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Transseptal access for left heart structural interventions in the setting of prior atrial septal defect closure

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INTRODUCTION

- Precise interatrial septum puncture is required for many left sided structural heart procedures.
- Atrial septal defect (ASD)/patent foramen ovale (PFO) closure devices may impact procedural success.
- This article describes a technique for planning and performing MitraClip™ (Abbott Vascular) and WATCHMAN™ (Boston Scientific) procedures in patients with an AMPLATZER™ atrial septal occluder (ASO) device (Abbott Vascular).

METHODS

Imaging

- Preprocedural cardiac-gated multidetector computed tomography (MDCT) was used to delineate margins of the ASD closure device relative to the septum in the bicaval, short axis and four chamber view to identify transseptal puncture location.
- Intraprocedural fluoroscopy, transesophageal echocardiography (TEE) and/or intracardiac echocardiography (ICE) were used to guide transseptal puncture.

Case 1: MitraClip™

- TEE and fluoroscopy were used to position the transseptal assembly inferoposteriorly away from the 22-mm ASO, and confirm adequate tenting and transseptal height.
- Transseptal puncture was performed using a radiofrequency (RF) needle (Baylis Medical) and SL-1 transseptal sheath (Abbott Vascular).
- A Cook extrastiff wire positioned in the left superior pulmonary vein was used to exchange the transseptal sheath for the MitraClip™ guiding catheter.
- The procedure was continued as per standard protocol without interactions with the ASO.
- No treatment was required for a small iatrogenic atrial septal defect (iASD) with left-to-right shunting at the end of the procedure.
- No residual flow through the iASD was found at 1 year postprocedure.

Case 2: Left atrial appendage closure (LAAC)

- In addition to fluoroscopy and TEE, ICE was used to visualize the inferior aspect of the fossa prior to transseptal puncture using the Baylis RF needle and SL-1 sheath.
- Due to space limitation on the septum below the 18-mm ASO, the ProTrack™ wire (Baylis Medical) was used to obtain LA access for the WATCHMAN™ sheath.
  - The ProTrack™ wire allowed oscillating rotation to overcome resistance against the ASO as the sheath was advanced into the LA.
- The procedure continued and a 27-mm WATCHMAN™ device was deployed without challenges.
- 6-week post-procedural TEE showed adequate device seating and no iASD.

DISCUSSION & CONCLUSIONS

- Transseptal puncture for structural heart procedures is possible in the presence of ASO devices.
- Multimodality imaging (e.g. MDCT, TEE, ICE and fluoroscopy) can be used to assess space on the interatrial septum, identify alternative sites and guide transseptal puncture.
- Stiff extra support wires should be considered when advancing large-bore sheaths with resistance against the ASO.

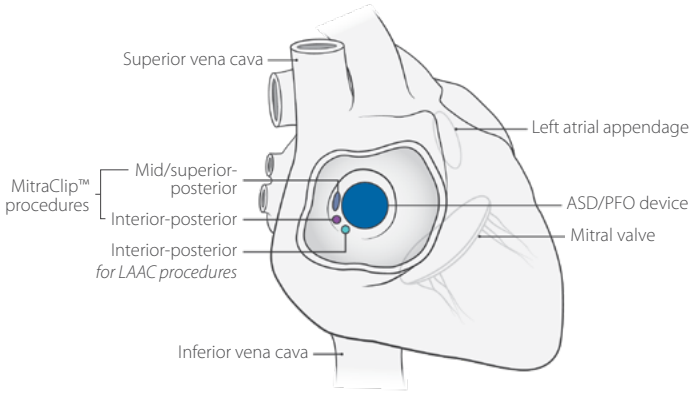

Figure 1. The relative location of cardiac structures to the interatrial septum provides a rationale for transseptal puncture location for MitraClip and LAAC procedures.

The NRG® Transseptal Needle is used to create an atrial septal defect in the heart. Please consult the respective manufacturer IFUs for other devices.

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