MECHANISMS OF HUMAN DISEASE
AND
PHARMACOLOGY & THERAPEUTICS

CARDIOVASCULAR
CASE-BASED SMALL GROUP DISCUSSION

MHD I
SESSION VIII

OCTOBER 22, 2014

STUDENT COPY

Case 1

Chief Complaint “I just feel so lousy for 3 weeks”

The patient is a 39-year old woman who has diabetes mellitus, type 1 and end stage renal disease requiring hemodialysis. For the past 3 weeks she has had low grade fevers, malaise, poor appetite, and weight loss. She feels “achy”. Recently she feels more short of breath. She denies headache, abdominal pain, cough, rhinorrhea, otorrhea, sore throat, diarrhea, constipation, or sick contacts. No recent travel out of the area.

Her past medical history is significant for diabetes mellitus type 1, hypertension, end stage kidney disease secondary to diabetes, and anemia. She has an arteriovenous (AV) fistula in her right arm through which she receives dialysis.

Her medications include:
Lantus insulin 12 units SQ qhs
Lispro insulin 3 units SQ three times daily with meals
Iron sulfate 325mg PO three times daily
Metoprolol XL 50mg PO daily

She has no known drug allergies.

She lives with her daughter. She drinks 1 beer daily and does not smoke. She is not sexually active.

Her mother died of “heart problems” at the age of 45. Her father has lung cancer. Her sister has hypertension.

On physical exam her temperature is 38.3^{o}C; left arm blood pressure 162/60 (BP not checked on the right arm secondary to presence of the AV fistula), pulse 100, and respirations 14. She appears fatigued.

Her sclera are anicteric.

There are no ulcers in her mouth. There is no pharyngeal erythema or exudate.

Her lungs are clear to auscultation bilaterally and normo-resonant on percussion.

On cardiovascular exam the PMI is displaced to the left of midclavicular line and inferior to the 5th intercostal space. S1 is soft, S2 is normal. There is a 2/4 early blowing decrescendo diastolic murmur heard best at the left lower sternal border with the patient sitting upright. There is no S3 or S4 heard.

The right arm AV fistula is identified; a thrill is palpated over the fistula; a bruit is appreciated on ausculation.

Bowel sounds are normoactive. There is no tenderness elicited on palpation of the abdomen. There is no hepatomegaly. The spleen tip is palpated.

There is no clubbing of her nails. On the palmar surfaces of her distal left index finger and middle finger there is a tender subcutaneous nodule.

Admission Laboratory Data

CBC w/ DIFF

WBC	16.3 H	[4.0-10.0] k/ul
RBC	3.39 L	[3.60-5.50] m/ul
Hgb	10.2 L	[12.0-16.0] gm/dl
Hct	30.6 L	[34.0-51.0] %
MCV	85	[85-95] fl
MCH	28.3	[28.0-32.0] pg
MCHC	33.3	[32.0-36.0] gm/dl
RDW	16.4 H	[11.0-15.0] %
Plt Count	410 H	[150-400] k/ul
Diff Type	Manual	
Gran	72 H	[45-70] %
Gran #	11.7 H	[2.0-7.0] k/mm3
Lymph	24	[20-45] %
Lymph #	3.9	[1.0-4.0] k/mm3
Mono	3	[0-10] %
Mono #	0.5	[0.0-1.0] k/mm3
Eo	1	[0-7] %
Eo #	0.2	[0.0-0.7] k/mm3
Baso	0	[0-2] %
Baso #	0.0	[0.0-0.2] k/mm3

Final – M6666

COMPLETE METABOLIC PANEL

Sodium	139	[136-146] mm/l
Potassium	3.9	[3.3-5.1] mm/l
Chloride	96	[98-108] mm/l
CO2	21	[20-32] mm/l
Bun	33 H	[7-22] mg/dl
Creatinine	3.7 H	[0.6-1.4] mg/dl
Glucose	145 H	[70-100] mg/dl
Albumin	3.1 L	[3.6-5.0] gm/dl
Protein, Total	6.8	[6.5-8.3] gm/dl
Calcium	7.9 L	[8.9-10.3] mg/dl
Alkaline Phosphatase	99	[30-110] iu/l
ALT (SGPT)	54 H	[7-35] iu/l
AST (SGOT)	43 H	[5-40] iu/l
Bilirubin, Total	1.1	[0.2-1.4] mg/dl

EXAM: DXCPORT - CHEST, SINGLE VIEW , FRONTAL (AP PORTABLE TECHNIQUE)

HISTORY: FEVER IN A DIABETIC PATIENT ON HEMODIALYSIS
COMPARISON:NONE

FINDINGS:
PA AND LATERAL

THERE IS CARDIOMEGALY. PULMONARY VASCULARITY IS WITHIN NORMAL LIMITS.

THERE IS NO FOCAL INFILTRATE, PLEURAL EFFUSION, OR PNEUMOTHORAX.

THIS EXAMINATION AND REPORT HAVE BEEN REVIEWED BY THE
ATTENDING RADIOLOGIST WHOSE NAME APPEARS ON THIS REPORT

1.Define all unknown terms. What are “arteriovenous fistulas”?

Hospital Course

Urinalysis and urine culture were not sent as the patient is anuric.

Two sets of blood cultures were sent on admission. After twelve hours of incubation both blood culture sets (4 of 4 specimens in 2 of 2 blood cultures) turned positive. Gram stain of the cultures all yielded “Gram positive cocci in pairs and chains”. Two additional blood cultures sets were drawn over the next 24-hour period and yielded the same Gram stain findings.

2.Of the following options, which is the most appropriate empiric intravenous antibiotic treatment for this patient’s bacteremia?

a. Ceftriaxone and gentamicin
b. Ampicillin and gentamicin
c. Gentamicin
d. Nafcillin

3. Develop a problem list

4. The Gram positive cocci growing from the blood cultures are catalase negative and nonhemolytic. The colonies are bile esculin positive and PYR positive. Based on the laboratory data, which microorganism is the most likely pathogen?

5. What is the likely underlying valvular pathology? Correlate with the physical exam findings.

The medical student taking care of the patient does a thorough chart review. The presence of a murmur on cardiac auscultation has not been previously documented.

6. What diagnosis/diagnoses are you considering?

A transthoracic echocardiogram is performed and confirms the clinical impression.

7. What is your diagnosis? Correlate the key clinical and laboratory findings.

8. What predisposed this patient to acquiring infection with this bacterium?

9. Despite antibiotic treatment, blood cultures remained positive. Intravenous Vancomycin was added to the drug regimen, however blood cultures drawn daily still continued to grow the same organism. She also had persistent fevers. What are some possible reasons why this patient is failing to improve on the antibiotics?

10. What infection control precautions must be taken for this patient?

(A helpful resource for infection control precautions is the LUMC Patient Care Policy and Procedure "General Guidelines for Isolation".
Go to Loyola.wired – Policies – Infection Control Policy Manual – General Guidelines for Isolation)

11. Review the Case Images

Bacteriology Set 6

Cases 2, 3, 4 are Unknowns – Students will not have case data until the session meets