

Approach to acute heart failure: A case-based discussion



SUMMER 2024

Case presentation



C.C:

تنگی نفس

P.I:

بیمار آقای ۵۵ ساله بدون PMH با شکایت دیس پنه ی فعالیت در حد FC-IV از ۱۲ روز قبل و با تشدید از صبح روز مراجعه به این مرکز مراجعه نمود.

تنگی نفس فعالیت (FC-IV) / +ارتوپنه -/dizziness-/chest pain-/ PND +/

LOC پیش از مراجعه به مرکز با تشدید تنگی نفس و دیسترس تنفسی دچار +loss of consciousness

شده بود که به دنبال آن به این مرکز مراجعه نمود -/palpitation-/(.ادم اندام تحتانی +/fatigue+

Case presentation



PMH

DH

PSH

H.H

30 p.yr سیگار
متادون

AH

FH

Case presentation



Phx

G.A

بیمار آقای میانسال هوشیار و اورینته به زمان مکان و شخص می باشد. دراز کشیده روی تخت و به سؤالات پاسخ می دهد.

ill-/toxic-

V/S:

بدو ورود:

T=36.5 PR=78 RR=19 BP=138/110 O2sat=91%

هنگام ویزیت:

T=36.7 PR=86 RR=18 BP=138/108 O2sat (with mask)=97%

Case presentation



P.E

معاینه ی قلبی ریوی JVP: برجسته /-سمع قلب S1 , S2 :بدون سوفل سمع شد- S ۳ .
دیسترس تنفسی +در سمع ریه رال تحتانی دو طرفه قابل سمع بود.
نبض اندام ها پر، قرینه قابل لمس بود .شواهد ادم اندام های تحتانی دو طرفه +۳
سایر معاینات نرمال

Case presentation



Problem list

- آقای ۵۵ ساله بدون PMH
- دیس پنه فعالیت FC-IV
- دیسترس تنفسی at rest
- رال در سمع ریه

Case presentation



Lab:

CBC:

WBC: 8.8(PMN=70%)->13.5(PMN=80%)
->12.4(PMN=75%)

RBC:4.2->4.3->5.34

Hb:11.6->11.6->14.9

MCV:88.33->87.67->88.95

Plt:346->348->400

Urea:69->79->91

Cr: 1.53->1.0->1.77

Na: 141->141->133

K: 3.9->3.3->3.2

Trop:<0.1

Lab:

BS=99->93

VBG:

PH:7.32 PCO2:46 PO2:33 HCO3:23.7

CRP:16.2

D-dimer: 1+

ESR:15

AST:51

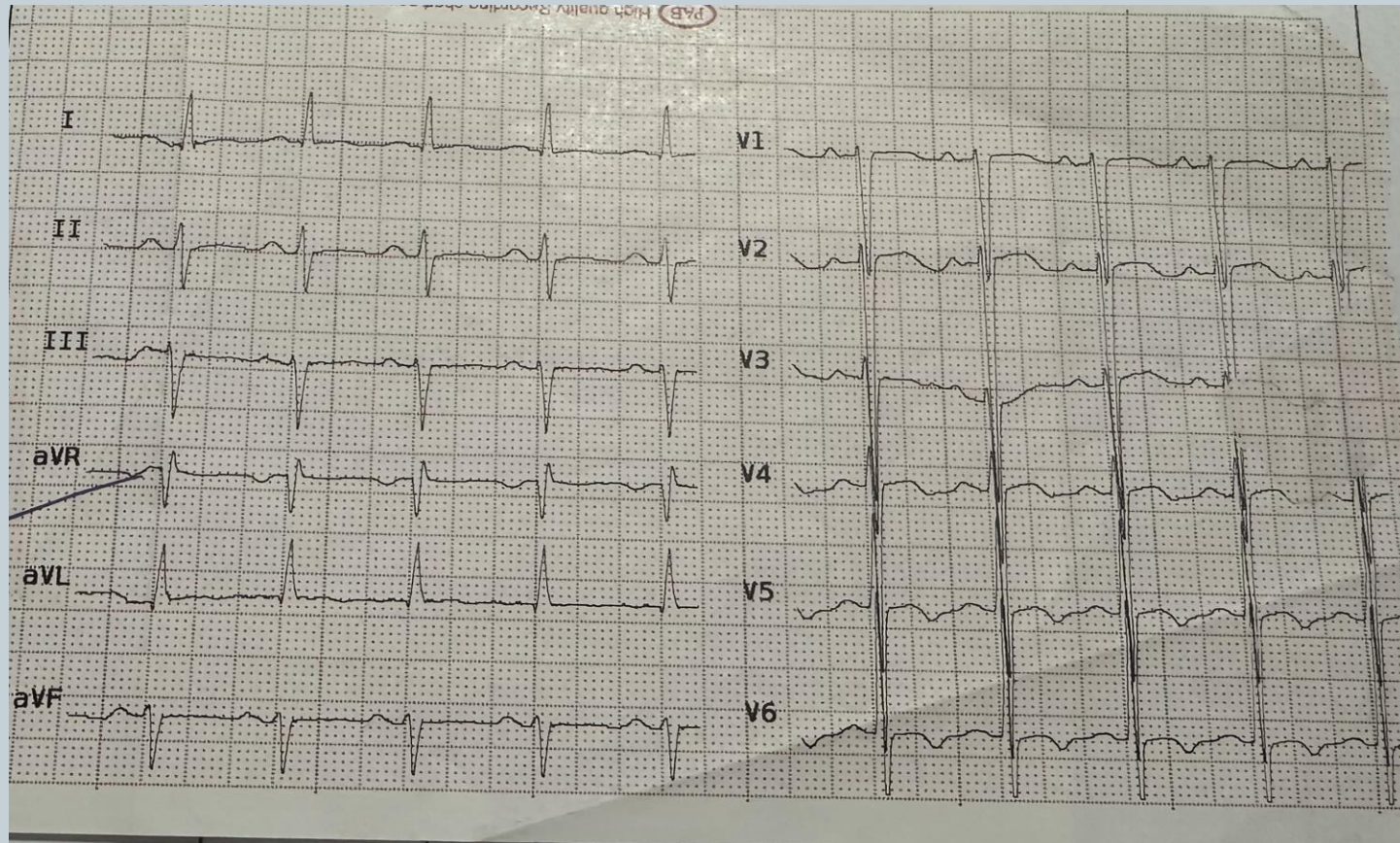
ALT:34

ALP:303

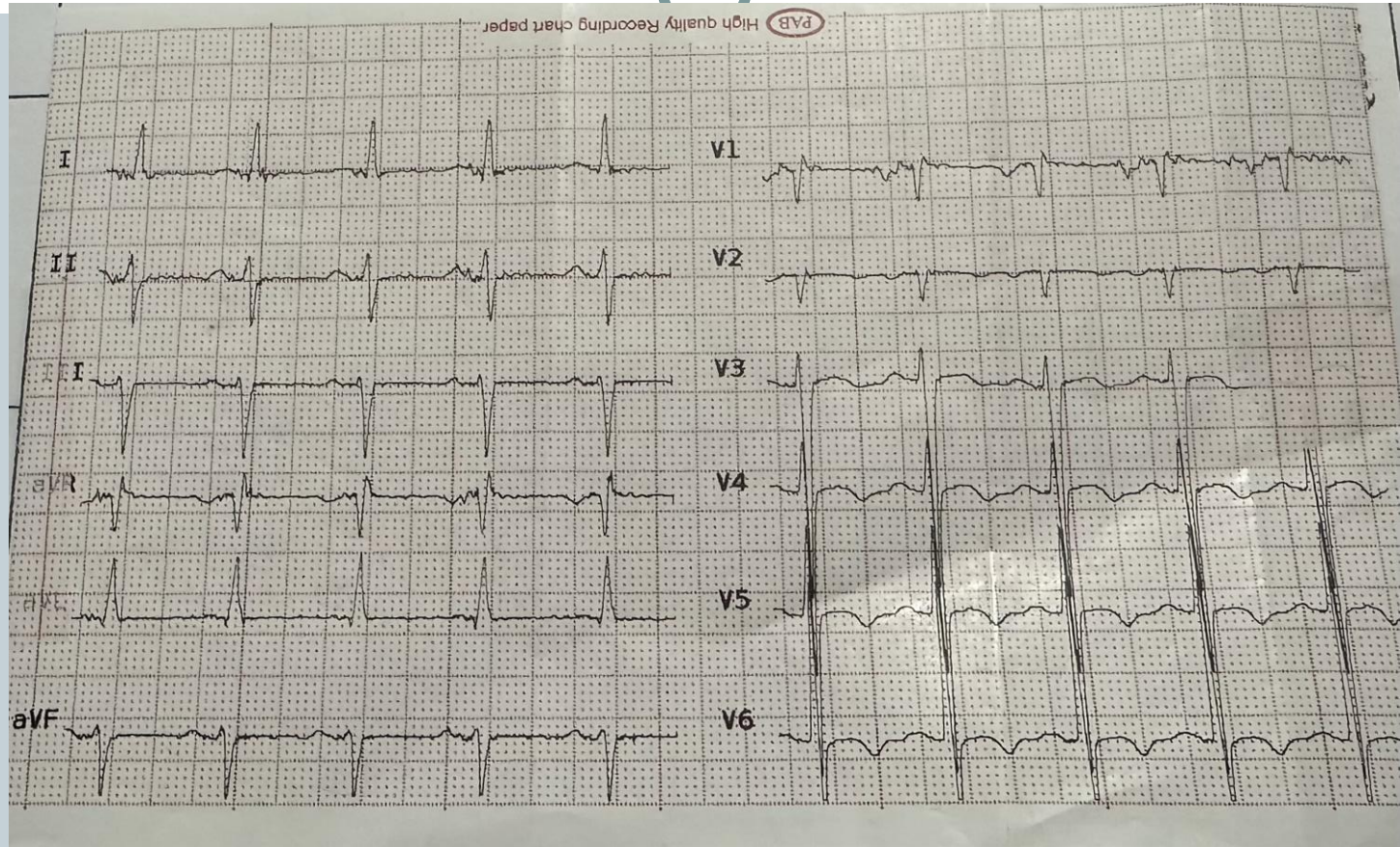
CPK:36

CKMB:25

Case presentation



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Paraclinical findings:

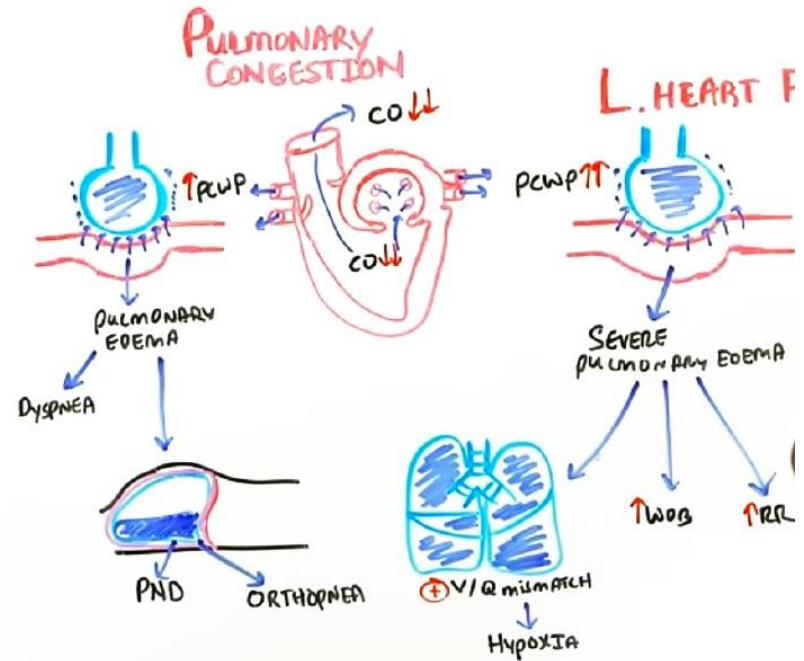
Echocardiogram: severe HFrEF (EF=20%)

Chest CT: Bilateral mild to moderate pleural effusion

Scattered ill-defined GGOs in both lower lobes

Cardiogenic pulmonary edema (CPE)

Pathophysiology



- Cardiogenic pulmonary edema (CPE) occurs when the pulmonary capillary pressure exceeds the forces that maintain fluid within the vascular space (serum oncotic pressure and interstitial hydrostatic pressure).
- Increased pulmonary capillary pressure may be caused by LV failure, obstruction to transmitral flow (e.g., mitral stenosis, atrial myxoma), or, rarely, pulmonary venoocclusive disease.
- Accumulation of fluid in the pulmonary interstitium is followed by alveolar flooding and impairment of gas exchange.

Cardiogenic pulmonary edema (CPE)



Clinical Presentation

- Clinical manifestations of CPE may occur rapidly and include dyspnea, orthopnea, anxiety, and restlessness. The patient may expectorate pink frothy fluid.
- It is important to delineate the onset and severity of symptoms. Patients should be carefully questioned regarding the precipitating factors such as; medication non-adherence, dietary indiscretion (i.e., increased sodium and fluid intake), postoperative status, peripartum status, and iatrogenic hypervolemia.
- Physical signs of decreased peripheral perfusion, pulmonary congestion, use of accessory respiratory muscles, and wheezing are often present.
- Physical exam may demonstrate pulmonary crackles, an S3 gallop, and peripheral edema. Elevated jugular venous distention is the most specific and reliable physical exam indicator of right-sided volume overload and generally representative of left-sided filling pressures.

Cardiogenic pulmonary edema (CPE)



Diagnostic Testing

Laboratories

- B-type natriuretic peptide (BNP)
- Cardiac enzymes (i.e., troponin I or troponin T) should be obtained to evaluate for ongoing myocardial ischemia.
- Additional laboratory abnormalities may include elevated levels of BUN and creatinine, hyponatremia, anemia, and elevated hepatic enzymes.

Electrocardiography

- Abnormalities in the ECG are common and include supraventricular and ventricular arrhythmias, conduction delays, and nonspecific ST–T segment changes.

Imaging

- Chest radiograph abnormalities include cardiomegaly, interstitial and perihilar vascular engorgement, Kerley B lines, and pleural effusions. The radiographic abnormalities may follow the development of symptoms by several hours, and their resolution may be out of phase with clinical improvement. A normal chest radiograph does not rule out LV dysfunction or HF.

Management



Acute pulmonary edema

First line of action

Administer

- **Furosemide** IV 0.5 to 1.0 mg/kg
- **Morphine** IV 2 to 4 mg
- **Oxygen/intubation** as needed
- **Nitroglycerin** SL, then 10 to 20 mcg/min IV if SBP greater than 100 mm Hg
- ***Norepinephrine, 0.5 to 30 mcg/min IV or Dopamine, 5 to 15 mcg/kg per minute IV if SBP <100 mm Hg and signs/symptoms of shock present**
- **Dobutamine** 2 to 20 mcg/kg per minute IV if SBP 70 to 100 mm Hg and **no** signs/symptoms of shock

Management



ACEI/ARB/**ARNI**

Loop diuretics (e.g,
furosemide)

Aldosterone antagonist
(E.g, spironolactone,
eplerenone)

A.S.A

SGLT2 inhibitors

Beta-blockers