Pulmonary venous flow changes after Mitraclip implantation is predictor of mid-term right ventricular function improvement

D. Bastidas Plaza1, E. Pozo Osinalde1, C. Olmos Blanco1, P. Mahia1, P. Marcos-Alberca1, L. Nombela-Franco1, P. Jimenez-Quevedo1, G. Tirado1, M. Luaces1, J.J. Gomez De Diego1, M.A. Cobos1, A. Fernandez-Ortiz1, J. Villacastin1, J.A. De Agustin Loeches1

1San Carlos Clinical Hospital, Madrid, Spain

Funding Acknowledgements: None.

Background: Percutaneous mitral valve repair with Mitraclip has become an effective therapeutic alternative to mitral valve surgery in high-risk surgical patients with severe mitral regurgitation. Pulmonary venous flow assessment by pulsed Doppler is widely used to determine the severity of mitral regurgitation and apparently is the best method to evaluate mitral regurgitation after the procedure because device artifacts do not affect it. The main objective of this study was to assess the impact of pulmonary venous flow changes after Mitraclip implantation in right ventricular function in the follow up at 6 months after the procedure.

Methods: This single-center, retrospective study included all consecutive patients with mitral regurgitation ≥ III/IV undergoing percutaneous mitral valve repair with the MitraClip device at our institution between 2010 and 2023. We analyzed the changes in the systolic/diastolic flow velocity time integral ratio in pulmonary veins pre and postprocedure. The tricuspid annular plane systolic excursion (TAPSE) was the method used to assess the right ventricular function in the follow up.

Results: A total of 158 consecutive patients that underwent Mitraclip implantation at our institution were included. Men age was 77 years ± 10.3, and 82 patients (52.5%) were women. The etiology of mitral regurgitation was degenerative in 70 patients (44.3%), functional in 60 patients (37.9%) and mixed in 28 patients (17.7%). Preprocedurally, tridimensional effective regurgitant orifice was 0.63 ± 0.33 cm², left ventricular end-diastolic volume 145.19 ± 66.14 ml (indexed 80.33 ± 59.59 ml/m²), left ventricular ejection fraction 45.90 ± 15.99%, pulmonary artery systolic pressure (PASP) 48.79 ± 18.12 mmHg and TAPSE 18.59 ± 4.43 mm. The change in the pulmonary venous flow assessed by the systolic/diastolic flow velocity time integral ratio, was predictor of a right ventricular function improvement at 6 months (y = -2.7169 + 3.0171 x, r² = 0.45, p = 0.006 see figure 1).

Conclusions: Pulmonary venous flow changes after Mitraclip implantation assessed by the systolic/diastolic flow velocity time integral ratio is predictor of mid-term right ventricular function improvement.

Figure 1