

MitraClip Implantation as a New Treatment Strategy against Systolic Anterior Motion-induced Outflow Tract Obstruction in Hypertrophic Obstructive Cardiomyopathy



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We report on catheter-based treatment of left ventricular outflow tract (LVOT) obstruction targeting primarily a systolic anterior motion of the anterior mitral leaflet in hypertrophic obstructive cardiomyopathy (HOCM). A patient was successfully treated with the MitraClip two years after septal myectomy in conjunction with mitral valve repair. The results prove the concept, that systolic anterior motion (SAM) is clearly involved in gradient formation and is more than an epiphenomenon in HOCM. Thus, SAM-induced subaortic obstruction might be a target for MitraClip implantation.

Keywords

Hypertrophic obstructive cardiomyopathy • Systolic anterior motion • MitraClip • Haemodynamics • Outflow tract obstruction

Introduction

There is an ongoing debate whether septal myectomy should be primarily performed using either surgical myectomy (Morrow procedure) or transcatheter instillation of alcohol into septal perforators for ablation of the septal hypertrophy. In younger patients with hypertrophic obstructive cardiomyopathy (HOCM) the gold standard is surgical myectomy to relieve left ventricular outflow tract obstruction and cardiac symptoms [1,2]. Interestingly, HOCM is frequently accompanied by abnormalities of the mitral valve and the subvalvular mitral apparatus [3]. Usually, these abnormalities can be best managed surgically, without the need for mitral valve replacement. But many surgeons still prefer mitral valve replacement (MVR, sometimes mechanical MVR) instead of mitral valve repair for patients with HOCM and concomitant mitral regurgitation (MR). In this regard systolic anterior

motion (SAM) of the anterior mitral leaflet usually causes the MR, but may also be a significant contributor to LVOT obstruction. To prevent LVOT obstruction extended septal myectomy is concomitantly performed with leaflet resection, leaflet plication and/or annuloplasty rings/bands [4]. In addition, an edge-to-edge stitch [5] or transfer of posteriorly directed secondary chords (which would otherwise be resected) to the underside of the middle of the mid-anterior leaflet with a small piece of an anchoring pledget [6] have been proposed. Thus the use of a MitraClip was especially appealing to us, since the MitraClip might keep the anterior leaflet edge away from the LVOT.

Case report

A 69 year-old male patient with a past medical history of treated HOCM was admitted to our institution. Two years ago he underwent surgical myectomy in conjunction with

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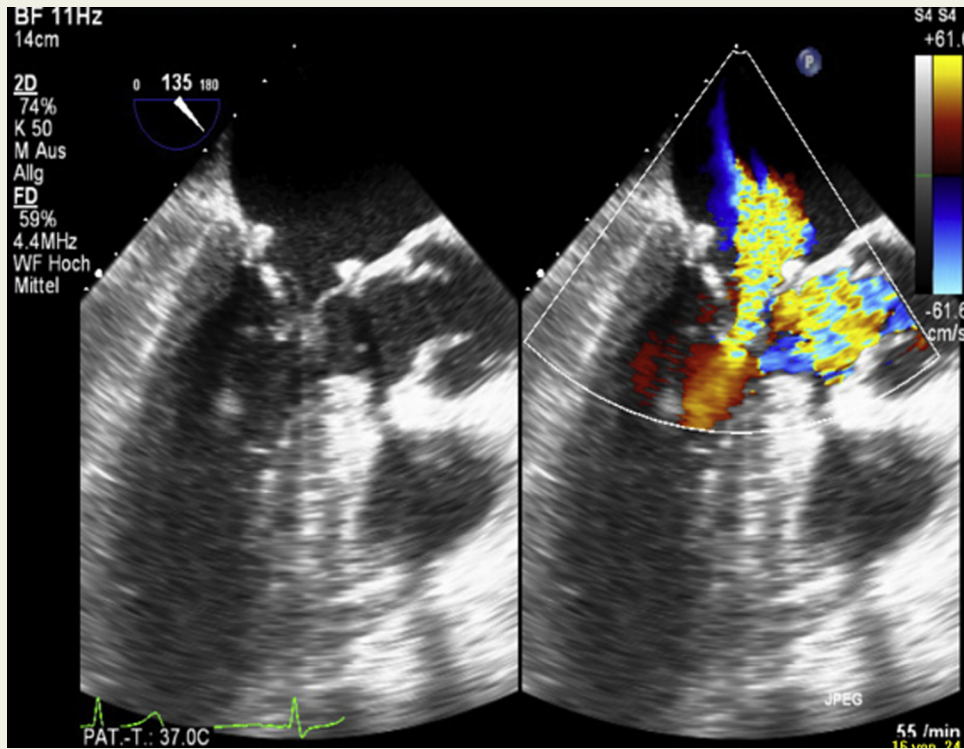


Figure 1 Transoesophageal echocardiography displaying significant mitral regurgitation in conjunction with significant LVOT obstruction due to severe SAM of the anterior mitral leaflet.

mitral ring annuloplasty (Edwards Physioring II 30 mm). The patient reported suffering from increasing dyspnoea on slight physical exertion (NYHA 2-3) and he complained about dizziness. During routine transoesophageal examination MR was discovered with significant SAM (Fig. 1) and LVOT obstruction. Invasive assessment confirmed a dynamic subaortic obstruction with a characteristic bifid

pulse and a basal peak pressure gradient between 59 and 83 mmHg at rest (mean gradient 38-60 mmHg), which was post-extrasystolic significantly augmented to more than 150 mmHg (Fig. 2). In addition infusion of nitroglycerine significantly augmented the pressure gradient across the LVOT. Laboratory testing showed normal troponin levels and an elevated Nt-proBNP. Coronary artery disease was

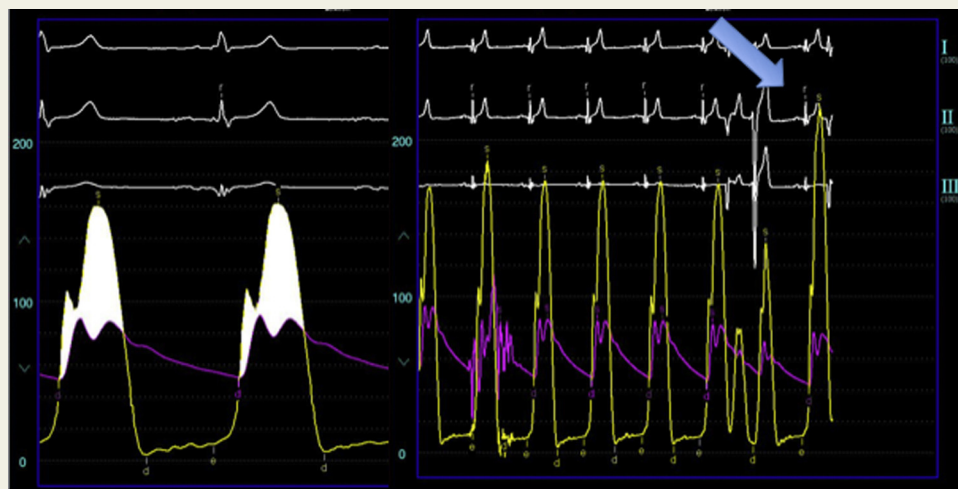


Figure 2 Invasive measurement of the basal transvalvular aortic gradient (aortic pressure vs. mid left ventricular pressure) displaying a significant LVOT obstruction. The transvalvular aortic gradient shows a significant post- extrasystolic increase (see blue arrow) indicating dynamic obstruction.

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