Pathological tricuspid regurgitation (TR) is more often secondary due to annular dilatation and increased tricuspid leaflet tethering. Although ring annuloplasty is key to surgery for TR, surgical treatment of TR in high-risk patients is associated with increased mortality. Percutaneous single or dual caval transcatheter heart valve-(THV)-prosthesis implantation seems feasible, but not realizable in many patients due to increased caval vein diameter.

In an 85-year-old woman with severe TR (Panels A and B) associated with advanced right-heart failure, ascites, and portal hypertension (Panel C) at prohibitive risk for open-heart surgery (EuroSCORE 21.7), transesophageal echocardiography (TEE) and multi-slice computed tomography (MSCT) revealed inferior vena cava (IVC) dilatation (Panel D; 34 × 43 mm).

To downsize the IVC to a mean diameter <30 mm, surgical banding was performed via right-lateral mini-thoracotomy using a longitudinally-opened goretex-prosthesis, which was ‘wrapped’ around the IVC below the diaphragm just after the confluence of the hepatic veins, while a 30 mm Z-MED II valvuloplasty balloon was inflatd in that position. Thereafter, a balloon-expandable stent (AndraStent-XXL, 35 mm, Andramed) was deployed within the banded IVC-segment, which was tightened with 5-0 Prolene-suture.

Finally, an Edwards-SAPIEN 29 mm was implanted into the stent (Panels E and F).

Although pacemaker leads in the superior vena cava (SVC) prohibited implantation of an upper caval valve, TR declined significantly (Panels G–J), and general condition had significantly improved at discharge after 2 weeks (decreased ascites and peripheral oedema; 9 kg weight loss). TEE/MSCT showed trace-leakage with decrease of RV and RA volumes and hepatic vein diameters.

We conclude that in high-risk patients with severe TR and enlarged IVC, downsizing of IVC is feasible to enable THV implantation.

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