CARDIAC IMAGING QUIZ

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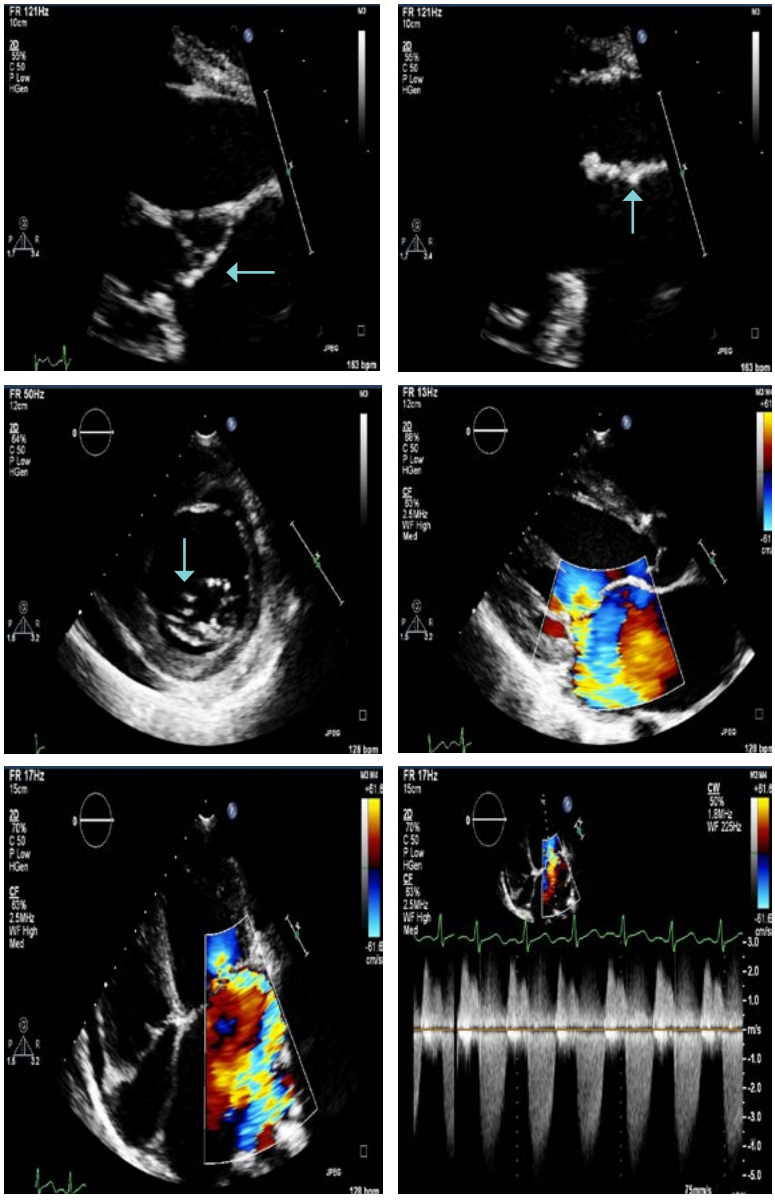

QUESTION: What is the diagnosis?

A. Infective endocarditis.

B. Libman–Sacks endocarditis.

C. Myxomatous degeneration.

D. Rheumatic carditis.

ANSWER

D. Rheumatic carditis.

CASE

A 17-year-old girl presented from a peripheral hospital with heart failure. On examination, she was tachycardic, had a displaced apex beat, and a severe mitral regurgitation holosystolic murmur radiating to the axilla was heard. A transthoracic echocardiogram was performed, which showed features consistent with rheumatic carditis in multiple views. Focal nodular beading on the mitral valve leaflet closure line (arrows in top and middle panels), annular dilation and restricted posterior leaflet motion were present (top and middle panels). Eccentric pathological mitral regurgitation secondary to leaflet malcoaptation extending into the pulmonary veins was noted in 2 valve planes, with a high-velocity jet (4 m/s, holosystolic) (middle and bottom panels). Additionally, an enlarged left atrium, left ventricle, and pericardial effusion were also noted (middle and bottom panels). Acute rheumatic carditis was confirmed by elevated antistreptolysin O titre (ASOT) and antibody to deoxyribonuclease B (anti-DNase B) titres.

DISCUSSION

Rheumatic carditis is a major manifestation of acute rheumatic fever and may present clinically or be detected only on echocardiography (subclinical carditis).[1] Clinically, it is characterised by evidence of cardiac inflammation, most commonly valvulitis causing new mitral regurgitation as in this case, and/or aortic regurgitation murmurs, and may be associated with cardiomegaly, congestive heart failure, or pericarditis with a pericardial rub or effusion. Echocardiography is recommended in all suspected cases because it can identify subclinical carditis, which is now recognised as a major Jones Criteria manifestation.[1,2]

Pathological mitral regurgitation is defined by a regurgitant jet seen in at least 2 views, extending ≥ 2 cm, with a peak velocity > 3 m/s, and a holosystolic pattern. Pathological aortic regurgitation must be seen in at least 2 views, extend ≥ 1 cm, have a peak velocity > 3 m/s, and be holodiastolic. Additional echocardiographic features supporting acute rheumatic valvulitis include mitral or aortic valve leaflet thickening/beading, prolapse or excessive leaflet tip motion, restricted leaflet mobility, chordal elongation, and left-sided chamber dilatation secondary to significant regurgitation.[1] Mitral regurgitation is the most common echocardiographic finding, followed by aortic regurgitation and combined valve involvement.

In acute rheumatic endocarditis, inflammation of the valvular endocardium results in the formation of small, sterile platelet and fibrin thrombi, known as verrucous vegetations (verrucae), along the line of valve closure.[1] These lesions arise from endocardial injury, fibrinoid necrosis, and mechanical stress at the sites where valve leaflets coapt. Echocardiographically, the verrucae appear as multiple small, uniform, echogenic nodules arranged in a characteristic "beaded" or "string of beads" pattern along the leaflet closure line, as in the images above. Unlike the vegetations seen in infective endocarditis, rheumatic verrucae are firmly attached, sterile, rarely embolise, and do not typically cause valve leaflet destruction. Instead, acute rheumatic valvulitis produces valvular regurgitation, most commonly mitral regurgitation, due to leaflet oedema, inflammation, and chordal involvement. Recognising these characteristic morphological features can help differentiate acute rheumatic carditis from other causes of valvular disease.

The main differential diagnoses of rheumatic carditis include infective endocarditis, Libman–Sacks endocarditis, and myxomatous valve degeneration.[1] Infective endocarditis may mimic rheumatic carditis by causing new murmurs and valvular regurgitation; however, it is usually associated with persistent fever, positive blood cultures, evidence of infection, and echocardiographic oscillating masses (vegetations). Libman–Sacks endocarditis, seen in patients with systemic lupus erythematosus or antiphospholipid syndrome, is characterised by sterile vegetations on both sides of the mitral or aortic valve leaflets and is accompanied by other autoimmune manifestations and positive serological markers. Myxomatous degeneration, the pathological basis of mitral valve prolapse, can produce mitral regurgitation and leaflet prolapse on echocardiography, but lacks the inflammatory features, systemic manifestations, and evidence of recent streptococcal infection characteristic of rheumatic carditis. Careful assessment of clinical findings, laboratory markers, and echocardiographic valve morphology helps distinguish these conditions from acute rheumatic carditis.

REFERENCES

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