Image of the month: Alternating bifid pulse – a novel manifestation of low cardiac output states

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An 18-year-old male with familial dilated cardiomyopathy was admitted with shortness of breath of 1-week duration. On clinical examination, he was tachypnoeic at rest and had tachycardia with regular beat-to-beat variation in the pulse volume. Jugular venous pressure was elevated. The blood pressure was 100/74 mmHg. Cardiovascular examination revealed cardiomegaly and left ventricular (LV) third heart sound. Bilateral fine basal crepitations were noted. 12-lead electrocardiogram showed sinus tachycardia and no significant ST-T changes. Transthoracic echocardiogram showed global LV hypokinesia with LV ejection fraction of 10%. Alternating weak and normal beats with 'M' pattern are seen in the radial artery pulse tracing (Fig 1).

Alternating weak and normal beats represent volume abnormality of the pulse due to alternation in the number of cardiac fibres contributing to each systole.[1] It indicates significant ventricular systolic dysfunction. Bifid pulse with systolic and diastolic peaks represents a character abnormality of the pulse. It indicates low cardiac output state. The incisural notch becomes prominent with respect to the overall arterial pulsation in low cardiac output state generating the classical M-shaped waveform of the dicrotic pulse.[2]

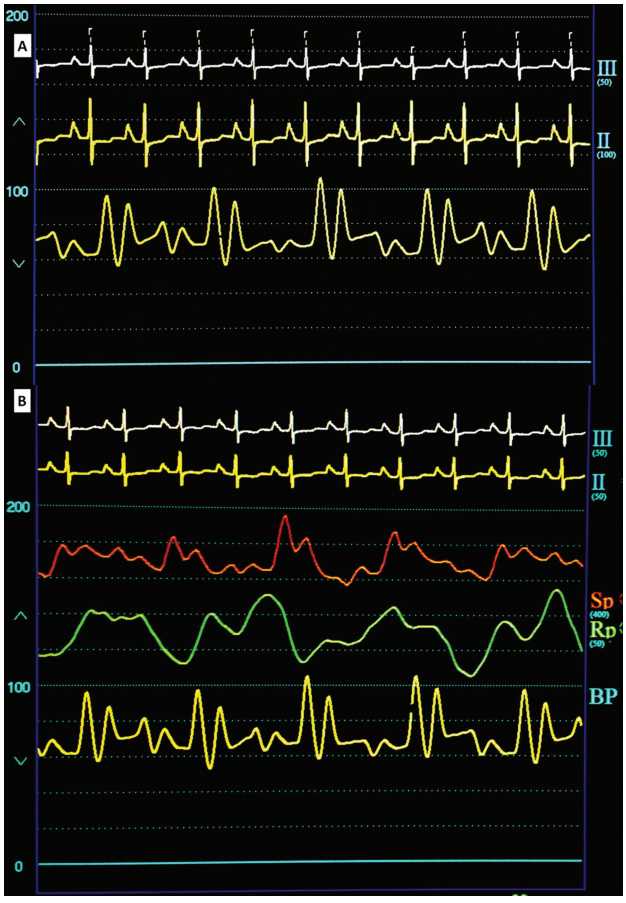

Fig 1. (A) Simultaneous ECG and radial artery tracing; (B) Simultaneous ECG, pulse oximetry recording (red), respirometer tracing (green) and arterial waveform tracing (yellow). ECG = electrocardiogram.

The radial artery pulse tracing shows simultaneous representation of pulses alternans and pulses dicroticus. The alternating bifid pulse represents significant LV dysfunction

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and low cardiac output state and carries poor prognosis. Simultaneous representation of these pulse abnormalities has not been described earlier and is reported for the first time. ■

References

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