

A Simple Method for Obtaining High-Fidelity Pressure Tracings

To the Editor,

The precise measurement of cardiac waveforms during heart catheterization is crucial for accurate diagnosis and effective treatment planning. However, the accuracy of these measurements can be compromised by the poor damping and frequency response of fluid-filled systems.

A particular challenge is the underdamping due to the hard pressure tubing commonly used in angiographic procedures. This often results in tracings with significant "ring" artifacts, making it difficult to accurately identify specific waveforms, especially the pulmonary capillary wedge pressure (PCWP), which is vital for assessing left ventricular function and diagnosing various cardiac conditions.

To address this issue, we propose a new method that can be easily implemented in clinical practice. By incorporating a serum set, which typically has more compliant tubing compared to standard pressure tubing, into the pressure line via a 3-way stopcock, the system gains a compliant chamber that counteracts the underdamping. The length of the serum set tubing can be adjusted by altering the position of the roller clamp (Figure 1). This adjustment allows for fine-tuning of the compliant addition to the system, effectively modulating the damping to achieve optimal waveform fidelity (Figure 2). The adequacy of the damping can be confirmed using a square-wave test, ensuring that the system provides high-definition pressure tracings.

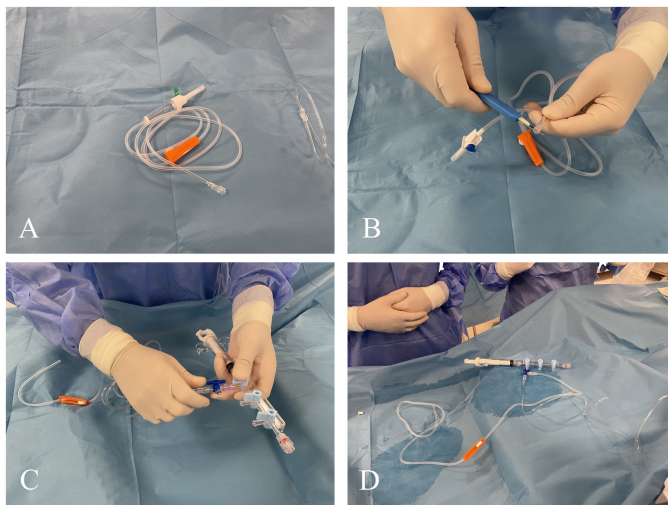


Figure 1. A, A regular serum tubing. B, The serum end is cut and removed. C, The remaining part is connected to the pressure measurement system using a 3-way stopcock. D, The roller clamp can be slid on the serum tubing to adjust the length, thereby varying the amount of required compliance added to the system to correct underdamping.



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LETTER TO THE EDITOR

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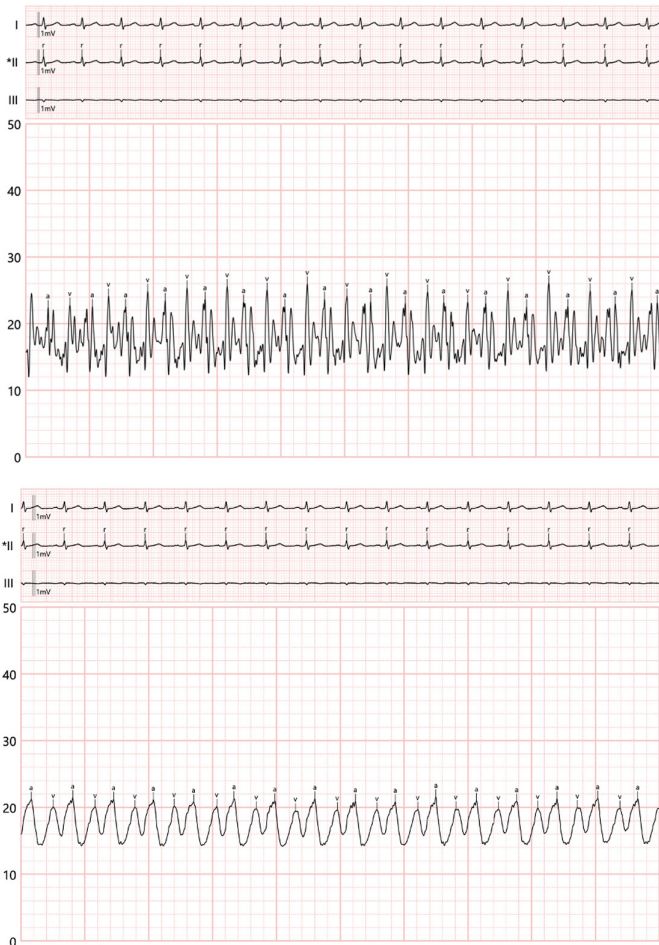
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In summary, we hereby define a simple yet effective method that enhances the quality of pressure waveform recordings without any additional cost, facilitating better diagnostic accuracy and ultimately improving patient care.

Figure 2. Upper panel, The default pulmonary capillary waveform recording suffering from pronounced ring artifact. Lower panel, The new system with appropriate adjustment of the roller clamp results in a high-fidelity pressure recording with clearly discernible a and v waves.