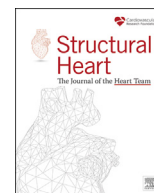


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# Structural Heart

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## Procedural Vignettes in Structural Heart Disease

# Ultrafiltration and Table Tilting to Reduce Coaptation Gap During Tricuspid Transcatheter Edge-To-Edge Repair

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We herein report the case of an 87 year-old woman with longstanding permanent atrial fibrillation and severe symptomatic atrial functional tricuspid regurgitation (TR), referred for TriClip tricuspid transcatheter edge-to-edge repair (T-TEER).

After a course of intravenous diuretics, catheterization showed normal pulmonary artery pressures. Cardiac index was 2.25 l/min/kg, and pulmonary capillary wedge pressure was 9 mm Hg. Echocardiography confirmed massive TR (effective regurgitant orifice 79 mm<sup>2</sup>; [Figure 1](#), panel a), with a tricuspid valve coaptation gap area of 0.59 cm<sup>2</sup> ([Figure 1](#), panel b; [Supplemental Video 1](#)). Both atria were dilated. Left ventricular function and size were normal, and right ventricular longitudinal function was mildly depressed. One month later, the patient was admitted for elective T-TEER. In the meantime, the patient had gained 5kg, with clinical evidence of increased sodium and water retention. On admission, she received

intravenous bumetanide during 48 hours. Thereafter, at the start of the T-TEER procedure, transesophageal echocardiography disclosed torrential TR, with a markedly increased tricuspid valve coaptation gap area (2.20 cm<sup>2</sup>; [Figure 1](#), panel c; [Supplemental Video 2](#)). Immediate ultrafiltration was undertaken, allowing an overall fluid removal of 2900 ml within 2 hours (2500 ml ultrafiltrate, 400 ml urine output). The resulting coaptation gap area was 0.97 cm<sup>2</sup> ([Figure 1](#), panel d; [Supplemental Video 3](#)). Anti-Trendelenburg maneuver was then performed (table tilted toward the patient's feet by 15°), allowing for an additional further reduction of right ventricular preload by venous pooling in the lower extremities. The resulting coaptation gap was 0.68 cm<sup>2</sup> ([Figure 1](#), Panel e; [Supplemental Video 4](#)). Thereafter, two XTW clips were implanted between the septal and the anterior leaflets, leaving the patient with moderate residual TR ([Figure 1](#), panel f). The patient was uneventfully discharged on day 7, and has now a 3-month hospitalization-free follow up.

Both diuretics and table-tilt maneuver<sup>1</sup> have been shown to reduce tricuspid valve coaptation gap by reducing right atrial and ventricular volumes, and tricuspid valve leaflet tethering, thereby facilitating leaflet grasping.<sup>2</sup> This case illustrates that volume state optimization can be acutely achieved by an integrative unloading strategy combining ultrafiltration and table-tilting in patients undergoing T-TEER.

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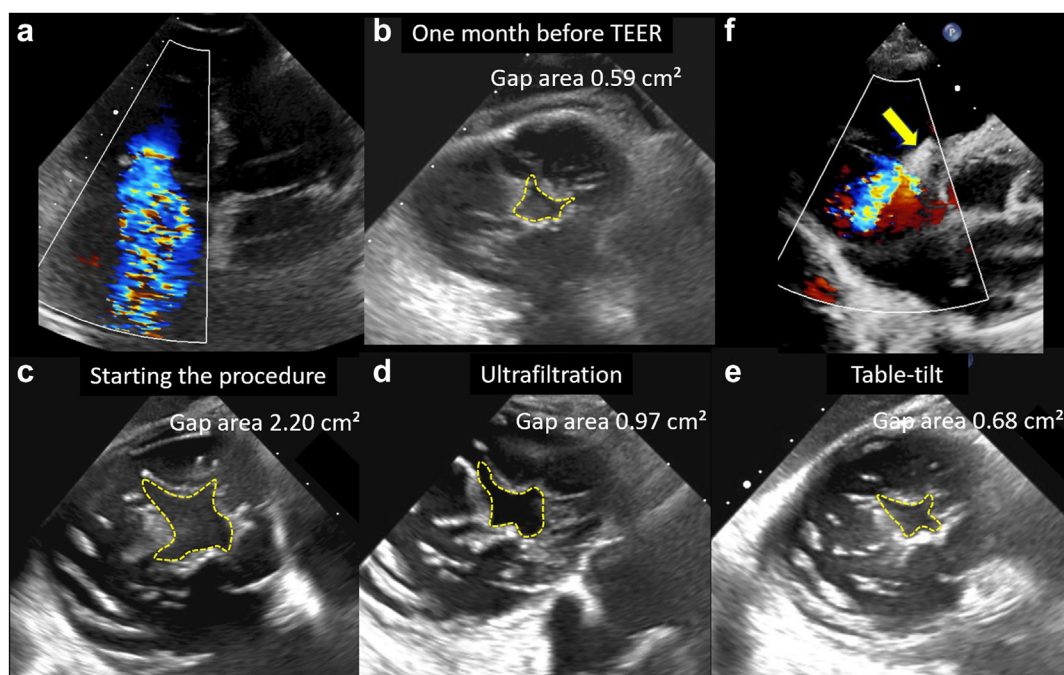
**Abbreviations:** TR, tricuspid regurgitation; T-TEER, tricuspid transcatheter edge-to-edge repair.

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**Figure 1.** Transthoracic color flow Doppler obtained 1 month before tricuspid transcatheter edge-to-edge repair (T-TEER) showing massive tricuspid regurgitation (panel a). Coaptation gap area by transesophageal trans-gastric short axis view 1 month before T-TEER (panel b), immediately before T-TEER (panel c), following ultrafiltration (panel d) and after subsequent anti-Trendelenburg table tilting (panel e). Moderate residual tricuspid regurgitation is seen the day after T-TEER (the arrow denotes a clip, panel f).

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Consent was obtained from the patient for publication of this report and any accompanying images.

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#### Supplementary Material

Supplemental data for this article can be accessed on the [publisher's website](#).

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