Transcatheter Closure of a Post-Myocardial Infarction Ventricular Septal Rupture Using a Parachute Device

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A 58-year-old man with exertional dyspnea (New York Heart Association class II) was admitted to our hospital. He suffered from acute anterior myocardial infarction 1 year earlier and had undergone percutaneous coronary intervention and closure of ventricular septal rupture (VSR) with an Amplatzer Septal Occluder (St. Jude Medical, St. Paul, Minnesota) 9 months before admission. Echocardiography taken on admission showed large residual apical ventricular septal shunts near the occluder (Figure 1A, Online Video 1) and left ventricular aneurysm, with left ventricular ejection fraction of 49%. An 85-mm Parachute device (CardioKinetix, Inc., Menlo Park, California) was used to restore the left ventricle and close the apical VSR simultaneously, with the method reported previously (1). After the procedure, the Qp/Qs ratio decreased from 1.8 to 1.2. An x-ray showed that the Parachute device was located at the left ventricular apex and the Amplatzer occluder intruded into the device (Figure 2). At 3-month follow-up, the patient’s symptom was relieved, and New York Heart Association class was improved to class I. Echocardiography demonstrated that apical ventricular septal shunts decreased significantly (Figure 1B, Online Video 2). The Amplatzer occluder intruded into the Parachute device, causing incomplete apposition of the device and a blood flow run into the partitioned apical cavity from left ventricular chamber (Figure 3), and then went through the apical ventricular septal (Figure 1B).

Post-myocardial infarction VSR is a serious disease. Even if treated with surgery or percutaneous intervention, it is still associated with high mortality. Previously, VSR was percutaneously closed using double-umbrella devices (2), which were not effective for multi-holes VSR. This is the first time we have explored the feasibility of transcatheter closure of apical VSR using a Parachute device (the schematic diagram is given in Figure 4). Because

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the Amplatzer occluder affected the partitioning effect of the Parachute device, residual shunts still existed. If the case had not been treated by Amplatzer occluder previously, the result might be better.

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![FIGURE 2 X-Ray Taken During the Procedure](image)

The Parachute device was located at the left ventricular apex and the Amplatzer occluder intruded into the device.

![FIGURE 3 Echocardiography After the Procedure](image)

The Amplatzer occluder intruded into the Parachute device, causing incomplete apposition of the device and a blood flow run into the partitioned apical cavity from the left ventricular chamber. Abbreviations as in Figure 1.

![FIGURE 4 Schematic Diagram of Transcatheter Closure of Apical VSR Using a Parachute Device](image)

The Parachute device partitions the apical cavity, as well as the apical ventricular septal rupture (VSR).
REFERENCES


KEY WORDS
Parachute device, percutaneous ventricular restoration, transcatheter closure, ventricular septal rupture

APPENDIX
For accompanying videos, please see the online version of this paper.