PATHOANATOMIC FINDINGS AND TREATMENT DURING HYPERTROPHIC OBSTRUCTIVE CARDIOMYOPATHY SURGERY: THE ROLE OF MITRAL VALVE

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Introduction

Transaortic septal myectomy is the most commonly used surgical technique to treat hypertrophic obstructive cardiomyopathy (HOCM), and is associated with low operative morbidity and mortality, and elimination of the outflow gradients. In the modern era, the role of the mitral valve has been addressed.

More recently, a “drag” rather than “suck” mechanism was proposed: the flow acceleration around the hypertrophied septum pushes the anterior mitral leaflet (AML) into the LVOT, causing systolic anterior motion (SAM). Mitral valve apparatus malformations causing SAM-related LVOT obstruction can occur even in patients with no or moderate septal hypertrophy. These include leaflets elongation and a wide array of malformations of the papillary muscles (PM) and chordae, which can be detected by echocardiography and cardiac magnetic resonance.

Methods

Twenty-eight consecutive patients (58±11 years, 53% female) undergoing HOCM surgery from 2007 to 2016 at our institute were retrospectively reviewed. End points included the involvement of the mitral valve in LVOT obstruction, mortality, and change in clinical and echocardiographic characteristics after HOCM surgery.

Results

Secondary chordae tendineae tractioning the anterior mitral leaflet to the interventricular septum, and systolic anterior motion were detected in 78% of the patients. Anomalous, hypertrophied, and fused PM with muscularis trabeculae hypertrophy were found in 50%, 25%, and 35% of the patients, respectively. Four patients had posterior leaflet reducency. Secondary chordae (92%), PM, and muscularis trabeculae resection (71%), and PM splitting and elongation (28%) were added variably to septal myectomy (100%). Nine procedures (32%) on mitral valve leaflets were performed, involving 6 posterior and 3 anterior mitral leaflets. Long-term follow up was 4±2.8 years. There was no hospital mortality, and NYHA was reduced from 3±0.5 to 1±0.7 (p<0.0001). In 7 patients, LVOT gradient from 88±35 to 20±18 mmHg (p<0.0001), mitral valve regurgitation from grade 3±1 to 1±0.7 (p<0.0001), and septum thickness from 18±3 to 14±2 mm (p<0.0001).

Conclusion

The mitral valve, particularly its subvalvular apparatus, substantially contributes to LVOT obstruction in patients with HOCM. Thus, surgical correction in addition to extended myectomy is recommended during surgery. Surgeons with expertise in mitral valve anatomy and extensive repair techniques, guided by a dedicated team for planning the proper operative strategy, can help guarantee the best operative results. Long-term follow-up data are needed to assess the effects of the mitral subvalvular remodeling during HOCM surgery on mitral valve function.