

## Case Conference 2014/04/23

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## PATIENT INFORMATION

- + 50歲 男性
- + 就診日期: DAY1 01時43分
- + 檢傷級數:2 科別:外科
- + 檢傷主訴:病人主訴為輛天前車禍右胸部鈍傷/喘/痛
- + 意識: E4V5M6 血氧: 096%
- + 體溫: 38.9°C 脈搏: 128次/分
- + 呼吸 22/min 血壓123/61mmHg
- + 過去病史: 良好

## 病史

主訴:Fever for 5 days  
5天前開車撞到牆壁 車禍前就fever  
HI(+) No ILOC No N/V  
Cough(-) Sputum(-) dysuria(-)  
N/V(-) Abd pain(-)

+ 過去病史 :  
Allergy:denied

## 理學檢查:

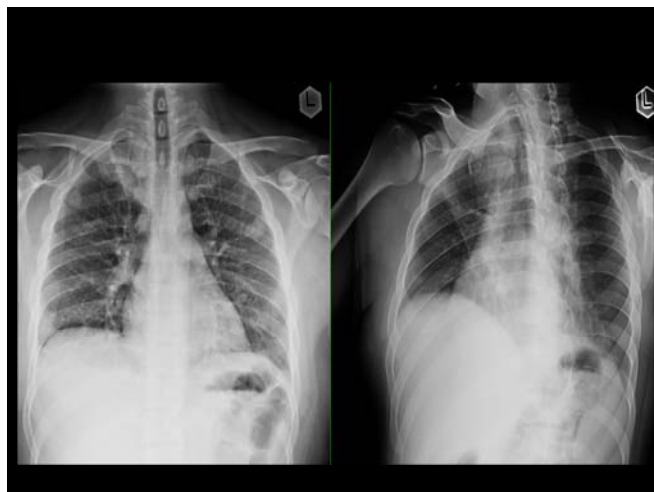
- + Consciousness clear
- + Neck: No tenderness
- + Chest: Coarse BS
- + Abdomen: Soft, no tenderness.
- + Four limbs: warm

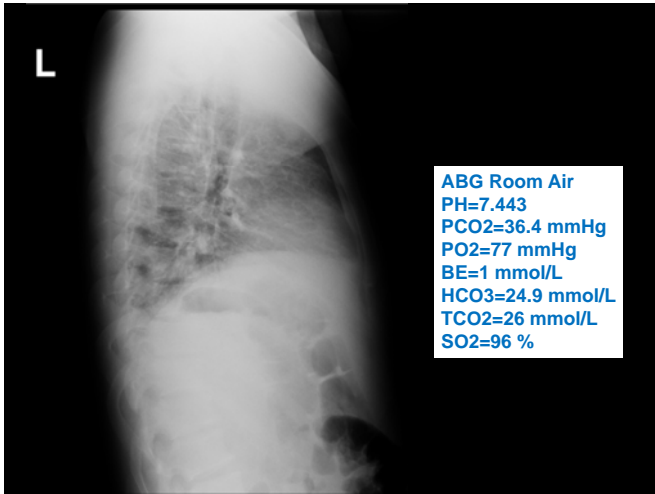
## Impression:

Fever, r/o PN

## COURSE

- 01:54
- CBC/DC/PLT
- Panel 1, CRP
- B/C X II
- IV: N/S run 60cc/hr
- ABG(G3)
- CXR(AP + Lat), R't rib X-ray
- EKG
- Cataflam 1# po st





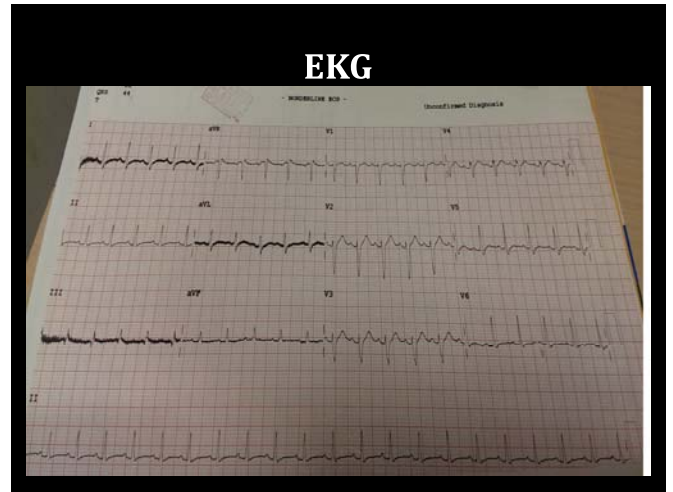
02:22 — U/A  
 Bedside echo

03:15 — BT:39 C, HR:135  
 →KTP 1 Amp IM st  
 N/S 1000 cc iv st

↓

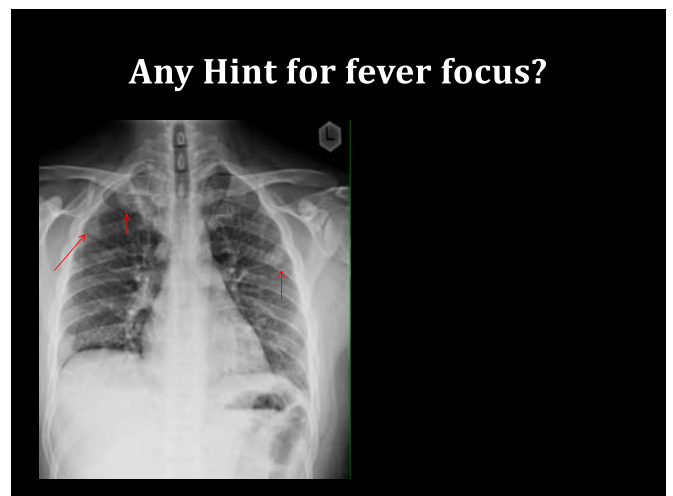
### Lab Data

WBC	23.0	X1000/ul	Glucose	124	mg/dL
RBC	4.37	million	GOT(AST)	19	U/L
Hb	13.0	gm/dl	BUN	14	mg/dL
Ht	36.6	%	Creatinine	1.0	mg/dL
MCV	83.8	fL	Na	129	mEq/L
MCH	29.7	pg	K	3.7	mEq/L
MCHC	35.5	%	eGFR	79.09	
RDW	13.3	%	CRP	20.580	mg/dL
Platelet	99	x1000/ul	Sediment	*****	
Differential count	*****		RBC	5-7	/HPF
Segmented Neutro.	72.0	%	WBC	3-5	/HPF
Lymphocyte	10.5	%	Epithelial cell	1-2	/HPF
Monocyte	14.0	%	Cast	Granular	/LFP
Eosinophil	0.0	%	Cast-amount	+	
Basophil	0.0	%	Crystal	Am,Urate	/HPF
Atypical lymphocyte	1.0	%	Cry-amount	+	
Band	2.5	%	Bacteria	+	
			Others	Not Found	



### Bedside Echo

- No ascites
- No hydronephrosis
- No obvious liver lesion
- No pericardial effusion
- No obvious vegetation



04:52 — B/C X I (3 rd 套)  
 ESR  
 PT/APTT  
 Gentamicin 80 mg I v Q8H + st  
 Vancomycin 1000mg iv Q12H + st  
 Hold 0900 abx  
 Heart echo  
 Abd echo  
 排Inf admission  
 待轉EC

PT	15.8	second
Normal control	10.2	second
INR	1.54	Ratio
APTT	43.2	second
Normal control	33.3	second
APTT ratio	1.30	
ESR	32	mm/hr

05:27 — HR:114,BP:93/55 → NS 500CC IV ST  
 HR:107,BP:90/53 → NS 500CC IV ST

Bp:89/53→  
 ON CVC,SCVO2,lactate  
 Cvp:8cmH2O  
 Levophed iv run 10cc/hr

Lactate	9.1	mg/dL
SCVO2=77 %		

## HEART ECHO

1. Dilated LA and normal wall thickness
2. No regional wall motion abnormality
3. **Mild TR without obvious intracardiac vegetate was noted**
4. No pleural effusion
5. IVC engorgement (IVC diameter= 1.68 cm)

## INFECTION MAN NOTES

Lab:WBC:23000 S:72 B:2.5 Crea:1  
 CXR:bilateral septic emboli  
 Imp:Septic shock, favor endocarditi  
 Suggest:  
 .May keep Vancomycin but decrease  
 keep Ceftazidime 2g iv Q8h  
 Wait blood culture.  
 .Arrange TEE. Check HIV screen ne  
 I will arrange ICU admission

## ER NOTE

- + HI(+),Cardiac echo: Mild TR
- + Septic lung
- + Can't R/O occult abd inf
- + do-whole body CT

## WHOLE BODY CT

住院後

DAY1 — TEE: no obvious vegetation  
 Heroin withdrawal syndrome

HIV Screen	0.45	S/CO
HBsAg	0.030	IU/mL
Anti-HCV	13.18	S/CO

**FINAL BLOOD CULTURE REPORT:**  
**Organism:**  
**Staphylococcus aureus(MSSA)**

Intermittent fever during ward

DAY27 — Escape from ward

## FINAL DIAGNOSIS

1. Infective Endocarditis with septic emboli in bilateral lung
2. Septic shock and MSSA bacteremia
3. Heroin and Amphetamine abuser

## DISCUSSION

## WHAT'S NEW?

1. Guidelines on the prevention, diagnosis, and treatment of infective endocarditis (new version 2009)

*European Heart Journal (2009) 30, 2369–2413 doi:10.1093/eurheartj/ehp285*

2. Complications and outcome of infective endocarditis

~2014 update

## EPIDEMIOLOGY

- + Predisposing factors have emerged—  
Valve prostheses, degenerative valve sclerosis, intravenous drug abuse, Intravascular device, Rheumatic heart

**Table 3** Classification and definitions of infective endocarditis

<b>IE according to localization of infection and presence or absence of intracardiac material</b>	
• Left-sided native valve IE	
• Left-sided prosthetic valve IE (PVE) <ul style="list-style-type: none"><li>- Early PVE: &lt; 1 year after valve surgery</li><li>- Late PVE: &gt; 1 year after valve surgery</li></ul>	
• Right-sided IE	
• Device-related IE (permanent pacemaker or cardioverter-defibrillator)	
<b>IE according to the mode of acquisition<sup>13</sup></b>	
• Health care-associated IE	IE developing in a patient hospitalized > 48 hours prior to the onset of signs / symptoms consistent with IE
• Non nosocomial:	Signs and / or symptoms of IE starting < 48 hours after admission in a patient with health care contact defined as: <ul style="list-style-type: none"><li>1) home-based nursing or intravenous therapy, haemodialysis, or intravenous chemotherapy &lt; 30 days before the onset of IE; or</li><li>2) hospitalized in an acute care facility &lt; 90 days before the onset of IE; or</li><li>3) resident in a nursing home or long-term care facility</li></ul>
• Community-acquired IE	Signs and / or symptoms of IE starting < 48 hours after admission in a patient not fulfilling the criteria for health care-associated infection
• Intravenous drug abuse-associated IE	IE in an active injection drug user without alternative source of infection
<b>Active IE</b>	
• IE with persistent fever and positive blood cultures or	
• Active inflammatory morphology found at surgery or	
• Patient still under antibiotic therapy or	
• Histopathological evidence of active IE	
<b>Recurrence</b>	
• Relapse:	Repeat episodes of IE caused by the same microorganism < 6 months after the initial episode
• Reinfection:	Infection with a different microorganism Repeat episode of IE caused by the same microorganism > 6 months after the initial episode

**Table 7** Clinical presentation of infective endocarditis

IE must be suspected in the following situations

1. New regurgitant heart murmur
2. Embolic events of unknown origin
3. Sepsis of unknown origin (especially if associated with IE causative organism)
4. Fever: the most frequent sign of IE.<sup>9</sup>

IE should be suspected if fever is associated with:

- a. Intracardiac prosthetic material (e.g. prosthetic valve, pacemaker, implantable defibrillator, surgical baffle/conduit)
- b. Previous history of IE
- c. Previous valvular or congenital heart disease
- d. Other predisposition for IE (e.g. immunocompromised state, IVDA)
- e. Predisposition and recent intervention with associated bacteraemia
- f. Evidence of congestive heart failure
- g. New conduction disturbance
- h. Positive blood cultures with typical IE causative organism or positive serology for chronic Q fever (microbiological findings may precede cardiac manifestations)
- i. Vascular or immunologic phenomena: embolic event, Roth spots, splinter haemorrhages, Janeway lesions, Osler's nodes
- j. Focal or non-specific neurological symptoms and signs
- k. Evidence of pulmonary embolism/infiltration (right-sided IE)
- l. Peripheral abscesses (renal, splenic, cerebral, vertebral) of unknown cause

<sup>9</sup>NB: Fever may be absent in the elderly, after antibiotic pre-treatment, in the immunocompromised patient and in IE involving less virulent or atypical organisms.

## DIAGNOSIS

**Table 11** Modified Duke criteria for the diagnosis of infective endocarditis (adapted from Li et al.<sup>10</sup>)

MAJOR CRITERIA	
<b>Blood cultures positive for IE:</b>	
<ul style="list-style-type: none"> <li>• Typical microorganisms consistent with IE from two separate blood cultures: <i>Viridans streptococci</i>, <i>Streptococcus bovis</i>, HACEK group, <i>Staphylococcus aureus</i>; or Community-acquired enterococci, in the absence of a primary focus</li> <li>or</li> <li>• Microorganisms consistent with IE from persistently positive blood cultures:                             <ul style="list-style-type: none"> <li>• At least two positive blood cultures of blood samples drawn &gt; 12 h apart; or</li> <li>• All of three or a majority of ≥ 4 separate cultures of blood (with first and last sample drawn at least 1 h apart)</li> </ul> </li> <li>or</li> <li>• Single positive blood culture for <i>Coxiella burnetii</i> or phase I IgG antibody titer &gt; 1:800</li> </ul>	
<b>Evidence of endocardial involvement</b>	
<ul style="list-style-type: none"> <li>• Echocardiography positive for IE                             <ul style="list-style-type: none"> <li>• Vegetation - Abscess - New partial dehiscence of prosthetic valve</li> </ul> </li> <li>• New valvular regurgitation</li> </ul>	
MINOR CRITERIA	
<ul style="list-style-type: none"> <li>• Predisposition: predisposing heart condition, injection drug use</li> <li>• Fever: temperature &gt; 38°C</li> <li>• Vascular phenomena: major arterial emboli, septic pulmonary infarcts, mycotic aneurysm, intracranial haemorrhages, conjunctival haemorrhages, Janeway lesions</li> <li>• Immunologic phenomena: glomerulonephritis, Osler's nodes, Roth's spots, rheumatoid factor</li> <li>• Microbiological evidence: positive blood culture but does not meet a major criterion or serological evidence of active infection with organism consistent with IE</li> </ul>	
<b>Diagnosis of IE is definite in the presence of</b> 2 major criteria, or 1 major and 3 minor criteria, or 5 minor criteria	
<b>Diagnosis of IE is possible in the presence of</b> 1 major and 1 minor criteria, or 3 minor criteria	

Adapted from Li J, Sexton DJ, Mick N, Nettles R, Fowler VG, Jr., Ryan T, Bashore T, Corey GR. Proposed modifications to the Duke criteria for the diagnosis of infective endocarditis. *Clin Infect Dis* 2000;30:633-638.

## DIAGNOSIS TOOLS

**Table 8** Role of echocardiography in infective endocarditis

Recommendations: echocardiography	Class <sup>a</sup>	Level <sup>b</sup>
<b>A - Diagnosis</b>		
1. TTE is recommended as the first-line imaging modality in suspected IE	I	B
2. TEE is recommended in patients with high clinical suspicion of IE and a normal TTE	I	B
3. Repeat TTE / TEE within 7-10 days are recommended in the case of an initially negative examination when clinical suspicion of IE remains high	I	B
4. TEE should be considered in the majority of adult patients with suspected IE, even in cases with positive TTE, owing to its better sensitivity and specificity, particularly for the diagnosis of abscesses and measurement of vegetation size.	IIa	C
5. TEE is not indicated in patients with a good-quality negative TTE and low clinical suspicion of IE	III	C
<b>B - Follow-up under medical therapy</b>		
1. Repeat TTE and TEE are recommended as soon as a new complication of IE is suspected (new murmur, embolism, persisting fever, heart failure, abscess, stroke/ventricular block)	I	B
2. Repeat TTE and TEE should be considered during follow-up of uncomplicated IE, in order to detect new silent complication and monitor vegetation size. The timing and mode (TTE or TEE) of repeat examination depend on the initial findings, type of microorganism, and initial response to therapy	IIa	B
<b>C - Intra-operative echocardiography</b>		
Intra-operative echocardiography is recommended in all cases of IE requiring surgery	I	C
<b>D - Following completion of therapy</b>		
TTE is recommended at completion of antibiotic therapy for evaluation of cardiac and valve morphology and function	I	C

<sup>a</sup>Class of recommendation.

<sup>b</sup>Level of evidence.

TTE = transthoracic echocardiography; TEE = transoesophageal echocardiography.

## BLOOD CULTURE

- + At least 3 sets before antimicrobial tx.
- + Culture-negative and positive的處理不一樣!

**Table 10** Investigation of rare causes of culture-negative infective endocarditis

Pathogen	Diagnostic procedure
<i>Bruceella</i> spp.	Blood cultures; serology; culture, immunohistology and PCR of surgical material
<i>Coxiella burnetii</i>	Serology (IgG phase 1 > 1:800); tissue culture, immunohistology and PCR of surgical material
<i>Bartonella</i> spp.	Blood cultures; serology; culture, immunohistology and PCR of surgical material
<i>Tropheryma whippelii</i>	Histology and PCR of surgical material
<i>Mycoplasma</i> spp.	Serology; culture, immunohistology and PCR of surgical material
<i>Legionella</i> spp.	Blood cultures; serology; culture, immunohistology and PCR of surgical material

PCR = polymerase chain reaction.

## ANTIMICROBIAL THERAPY

- + Native valve v.s. prosthetic valve
- + 菌種

## INDICATION FOR SURGERY

**Table 19** Indications and timing of surgery in left-sided native valve infective endocarditis

Recommendations: Indications for surgery	Timing <sup>a</sup>	Class <sup>b</sup>	Level <sup>c</sup>
<b>A - HEART FAILURE</b>			
Aortic or mitral IE with severe acute regurgitation or valve obstruction causing refractory pulmonary oedema or cardiogenic shock	Emergency	I	B
Aortic or mitral IE with fistula into a cardiac chamber or pericardium causing refractory pulmonary oedema or shock	Emergency	I	B
Aortic or mitral IE with severe acute regurgitation or valve obstruction and persisting heart failure or echocardiographic signs of poor haemodynamic tolerance (early mitral closure or pulmonary hypertension)	Urgent	I	B
Aortic or mitral IE with severe regurgitation and no HF	Elective	IIa	B
<b>B - UNCONTROLLED INFECTION</b>			
Locally uncontrolled infection (abscess, false aneurysm, fistula, enlarging vegetation)	Urgent	I	B
Persisting fever and positive blood cultures > 7-10 days	Urgent	I	B
Infection caused by fungi or multiresistant organisms	Urgent/elective	I	B
<b>C - PREVENTION OF EMBOLISM</b>			
Aortic or mitral IE with large vegetations (> 10 mm) following one or more embolic episodes despite appropriate antibiotic therapy	Urgent	I	B
Aortic or mitral IE with large vegetations (> 10 mm) and other predictors of complicated course (heart failure, persistent infection, abscess)	Urgent	I	C
Isolated very large vegetations (> 15 mm) <sup>d</sup>	Urgent	IIb	C

<sup>a</sup>Class of recommendation.

<sup>b</sup>Level of evidence.

<sup>c</sup>Emergency surgery: surgery performed within 24 h, urgent surgery: within a few days, elective surgery: after at least 1 or 2 weeks of antibiotic therapy.

<sup>d</sup>Surgery may be preferred if procedures preserving the native valve is feasible.

## Complications of infective endocarditis

## COMPLICATION

Most: Cardiac complication

+ ~~~Heart failure, perivalvular abscess, pericarditis, intracardiac fistula.

+ Heart failure is the most common indication for cardiac surgery in patients with IE and is the most common cause of death.

## COMPLICATIONS

- + Septic embolization, metastatic abscess, mycotic aneurysm.
- + Neurologic complications :stroke, brain abscess, meningitis,
- + Renal complications :renal infarction or abscess , glomerulonephritis
- + Musculoskeletal complications :Vertebral osteomyelitis,septic arthritis.

## THE END