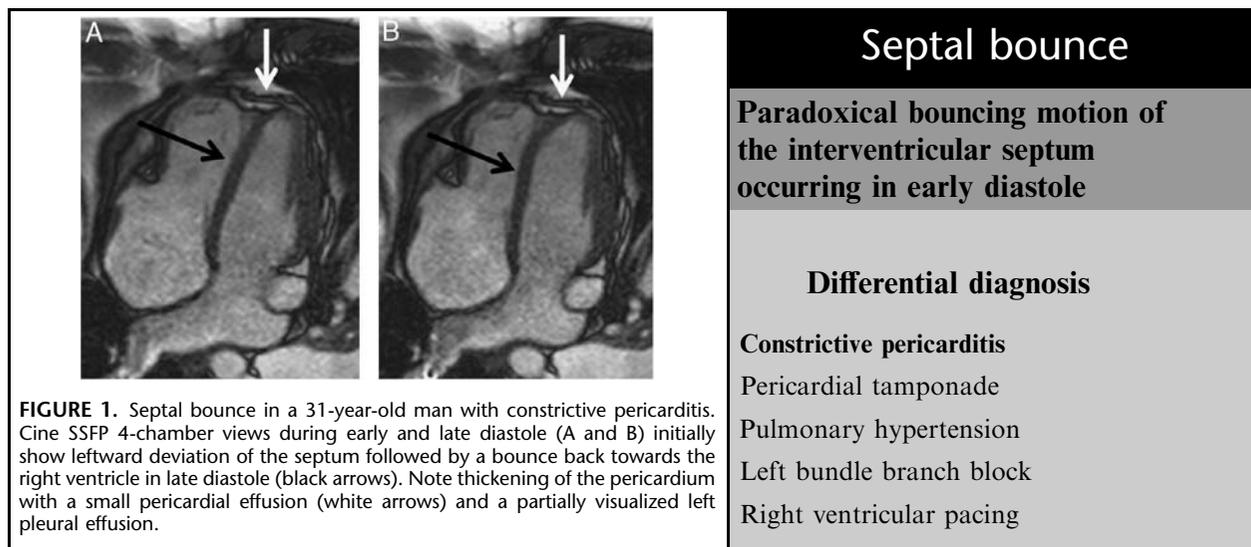


"Septal Bounce"

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Appearance: The septal bounce is a paradoxical bouncing motion of the interventricular septum initially directed towards and then away from the left ventricle during early diastole (Fig. 1 and see Video, Supplemental Digital Content 1, which demonstrates characteristic septal bounce on cine SSFP 4-chamber images, <http://links.lww.com/JTI/A16>). It is accentuated by deep inspiration and reverses with exhalation. Transient leftward shift of the interventricular septum can also be seen with the Mueller maneuver (i.e. forced inspiration against a closed glottis).¹ The septal bounce may at times occur in right ventricular dysfunction related to massive pulmonary embolism or other causes of pulmonary arterial hypertension.²

Explanation: The septal bounce is typically seen in constrictive pericarditis and cardiac tamponade when there is an increase in ventricular interdependence. Ventricular interdependence occurs in conditions where an increase in volume of one ventricle causes a decreased volume in the opposite ventricle. This phenomenon is caused by reduced ventricular compliance due to a fixed pericardial volume.³ During early diastole there is rapid inflow of blood into the ventricles which causes a marked change in ventricular pressures.⁴ Because right ventricular filling begins slightly before left ventricular filling, the change in pressure equates to paradoxical leftward motion of the interventricular septum. The septal bounce is accentuated during inspiration when venous return to the right ventricle increases. This effect is reversed during exhalation when less blood is returned to the right ventricle.³

Discussion: The septal bounce is most commonly associated with constrictive pericarditis but can also be seen in cardiac tamponade. In the broadest sense, a septal bounce-like motion may also be seen in the setting of elevated right heart pressures, right ventricular pacing, and left bundle branch block.⁵ The sign is most useful in differentiating constrictive pericarditis from restrictive cardiomyopathy in order to guide appropriate therapy decisions. Constrictive pericarditis is treated with pericardiectomy, whereas medical treatment is used in restrictive cardiomyopathy.⁶ This sign is highly specific and relatively sensitive in the setting of suspected constrictive pericarditis. In two cardiac MRI studies involving 86 patients with constrictive/restrictive physiology, the sign had a sensitivity of 81% to 96% and a specificity of 100% for the diagnosis of constrictive pericarditis.^{3,7} Importantly, the septal bounce was not present in the asymptomatic control group of 37 patients.^{3,7} There are reports in the echocardiography literature of the septal bounce being seen in normal patients and in patients with restrictive cardiomyopathy.^{6,8} Therefore, this sign should be used in conjunction with other imaging signs (i.e. pericardial thickening ≥ 4 mm, dilated right atrium, and dilated inferior vena cava) in order to correctly diagnose constrictive pericarditis.

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