Case Series

Infective endocarditis: A case series

S. Shadiya Sulthana*

General medicine resident, Kauvery Hospital, Tennur, Trichy
*Correspondence

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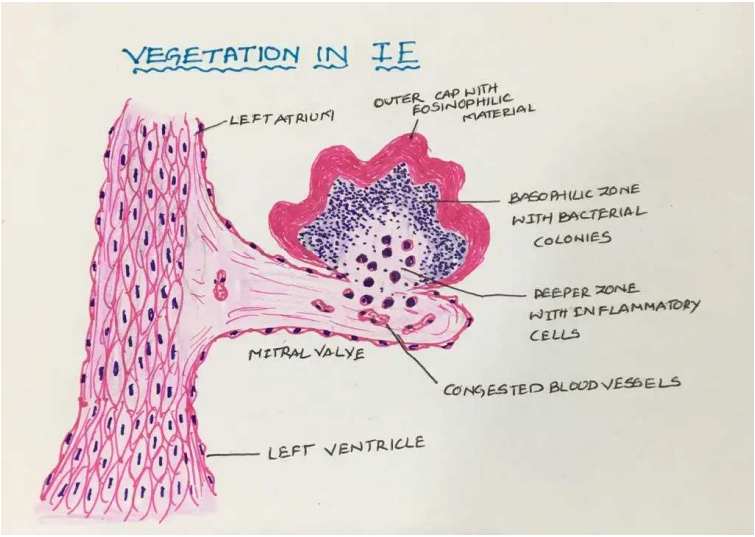
1. Background

Infective endocarditis is the inflammation of the endocardium, the inner lining of the heart, as well as the heart valves.

Clinically, infective endocarditis may present with a multitude of signs and symptoms, and clinicians should consider this diagnosis in any patient with risk factors who present with fever or sepsis of unknown origin. A host of intracardiac and extracardiac complications can stem from infective endocarditis. A thorough history and careful physical examination can help guide management limiting morbidity and mortality.



Vegetation - Is a mass of platelets, fibrin, microorganisms, and scant inflammatory cells

2. Case Presentation

This paper presents a case series of five such successfully managed patients with infective endocarditis each of who presented with varied manifestations.

Here is the initial assessment of the five patients:

Vitals	Case 1 Mr. J	Case 2 Mr. J	Case 3 Mr. A	Case 4 Mrs. S	Case 5 Mr. K
Fever	+	+	+	+	-

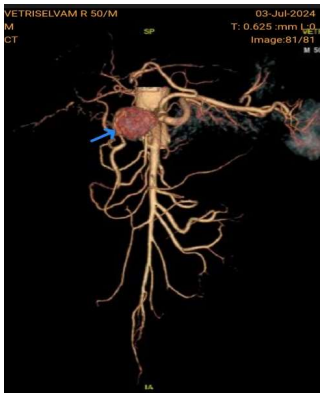
Anorexia, weight loss, malaise	+	+	+	-	+
Myalgias, arthralgias	-	-	+	-	-
Heart murmur	+	+	+	+	+
Arterial emboli	+	-	-	+	-
Aneurysm	-	+	-	-	+
Pallor	+	+	+	+	+
Clubbing	+	+	+	-	+
Neurologic manifestations	+	-	-	+	-
Peripheral manifestations (Osler's nodes, subungual hemorrhages, Janeway lesions, Roth's spots)	+	-	-	-	-
Anemia ,Leukocytosis	+	+	+	+	+
Elevated CRP	+	+	+	+	+

2.1. Case 1

This patient presented with peripheral manifestations (Osler's nodes, subungual haemorrhages, Janeway lesions, Roth's spots).

2.2. Case 2

This patient presented with the above-mentioned complaints, was advised for CT scan



Impression

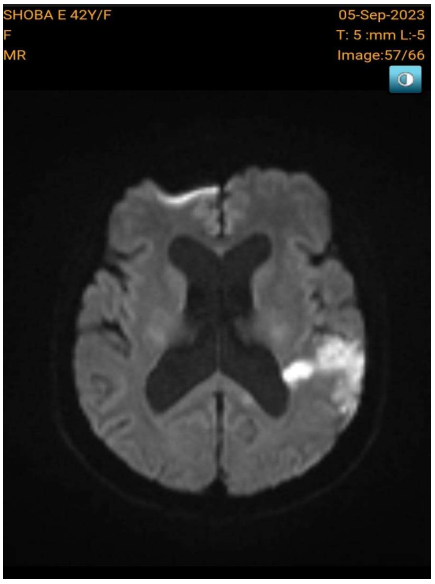
CECT: Pseudo aneurysm with partial thrombus - distal common hepatic artery

2.3. Case 3

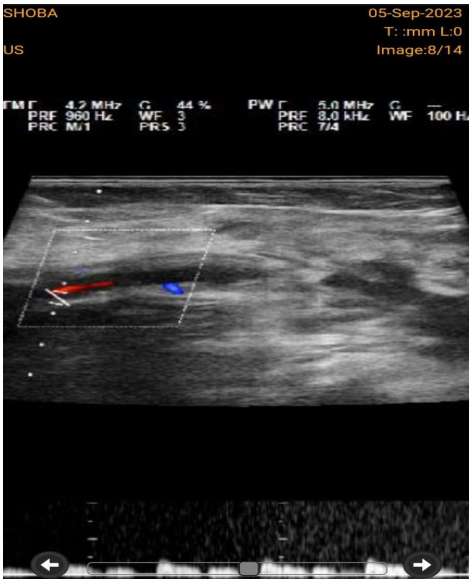
This patient presented with complaints of fever, anorexia, weight loss, and malaise along with an elevated ESR. Absence of neurologic and peripheral manifestation.

2.4. Case 4

This patient was confirmed with the above-mentioned initial assessments, especially with neurologic manifestation. so advised for MRI and Doppler Tests.



MRI



Doppler

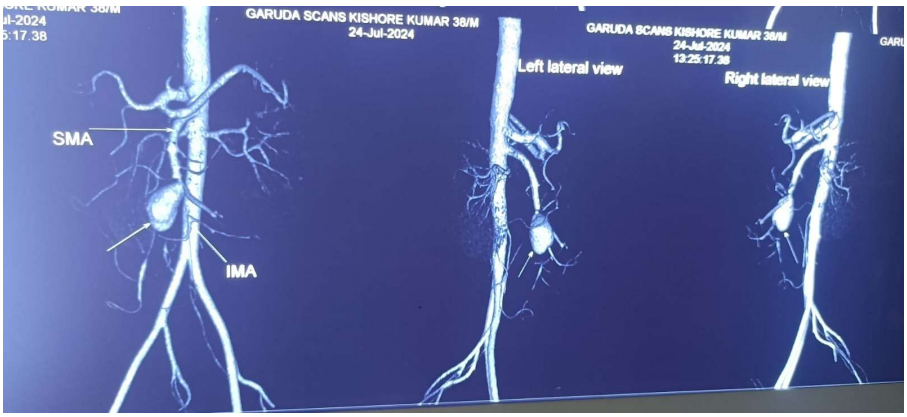
Impressions

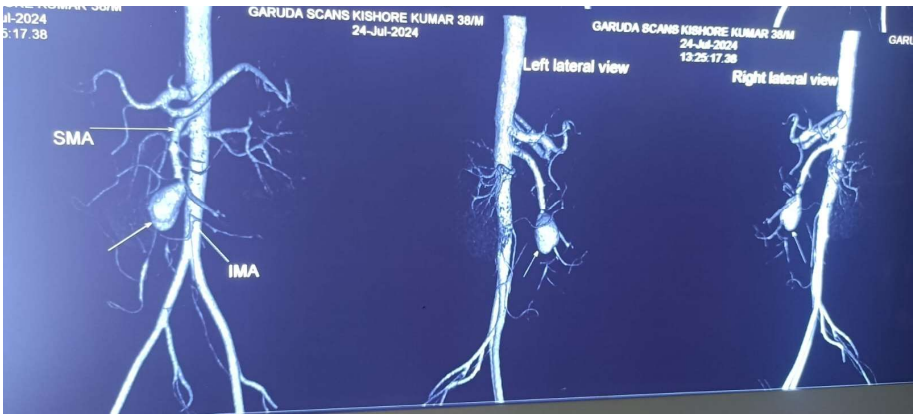
MRI Brain: Acute infarct involving left temporal lobe, posterior parietal and B/L periventricular cortex

Doppler: Subacute thrombosis of right distal brachial artery.

3.5. Case 5

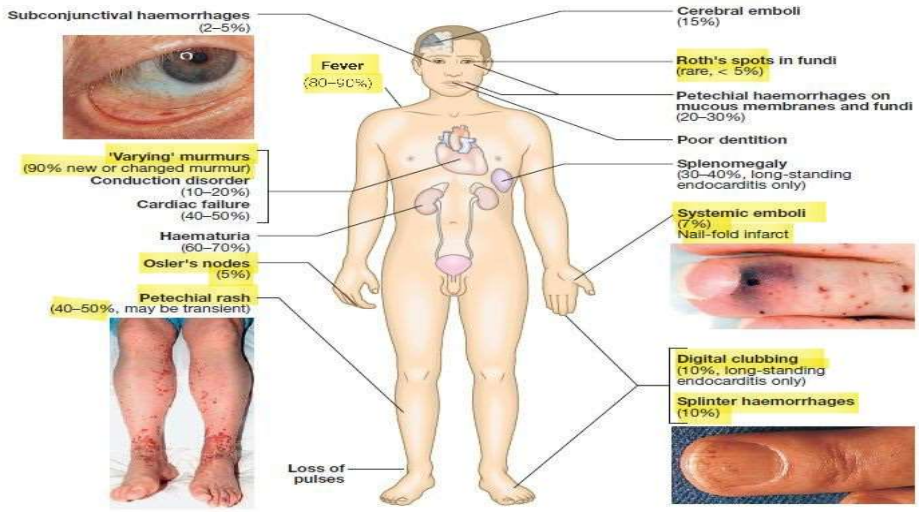
This patient presented without fever but with anemia, leukocytosis and elevated ESR. CT - angiogram was advised for the patient.





Impression

CT angio: 3.3×3.1×3.6 cm SMA Aneurysm



Blood Culture Drawing

Three, two-bottle blood culture sets containing the appropriate volume of blood (10 mL per bottle) were obtained from different venipuncture sites over 1–2 hr.

Emergencies

Case 1 Mr. J

- Had developed bradycardia and complete heart block
- Had to undergo emergency temporary pacemaker implantation
- Reverted to sinus rhythm and pacemaker removed

Case 2 Mr V

- Had pseudoaneurysm with thrombus from distal common hepatic artery + Splenic infarcts
- Had to undergo percutaneous glue embolization under fluoroscopy guidance of large common hepatic artery mycotic aneurysm

Case 5 Mr K

- Had features of impending SMA mycotic aneurysm rupture and suspicion of bowel ischemia
- Undergone explorative laparotomy with ligation of SMA aneurysm
- Re exploration after 48 hr showed normal bowel.

Vitals	Case 1 Mr. J	Case 2 Mr. J	Case 3 Mr. A	Case 4 Mrs. S	Case 5 Mr. K
Blood culture	MRSA	Vre - enterococcus faecalis - left metacarpal, left cubital	Streptococcus mutants	Streptococcus mutans	Enterococcus faecalis (right and left femoral line and right brachial line)

Antibiotic tailoring	Teicoplanin, Daptomycin + linezolid	Daptomycin and linezolid	Vancomycin, teicoplanin	Ceftriaxone and vancomycin	Ampicillin 12g per day (2g 4th hourly) along with ceftriaxone
Modified duke criteria	1 major + 3 minor	2 major	1 major +3 minor	1 major + 3 minor	2 major

TABLE 128-3 The Modified Duke Criteria for the Clinical Diagnosis of Infective Endocarditis[a]

Major Criteria

1. Positive blood culture
   - Typical microorganism for infective endocarditis from two separate blood cultures
     - Viridans streptococci, *Streptococcus gallolyticus*, HACEK group organisms, *Staphylococcus aureus*, *or*
     - Community-acquired enterococci in the absence of a primary focus,
     - ***or***
   - Persistently positive blood culture, defined as recovery of a microorganism consistent with infective endocarditis from:
     - Blood cultures drawn >12 h apart; *or*
     - All of 3 or a majority of ≥4 separate blood cultures, with first and last drawn at least 1 h apart
     - ***or***
   - Single positive blood culture for *Coxiella burnetii* or phase I IgG antibody titer of >1:800
2. Evidence of endocardial involvement
   - Positive echocardiogram[b]
     - Oscillating intracardiac mass on valve or supporting structures or in the path of regurgitant jets or in implanted material, in the absence of an alternative anatomic explanation, *or*
     - Abscess, *or*
     - New partial dehiscence of prosthetic valve,
     - ***or***
   - New valvular regurgitation (increase or change in preexisting murmur not sufficient)

Minor Criteria

1. Predisposition: predisposing heart conditions[c] or injection drug use
2. Fever ≥38.0°C (≥100.4°F)
3. Vascular phenomena: major arterial emboli, septic pulmonary infarcts, mycotic aneurysm, intracranial hemorrhage, conjunctival hemorrhages, Janeway lesions
4. Immunologic phenomena: glomerulonephritis, Osler's nodes, Roth's spots, rheumatoid factor
5. Microbiologic evidence: positive blood culture but not meeting major criterion, as noted previously,[d] *or* serologic evidence of active infection with an organism consistent with infective endocarditis

Example,

Definite IE: 2 major (or) 1 major + 3 minor (or) 5 minor

Possible IE: 1 major + 1 minor (or) 3 minor

3. Discussion

Treatment options

Empirically start on ceftriaxone + vancomycin

Streptococcus	
Penicillin-susceptible streptococci: Ceftriaxone (2 g daily as a single dose for 4 weeks) Vancomycin (15 mg/kg IV q12h for 4 weeks) OR Ceftriaxone for 4 weeks plus Gentamicin for 4 weeks	**Penicillin resistant:** Ceftriaxone for 6 weeks + Gentamicin for 6 weeks Vancomycin for 6 weeks
Enterococcus	
Susceptible Enterococci: Ampicillin (2 g IV q4h) plus ceftriaxone (2 g IV q12h), both for 6 weeks	**VRE - Vancomycin Resistant Enterococci:** Daptomycin + Linezolid for 6 weeks
Staphylococcus	
MSSA infecting native valves: Vancomycin (15 mg/kg IV q12h for 6 weeks)	**MRSA of native valves:** Vancomycin (15mg/kg IV q8–12h) or daptomycin (8–10 mg/kg daily) for 6 weeks

Failed Medical Therapy

Case 1 Mr J

- Developed thrombocytopenia again. Linezolid stopped.
- Fever with large vegetations persisted despite 14 days of Daptomycin. Stopped and Vancomycin started.
- Because of Failed Medical Therapy shifted to Heart City – for mitral valve replacement
- MVR done and patient was stable.

Case 2 Mr. A

- He had a persistent fever so switched to Vancomycin, but developed leucopenia
- Also developed heart failure
- Vancomycin stopped, switched to Teicoplanin, and then shifted to Heart City for AVR under high risk.
- Started responding to teicoplanin, and showed clinical improvement.
- AVR done, on regular followup – the patient was stable

Surgery Indications

- Persistent bacteremia without an extracardiac cause despite 7–10 days of optimal antimicrobial therapy
- Heart failure or shock
- Paravalvular extension of infection with abscess, fistula, or heart block
- Fungal or Brucella infection
- Large (>10-mm) hypermobile vegetation, particularly with prior systemic embolus and significant valve dysfunction
- Very large (>30-mm) vegetation
- Right-sided vegetation larger than >20mm.

Measures to Prevent Infective Endocarditis

Which patients	Which procedures
• Prosthetic heart valve/surgical or trans catheter • Valve clips, annuloplasty • Previous relapsed or recurrent IE • Repaired congenital defect or residual defect adjacent to the patch • RHD – regurgitant lesions and AS, HOCM.	• Invasive dental or oral procedures maximum risk dental extractions. • OGD, TEE, Colonoscopy or cystoscopy, - can be considered on individual basis

Table 2: Oral antibiotic regimens for prevention of endocarditis prior to dental procedures¶

	Agent	Adult dose	Pediatric dose (not to exceed adult dose)
Preferred agent	Amoxicillin	2 g	50 mg/kg
Options for patients allergic to penicillins (eg, ampicillin)	Cephalexin◇	2 g	50 mg/kg
	OR		
	Azithromycin or clarithromycin	500 mg	15 mg/kg
	OR		
	Doxycycline	100 mg	<45 kg: 2.2 mg/kg ≥45 kg: 100 mg

*Single oral dose 30 – 60 min before the procedure

Take Home Message

- Anyone coming with history of fever, with pallor clubbing and heart murmur on examination – suspect infective endocarditis
- Immediately send blood cultures according to IE protocol
- Start on Empirical antibiotic therapy (Ceftriaxone and Vancomycin) after cultures are taken.
- Apply Duke's Criteria
- Tailor antibiotics after culture reports