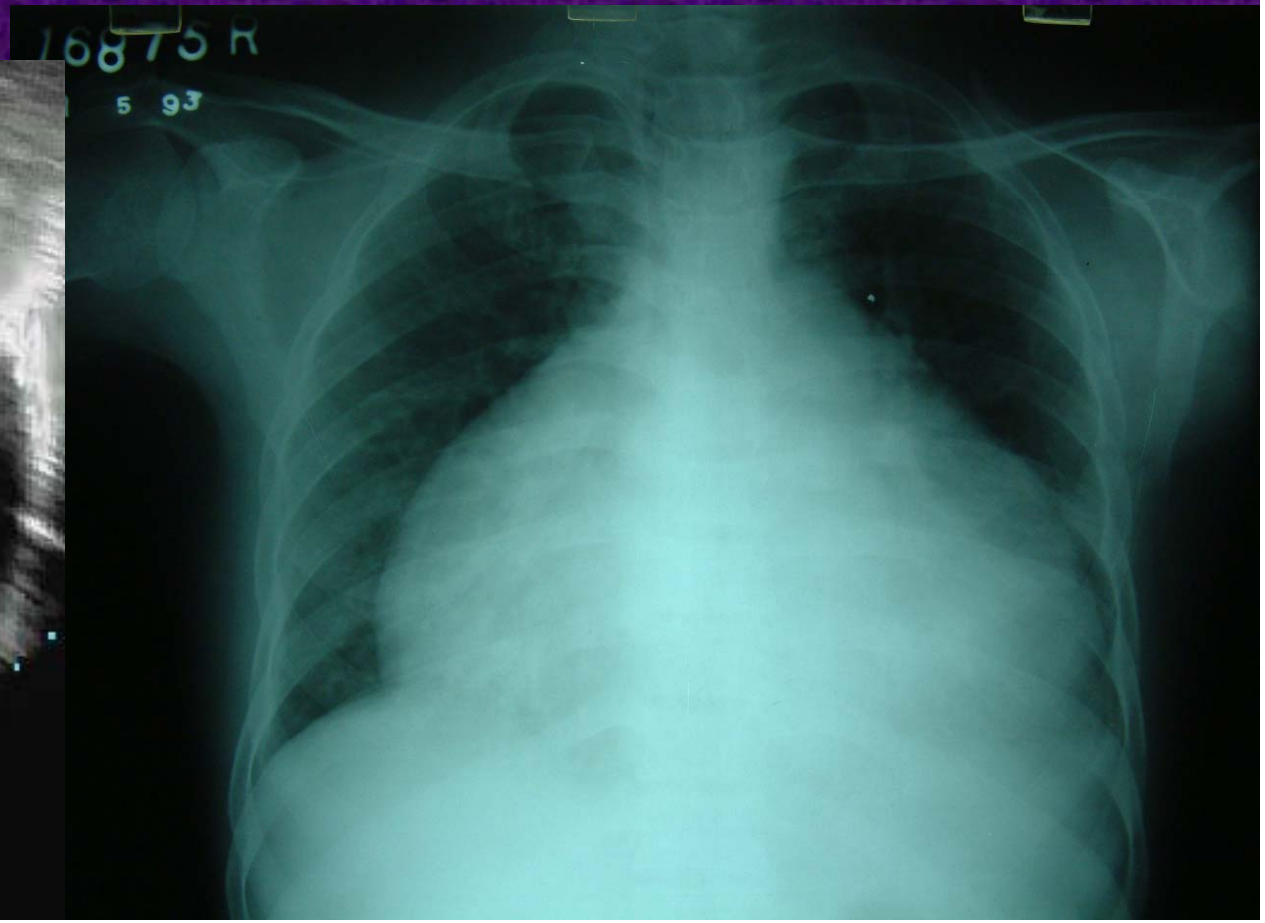
- History of viral disease – not always
- Renal disease, oncology
- Usually more severe pain
- Intensified when lying down and lessens when leaning forward
- ECG – generalized ST elevation
- ? tamponade

Pericarditis - ECG



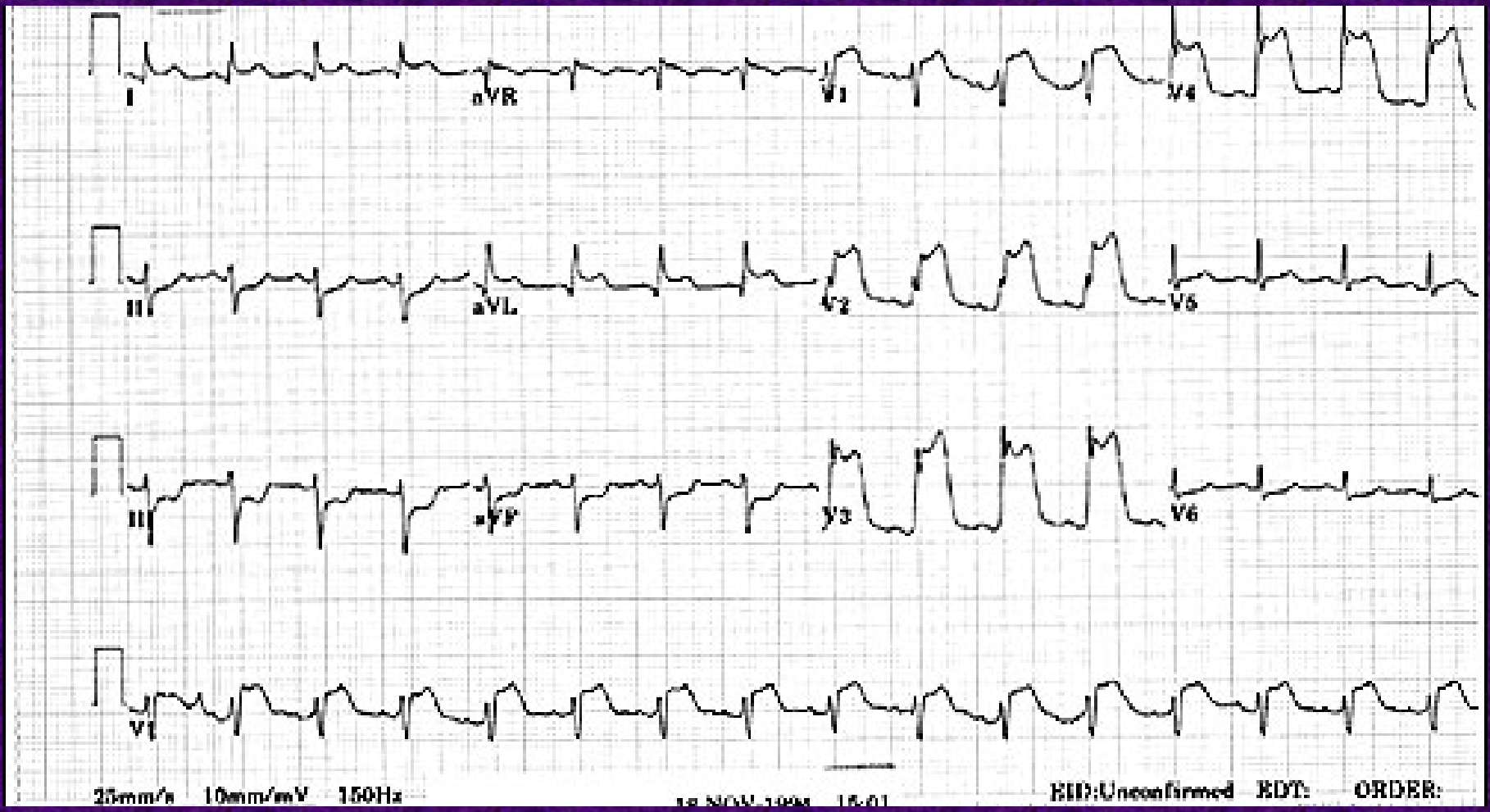
Pericarditis





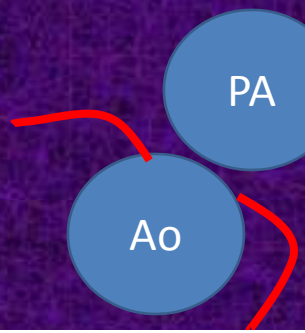
Ischemia

Chest pain

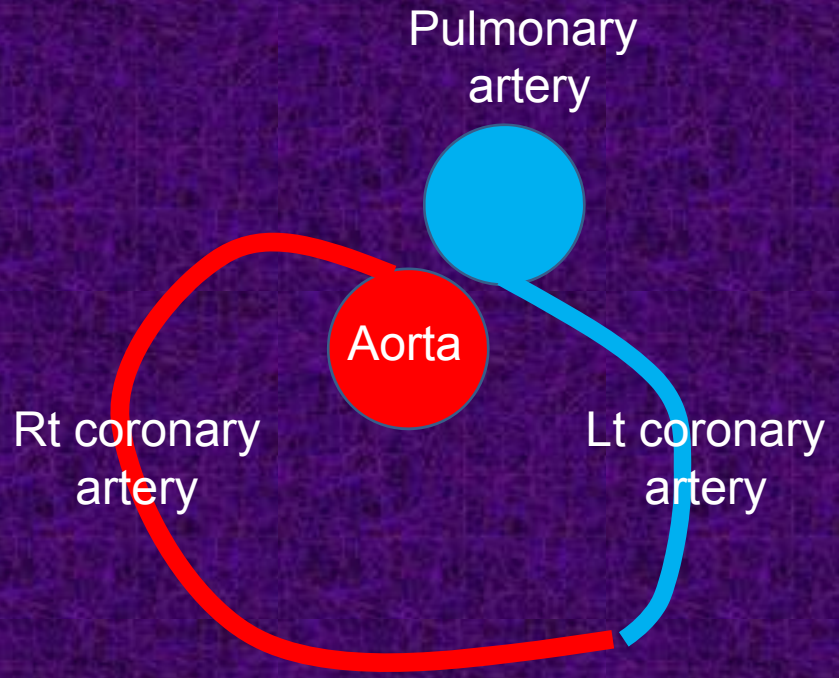

I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
V1
25mm/s 10mm/mV 150Hz
KID:Unconfirmed RDT: ORDER:

Anomalous origin of the left coronary artery from the pulmonary artery

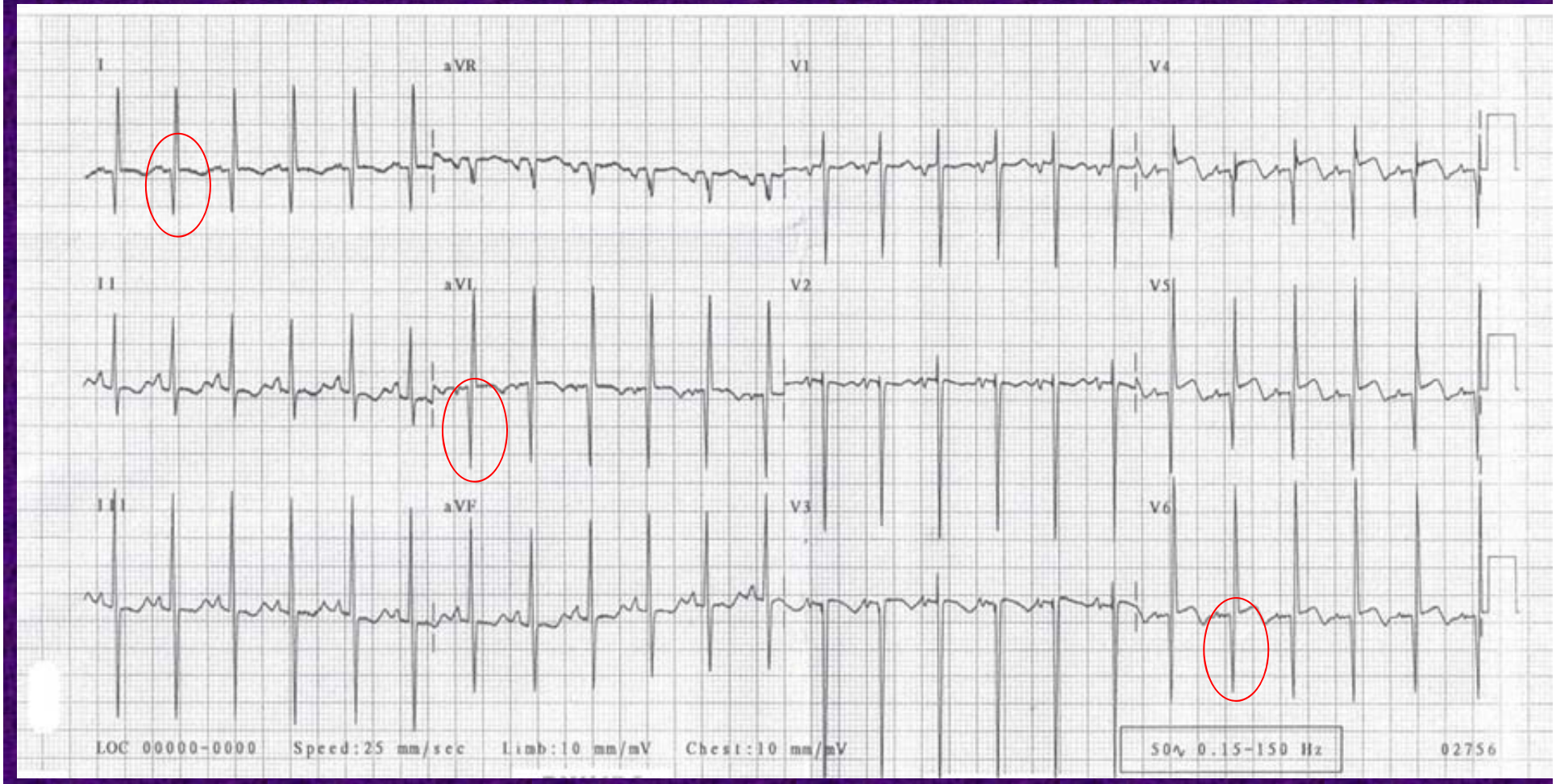
- Symptoms usually in the first 2 months
- Irritability
- Breathing problems
- Mitral regurgitation
- Abnormal ECG



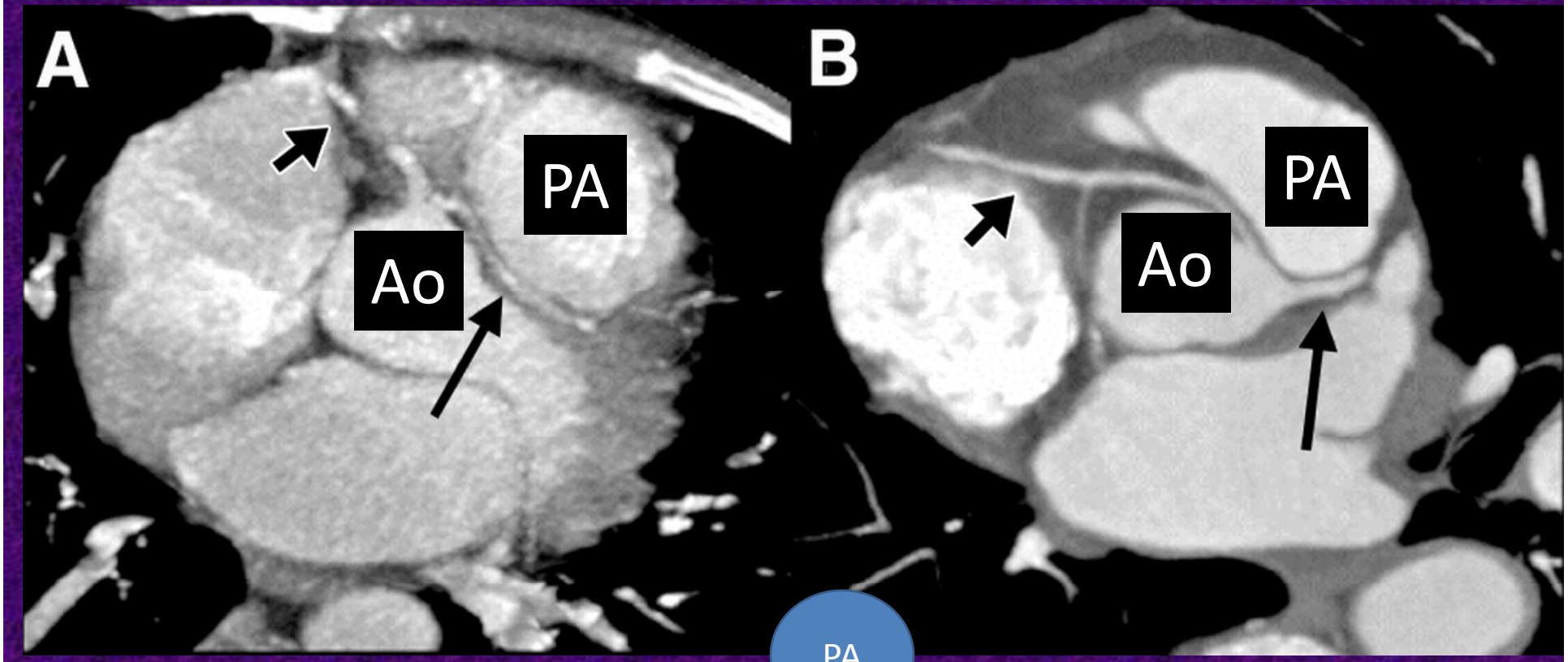
Normal

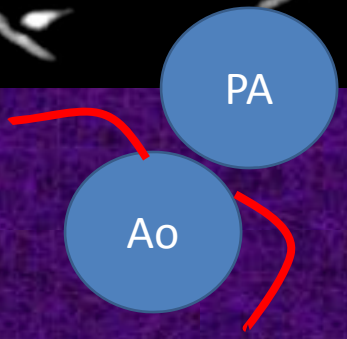


Anomalous origin of the left coronary artery from the pulmonary artery



Origin if coronary artery from the wrong sinus





Normal

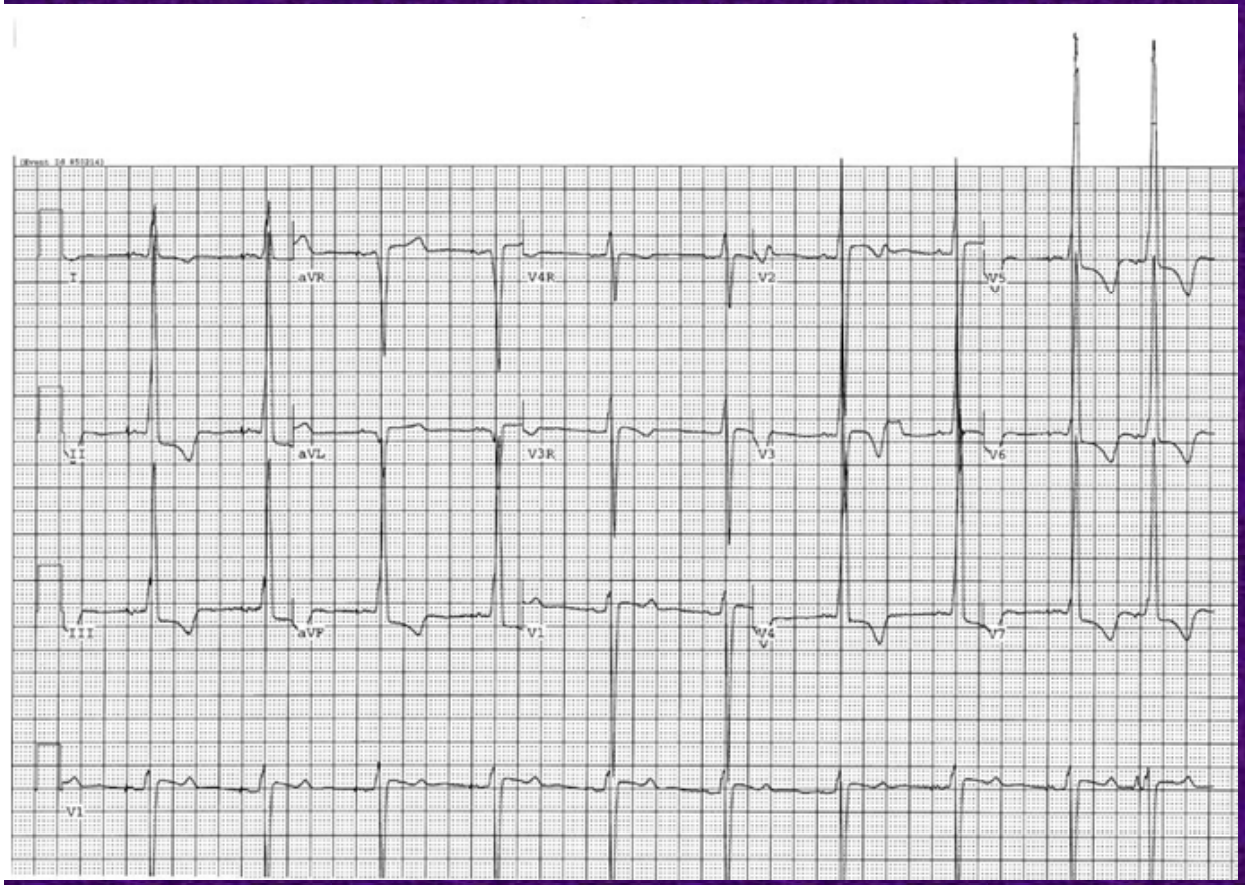
Kawasaki Disease

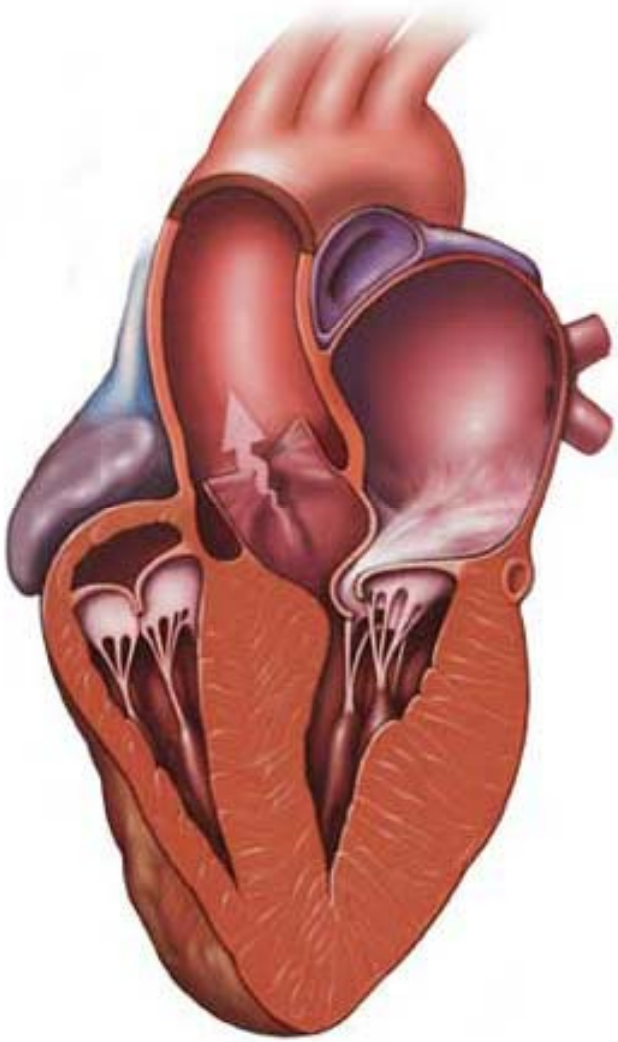
- Usually late after significant coronary arterities
- Angina or MI

Other cardiac problems

- Hypertrophic cardiomyopathy
- Severe aortic stenosis
- Williams syndrome
  - coronary stenosis
- Pulmonary atresia – intact ventricular septum
  coronary fistula
- Marfan Syndrome
  - Aortic dissection

Hypertrophic cardiomyopathy



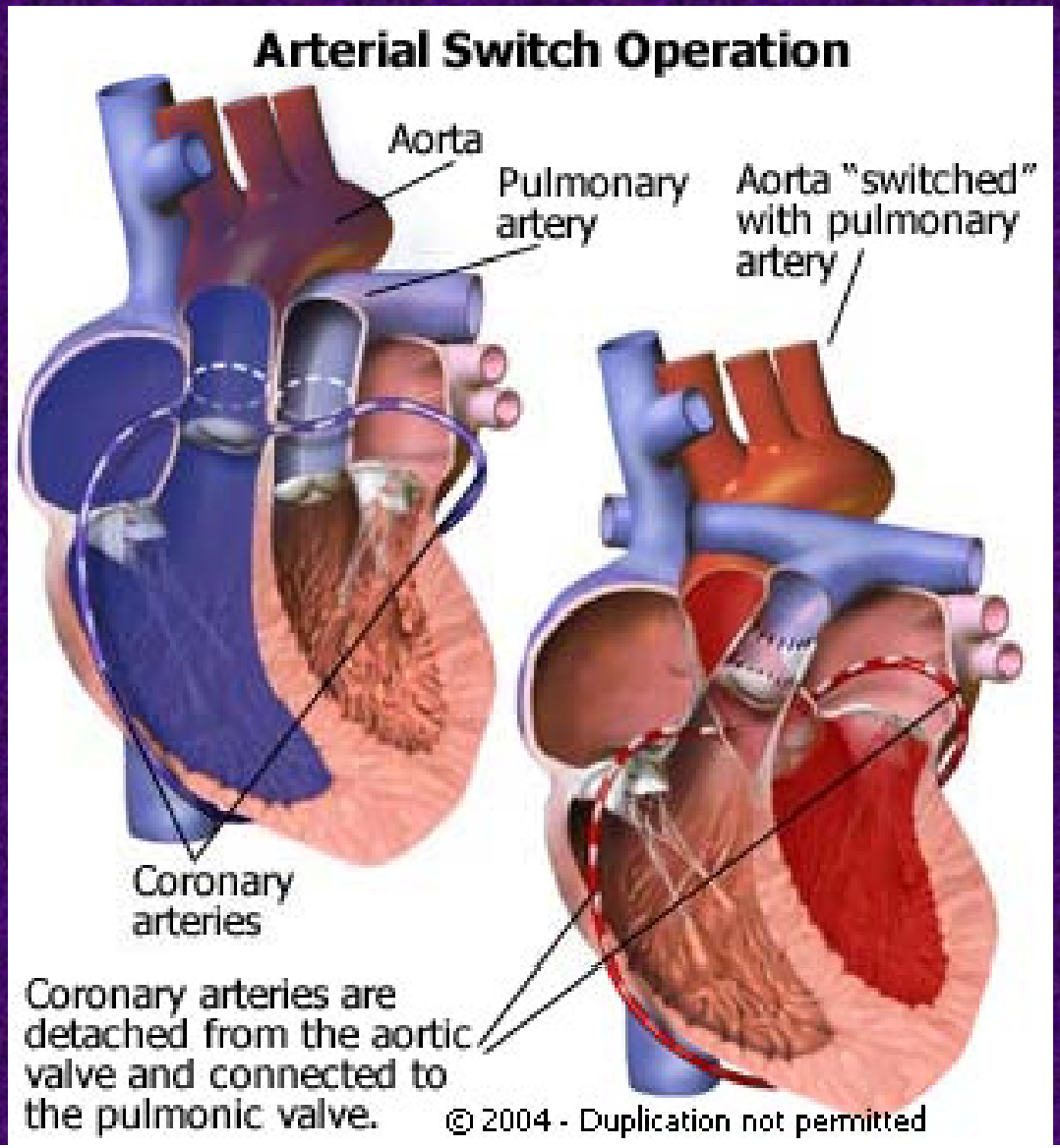


Beware the patient after cardiac intervention

Post operative problems

- Pericardial / pleural effusion
- Post pericardiotomy syndrome
- Infection
- Surgical wound problems
- Scar tenderness

Transposition of the Great Arteries
Arterial Switch



Post catheterization

History

- History of heart disease / surgery
- Family history
- Character of pain
  - Type
  - Location
  - What brings it / relieves it
  - Duration
  - Exercise

History

- Fever
- Respiratory complaints
- Palpitations
- Dizziness or syncope
- Vomiting or dysphagia

Physical Examination

- Signs of injury such bruising or swelling
- Symmetry
- Breasts in girls and in boys
- Palpate the entire thoracic cage
- Auscultation
  - Arrhyhthmia
  - Murmur / Pericardial friction rub
  - Pneumonia
  - bronchospasm

Maneuvers to illicit the pain

- Twist
- Raise arm over the head
- Push or pull against resistance
- Inhale deeply

Further investigations

- ECG
  - –Arrhythmia
  - –Q waves
  - –ST-T changes
  - –Hypertrophy

Further investigations

- Chest X ray
  - Pericardial/pleural effusion
  - Lung disease
  - Pneumothorax / pneumomediastinum
  - Chest wall disease

Further investigations

- Echocardiography
  - –Cardiac anomaly
  - –Coronary origin / anomalies
  - –Pericarditis / pleuritis

Further investigations

- Exercise test
- Nuclear perfusion - MUGA

Test for coronary disease in adults

	sensitivity	Specificity
Exercise ECG	50%	90%
Nuclear perfusion	85%	85%

Anthony D. Prim Care Clin Office Pract 32 (2005) 931

Reasons to Refer Children Who Have Chest Pain to a Cardiologist

- Abnormal cardiac findings
- During exercise
- Syncope
- Palpitations
- ECG abnormalities
- Family history of
  - Arrhythmias/Sudden death
  - genetic disorders
  - Familial hypercholesterolemia
- History of cardiac surgery or interventions
- History of Kawasaki disease

גישה לילד עם כאבים בחזה

- אנמנזה שלילית
- בדיקה גופנית תקינה

- אין צורך בבדיקת נוספות

- מספר מחקרים הראו שללא אינדיקציות ברורות, בדיקות נוספות כגון אקו ומבחן מאמץ לא שיפרו את הסיכוי לאבחנת הגורם לכאבים

Driscoll DJ, Moss and Adams, 2008

הגישה לילד עם כאבים בחזה

- לעיתים קרובות הרופא מעדיף לשלוח את הילד לבדיקות נוספות כדי להרגיע את ההורים, ואת עצמו
- לבדיקות נוספות יכולה להיות השפעה הפוכה, מגביר את הדאגה:

"כי אם צריך עוד בדיקות כנראה יש בעיה"

Driscoll DJ, Moss and Adams, 2008