Short Term Failure after Residual Intra Mitraclips Regurgitation Treated with Transcatheter Implantation of an Amplatzer Ventricular Septal Defect Device

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A 74 years old male with known chronic obstructive pulmonary disease, permanent atrial fibrillation with previous stroke and ischemic heart disease treated with by-pass surgery (LIMA to the LAD; and saphenous vein grafts to the right and circumflex artery) and a previous percutaneous management of a severe mitral regurgitation treated with 2 mitraclips placed between scallops A1-P1 and A2-P2 (Figure 1, panel A and panel C) was acutely admitted for recurrent heart failure. Trans-esophageal echocardiography (TEE) showed a significant residual mitral regurgitation with two distinct jets. A prominent, central, intra-clip regurgitation and a second, medial jet originating from A1-P1 scallops (Figure 2, panel B).

The close proximity between the two previously implanted mitraclips discouraged the implant of a third central clip to address the prevalent intraclip regurgitation. Thus, following the description of the first in man First-in-man report of residual “intra-clip” regurgitation between two mitraclips treated with implantation of an Amplatzer Vascular Plug II that showed this approach to be feasible [1], we decided to attempt the implant of an occlusive device in between the two previously implanted clips.

The intervention was performed under general anaesthesia and 2D and real-time 3D TEE. Through a TEE guided trans-septal puncture a Mullins catheter was advanced into left atrium. A standard 6F JR 4 catheter was used to cross the central (intra-clip) orifice of the mitral valve with a standard J tipped peripheral wire (Figure 2, panel A). Once access to the left ventricle (LV) was gained, the system was advanced to allow the stable positioning of a manually shaped Amplatz Super Stiff (Boston Scientific) wire into the LV, used to exchange the system for a 6F TorqVue 45° delivery system (Figure 2, panel B). Then an Amplatzer Ventricular septal occluder 8x4 mm was chosen to obliterate the intra clip residual regurgitation and implanted through standard technique (Figure 2, panels C, D). After deployment a good device stability and a significant reduction of the intraclip jet was ascertained both with fluoro and TEE (Figure 2, panel E). Final TEE control showed only a globally mild residual MR with an antegrade transmural gradient lower than 5 mmHg.

Despite an initial improvement in symptoms and quality of life, seven months after this procedure, the patient was newly admitted for acute heart failure. TEE showed a significant

Highlights:
We here report the case of a patient with significant recurrent “intraclip” mitral regurgitation following the implant of two Mitracles for a functional mitral incontinence. An AMPLATZER Ventricular septal occluder deployed between the two clips with reduced the regurgitation to a mild degree with trivial trans-valvular gradients. Few months after the procedure, the patient was newly admitted for acute heart failure with evidence of to recurrent MR with a partial detachment of both clips and of the vascular plug forcing a surgical solution for the case.

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recurrent mitral regurgitation (Figure 3), due to a double partial detachment of the lateral and medial clips with a single remaining central clip (implanted between A2-P2) still catching both mitral leaflets (Figure 4). At TEE, the previously implanted vascular plug was seen partially attached to the anterior mitral leaflet without significant connections to the posterior leaflet, flipping between LA and LV during the cardiac cycle.

Notwithstanding the intermediate predicted surgical risk (Euroscore II 4.72%; STS estimated mortality 4.82%), no other option than a surgical correction was then available. This comprised a surgical mitral valve replacement with the implant of a bioprosthesis, the implant of a tricuspid ring and left atrial appendage occlusion. The post op period was characterized by a severe and long standing vascular vasoplegia and difficult weaning from assisted ventilation with need for tracheostomy.

The surgical specimen confirmed TEE findings showing that only the central mitraclip was effectively attached to both leaflets with the lateral being only connected to the anterior and the more medial to the posterior. Close up photos shows nicely the Amplatzer Vascular Plug III partially endothelialized and connected to the anterior, but not the posterior mitral leaflet.

This second report of a residual intra mitraclips regurgitation treated with transcatheter implantation of an Amplatzer ventricular septal defect device confirms feasibility of this approach. In our case a good procedural result was obtained, but the recurrent mitral regurgitation at a short term follow up questioned its the long term efficacy. Our experience suggests that this approach may be indicated in compassionate cases but surgical approach should be evaluated in patients with a reasonable operative risk.
Conflict of Interest
The authors have no conflicts of interest to disclose.

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The authors have abided by requirements for ethical publishing in biomedical journals [2].

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