Mitraclip XTR device used for the treatment of functional tricuspid regurgitation provides significant reduction of annular size

Authors:
M Russo¹, R Zilbersac², P Werner³, S Scherzer³, M Taramasso³, M Zuber³, J Mascherbauer², M Andreas⁴, 
¹Medical University of Vienna, Cardiac Surgery - Vienna - Austria, ²Medical University of Vienna, Cardiology - Vienna - Austria, ³University Hospital Zurich, Cardiac Surgery - Zurich - Switzerland, ⁴University Tor Vergata, Cardiac Surgery Unit - Rome - Italy,

On behalf: Applied Research Group in Cardiac Surgery

Topic(s):
Tricuspid Valve Intervention

Citation:
Background: Tricuspid valve regurgitation (TR) is a progressive disease strongly associated with increased cardiac and all-cause mortality. The transcatheter approach to this pathology has been recently described with promising results in the treatment of symptomatic patients despite optimal medical therapy. Development of annular dilation and leaflet tethering represent a continuous pattern in the pathophysiology of functional TR; for this reason, to reduce and stabilize the annulus is the goal of an efficacious therapy.

Purpose: In order to simplify leaflet grasping, the novel MitraClip XTRdevice has significantly longer clip arms compared to its predecessor. The increased grasping length could be able to apply a radial tension on the tricuspid annulus, reducing it in dimensions. Despite, the increased tension on the leaflets may theoretically impose a higher risk for leaflet tearing We analyzed our single-center experience in order to clarify the capability of the device in the feature of annular reshapement.

Methods: Five high-risk patients (4 females, 72(quartiles 69-79) y.o., EuroSCORE II 10(7.25-11.2)% affected by severe symptomatic functional TR were treated with MitraClip XTR implantation in tricuspid position. Right ventricular function was apparently preserved in all cases and the mean sPAP was 41(quartiles 38-45) mmHg. Perioperative echo-results were collected prospectively and analyzed.

Results: Procedural success (defined as a reduction of more than 1 degree of TR) was achieved in 4 cases (80%). 3 ± 1 devices were implanted per patient in the antero-septal commissure. The tricuspid annular diameter (measured in four chamber view) was reduced from 39(quartiles 39-41) mm to 31(quartiles 30-31) mm (p=0.043). Accordingly, the effective regurgitant orifice area (EROA) decreased from 110(quartiles 70 to 160) mm²to 45(quartiles 9-55) mm²( p=0.02) and the systolic VTI in the hepatic veins decreased by 42%. No significant increase of trans-valvular mean gradients was observed (2.5 (quartiles 2.25 to 2.75)) mmHg vs 3.75(quartiles 3.75 to 4) mmHg; p=0.2) as well no cases of acute leaflet tearing.

Conclusion: The reduction in tricuspid annulus size with the novel XTRdevice represents an unexpected and interesting achievement of the procedure. A significant reduction of annular dimensions might provide a more durable reduction of functional TR. Long-term follow-up data will be required to clarify these initial results and as well as patient selection criteria.
Abstract: The MitraClip XTR device used for the treatment of functional tricuspid regurgitation provides significant reduction of annular size.

Purpose: In order to simplify leaflet grasping, the novel MitraClip XTR device has significantly longer clip arms compared to its predecessor. The increased grasping length could be able to apply a radial tension on the tricuspid annulus, reducing it in dimensions. Despite, the increased tension on the leaflets may theoretically impose a higher risk for leaflet tearing. We analyzed our single-center experience in order to clarify the capability of the device in the feature of annular reshaping.

Methods: Five high-risk patients (4 females, 72 (quartiles 69-79) y.o., EuroSCORE II 10 (7.25-11.2)% affected by severe symptomatic functional TR were treated with MitraClip XTR implantation in tricuspid position. Right ventricular function was apparently preserved in all cases and the mean sPAP was 41 (quartiles 38-45) mmHg. Perioperative echo-results were collected prospectively and analyzed.

Results: Procedural success (defined as a reduction of more than 1 degree of TR) was achieved in 4 cases (80%). 3 ± 1 devices were implanted per patient in the antero-septal commissure. The tricuspid annular diameter (measured in four chamber view) was reduced from 39 (quartiles 39-41) mm to 31 (quartiles 30-31) mm (p=0.043). Accordingly, the effective regurgitant orifice area (EROA) decreased from 110 (quartiles 70 to 160) mm² to 45 (quartiles 9-55) mm² (p=0.02) and the systolic VTl in the hepatic veins decreased by 42%. No significant increase of trans-valvular mean gradients was observed (2.5 (quartiles 2.25 to 2.75)) mmHg vs 3.75 (quartiles 3.75 to 4) mmHg; p=0.2) as well no cases of acute leaflet tearing.

Conclusion: The reduction in tricuspid annulus size with the novel XTR device represents an unexpected and interesting achievement of the procedure. A significant reduction of annular dimensions might provide a more durable reduction of functional TR. Long-term follow-up data will be required to clarify these initial results and as well as patient selection criteria.