

## Introduction:

Infective endocarditis (IE) is referred to as an inflammation of the endocardium secondary to bloodstream infection. The diagnosis is usually made using the Modified Duke's Criteria (Table 1). IE involving the right side of the heart accounts for ~10% of all IE cases and generally occurs in younger IV drug users (IVDU) with few co-morbidities and valve disease as compared to those with left-sided IE. *Staphylococcus aureus* is the causative agent in 70% right-sided IE (RSIE). Here we report a case of young IVDU with RSIE.

## Case Description:

A 31-year-old female with a history of polysubstance abuse, presented to the ED with worsening body aches, reported fever, weakness, dry cough, pleuritic chest pain, and shortness of breath for a month. Associated symptoms included weight loss of 35 pounds in three months. Vitals in the ED were significant for HR of 111 bpm. Labs were significant for leukocytosis, bandemia, and urine toxicology was positive for cocaine, opiate, and methadone. Chest x-ray showed bibasilar haziness. She was admitted for sepsis and was started on vancomycin and piperacillin/tazobactam. The blood cultures x 2 eventually grew methicillin sensitive-*Staphylococcus aureus* and the antibiotic regimen was switched to nafcillin.

Transthoracic echocardiogram (Figure 1A) showed moderate to severe tricuspid valve regurgitation (MTSTVR) with a large vegetation 2.3 cm x 1.13 cm attached to the anterior leaflet of the tricuspid valve. Transesophageal echocardiogram (Figure 1B) also revealed MTSTVR with a large multi-lobulated echo density measuring 1.5 cm x 0.56cm and another measuring 1.16 cm x 0.36cm. There was no evidence of tricuspid annular or valve ring abscess. The patient was transferred to a tertiary care center for cardiothoracic surgery.

Table 1. MODIFIED DUKE'S CRITERIA

Major Criteria	
• Blood culture positive for IE	• Typical microorganisms consistent with IE from two separate blood cultures
	• Viridans streptococci; <i>Streptococcus bovis</i> , HACEK group, <i>Staphylococcus aureus</i> ; or
	• Community-acquired enterococci, in the absence of a primary focus
• Microorganisms consistent with IE from persistently positive blood cultures, defined as follows:	
	• At least two positive blood cultures of blood samples drawn >12 h apart; or
	• All of three or a majority of ≥4 separate cultures of blood (with first and last sample drawn at least 1 h apart)
• Single positive blood culture for <i>Coxiella burnetii</i> or antiphase I IgG antibody titer >1:800	
Evidence of endocardial involvement	
• Echocardiogram positive for IE (TEE recommended in patients with prosthetic valves, rated at least "possible IE" by clinical criteria, or complicated IE [paravalvular abscess]; TTE as first test in other patients), defined as follows:	
	• Oscillating intracardiac mass on valve or supporting structures, in the path of regurgitant jets, or on implanted material in the absence of an alternative anatomic explanation; or
	• Abscess; or
	• New partial dehiscence of prosthetic valve
• New valvular regurgitation (worsening or changing or preexisting murmur not sufficient)	
Minor Criteria	
• Predisposition, predisposing heart condition or injection drug use	
• Fever, temperature >38°C	
• Vascular phenomena, major arterial emboli, septic pulmonary infarcts, mycotic aneurysm, intracranial hemorrhage, conjunctival hemorrhages, and Janeway lesions	
• Immunologic phenomena: Glomerulonephritis, Osler nodes, Roth's spots, and rheumatoid factor	
• Microbiological evidence: Positive blood culture but does not meet a major criterion as noted previously (excluding single positive cultures for coagulase-negative staphylococci and organisms that do not cause endocarditis) or serologic evidence of active infection with organisms consistent with IE	
• Echocardiographic minor criteria eliminated	

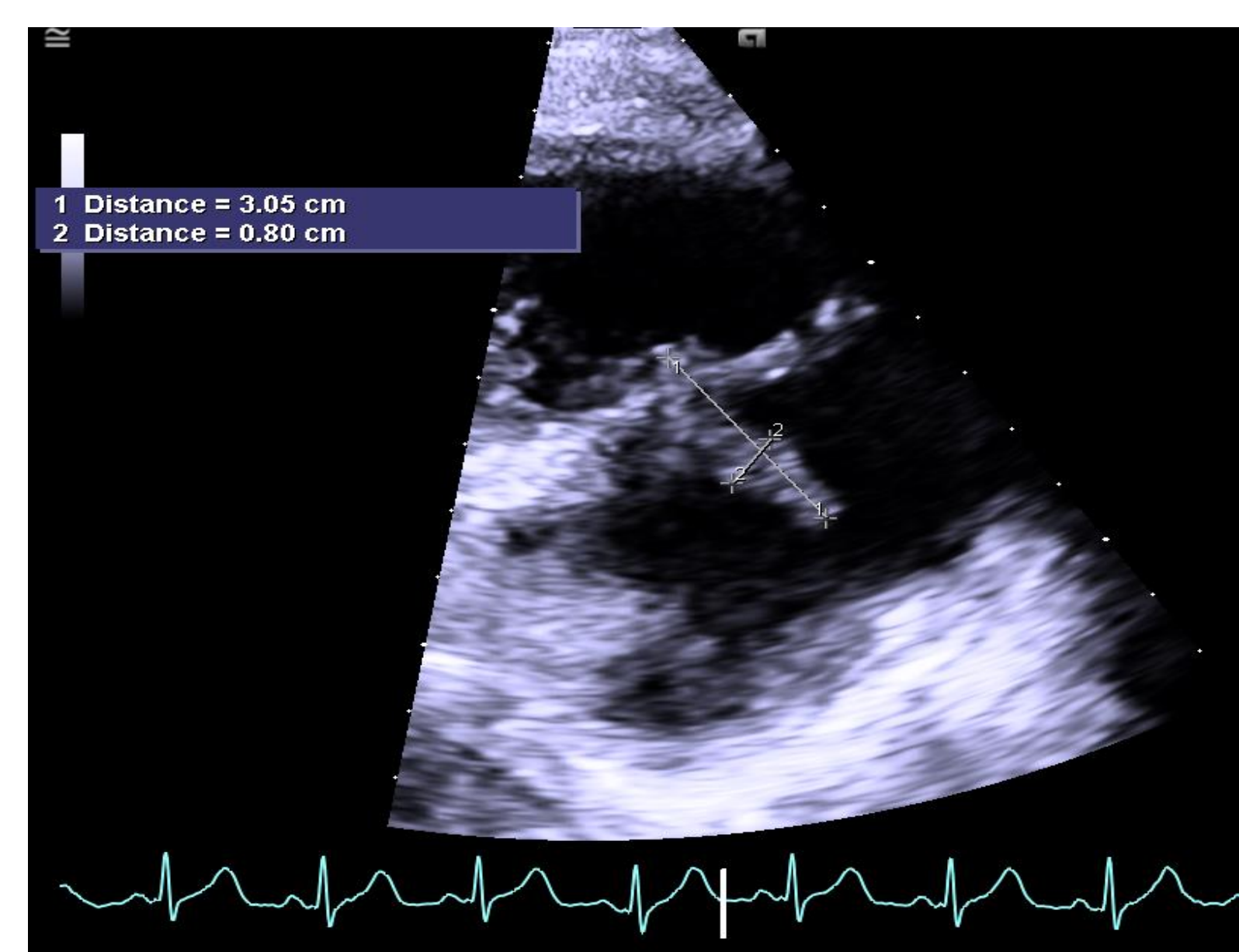


Figure 1A. Transthoracic echocardiogram (TTE) showing vegetation in the tricuspid valve.

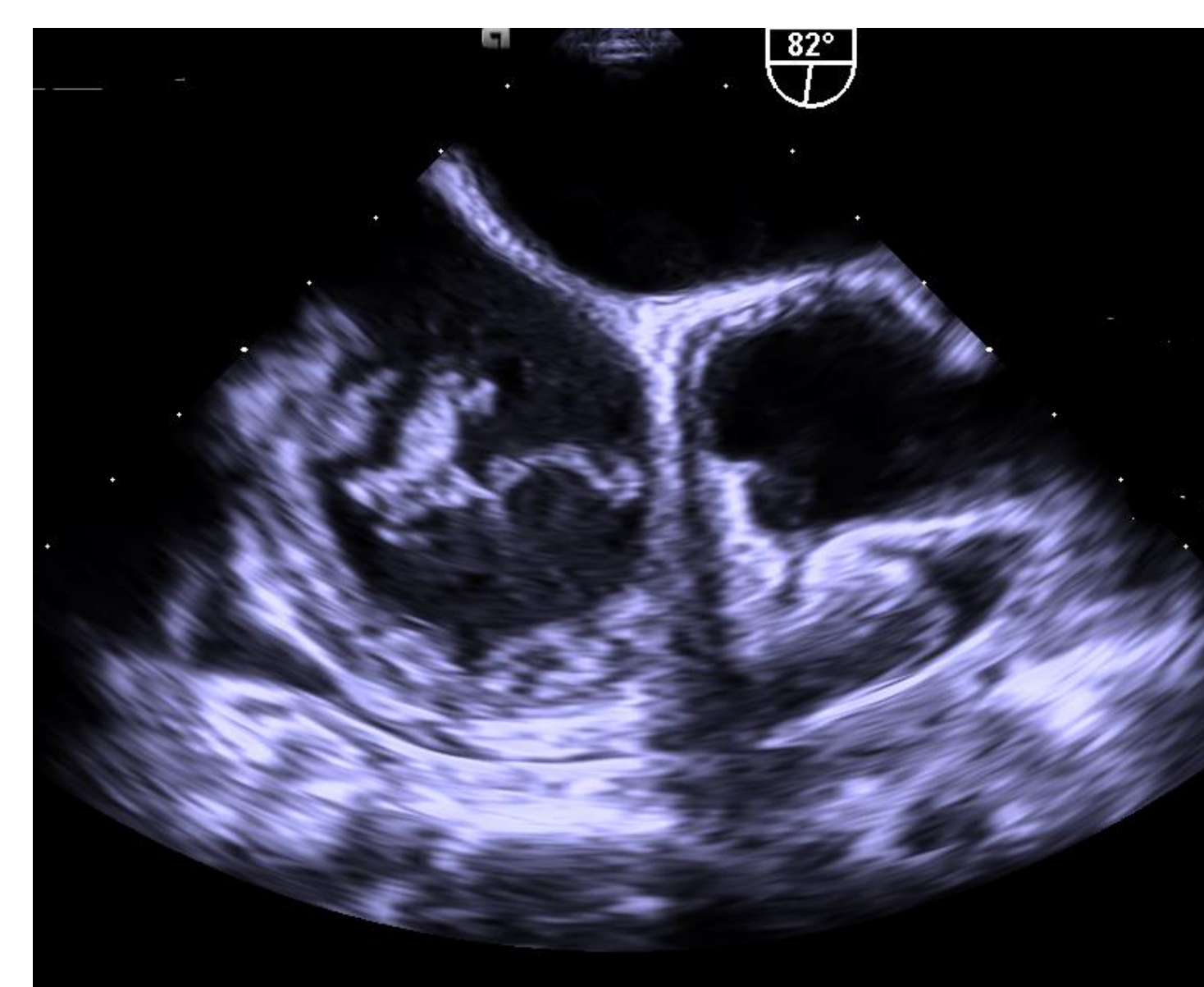


Figure 1B. Transesophageal echocardiogram (TEE) showing vegetation in tricuspid valve. There was no evidence of valvular abscess.

## Discussion:

Amongst all IV drug-related endocarditis, heroin use has been more frequently associated with infective endocarditis as in our patient. Indications of surgery for infective endocarditis include large vegetations (>10mm) with embolic complications or very large vegetations (>15mm) without embolic complications. The size of vegetations in our patient in the setting of sepsis qualified her for surgery.

Other indications for surgery include, but are not limited to:

### 1) Congestive heart failure (CHF)

a. CHF caused by severe aortic regurgitation (AR) or mitral regurgitation (MR) or valve obstruction caused by vegetation

b. Severe AR/MR with echocardiogram showing elevated LVEDP or significant pulmonary hypertension

### 2) Perivalvular abscess

3) Difficult organisms- *S. aureus* IE involving prosthetic valve, most often left-sided native valve, IE caused by multi-resistant organism MRSA or VRE, aggressive organism such as *Brucella*, *S. lugdunensis*, and *Pseudomonas aeruginosa*

4) Prosthetic valve endocarditis- virtually all cases especially *S. aureus*.

It is crucial for physicians to keep in mind of these indications, for appropriate surgery referral in a young patient such as ours.

## References:

1. Moss, Rob and Brad Munt. "Injection drug use and right sided endocarditis" *Heart (British Cardiac Society)* vol. 89,5 (2003): 577-81.
2. Hoen B, Alla F, Selton-Suty C, Béguinot I, Bouvet A, Briançon S, Casalta JP, Danchin N, Delahaye F, Etienne J, Le Moing V, Lepout C, Mainardi JL, Ruimy R, Vandenesch F; Association pour l'Etude et la Prévention de l'Endocardite Infectieuse (AEPEI) Study Group. "Changing profile of infective endocarditis: results of a 1-year survey in France." *JAMA*. 2002 Jul 3;288(1):75-81.
3. [www.ahajournals.org/doi/10.1161/CIRCULATIONAHA.108.773598](http://www.ahajournals.org/doi/10.1161/CIRCULATIONAHA.108.773598)