

# Septic Emboli

## Secondary to Infective Endocarditis

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Ms. Y.Z. is a 31 year old lady brought to casualty by a friend, unconscious and incontinent of urine and faeces. She was responsive to verbal stimuli with a Glasgow Coma Scale (GCS) of 10 and noted to have a fever of 39.6°C. She had a blood pressure (BP) of 116/65 mmHg and a pulse rate of 160 bpm. She was allegedly unresponsive for two days prior to admission. She is a known intravenous drug user (IVDU). Physical examination revealed bilateral puncture wounds in the groin. In view of her poor general condition she was admitted to the intensive therapy unit (ITU). She was started on empirical antibiotics which included both G+ and G- coverage. Blood culture eventually grew a methicillin sensitive staphylococcus aureus (MSSA), and the antibiotics were eventually downgraded to flucloxacillin. A transoesophageal echocardiogram (TOE) showed a massive infective endocarditis of the mitral valve, which was rendered incompetent. An MRI scan of the brain revealed multiple septic emboli resulting in several cerebral infarcts.

### Fact File on Infective Endocarditis

Infective Endocarditis (IE) is an infection of the endocardial lining of the heart, which may involve one or more heart valves. The valve most commonly implicated is the mitral valve (Murdoch & David, 2009). Common signs and symptoms include fever, night sweats, and a new or changed heart murmur. The intracardiac consequences include severe valvular insufficiency, which may result in intractable congestive heart failure and myocardial abscesses. As many as 40% of IE patients develop neurological complications, as a result of septic emboli arising from endocardial vegetations. Such complications include embolic stroke, intracerebral haemorrhage and microabscesses.

IE is a major cause of morbidity in intravenous drug users, in which case it usually affects the tricuspid valve, with the most common infective organism being *Staphylococcus aureus*. It is generally accepted practice to suspect right-sided

endocarditis in active IVDU presenting with fever and radiologic pulmonary infiltrates, whether or not a murmur is detected clinically. The prognosis of IE in IVDU largely depends on the side of the heart involved, as well as the particular causative organism. When treated, the outcome of staphylococcal right-sided IE is usually good, with a mortality of less than 5% (Miró & José, 2003).

### Case Report on Septic Emboli Secondary to Infective Endocarditis

#### Presenting Complaint

The patient was found by a friend of hers, unconscious, incontinent of urine and faeces. Once the patient was able to give a history, she reported a prior 3 week history of altered mental status, loss of balance and a low grade fever.

#### Past Medical & Surgical History

The patient was known to be Hepatitis C positive. She was previously treated

for leg ulcers that arose secondary to intravenous (IV) drug use. She also had kyphoscoliosis (L2/L3) secondary to methicillin resistant staphylococcus aureus (MRSA) discitis. The patient delivered her daughter by caesarian section. She also had plastic surgery to treat her leg ulcers. The surgery was unsuccessful as she used the graft for intravenous drug abuse.

#### Drug History & Allergies

The patient is currently being prescribed the medications listed in Table 1. She is allergic to rifampicin.

#### Family History

The patient's medical family history is unremarkable except for the fact that her father is an alcoholic.

#### Social History

Ms. Y.Z., originally from Ukraine, now

lives with her husband. She describes her housing as a regular house. She has a ten pack year smoking history but does not smoke more than 2-3 cigarettes a day now. She has been using illicit drugs since she came to Malta. She is a social drinker and does not gamble. She has not had any trouble with the police apart from them finding needles in her car. She has not worked in Malta since she has been here because of her drug problem, her pregnancy, looking after her daughter and her vertebral problem. She has a ten year history of illegal drug abuse. She started snorting coke socially and proceeded to injecting. She later started injecting heroin. She had been off heroin for three years prior to admission apart from the month before admission where she had a relapse. She says that she relapsed because she was suffering from a depression brought about by marital friction which stemmed from her vertebral problems.

She describes a happy childhood; she was a high achiever at school and went to university to study ecological engineering. She came to Malta in 2003 and entered a relationship with a cocaine user. She subsequently adopted the habit herself. She became pregnant with his child and gave birth to a girl who lives in Ukraine. She left her previous relationship and is now married to another man who abuses drugs but does not inject. She does not have any children with her husband. She describes her marriage negatively and does not wish to remain with her husband.

### Systemic Inquiry

**General Health:** Pallor, dehydration;  
**Cardiovascular System:** Nil to note;  
**Respiratory System:** Patent airway;  
**Gastrointestinal Tract:** Nil to note;  
**Genitourinary System:** Nil to note;  
**Central Nervous System:** Loss of consciousness;  
**Musculoskeletal System:** Kyphoscoliosis (L2/L3) secondary to MRSA discitis;  
**Endocrine System:** Nil to note.

### Physical Examination & Preliminary Investigations

Table 2 lists the examinations and routine investigations that were carried out on the patient upon admission to casualty.

Generic Drug Name	Dosage	Frequency	Formulation	Reason for Prescription
Diclofenac Potassium	50mg	Trice Daily	Immediate Release Tablet	Back pain relief
Methadone	40ml	Once Daily	Intravenous Injection	Opioid replacement therapy

Table 1: Medications prescribed to the patient.

Examination / Investigation	Result
Pulse Rate	160 bpm
SpO <sub>2</sub>	100 %
Blood Pressure	116/65 mmHg
Temperature	39.6 °C
Heart Sounds	S1 + S2 + 0
Chest	Clear, good air entry
Abdomen	SNT
Neurological System	GCS 10, E 3, M 5, V 2 Both pupils reactive, Unable to assess cranial nerves, limbs, cerebellum. No rashes or neck stiffness.
Chest X-Ray	The heart is enlarged even for an AP projection; There is a right central line with its distal tip in the projection of the right atrium. There is a lobulated right pleural effusion on the right; No signs of consolidation or collapse in either lung noted; Severe mid-thoracic scoliosis noted. See Figure 1
ECCG	Sinus tachycardia
Arterial Blood Gases	<ul style="list-style-type: none"> <li>pO<sub>2</sub>: 206.3 mmHg</li> <li>pCO<sub>2</sub>: 24.8 mmHg</li> <li>pH: 7.619</li> </ul>
Blood Analysis	<ul style="list-style-type: none"> <li>Hb: 8.0 g/dL</li> <li>Na<sup>+</sup>: 141 mmol/l</li> <li>K<sup>+</sup>: 2.6 mmol/l</li> <li>Cl<sup>-</sup>: 92.4 mmol/l</li> <li>Glucose: 8.2 mmol/l</li> </ul>

Table 2: Examinations and routine investigations that were carried out on the patient upon admission to casualty.



Figure 1: Chest X-Ray

## Differential Diagnoses

1. Septic emboli secondary to infective endocarditis;
2. Meningitis;
3. Sepsis secondary to infected leg ulcers;
4. Encephalitis.

## Diagnostic Investigations

Requested investigation: **Blood culture and sensitivity;**

Justification for procedure: To detect bacteremia, identify organism and obtain sensitivities;

Result: MSSA cultured;

Conclusion: Antibiotics were changed according to sensitivity

Requested investigation: Trans-oesophageal echocardiogram;

Justification for procedure: To diagnose infective endocarditis;

Result: Gross vegetation attached to the mitral valve leaflets with resulting severe mitral regurgitation;

Conclusion: Investigation is diagnostic of infective endocarditis.

Requested investigation: **MRI (brain) with contrast;**

Justification for procedure: To identify focal lesions causing neurological deficit;

Result: Multiple embolic infarcts;

Conclusion: Septic emboli from infective endocarditis confirmed.

In conclusion, the trans-oesophageal echocardiogram confirmed the presence of infective endocarditis of the mitral valve. Moreover, the MRI scan of the brain allowed for the diagnosis of septic emboli to be made.

<b>Generic Drug Name</b>	<b>Dosage</b>	<b>Frequency</b>	<b>Formulation</b>	<b>Reason for Prescription</b>
<i>Teicoplanin</i>	<i>400mg</i>	<i>Initially 12hrly for 3 doses, then once daily.</i>	<i>Intravenous infusion</i>	<i>Empirical antibiotic therapy</i>
<i>Meropenem</i>	<i>1g</i>	<i>8hrly</i>	<i>Intravenous infusion</i>	<i>Empirical antibiotic therapy</i>
<i>Vancomycin (replacing teicoplanin)</i>	<i>1.5g</i>	<i>12hrly</i>	<i>Intravenous infusion</i>	<i>Empirical antibiotic therapy</i>
<i>Septin</i>	<i>960mg</i>	<i>12hrly</i>	<i>Intravenous infusion</i>	<i>Empirical antibiotic therapy</i>
<i>Dexamethasone</i>	<i>4mg</i>	<i>6hrly</i>	<i>Intravenous infusion</i>	<i>Suppression of cerebral inflammation</i>
<i>Flucloxacillin</i>	<i>2g</i>	<i>6hrly</i>	<i>Intravenous infusion</i>	<i>Targeted antibiotic treatment for MSSA</i>

Table 3: Pharmacological Therapy.



Figure 2: Ms. Y.Z.'s MRI brain scan, demonstrating septic emboli.

Requested investigation: **MRI Vertebral Column;**

Justification for procedure: To assess extent of kyphoscoliosis and discitis for orthopaedic review;

Result: Severe kyphoscoliosis and MRSA discitis of L2/L3;

Conclusion: Extensive kyphoscoliosis and MRSA discitis of L2/L3 confirmed.

### Diagnosis

In conclusion, the trans-oesophageal echocardiogram confirmed the presence of infective endocarditis of the mitral valve. Moreover, the MRI scan of the brain allowed for the diagnosis of septic emboli to be made.

### Management

#### Pharmacological Therapy

The patient was admitted to ITU where she was intubated and sedated and given supportive care; Table 3.

#### Surgical Therapy

The patient was not initially a candidate for valve replacement surgery.

#### Follow Up

The patient is now awaiting valve replacement surgery. Hepatitis C is to be treated. She is also being followed up by orthopaedics as she will eventually need spinal stabilisation.

### References

Murdoch, David R. "Clinical Presentation, Etiology, And Outcome Of Infective Endocarditis In The 21St Century". Arch Intern Med 169.5 (2009): 463. Web. 2 Feb. 2016.

Miró, José M., Asuncion Moreno, and Carlos A. Mestres. "Infective Endocarditis In Intravenous Drug Abusers". Current Infectious Disease Reports 5.4 (2003): 307-316. Web. 2 Feb. 2016.



Figure 3: Ms. Y.Z.'s MRI scan of the vertebral column.



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