Mechanical Valve M-Mode Contour: *A Disk Excursion Tip!*

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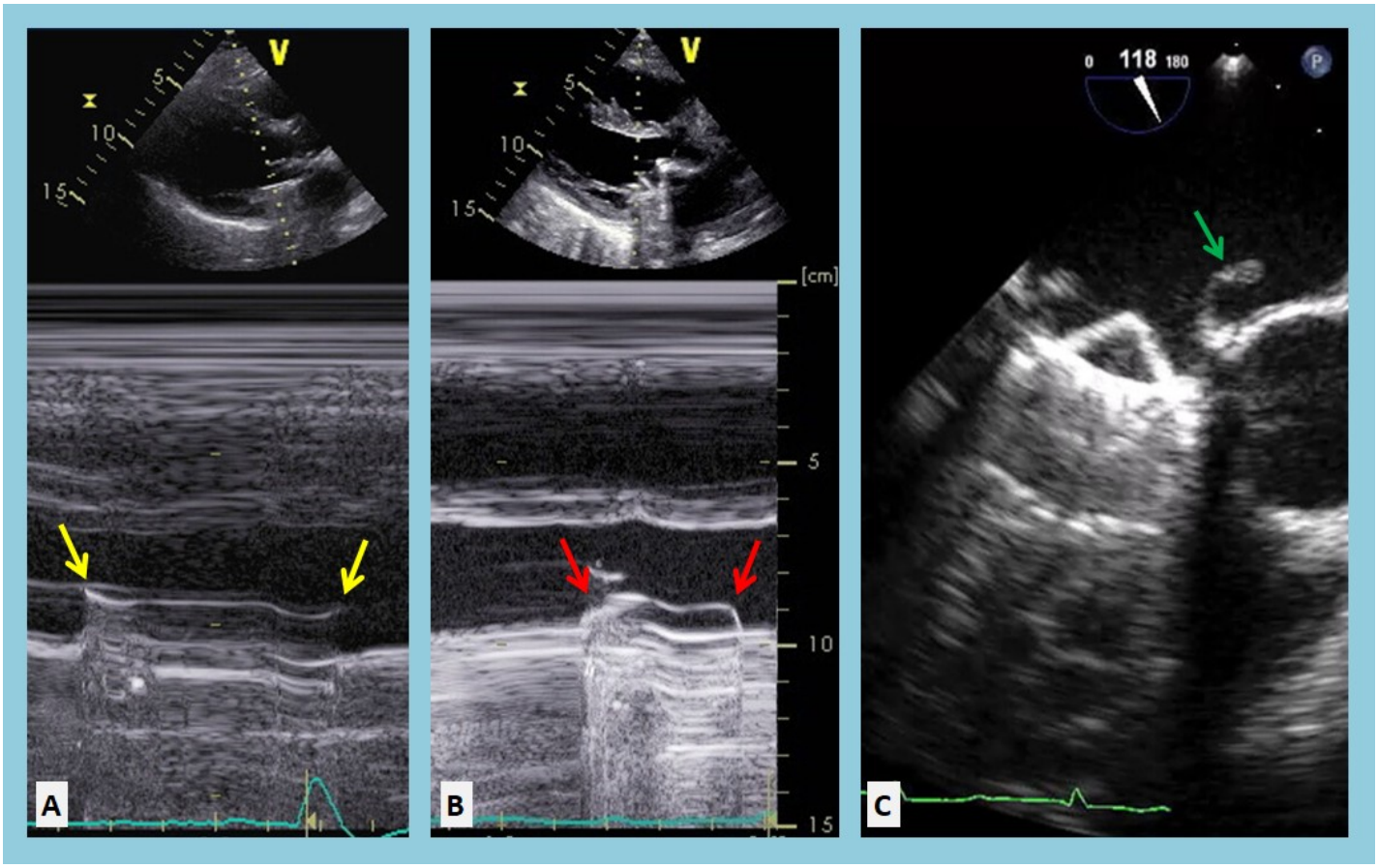

Description

Mechanical heart valves are often not well visualized by transthoracic 2-dimensional (2-D) echocardiography (TTE) and require transesophageal echocardiography (TEE) and/or fluoroscopy for better evaluation of valve structure and function. The above 2-D TTE and TEE images demonstrate the crucial role of m-mode echocardiography in the assessment of the function of mechanical valves.

In a normally functioning mechanical bileaflet tilting disk mitral valve prosthesis, shown in figure A, there is brisk opening (left yellow arrow) and closure (right yellow arrow) of the prosthetic disks, seen as sharp demarcation of the m-mode opening and closure contour, indicative of unobstructed disk excursion.

When there is obstruction to disk excursion as shown in figure B, the opening and closure m-mode TTE contours (left and right red arrows) become blunted and rounded, rather than sharp and brisk, providing a clue that disk movement is pathological impeded and need to be further evaluated. This can be a valuable tool in TTE imaging given the high temporal resolution of m-mode echocardiography.

Mid-esophageal TEE image shown in figure C, of the case in figure B, clearly demonstrates vegetations along the struts of the mechanical mitral prosthesis; with further vegetations identified along the disks in other images not shown, providing explanation to the abnormal m-mode contour on TTE.

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.Discussion

The limitations of TTE in the evaluation of prosthetic valves have long been recognized, with TEE providing higher specificity and sensitivity in detecting valvular abnormalities [1]. With evolving technology, a comprehensive multimodality imaging is often required for the complete assessment of prosthetic heart valve function [2].

Technology is in continuous and exponential evolution. As the incremental value of 2-D over m-mode echocardiography was questioned in 1979 [3], there was an obviously limited discussion of m-mode echocardiography in the American Society of Echocardiography recommendations for quality echocardiography laboratory operations document in 2011 [4], prompting expert criticism [5].

M-mode echocardiography remains a valuable tool in echocardiography enjoying a higher temporal resolution than 2-D echocardiography [6]. It remains of great value in assessing prosthetic valve function, as demonstrated in the above discussed images, providing clues which can prompt further assessment when the 2-D images are limited.

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KEYWORDS: Mechanical Mitral Valve; M-Mode Echocardiography; Endocarditis.

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