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## ***Editorial Comment***

### **Closure of Postmyocardial Infarction VSD: A Call for New Devices**

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Rupture of the ventricular septum associated with transmural necrosis from a large myocardial infarction has been a frustrating medical condition that is associated with a high mortality. This most commonly occurs in elderly patients with a large infarction who may also have renal insufficiency or cerebral and peripheral vascular disease that accentuate the surgical risk.

In addition to being hemodynamically unstable, the surgical results are frustrated by having to sew into necrotic tissue. If one waits until the tissue stabilizes, so that it will more readily accept sutures, then the patient is likely to have developed end-organ damage from hypoperfusion associated with renal failure, pulmonary edema, and sepsis. With this condition, our surgeons prefer to operate immediately or not at all.

Percutaneous closure is an appealing alternative to avoid the high risks associated with surgery. But percutaneous approaches have not been uniformly successful. This is understandable because these lesions, on pathologic examination, do not consist of a symmetric hole like an ASD or membranous VSD, but are an irregular tear that may take a variable sigmoid path through the septum. In addition, the post-MI VSD tends to enlarge over time as more necrosis undermines tissue integrity surrounding the original rupture site.

Lowe et al. [1] describe a hybrid approach for dealing with these variable problems. Their case report describes an elderly man with an acute anterior MI who developed

a VSD and initially had a surgical procedure to exclude the apical septal rupture with a patch. An extension of the VSD occurred 1 day postsurgery and this extension of the original tear was approached percutaneously. Initially, several CardioSEAL devices were tried, but neither appeared to fit the tear appropriately. Then a 26 mm Amplatzer ASD occluder device was used successfully to obstruct the remaining interventricular shunt.

We recently had a similar case of an 85-year-old woman who had a large anterior MI. Following emergent coronary artery recanalization with a stent, left ventriculography revealed an apical VSD. Since surgery was felt to be of prohibitive risk, a percutaneous approach was attempted. A 40 mm CardioSEAL device was successfully deployed from the right internal jugular vein across the ventricular septum. Despite adequate positioning of this relatively large closure device, the shunt was not diminished, and it is possible that the device acted to stent open the VSD tear. The patient succumbed to low-output heart failure.

These cases demonstrate that we need a better percutaneous device that is made specifically for this condition. Unfortunately (for development of innovative devices), this is an "orphan" indication. There are too few cases to provide much monetary incentive to companies to develop such a device. However, the ability to avoid surgery and still successfully close this necrotic interventricular shunt could provide another lifesaving tool for interventional cardiology.

#### **REFERENCES**

1. Lowe HC, Jang IK, Yoerger DM, MacGillivray TE, de Moor M, Palacios IF. Compassionate use of the Amplatzer asd closure device for residual post-infarction ventricular septal rupture following surgical repair. *Cathet Cardiovasc Intervent* 2003;59:230–233.

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