Clinical Case Discussion

James J. Cappola, III,M.D.,FACP

Chair and Associate Professor of Internal Medicine

CUSOM

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CAMPBELL UNIVERSITY | Jerry M. Wallace School of Osteopathic Medicine

A 30-year-old previously healthy woman presents to the emergency department with severe chest pain over the last two days. The chest pain is left-sided, sharp and without radiation. The chest pain is constant and worsens when she tries to exercise. The chest pain also becomes much worse when she lays flat on her back in bed and improves when she sits up. Her only other complaint is fatigue and intermittent pain in the joints of both hands for the last four months.

She describes intermittent fevers. She denies weakness, weight gain or weight loss.

PMH:

- Hypothyroidism x 3 years
- Asthma x 10 years

PSH: None

Medications:

- Budesonide/Fometerol 80 mcg/4.5 mcg: 1 puff bid
- Albuterol inhaler: 2 puffs every 4 hours prn SOB

- No hospitalizations
- No serious injuries
- Up to date on flu and COVID vaccines

NKDA

Soc hx: She is single. She teaches highschool English. She is in a monogamous relationship with her boyfriend. There is no hx of tobacco, alcohol or drug use. She exercises at a gym three times per week.

Family hx:

- mother age 58 has hx hypothyroidism and rheumatoid arthritis
- father age 62, healthy
- 1 brother, age 20 with type 1 diabetes

ROS:
Gen: +intermittent fevers –weakness - weight gain - weight loss.
HEENT: - vision changes + mouth ulcers– sore throat-rhinorrhea
Neck: - swollen glands or masses
Cardiac: + chest pain as per HPI – palpitations
Resp: -SOB – cough
GI:- abd pain –n/v –changes in BMs
GU: - dysuria – menses regular –LMP 2 weeks ago
MSK: + arthralgias in hands and feet
Skin: + excessive erythema in bright sunlight – urticaria
Heme: -occasional gum bleeding
Lymph: - swollen glands
Psych: mood stable

On exam, VS: bp 110/65 p 88 RR 18 temp 99.9F O2 sat 97% on RA

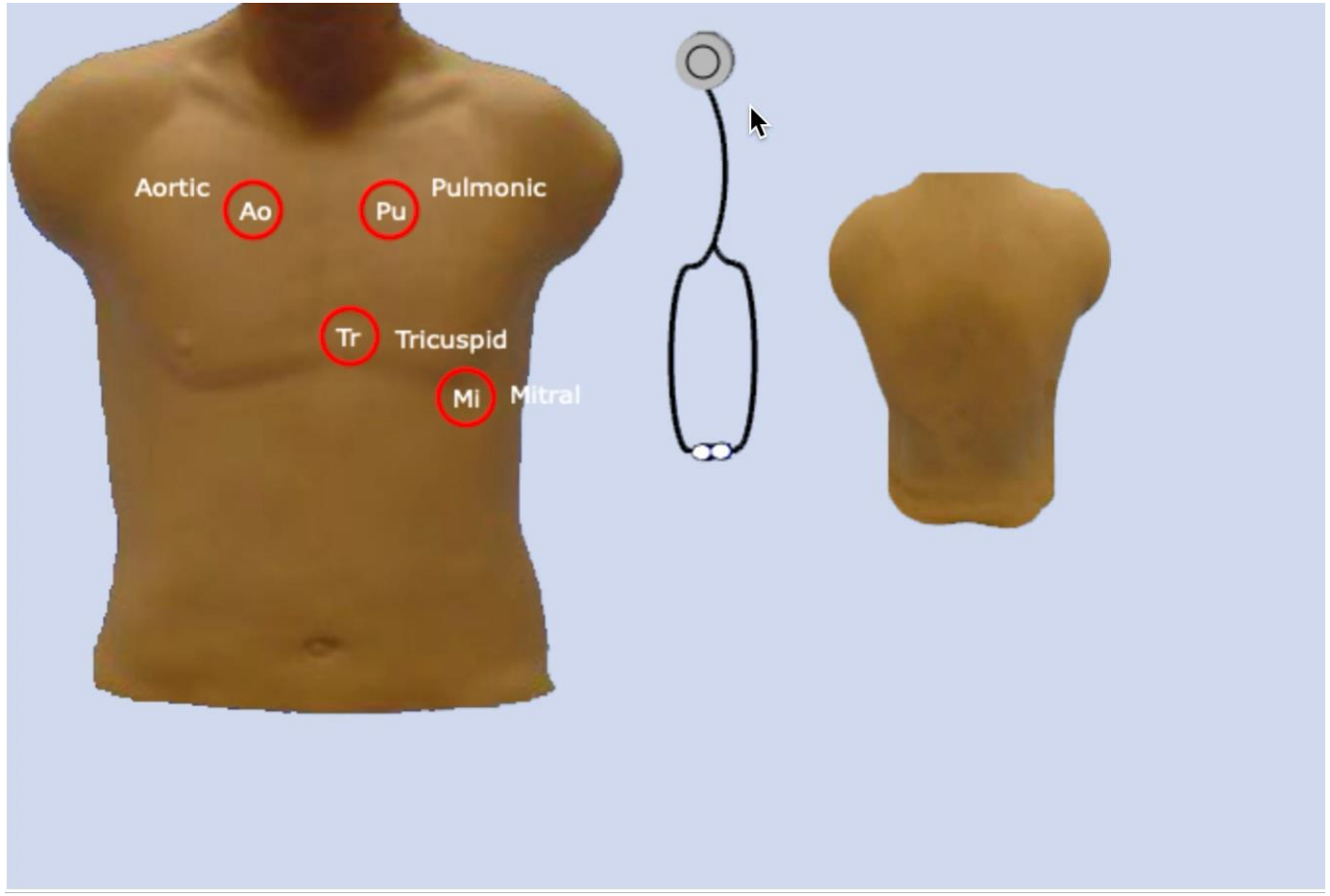
HEENT: PERRL; EOMI
OP: mucosal lesion noted . . .
throat without exudate

Aphthous ulcer

Skedoc.com

Neck: Full ROM; trachea midline; thyroid not enlarged and without masses but with granular consistency; no adenopathy

Chest Examination



Lungs: CTA without wheezes, rales or rhonchi

OMM: thoracic inlet restricted on the L
T2FRLSL
L 1st, 2nd and 3rd rib inhaled

Skin: no nevi or rashes

Abd: nondistended, active bowel sounds, soft, nontender without guarding or rebound; no hepatosplenomegaly

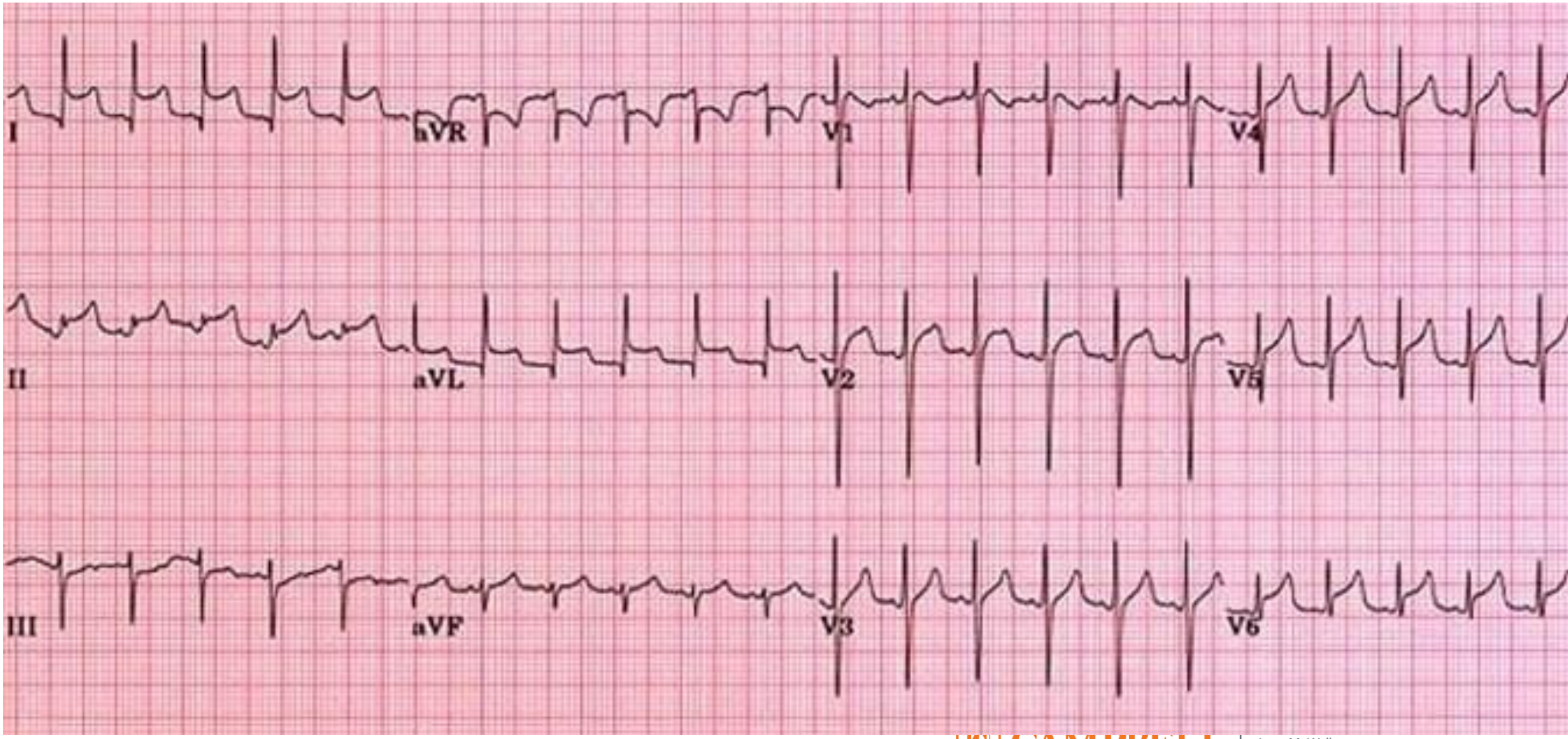
Extr: no edema; dp pulses 2+ B/L

Neuro:

- CNs II through XII grossly intact.
- Motor:
  - normal bulk and tone all 4 extr
  - strength: wrist ext, flex, forearm ext, flex; hip ext, flex, leg ext, flex all 5/5 B/L
- Sensory: light touch grossly intact throughout
- Cerebellar: finger to nose, heel to shin testing without difficulty B/L
- Refl: biceps, triceps, patellar, ankle jerks 2+ B/L; toes downgoing B/L.
- Gait: not tested

Now what???

An EKG is performed . . .



elentra,.healthsci.queensu.ca

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Labs:

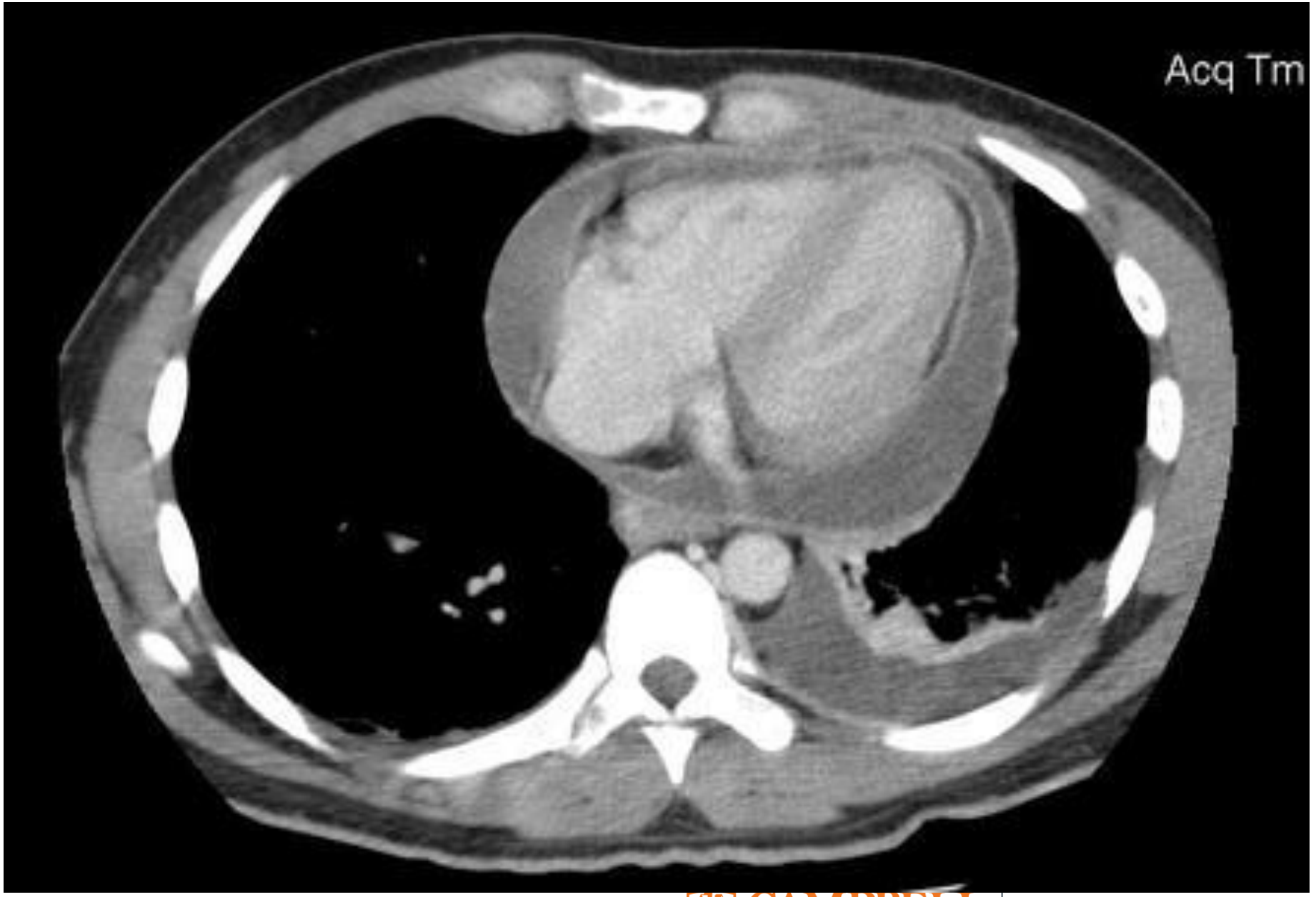
wbc	10.5
hgb	10.0
hct	30%
platelets	78,000

hs-cTnI (ng/L) Normal < 14 ng/L	10

ESR Normal < 10 mm/hr	95

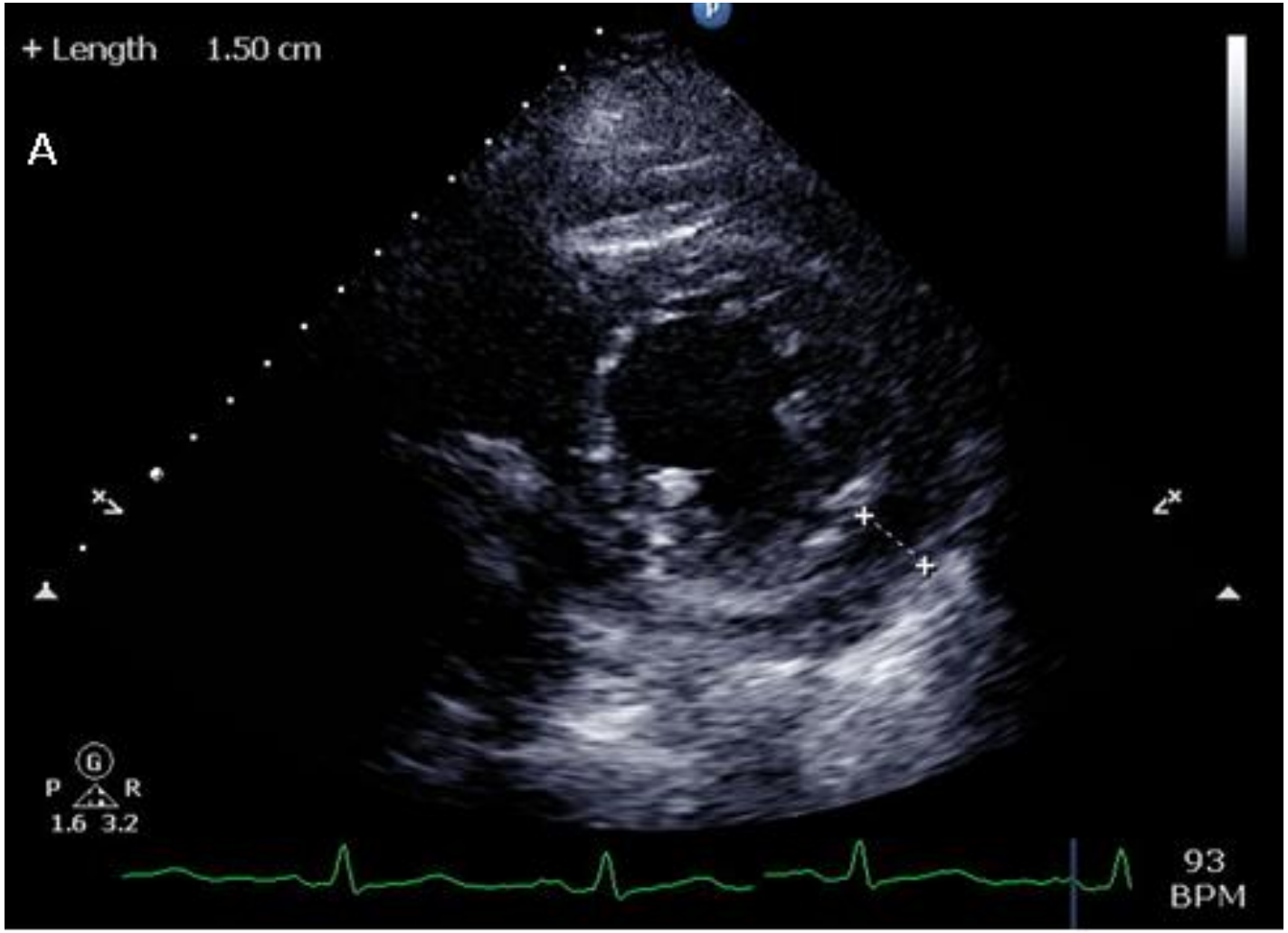
Na	137
K	4.1
CL	102
CO2	25
BUN	18
Cr	0.9
Glc	82

A chest CT is performed . . .



Radiopaedia.org

A 2-D echocardiogram is performed . . .



Apical four chamber view

Apr 18, 2017 | Beni Verma, MD; James L Gentry, III, MD , FACC; Serge C Harb, MD, FACC; Apostolos Kontzias; Allan L. Klein, MD, CM, FACC

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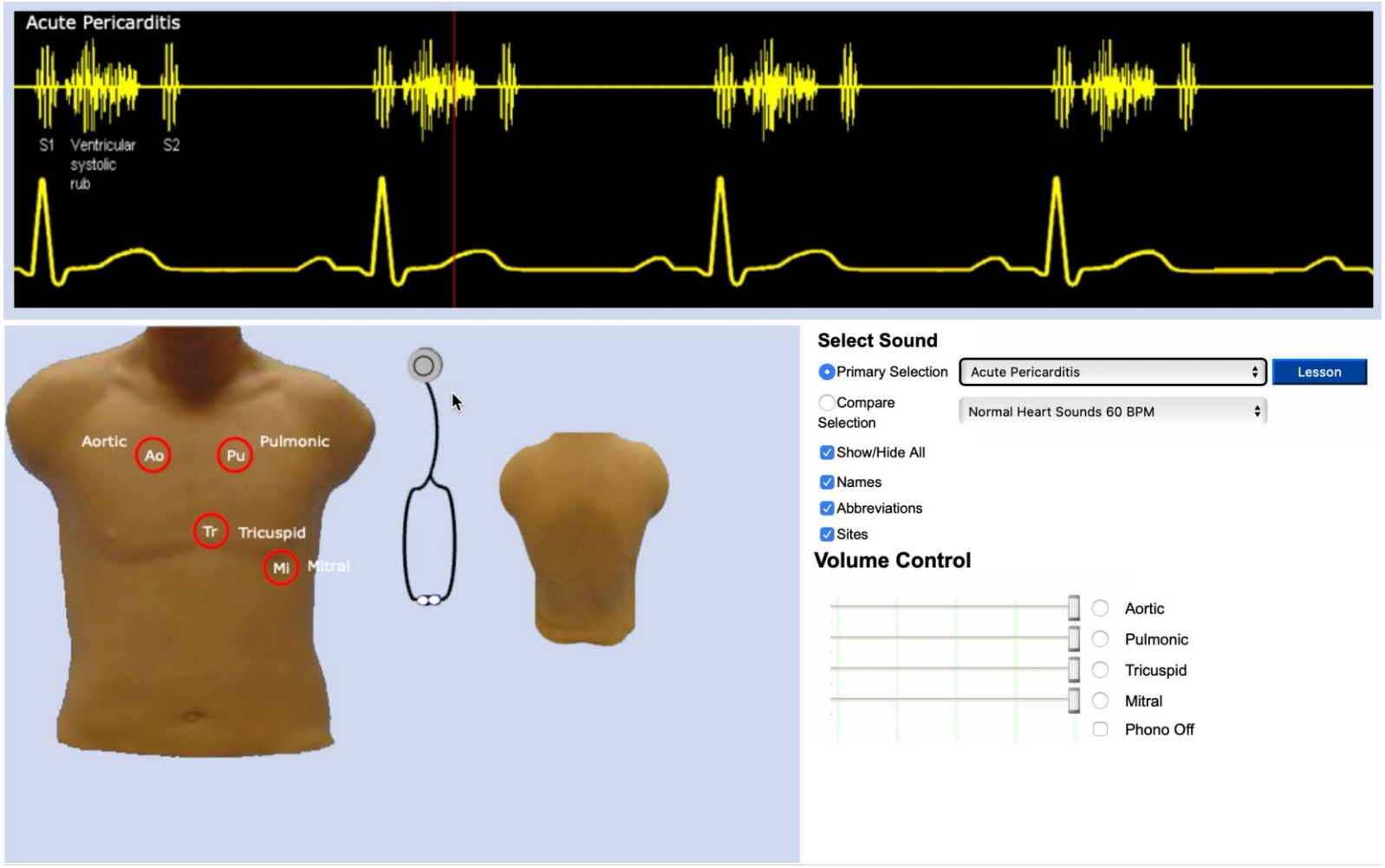
Acute Pericarditis!

Pericardial Friction Rub



Pericardial friction rub (Imazio M UpToDate 2021)

Characteristic	Triphasic Scratching or squeaky sound Intermittent Intensity waxes and wanes
Location	Variable: localized or widespread Usually loudest over the left sternal border
Etiology	Autoimmune (ex: lupus) Infectious (viral, bacterial, mycobacterial) Neoplastic Inflammatory (ex: post-MI) Metabolic (ex: ESRD)

Pericardial Friction Rub (Imazio, M UpToDate 2021)

Associated Physical Findings	Heard best with the patient leaning forward or while resting on the elbows and knees

Pericardial Friction Rub (Imazio, M UpToDate 2021)

Clinical settings seen	Very specific for acute pericarditis
Management	Treat underlying cause of pericarditis Consider NSAIDS, colchicine, glucocorticoids

Why does this patient have pericarditis???

Differential diagnosis of pericarditis . . .

- Neoplastic
- Tuberculous
- Autoimmune
- Purulent (Ex: *Streptococcus pneumoniae*)

Imazio M UpToDate 2024

Laboratory Evaluation of Acute Pericarditis

- Blood cultures
- HIV serology
- Hepatitis C serology
- ANA
- TB skin test or interferon-gamma release assay

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Indications for Pericardiocentesis

- Cardiac tamponade: diagnostic and therapeutic
- Suspected malignant pericardial effusion
- Suspected purulent (ie. bacterial) pericarditis
- Pericarditis refractory to medical therapy

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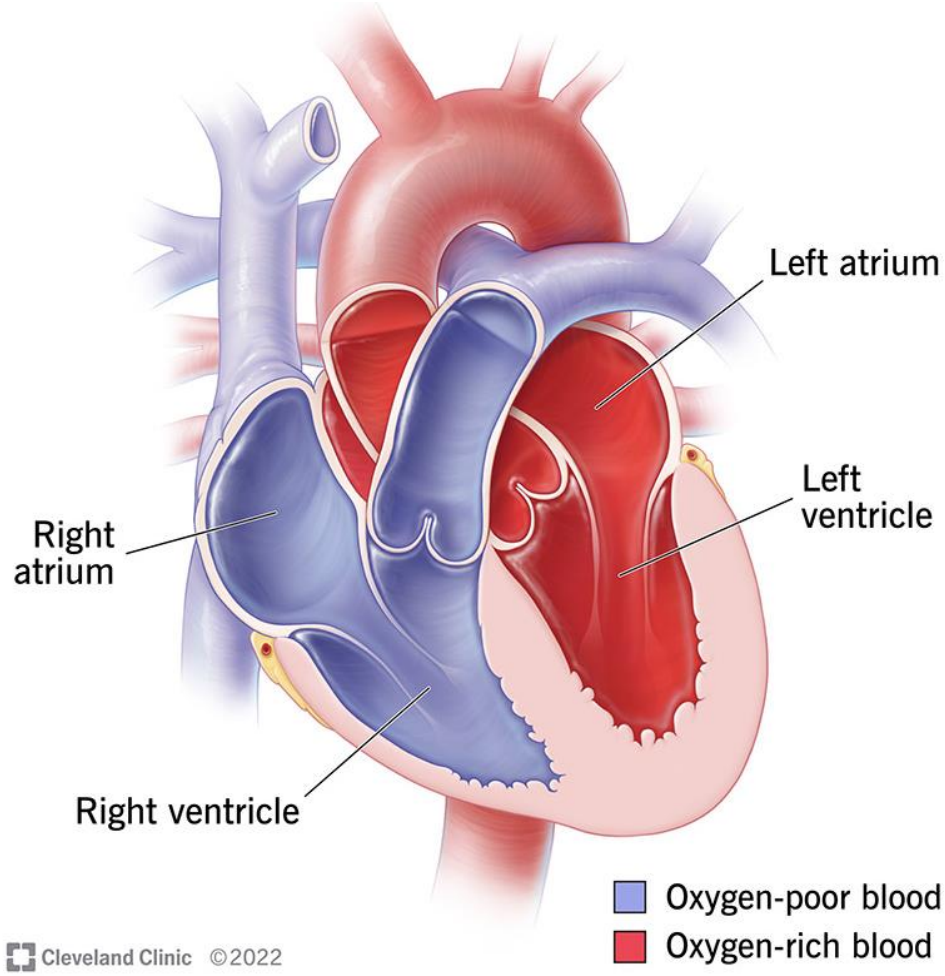
Complication of Pericardial Effusion: Cardiac Tamponade

Pulsus paradoxus and tamponade physiology . . .

In the normal heart, during *inspiration*, the R ventricle fills easily from the SVC and IVC from negative intrathoracic pressure

As the R ventricle fills, it can normally expand into the pericardial space with *negligible* impact on L ventricular filling

The result is that normally, there is a negligible drop in systolic bp during inspiration . . .



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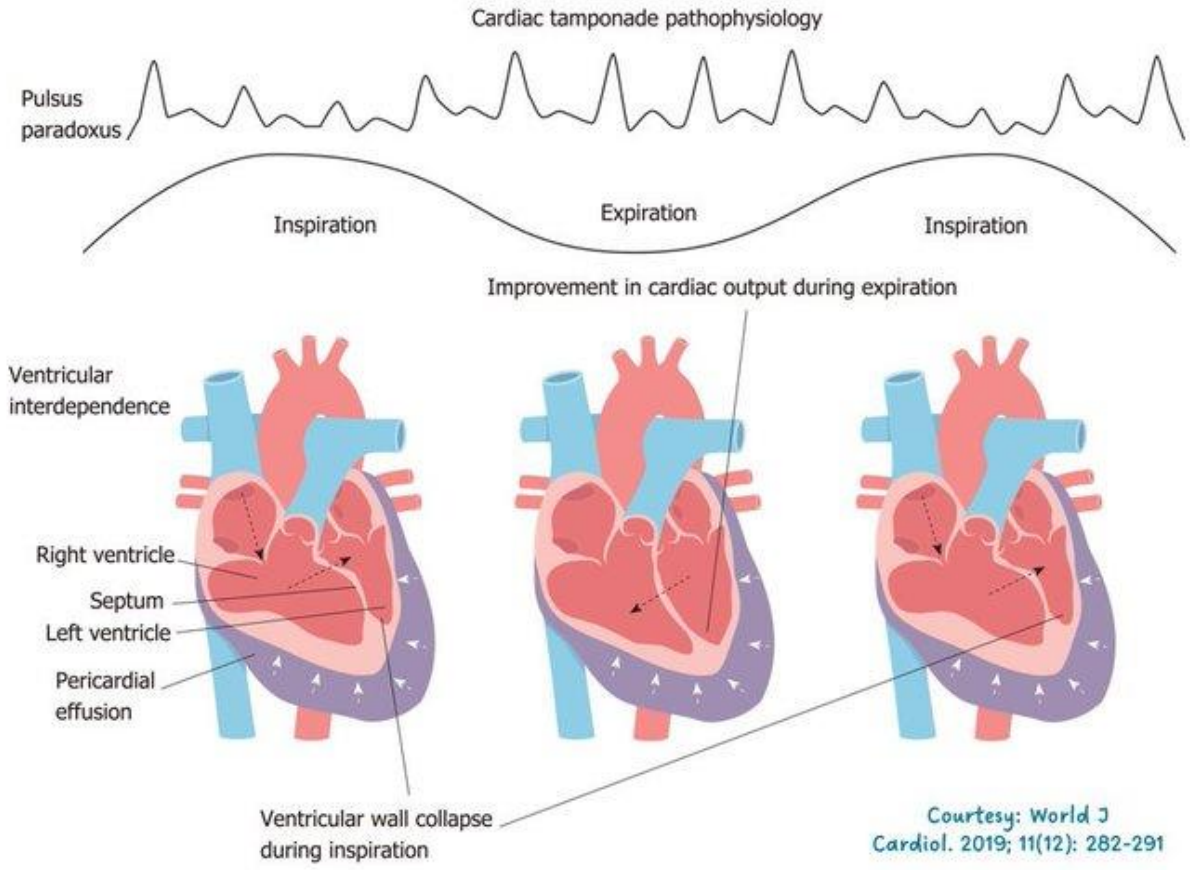
Pulsus paradoxus and tamponade physiology . . .

In **cardiac tamponade** from a pericardial effusion, the R and L ventricles become much more **interdependent** when filling.

All the chambers become less compliant due to the pericardium. . .

So, if the R ventricle fills *more*, the septum bows into the L ventricle and the L ventricle *MUST fill less*

So the result is that systolic bp drops more than 10 mm Hg during inspiration in cardiac tamponade



X.com

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Measuring Pulsus Paradoxus

Must use a manual bp cuff

Deflate cuff slowly while watching patient's inspiration and expiration. . .

The Korotkoff sounds will be heard first with expiration only. Note the pressure reading at that time.

Keep deflating the cuff slowly and note the pressure reading when the Korotkoff sounds are heard during expiration **and** inspiration

If the difference between the first pressure and second pressure is > 10 mm Hg, a pulsus paradoxus is confirmed which suggests cardiac tamponade . . .

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Medical Management of Lupus Pericarditis

- Rule out tamponade physiology, which is rare in lupus pericarditis
- First-line medical therapy:

Drug	**Recommended Dose**	**Duration**	**Taper**
ONE of the following:			
Aspirin	650 to 1000 mg po tid	1 to 2 weeks	250 mg per week
Ibuprofen	600 to 800 mg po tid	1 to 2 weeks	200 mg per week
Indomethacin	25 to 50 mg po tid	1 to 2 weeks	25 mg per week
Plus			
Colchicine	0.6 mg po bid	3 months	Usually not tapered

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Patient follow up . . .

- Our patient was admitted to a telemetry bed.
- She was gently hydrated
- She was not found to have pulsus paradoxus
- Similarly, her 2-D echo confirmed a pericardial effusion but did not demonstrate tamponade physiology . . .
- There is no indication for pericardiocentesis or pericardial biopsy

Patient follow up . . .

- Her significant clinical and laboratory findings included:
  - Pericarditis (ie. serositis)
  - Thrombocytopenia
  - Nonerosive arthritis
  - ANA positive
  - Anti-ds DNA positive

SLE Operating Characteristics (cont.)

Clinical Finding	Sens (%)	Spec (%)	LR+	LR -
Arthritis	86	37	1.4	0.38
Serositis	56	86	4.0	0.51
Heme Disorder	59	89	5.4	0.46

Pretest Probability of SLE in the general (hospitalized) population = 1%
Pretest Odds = 0.01:0.99
= 1:99

In a 30-year-old woman with nonerosive arthritis, serositis and thrombocytopenia:

Posttest Odds = 1:99 X 1.4 X4.0 X 5.4
= 30.24:99
Posttest Prob = 30.24/(30.24+99)
= 23.3% Posttest Probability with three clinical SLE findings

How will the results of antinuclear antibody testing effect the probability of lupus in this patient?

Operating Characteristics of Laboratory Tests in SLE

Test	Sens (%)	Spec (%)	LR+	LR-
ANA	99	80	5.0	0.013

Revised pretest probability of SLE in our patient = 23.3%
Pretest Odds = 0.233:0.767

With a positive ANA:
Posttest Odds = 0.233:0.767 X 5.0
1.165:0.767
Revised Posttest Probability = 60% with three SLE clinical findings AND positive ANA

With a negative ANA:
Posttest Odds = 0.233:0.767 X 0.013
0.003:0.767
Posttest Prob = 0.003/(0.003+0.767)
Revised Post Test Probability = 0.4% with three SLE clinical findings AND negative ANA

How will the results of an anti-double-stranded DNA serology effect the probability of lupus in this patient?

Operating Characteristics of Laboratory Tests in SLE

Test	Sens (%)	Spec (%)	LR+	LR-
Anti ds DNA	52	98	26	0.49

Given a revised pretest probability of 60% in our pt with three clinical criteria and a positive ANA, order anti ds DNA.

With a positive anti ds DNA:
Posttest Odds = 3:2 X 26 = 78:2
Posttest Prob = 78/(78+2)
Revised Post Test Probability = 98% with three clinical findings AND positive ANA AND positive anti ds DNA

The bottom line: If a patient has at least three clinical features of SLE plus a positive ANA and positive anti ds DNA antibody, you can diagnose SLE with confidence.

Remaining Laboratory Tests all Negative

- Blood cultures
- HIV serology
- Hepatitis C serology
- TB skin test or interferon-gamma release assay
- Urine pregnancy test

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Final diagnosis:
Systemic lupus erythematosus-induced pericarditis

Patient follow up . . .

- She is started on indomethacin 50 mg po tid PLUS
- Colchicine 0.6 mg po bid
- Morphine 2 mg IV q6hrs prn breakthrough pain
- She improves over the following two days . . .

Osteopathic Considerations in the Management of Pericarditis

Findings on osteopathic screening exam:

- thoracic inlet restricted on the L
- T2FRLSL
- L 1st, 2nd and 3rd rib inhaled

- Treatment plan?

Sample OsteopathicTreatment Plan for Management of Our Patient's Pericarditis

Osteopathic exam finding	**OMT**
thoracic inlet restricted on the L	Myofascial release then pedal pump
T2FRLSL	Facilitated positional release
L 1st, 2nd and 3rd rib inhaled	Muscle energy with respiratory assist

Patient follow up . . .

- She is discharged on
  - Indomethacin 50 mg po tid with taper of daily dose of 25 mg per week
  - Colchicine 0.6 mg po bid
- Follow up with her primary care physician
- Follow up with cardiology for office visit and repeat 2-D echo in six weeks
- Outpatient rheumatology referral

Questions?

Thank you!