Interactive Pathologies of Mitral Prolapse and True Membranous Septal Aneurysm With a Valve-Like Structure

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A 70-year-old man was admitted to our hospital for surgical treatment of mitral insufficiency. A preoperative echocardiogram revealed a prolapsed anterior mitral leaflet, membranous septal aneurysm (MSA), and unusual chordae extending from the ventricular septum to the anterior mitral leaflet (Movies I and II in the online-only Data Supplement). In surgery, the aneurysm was examined through the tricuspid valve before the heart was arrested (Figure 1A). On further inspection, when the MSA was pushed with forceps, a large quantity of blood suddenly flowed out from the MSA and stopped after the forceps were released. Once the heart was arrested, we discovered a valve-like structure on the MSA (Figure 1B and 1C). There was a gap in the MSA, and the free edge was supported by chordae arising from the ventricular septum and a large single papillary muscle in the left ventricle (Figure 1D). A valve-like phenomenon was also observed (Movies III and IV in the online-only Data Supplement). Most of the chordae attaching to the anterior mitral leaflet extended from this papillary muscle. Unusual chordae connecting to the medial section of the anterior mitral leaflet directly from the ventricular septum were torn or elongated. The mitral valve and the MSA were thus anatomically interactive by sharing chordae (Figure 2A and 2B). Two prosthetic chordae were placed on the papillary muscle for mitral repair; the MSA was resected; and the defect was closed with a patch. Great caution was necessary through both the mitral valve and the MSA to avoid severing chordae to the anterior mitral leaflet.

This is the first report to show the anatomic features of an MSA while the heart is beating and the left ventricle is pressurized and a valve-like structure within the MSA. Although

**Figure 1.**

A, The aneurysm was pressurized without a shunt in the beating heart. B and C, An atrioventricular valve-like structure. Several chordae were visible. D, The papillary muscle in the left ventricle was observed through the valve-like structure in the membranous septal aneurysm.
similar pathology is occasionally observed in the natural history of ventricular septal defect. True MSA is a rare and distinct anomaly that should be distinguished as such. Because true MSA may not necessarily be a simple bulging structure, careful investigation is vital for accurate diagnosis and adequate repair.

Disclosures
None.

References
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