

## CORRESPONDENCE

## Ventilation manoeuvres facilitate MitraClip placement

**To the Editor** It was with great interest that we read the article by Borgia *et al*<sup>1</sup> on their experience with an adenosine-induced asystole to facilitate the grasping of the mitral valve leaflets during a MitraClip procedure. We would like to comment on our experience with an adenosine-induced asystole and describe an alternative method using ventilation manoeuvres to ease the grasping of the mitral valve leaflets. Borgia *et al* described their method in a situation where the first clip had already been placed and grasping of the leaflets for the second clip appeared to be difficult. We have also attempted to facilitate leaflet grasping using an adenosine-induced asystole when the positioning of the first clip proved difficult. Unfortunately, this method did not lead to the desired outcome because, in our experience, the position of the valve leaflets during the induced asystole cannot be predicted and may not be appropriate for grasping. This appears to be different in the case described by Borgia *et al*, where the first clip may have limited leaflet movement during the induced asystole. Currently, we anaesthetists facilitate the grasping of the leaflets by implementing various ventilation manoeuvres. Because all patients undergoing a MitraClip procedure are intubated and ventilated, the position of the heart is highly dependent on the actual ventilation phase. A lateral shift of the heart can be observed in the transoesophageal echocardiography during inspiration and a corresponding medial shift during expiration. By decreasing the tidal volume and increasing the ventilation frequency, these movements can be considerably reduced. If grasping proves more difficult, manual ventilation is applied to achieve the desired heart position. Pressure is carefully applied to the manual ventilation bag to achieve a superior position in which the leaflets can be grasped. We believe that extremely close cooperation between interventional cardiologists and cardiac anaesthe-

tists is crucial for the successful execution of MitraClip procedures.

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## REFERENCE

1. **Borgia F**, Di Mario C, Franzen O. Adenosine-induced asystole to facilitate MitraClip placement in a patient with adverse mitral valve morphology. *Heart* 2011;**97**:864.

**The Authors' reply** We would like to thank N Patrick Mayr *et al* for their insightful comments.<sup>1</sup> MitraClip implantation certainly requires an exciting team work with a key role for the anaesthetist who was in fact administering adenosine via a central line in the case we reported. We agree with our colleagues that there are other manoeuvres which can be used to modify the spatial relation of the clip and the leaflets. As adenosine induces an atrioventricular block, the atria are contracting while the ventricles are not contracting. As a result, the leaflets usually come to rest at the height of the mitral annulus. This can help to grasp mitral leaflets if they tend to slip off the clip arms due to, for instance, ruptured secondary chords. This was the case in the patient we reported.<sup>2</sup> Rapid pacing seems to have less reproducible influence on the position of the leaflets because the atrium and ventricle may contract. We share the experience of our colleagues that ventilation influences the spatial relation too. The clip is moving during respiration, mostly in the lateral–medial direction. A stop of the ventilation in the appropriate phase can help first to

position the clip correctly and thereafter to grasp the leaflets at this location. We hope that our report made clear that a lateral–medial movement of the clip was not the problem in our patient. Additionally, an induced raise of the intrathoracic pressure can reduce the venous return to the heart and therefore reduce the size of the left ventricular cavity, thus helping the posterior and anterior mitral leaflet to come closer together. This manoeuvre theoretically may have helped in this case. We do not have specific experience with this manoeuvre during MitraClip implantation but certainly appreciate the positive experience reported in this letter<sup>1</sup> with ventilation manoeuvres. We feel it is important to mention that in the vast majority of patients with suitable mitral valve anatomy, none of these ‘tricks’ is required to safely grasp the mitral leaflets.

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**Patient consent** Obtained.

**Ethics approval** This study was conducted with the approval of Royal Brompton Hospital Ethics Committee.

**Contributors** The three authors have written and reviewed together this letter.

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2. **Borgia F**, Di Mario C, Franzen O, *et al*. Adenosine-induced asystole to facilitate MitraClip placement in a patient with adverse mitral valve morphology. *Heart* 2011;**97**:864.



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