07/02/21 Morning Report with @CPSolvers

***Case Presenter**: Kirtan Patolia (@KirtanPatolia) **Case Discussants**: Rabih (@rabihmgeha) and Reza (@DxRxEdu)*

CC: shortness of breath and productive cough for two days. - **"A shocking diagnosis"**

HPI: 81 yo male with chest heaviness, dyspnea, productive cough for 2 days. Cough was whitish without blood streaks. PCR COVID negative (twice). Presents to ED with unstable vitals (BP 80x50, SpO2 80% on O2 mask). Respiratory exam showed crepitations bilaterally through lung fields. CVS clear. Chest CT: diffuse alveolar infiltrates without pneumothorax, pleural effusion, or consolidation. CT Angiogram: negative for PE. Continued to be hypotensive despite fluids and inotropes. Hypotension persisted even after providing hydrocortisone + ATBs. He then became anuric. Dialysis was done for 10h. Denies fever, weight loss, headache, night sweats, abdominal pain.

PMH:
Total knee arthroplasty - 10 years back
MCA stroke 2 years ago -> physical therapy and rehabilitation, able to do daily activities
Elevated BP when the stroke occured, but controlled only with diet and exercise
Meds: none.

Fam Hx: not significant

Soc Hx: denies ethanol and tobacco use
Health-Related Behaviors:
Physically active and regularly goes to gym

Allergies: none

Vitals: **T**: nl **HR**: nl **BP**: impossible to get, barely palpable **RR**: 24 **SpO_2**: 82%
Exam:
CV: S1 and S2 normal, regular rhythm, JVP not obtained
Pulm: evidence of crackles in all lung fields
Abd: no tenderness, rigidity, or guarding.
Neuro: alert, oriented to time, person, place. Cranial nerves: normal. Reflexes, strength, sensation, cerebellum - normal. No Babinski sign.
Extremities/Skin: cold and clammy skin in all extremities.

Notable Labs & Imaging:
Hematology: WBC: nl Hgb: nl Plt: nl
Chemistry:
Na: 125 K: 5.5 Cl: 97 CO2: BUN: 40 Cr:1.5 -> 2.5
glucose: Ca: Phos: Mag: CPK 2639 CKMB 257
Troponin very elevated NT-pro-BNP > 35000
AST: 4808 ALT: 2928 LDH 1088
CRP and ESR normal
Imaging:
-EKG: elevated ST segments in II, III, V2, V3, V4, V5
-Echocardiogram: EF 20%, dilation of the left side of the heart, global severe left ventricular hypokinesis, diastolic dysfunction. Inferior renal cava congested. No evidence of pericardium effusion.
-Angiography: triple vessel disease, 80% blockage in all of them.

Final diagnosis: Acute Myocardial Infarction leading to Cardiogenic Shock

Problem Representation: 81 yo male presents with an acute shortness of breath and cough, associated with severe refractory shock and anuria. Echocardiogram showed evidence of left ventricular dysfunction and angiography showed triple vessel blockage of 80%, that are compatible with cardiogenic shock.

Teaching Points (Rafa):

- **SOB + PRODUCTIVE COUGH**
  SOB: Consider base rate - heart / lung conditions
  Don't forget other less common causes including hyperthyroidism, anxiety, acidosis, neuromuscular weakness (ALS, myasthenia gravis), obesity
  Cough : Localizes to the lung - but where is the cause - intrinsic / extrinsic causes (cardiac causes - HF leading to pulmonary edema)
- **SHOCK**
  Life-threatening fall in BP w/ poor tissue perfusion
  Search for clues: lactate level, urine output, tachycardia
  Repeat BP, fluids, assess the needs for vasoconstrictors, inotropes
  Raise the legs - increase venous return - increase preload - increase CO
  Which type of shock: distributive (peripheral vasodilation - sepsis, anaphylaxis)? Cardiogenic (decreased CO - MI)? Obstructive (obstruction - PE, cardiac tamponade)? Hypovolemic (hemorrhage, burns, dehydration)
  Cold/clammy skin - high SVR - hypovolemic, cardiogenic, obstructive
  Warm/dry skin - low SVR - distributive
- **PULMONARY RENAL ASSOCIATIONS**
  PNA - acute tubular necrosis / Renal failure - pulmonary edema
  Nephrotic syndrome - pulmonary embolism (loss of AT III), pleural effusion
  Interstitial: hantavirus, leptospirosis, TB , legionella - interstitial kidney disease
  Vessels: Scleroderma renal crisis - severe pulmonary HTN
- **PEARL** - CK - if <5k - check again - if it's low - rule out rhabdomyolysis
- **CARDIOGENIC SHOCK** - pulmonary edema / ATN / shock liver (AST/ALT >1K, LDH >1k).. Many causes: acute MI, HF, valvular dysfunction , arrhythmia
  Hypercuate HF - Endocarditis, valve failure, MI, myocarditis, hyperthyroidism, thiamine deficiency, takotsubo (stress-induced), tamponade
- **PEARL** - troponin x EF - if <250 - suggestive of takotsubo - low troponin levels