

EDITORIAL COMMENT

Transseptal Catheterization With a New Septal Device Implanted



A Paradoxically Complex Procedure When the Door Is Wide Open?*

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Transseptal catheterization (TSP-C) allows left atrial (LA) access through the fossa ovalis (FO), which represents the unique anatomic septal site where a needle puncture can be safely performed (1). Therefore, most of the difficulties in TSP-C are related to peculiar location or anatomic features of the FO. In cardiac electrophysiology, TSP-C has been widely adopted on account of the exponential growth of pulmonary vein isolation procedures over the past decades (2). Possibly, the number of TSP-C procedures is expected to further increase in the future due to extended recommendations for catheter ablation of atrial fibrillation in accordance with the most recent European guidelines and new evidence of a randomized controlled trial (3,4).

Although no systematic review or meta-analysis including TSP-C studies in the setting of atrial fibrillation ablation have been published so far, a large survey (2) and a nonsystematic review (5) report progressive abatement of TSP-C-related complications over the years with the adoption of specific techniques and technologies. However, a mortality rate of 0.018% to 0.2% is still reported (5). Indeed, the risk of complications, such as inadvertent puncture of the aortic root, may expose the patient to life-threatening complications. Therefore, TSP-C remains

a demanding procedure even in experienced hands and should be flawlessly performed relying on established workflows (6), where each step should serve as a cog in a well-functioning clock. This fosters the importance of accurate and specific training using also dedicated simulators (7) (Figure 1).

As mentioned previously, the anatomy of the FO is variable in terms of both thickness (1) and area (8), the last one showing a wide range from 9.2 to 424.3 mm². Intracardiac or transesophageal echocardiography help localize the FO (5). When the FO is resistant to needle puncture, a 0.0014-inch J-shaped dedicated guidewire can be safely used (9) or, alternatively, a radiofrequency energy needle can be adopted, which is associated with shorter instrumentation times and less failure in achieving the LA access compared with the traditional Brockenbrough needle (10). Furthermore, when the going gets tough, such as in case of venous anomaly like interruption or absence of inferior vena cava, a radiofrequency-assisted TSP access via a superior approach (11) or a hepatic vein access (12) might be effective strategies to warrant LA access, mapping, and ablation.

To further complicate this scenario, over the years, a variety of percutaneous interatrial septal devices have been increasingly used for the closure of atrial septal defects. These devices may pose challenges to cross the septum during TSP-C, but a certain body of evidence reports the feasibility of the procedure under ultrasound guidance (13). In fact, in these cases, direct puncture through the device seems safe but is associated with a significantly longer total procedural time (13). Moreover, the procedure is perceived as even safer and faster if TSP-C is performed in a portion of the native FO not covered by the occluder, generally located postero-inferiorly to the device (13).

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**ABBREVIATIONS
AND ACRONYMS****FO** = fossa ovalis**HFpEF** = heart failure with preserved ejection fraction**LA** = left atrial**TSP-C** = transseptal catheterization

In addition to the reported occluders, new interatrial septal devices have been developed and are being used to create a iatrogenic left-right shunt to unload left-sided heart chambers in case of heart failure with preserved ejection fraction (HFpEF) refractory to optimal medical therapy (14). Considering the high prevalence of atrial fibrillation in patients with HFpEF (15), the possibly wide adoption of this type of device may pose significant challenges in TSP-C when a pulmonary vein isolation must be scheduled.

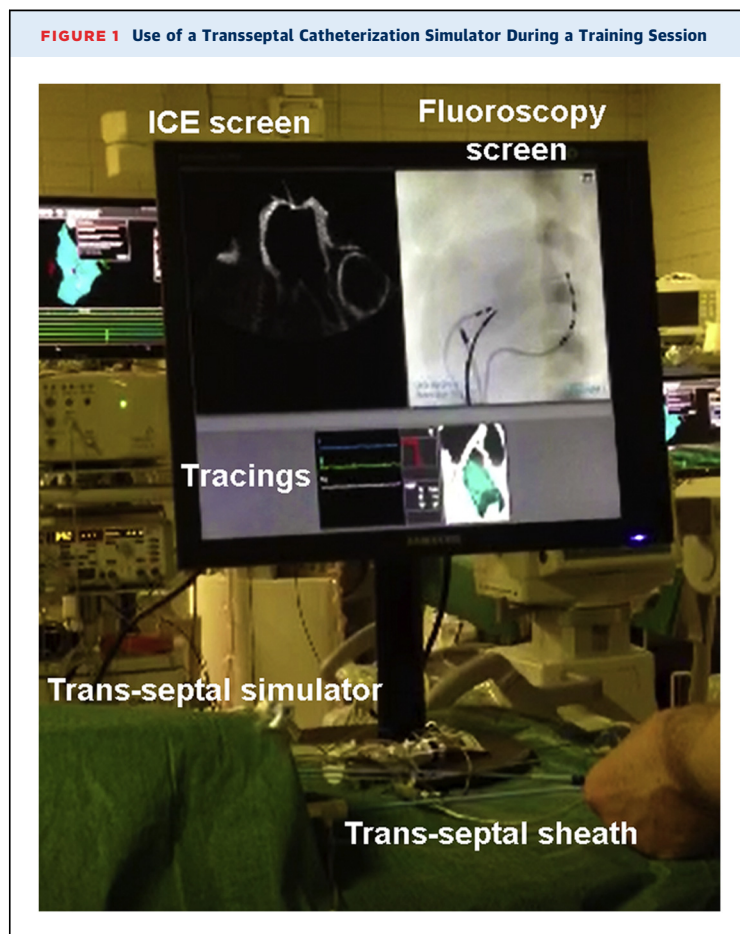
In this issue of *JACC: Case Reports*, Guandalini et al. (16) nicely report the first description of TSP-C for catheter ablation of persistent drug-refractory atrial fibrillation in a 71-year-old patient with an investigational interatrial shunt device implanted to treat refractory HFpEF. This device possesses a cage-like appearance and a 24-F internal diameter. When properly nestled into the interatrial septum, as compared with the flat surface toward the LA, a cumbersome right-sided profile is clearly shown in the fluoroscopic and ultrasound images. Although an access through this device was initially considered, a double TSP access though the exposed portion of the FO was preferred using a radiofrequency needle and steerable and nonsteerable sheaths. In keeping with previous evidence in case of septal occluders (13), FO was engaged inferiorly to the device under intracardiac echocardiography guidance to avoid catheter entrapment, device embolization, and to optimize catheter maneuvering in the LA. Not only was the ablation procedure feasible and the follow-up uneventful, but the chosen access to the LA was particularly appropriate during the procedure, especially to access the right inferior pulmonary vein.

The authors should be praised for having described, for the first time, a well-known and routinely performed procedure applied to the new category of interatrial shunt devices. Nevertheless, alternatives to this access have not been evaluated yet, nor the influence of different atrial septal anatomies assessed on account of the single case nature of this report. Therefore, more evaluations are required to assess the feasibility of TSP-C in this clinical setting.

AUTHOR DISCLOSURES

The authors have reported that they have no relationships relevant to the contents of this paper to disclose.

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