

WATCHMAN FLX implantation with an extremely small left atrial appendage ostium

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An 84-year-old man with paroxysmal atrial fibrillation and repeated episodes of colonic diverticular bleeding [the CHA₂DS₂-VASc score was 5 for including age, hypertension, diabetes mellitus and stroke (cardiogenic cerebral embolism), and the HAS-BLED score 4 for including hypertension, stroke, bleeding, and age] underwent a left atrial appendage (LAA) occlusion using a WATCHMAN FLX (Boston Scientific, Marlborough, MA, USA).

Pre-procedural transoesophageal echocardiography (TOE) revealed a very small LAA ostium (Figure 1A–D and Video 1). The LAA had the following measurements: 11.3 mm ostium × 10.8 mm depth (45°), 10.0 mm ostium × 11.9 mm depth (90°), and 11.9 mm ostium × 11.9 mm depth (135°), respectively. The details of the distal LAA could not be evaluated by TOE. To confirm the details of the LAA anatomy, pre-procedural computed tomography (CT) was performed. It showed the same small LAA ostium (10.8 mm) as the TOE and the 11.8 mm depth (Figure 1E and F). Although the device requires an LAA ostial diameter of at least 14 mm, we decided to perform the procedure anyway because of the possibility that there was an underestimation of the ostial diameter by TOE and CT, and the safe distal device advancement and strong radial force of WATCHMAN FLX.^{1,2}

The LAA angiography showed that the LAA ostial diameter calculated based on the diameter of the guiding catheter was 10.4 mm (Figure 1G). The WATCHMAN FLX (20 mm) was deployed while the distal end of the device was pressed on the LAA wall (Figure 1H and Video 2). The post-release diameter ranged from 17.0 to 18.2 mm (9–15% compression) and TOE

revealed a well-seated device (Figure 1I–L and Video 3). We determined it could be placed because of the device good stability during a strong tug test. A sufficient LAA seal was confirmed 45 days after the WATCHMAN FLX implantation (Figure 1M–O).

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Consent: The authors confirm that written consent for submission and publication of this case report including images and associated text has been obtained from the patients in line with COPE guidance.

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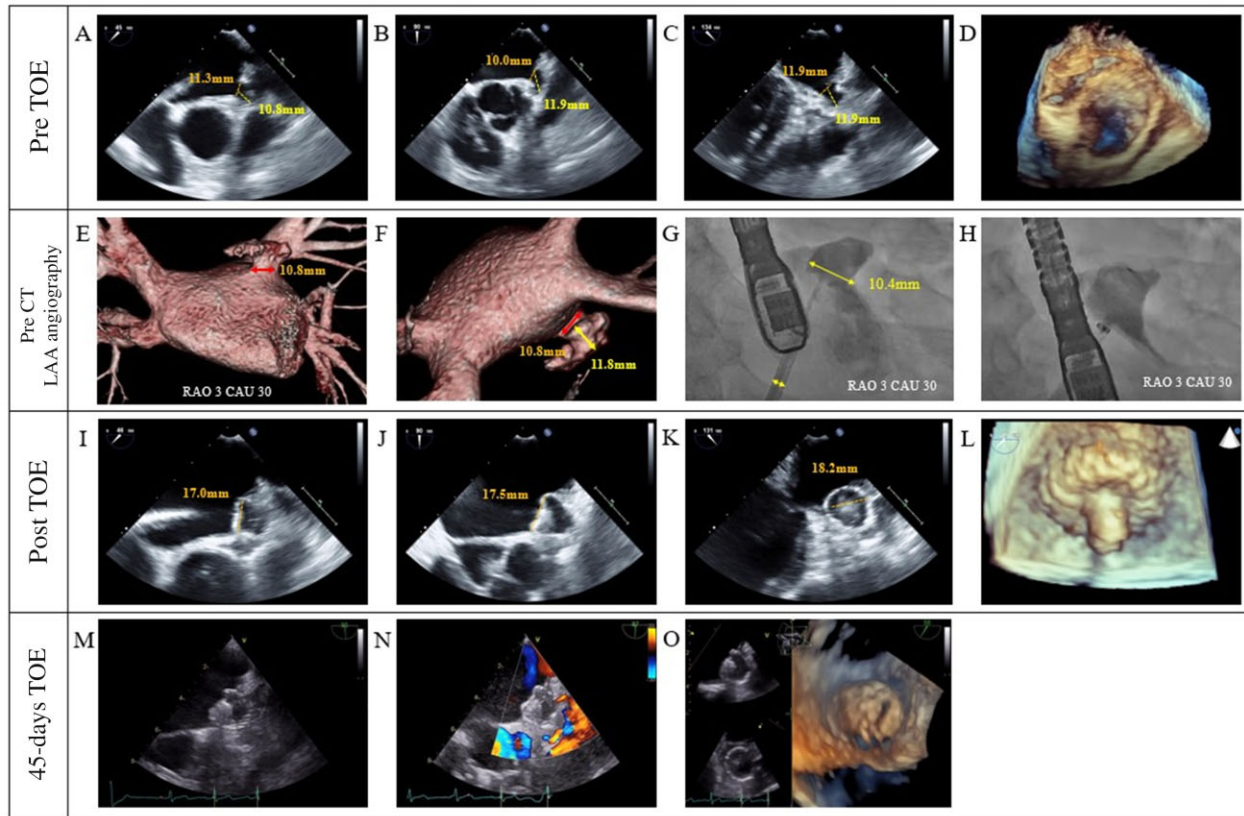
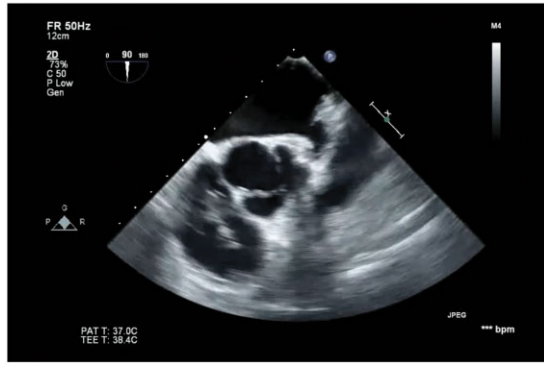


Figure 1 (A) Pre-procedural transoesophageal echocardiography showing the left atrial appendage had 11.3 mm ostium \times 10.8 mm depth (stump at 45°). (B) Pre-procedural transoesophageal echocardiography showing the left atrial appendage had 10.0 mm ostium \times 11.9 mm depth (stump at 90°). (C) Pre-procedural transoesophageal echocardiography showing the left atrial appendage had 11.9 mm ostium \times 11.9 mm depth (stump at 135°). (D) Pre-procedural transoesophageal echocardiography showing the left atrial appendage three-dimensional image. (E) Pre-procedural computed tomography in the right anterior oblique 3 CAU 30 view; the left atrial appendage ostium 10.8 mm. (F) Pre-procedural computed tomography in the superior view showed the ostium was 10.8 mm, and it was 11.8 mm from the ostium to the opposite wall of the left atrial appendage. (G) Left atrial appendage angiography. The guiding catheter was 8 Fr (external diameter = 2.7 mm) and the left atrial appendage ostial diameter was 10.4 mm as calculated based on the reference diameter. (H) Angiographical image after the WATCHMAN FLX implantation. (I) Post-procedural transoesophageal echocardiography showing the left atrial appendage was 17.0 mm ostium (stump at 45°). (J) Post-procedural transoesophageal echocardiography showing the left atrial appendage was 17.5 mm ostium (stump at 90°). (K) Post-procedural transoesophageal echocardiography showing the left atrial appendage was 18.2 mm ostium (stump at 135°). (L) Post-procedural transoesophageal echocardiography showing the left atrial appendage three-dimensional image. (M) Transoesophageal echocardiography 45 days after the implantation showed no thrombi along the device. (N) Transoesophageal echocardiography 45 days after the implantation showed that there was no leak flowing around the device. (O) Transoesophageal echocardiography 45 days after the implantation showing the left atrial appendage three-dimensional image. CT, computed tomography; LAA, left atrial appendage; TOE, transoesophageal echocardiography.



Video 1 Pre-procedural transoesophageal echocardiography (stump at 90°).



Video 3 Post-procedural transoesophageal echocardiography (stump at 90°).



Video 2 WATCHMAN FLX deployment.