

Inferior sinus venosus and two ostium secundum atrial septal defects is possible to treat with three occluders

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A 73-year-old woman known to have multiple atrial septal defects (mASD) since 2006 rejected cardiac surgery and was referred to our department with signs of right heart failure. Echocardiography demonstrated one defect located in the inferior portion of the atrial septum that led to an overriding inferior vena cava (IVC) – an inferior sinus venosus defect (SVD) and two additional ostium secundum ASDs (ASDII; Figure 1). Furthermore, a significant left-to-right atrial shunt and dilation of the right ventricle were observed.

Cardiac surgery was reconsidered but ultimately refused by the patient. During right heart catheterization, the mean pulmonary pressure was 28 mm Hg, and the pulmonary-to-systemic flow ratio was 4.0. Therefore, we proceeded with percutaneous closure of the mASD; three Figulla ASD occluders (Occlutech GmbH, Germany; 21 mm, 21 mm and 10 mm) were successfully implanted (Figure 2). The pulmonary-to-systemic flow ratio after the mASD closure procedure decreased to 1.1. At a 1-month follow-up, the patient reported significant improvements in her symptoms, and adequate positioning of the occluders was demonstrated (Figure 2).

The percutaneous closure of ASDIIs has become the standard of care in the majority of patients [1]. Surgical correction is reserved for other types of ASD, such as ostium primum and sinus venosus ASDs. Inferior SVDs are rare ASDs that originate in the mouth of the IVC, continue directly into the infero-posterior border of the left atrium and leave no residual atrial septal tissue at the inferior margin [2].

To the best of our knowledge, this is the first case of percutaneous closure of an inferior SVD with the simultaneous use of three Figulla occluders for the closure of an mASD. The successful result of our procedure suggests that, in patients who refuse surgery, the percutaneous approach should be considered. However, surgery remains the treatment of choice for inferior SVD closures.

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Conflict of interest

The authors declare no conflict of interest.

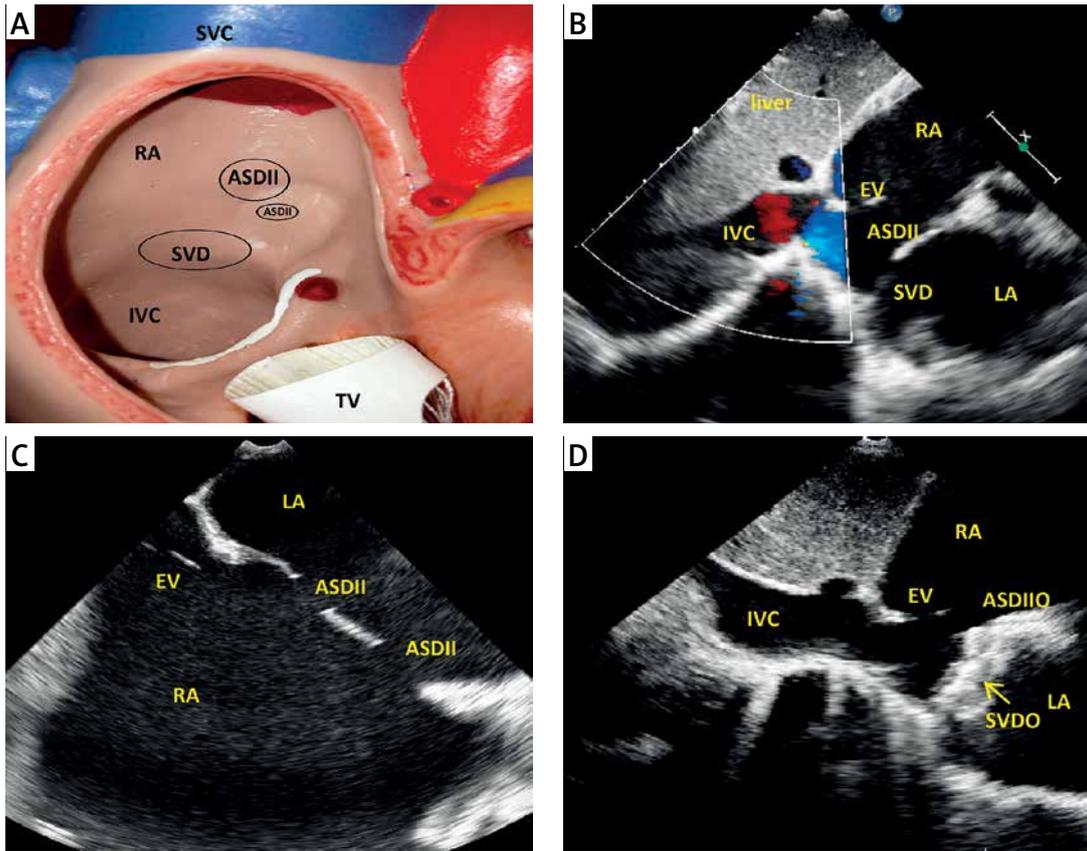


Figure 1. **A** – Schematic diagram of the mASD distribution of our case. **B** – Subcostal TTE showing the inferior SVD (the two ASDIIs are not visible). **C** – TEE showing the two ASDIIs (the inferior SVD is not visible). **D** – Subcostal TTE showing two occluders in a nearly rectangular configuration (the occluders in the inferior SVD and one of the ASDIIs are shown; the occluder in the other ASDII is not visible)

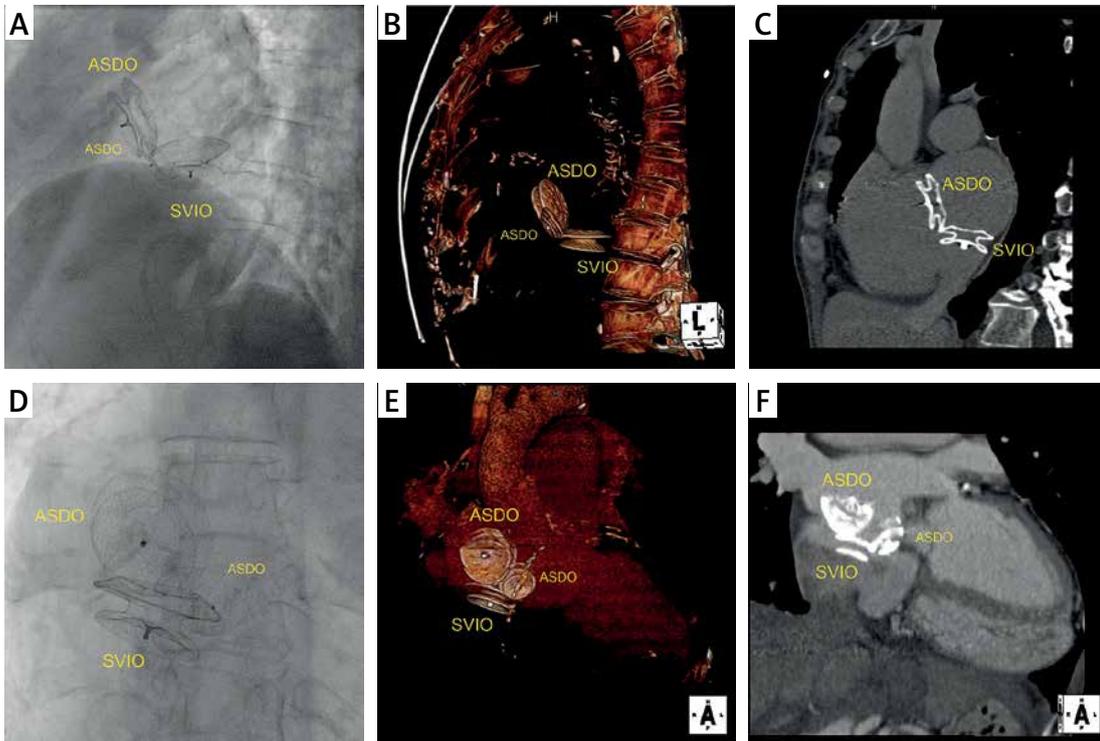


Figure 2. The three occluders as shown by fluoroscopy, three-dimensional CT reconstruction and two-dimensional CT in the lateral (**A–C**) and sagittal (**D–F**) views. Note the nearly rectangular configuration of the occluders in the SVD and one of the ASDIIs

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