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Shortness of breath and cough in a kidney-transplant patient

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White 10, Team C – Massachusetts General Hospital,
Boston – MA, USA

History of present illness

- AJMK is a 43 y.o. male with history of ESRD, kidney transplant and asthma
- Presenting with SOB, cough, headache
- The pt. was in his usual state of health until 2 weeks prior to admission, when he developed a cough productive of yellow sputum and headache
- 4 days prior to admission the pt. reports SOB upon 1 flight of stairs (prior to episode, he was able to walk 3-4 flights of stairs before experiencing SOB)
- The pt. took Tylenol and Robitussin, without improvement of symptoms
- He denies fever, nausea or vomiting, but reports chills, chest tightness and wheezing

History of present illness

- The pt. reports two episodes of pneumonia this year (one in-patient treatment).
- He was treated with levofloxacin in the in-patient setting and quickly improved
- The pt. also reports that all three of his children recently had hand-foot-mouth disease (evident only in throat), but reports no other sick contacts

Review of systems

- He does report a decrease in appetite, which he believes is secondary to decreased renal function

Past medical history

- **Membrano-proliferative glomerulonephritis and ESRD** – Diagnosed with renal disease in 1995 (for casual finding of proteinuria). Began dialysis in 1997. Right-sided living kidney transplant from his father in 1998, after bilateral nephrectomy. In May 2005, his creatinine increased from a baseline of 3.5 to 4.4 mg/dl. He already has a R AV fistula placed (6/'05) for secondary access in emergency.

Past medical history

- **CMV infection** – May 1998; treated with Ganciclovir IV
- **Asthma** – diagnosed within last year
- **Hypertension** – diagnosed >20 years ago; well controlled, with baseline SBP of 120 mmHg
- **Gastro-Esophageal Reflux Disease (GERD)**
- **Dyslipidemia**

Medications on admission

- Tacrolimus (Prograf) 2 mg PO Q12H
- Mycophenolate mofetil (CellCept) 500 mg PO BID
- Valganciclovir (Valcyte) 450 mg PO QOD
- Esomeprazole (Nexium) 40 mg PO QD
- Amlodipine (Norvasc) 10 mg PO QD
- Labetalol 400 mg PO BID
- Sodium bicarbonate 2600 mg PO twice QOD
- Montelukast (Singulair) 10 mg PO QD

Medications on admission

- Iron 325 mg PO BID
- ASA (Aspirin) 81 mg PO QD
- Fluticasone propionate/Salmeterol 500/50 mg (Advair diskus 500/50) 1 puff BID
- Nasonex spray
- Furosemide (Lasix) 40 mg PO BID
- Atorvastatin (Lipitor) 10 mg PO QPM
- Multivitamin PO QPM
- Renagel (Sevelamer) 800 mg PO TID

- **Allergies** – NKDA; seafood (itching)
- **Social history** – He lives with his wife and 3 kids (ages 5, 2, 2). He is a merchandiser for a liquor distributor. He denies tobacco, alcohol and illicit drug use.
- **Familial history** – He reports diabetes in great-grandparents. Mother died at 57 from MI. HTN reported in siblings.

Physical exam

- Vital signs – T 99.7, HR 86, BP 140/66, RR 18, SaO_2 96% RA
- General – the patient appears his stated age and is in non-apparent distress
- HEENT – PERRL, sclera anicteric
- Neck – no carotid bruits, JVP 8 cm
- Nodes – no cervical or supraclavicular LAD
- CV – RRR, S1 & S2 nl, No m/r/g

Physical exam

- Chest – bilateral ronchi in RLL/LLL, no crackles, dullness to percussion RLL
- Abdomen - +BS, NT, ND. No HSM. No peritoneal signs
- Ext – R AV fistula; 2+ peripheral edema bilaterally on lower extremity to just below the knee
- Skin – no rashes
- Neuro – A&Ox3; CN II-XII intact

Labs and studies

Blood

Na^+	136	(135-145)	mmol/l
K^+	4.8	(3.4-4.8)	mmol/l
Cl^-	115 (H)	(100-108)	mmol/l
CO_2	15.2 (L)	(23.0-31.9)	mmol/l
Ca^{2+}	8.7	(8.5-10.5)	mg/dl
PO_4^{3-}	4.8 (H)	(2.6-4.5)	mg/dl
Mg^{2+}	1.4	(1.4-2.0)	mEq/l

Labs and studies

Blood

BUN	63 (H)	(8-25)	mg/dl
Creatinine	6.1 (H)	(0.6-1.5)	mg/dl
Glucose	105	(70-110)	mg/dl
Total proteins	6.4	(6.0-8.3)	g/dl
Albumin	3.2 (L)	(3.3-5.0)	g/dl
Total bilirubin	0.3	(0-1.0)	mg/dl
Direct bilirubin	refused	(0-0.4)	mg/dl

Labs and studies

Blood

AST	36	(10-40)	U/l
ALT	12	(10-55)	U/l
ALP	59	(45-115)	U/l
Amylase	42	(3-100)	U/l
Lypase	3.0	(1.3-6.0)	U/dl

Labs and studies

Blood

RBC	3.53 (L)	(4.50-5.90)	$\cdot 10^9 / mm^3$
HCT	32.5 (L)	(41.0-53.0)	%
Hb	9.8 (L)	(13.5-17.5)	g / dl
MCV	92	(80-100)	fl
MCH	27.7	(26.0-34.0)	pg
MCHC	30.1 (L)	(31.0-37.0)	g / dl
RDW	15.7 (H)	(11.5-14.5)	%

Labs and studies

Blood

WBC	9.0	(4.5-11.0)	$\cdot 10^3/mm^3$
PLT	223	(150-350)	$\cdot 10^3/mm^3$
PT	12.3	(11.3-13.3)	s
APTT	27.9	(22.1-35.1)	s

Labs and studies

Urine

Specific gravity	1.025	(1.001-1.035)	kg/l
pH	5.0	(5.0-9.0)	
WBC screen	Negative	Negative	
Nitrite	Negative	Negative	
Albumin	3+	Negative	
Glucose	Trace	Negative	
Ketones	Negative	Negative	

Labs and studies

Urine

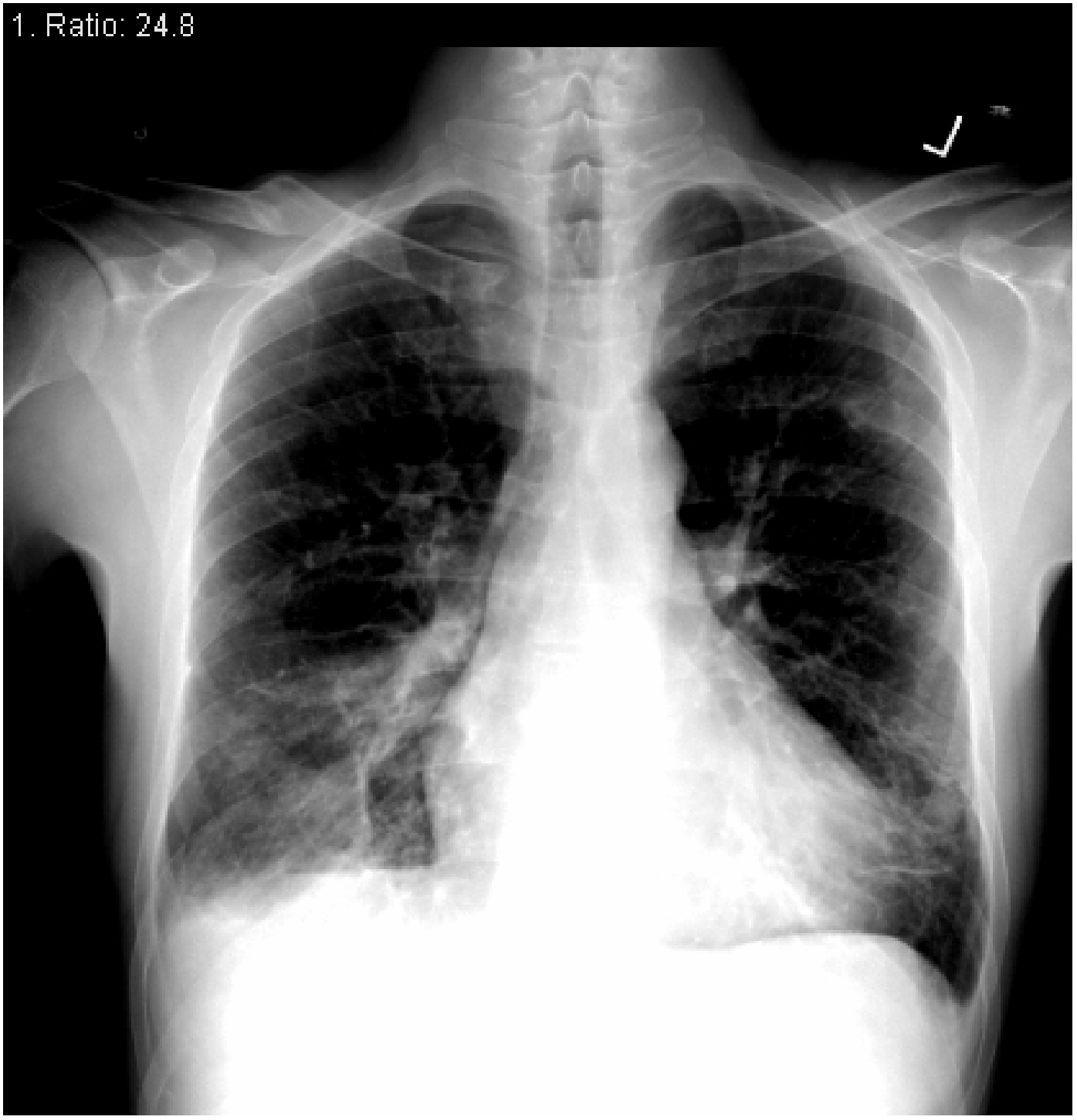
Occult blood	3+	Negative	
Sed-RBC	10-20	(0-2)	/hpf
Sed-WBC	0-2	(0-2)	/hpf
Sed-Bacteria	Few	Negative	/hpf
Hyaline casts	10-20	(0-5)	/lpf
Squamous cells	Negative	Negative	/hpf
Bladder cells	Few	Negative	/hpf
Amorphous crystals	Moderate	Negative	/hpf

Labs and studies

Microbiology

CMV antigenemia	Negative
Blood culture	No growth after 5 days
Induced sputum	Few gram –ve rods of mixed morphologies, few gram +ve cocci in pairs/clusters; no acid fast bacilli; growth of few non-enteric gram –ve rods; no growth of microbacteria after 2 days; no fungi; no *P. Carinii*

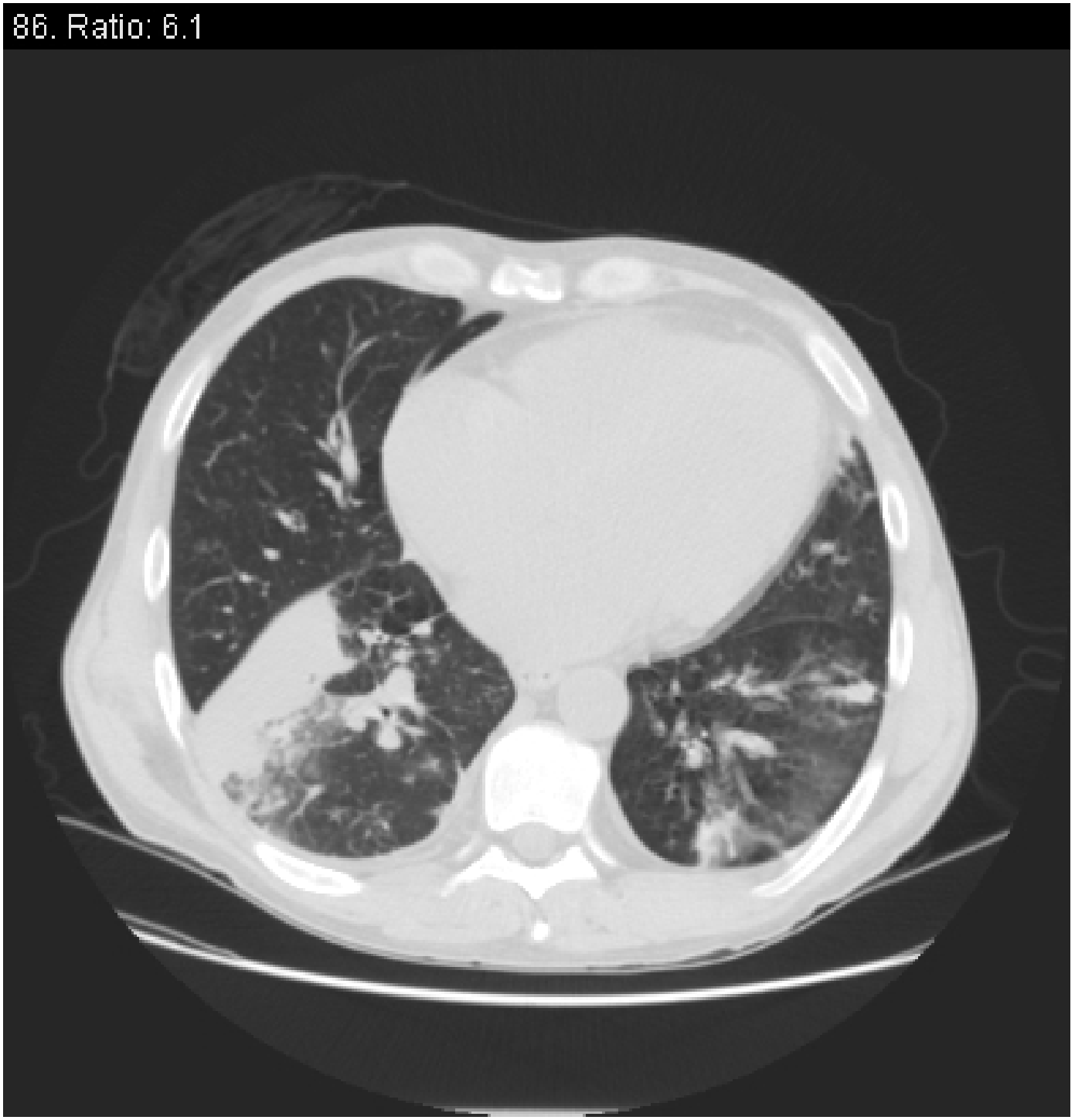
Chest X-Ray



Chest X-Ray

- Interval development of right lower lobe pneumonia and small right pleural effusion. Follow-up films to resolution are suggested.

Chest CT



Chest CT

- Multifocal air space opacifications and tree-in-bud opacities as above may represent inflammatory change, aspiration, or pneumonia.

- Bilateral hilar and mediastinal lymphadenopathy, likely reactive in nature.

Assessment and plan

- AJMK is a 43 y.o. male with history of ESRD and recurrent lower respiratory tract infections, presenting with SOB, cough productive of yellow sputum and headache.

1) SOB / Cough

- SOB / Cough productive of yellow sputum / headache / chills – suggestive of pneumonia. PE ronchi bilaterally. PA & LA CXR: RLL infiltrate and small right pleural effusion. Preliminary sputum gram stain revealed rare gram –ve rods; respiratory and blood cultures pending.

Assessment and plan

- Asthma – While SOB could be related to asthma, the acute onset along with cough productive of yellow sputum and chills suggests infectious cause.
- Heart disease – HD could produce SOB and chest tightness; cardiac ultrasound on 7/19/'05 showed normal valve structure; trace MR, AI and TI; dilated LA and LV hypertrophy; EF=66%. Diastolic heart failure may play a role in the patient's shortness of breath and peripheral edema. Diuresis may help with symptoms.

Assessment and plan

- Plan
  - Treatment: Vancomycin 1g IV for coverage of resistant gram +ve, and Cefepime 2g IV for gram –ve coverage, in immunosuppressed patient with multiple recent pneumonias
  - Await final sputum gram stain, respiratory and blood cultures
  - Chest CT ordered to evaluate pleural effusion and consolidation

Assessment and plan

2) Membrano-proliferative glomerulonephritis and ESRD

- Labs and exam consistent with MPGN: UA-occult blood 3+, UA-Sed-RBC 10-20, UA-Hyaline casts 10-20, UA-Albumin 3+ (nephrotic characteristic seen in MPGN); peripheral edema, HTN
- Na^+ nl, K^+ nl, Phos 4.8 mg/dl
- Plasma CO_2 15.2 mmHg – levels have been chronically low, suggesting the kidney's inhability to make HCO_3^- and handle acid load

Assessment and plan

- Transplant 1998; Immunosuppression: Tacrolimus (Prograf) 2 mg PO Q12H; Mycophenolate mofetil (CellCept) 500 mg PO BID
- Suspect transplant rejection → kidney function: Cre 6.1 (from 4.1 on 5/27/'05); BUN 63 (from 62 on 5/27/'05). Continue to monitor Cre and BUN.

Assessment and plan

- Plan
  - Monitor electrolytes
  - Diet: low K^+ and low Phos
  - Renagel (Sevelamer) 800 mg PO TID
  - Immunosuppression: Tacrolimus (Prograf) 2 mg PO Q12H; Mycophenolate mofetil (CellCept) 500 mg PO BID
  - Consult renal team and discuss indication to start dialysis (not urgent)

Assessment and plan

3) Volume overload

- The patient is thought to be volume-overloaded due to JVP 8 cm, renal disease, BP 140/66 and peripheral edema.

- Plan
  - Furosemide (Lasix) 40 mg PO BID

Assessment and plan

4) Anemia

- HCT 32.5 (from 25.4-29 on 5/'05-6/'05), possibly secondary to decreased erythropoietin production by kidney. No plan to transfuse at this time as patient is hemodynamically stable

  - Plan
    - Pt. on Epogen 20,000 units 2/week at home

Assessment and plan

5) CMV

- The patient had a CMV infection in May 1998, which was treated with Ganciclovir IV.

- Plan
  - Send CMV antigenemia assay to assess activity of CMV
  - Valganciclovir (Valcyte) 450 mg PO QOD
  - Involve Transplant ID, as specific management questions arise regarding CMV and management of pneumonia

Conclusions

- Await final sputum gram stain, respiratory and blood cultures to guide treatment of pneumonia
- Consult Transplant ID team to
  - Evaluate the possibility of resuming dialysis
  - Discuss about CMV- and pneumonia-related issues