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STUDIUM PRZYPADKU / *CLINICAL VIGNETTE*

Balloon-assisted closure of a large atrial septal defect — guaranteeing a soft landing

Zamknięcie wielkiego ubytku w przegrodzie międzyprzedsionkowej z wykorzystaniem cewnika balonowego

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Transoesophageal echocardiogram (TEE) performed on a 51-year-old male complaining of breathlessness on exertion delineated a 3.5-cm atrial septal defect (ASD) with an absent anterosuperior rim and thin floppy tissue making up the other margins. The patient had hepatocellular carcinoma and was scheduled for liver surgery. In view of this comorbidity, we decided to attempt percutaneous ASD closure rather than surgical closure on cardiopulmonary bypass. Under general anaesthesia, three-dimensional (3D) TEE and balloon sizing of the defect were performed (Fig. 1A–F). 3D TEE revealed a 39 × 30 mm defect. A 34-mm sizing balloon was over-inflated, but complete "stop-flow" could not be achieved. On fluoroscopy the balloon diameter was 34–35 mm, and 36–37 mm on TEE. Given the challenging size and morphology of the defect we elected to attempt device deployment with the balloon assist technique. This involves deploying the device with its discs splayed over the inflated sizing balloon, then gently deflating the sizing balloon, allowing the device to settle down onto the aortic margin. This reduces the risk of failure to capture the aortic margin due to unfavourable angulation of the left disc during and after deployment. A 40-mm Amplatzer Septal Occluder (St. Jude Medical) was implanted via a standard 14 F TorqueVue sheath (St. Jude Medical) (Fig. 2A–F). Final TEE assessment confirmed satisfactory device position with mild residual left-to-right flow. Transthoracic echocardiography performed on the following day showed the occluder *in situ* with the same trivial left-to-right shunt. The patient remains well with improved cardiovascular fitness at six-month follow-up. Balloon assisted deployment of ASD devices is one method of device positioning in challenging defects, especially those associated with an absent aortic rim. Other methods are described, including use of the Hausdorf sheath shape and deployment from the right upper pulmonary vein. Certain manufacturers also claim that their device design inherently increases the likelihood of successful deployment; however, this is speculative. Balloon assist requires a second venous access, but may decrease the overall time spent manipulating equipment in the left atrium; a factor implicated in both clot formation and erosion risk.

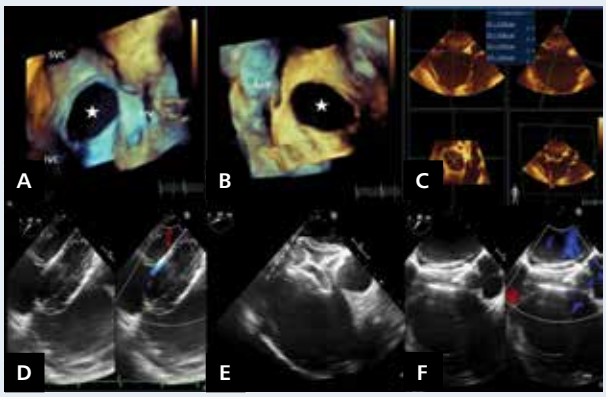

Figure 1. Transoesophageal echocardiogram; **A**, **B**. Three-dimensional images of the atrial septal defect (white star) viewed from the right (**A**) and left (**B**) atrial perspectives; **C**. Multiplanar reconstruction of the atrial septum with measurements of the defect; **D**. Over-inflation of the sizing balloon in an attempt to reach stop-flow; **E**. Both discs of the occluder deployed but held splayed by the inflated (dashed white line) sizing balloon; **F**. Final result after release of the device; SVC — superior vena cava; IVC — inferior vena cava; TrV — tricuspid valve; AoV — aortic valve

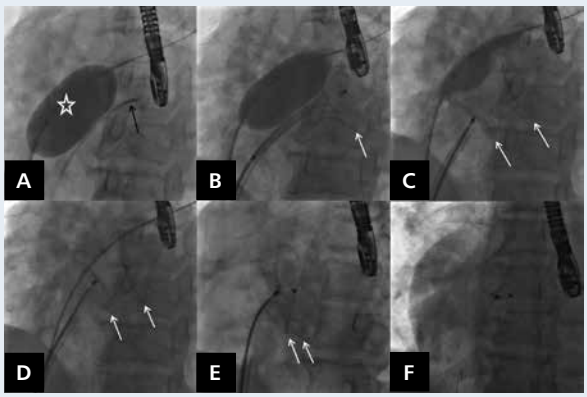

Figure 2. **A**. Sizing balloon (white star) inflated in the defect with an end-hole catheter (black arrow) placed in the left atrium; **B**. Left atrial disc (white arrow) deployed with sizing balloon inflated; **C**. Gradual deflation of the sizing balloon with both discs (white arrows) deployed; **D**, **E**. Progressive conformation of the device discs (arrows) as the balloon is completely deflated, then removed; **F**. Final position of the occluder after release

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