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# Plug-based closure in completely percutaneous right-sided transaxillary transcatheter aortic valve implantation

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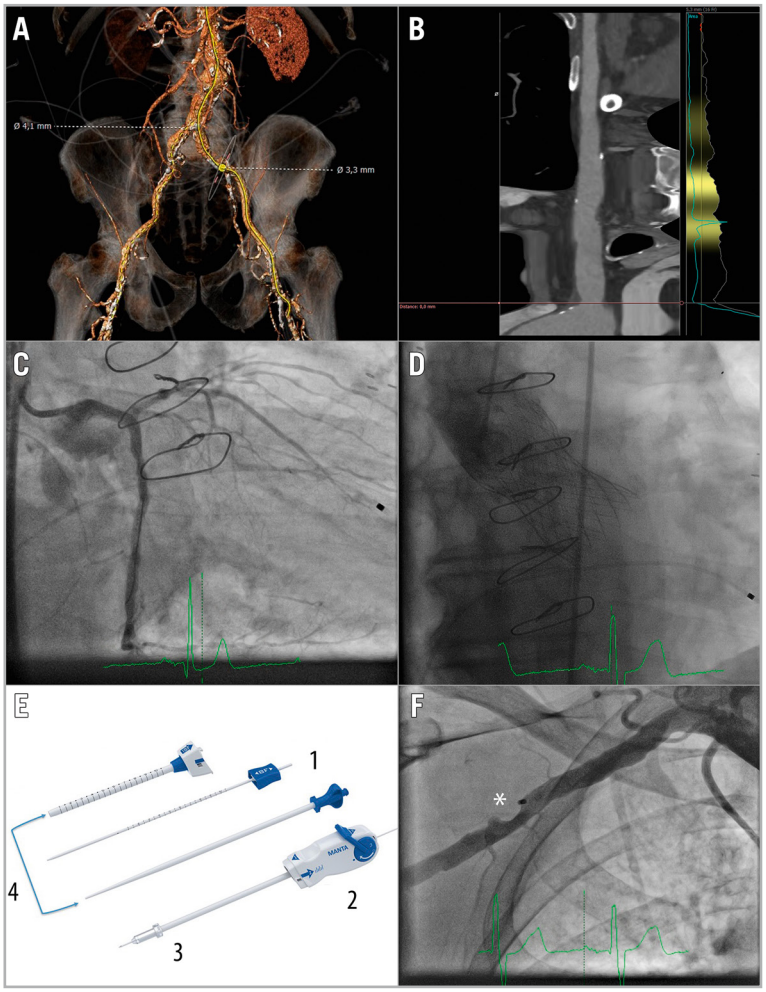


**Figure 1.** *Planning and performing plug-based closure in percutaneous right-sided transaxillary TAVI. A) No safe femoral access due to small diameters. B) Right subclavian artery. C) Result after successful LM stenting. D) Post-deployment angiography of the CoreValve Evolut R XL. E) Puncture location dilator (1); delivery system (2); closing unit (3); dedicated MANTA sheath and introducer (4). F) Final angiography after MANTA closure. * Endoluminal bioresorbable toggle*

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An 82-year-old male patient was referred to our hospital because of dyspnoea on minimal exertion. Diagnostic investigations showed a severe aortic valve and distal left main (LM) stenosis. A multislice computed tomography scan demonstrated no safe femoral access (diameters of 3.3 mm and 4.1 mm) **(Figure 1A)**. The Heart Team reached consensus for transcatheter aortic valve implantation (TAVI) combined with percutaneous coronary intervention (PCI). Access through the right subclavian artery was preferred **(Figure 1B)**, because of the presence of a LIMA graft.

Completely percutaneous transaxillary TAVI is feasible[1]. Transaxillary access was utilised under continuous ultrasound guidance **(Moving image 1)**. Angiography images show the result after successful LM stenting and CoreValve® Evolut™ R XL valve (Medtronic, Minneapolis, MN, USA) deployment **(Figure 1C, Figure 1D)**. Currently, percutaneous closure of large bore arteriotomies can be achieved through suture and plug-based closure. However, suture-based closure comes with a major vascular complication rate of approximately 14% with two thirds of them caused by closure device failure[2].

We performed arteriotomy closure with the MANTA™ device (Essential Medical, Inc., Exton, PA, USA). It consists of an endoluminal bioresorbable toggle and a collagen plug outside the vessel connected together with a suture and a stainless steel lock. Step-by-step deployment has been described previously[3]. In short, before the index procedure the arteriotomy depth must be measured with the puncture location dilator **(Figure 1E1, Moving image 2)**. After performing the index procedure, the delivery system with the closing unit **(Figure 1E2, Figure 1E3)** is clicked on the dedicated MANTA sheath **(Figure 1E4)**. We inserted a femoral safety wire in case it was needed for bail-out situations (i.e., balloon dilatation or a covered stent) **(Moving image 3)**. The delivery system is then pulled back up to the arteriotomy depth measured previously, and the toggle can then be released. A blue tamper tube rises up which can be advanced over the wire to tighten up the collagen plug to the toggle **(Moving image 4)**. In our case immediate haemostasis was reached. Note the presence of the endoluminal bioresorbable toggle **(Figure 1F)** which will resorb completely within six months.

In conclusion, plug-based closure with the MANTA device may be feasible in completely percutaneous right-sided transaxillary TAVI.

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## Conflict of interest statement

N. Van Mieghem is a member of the advisory board of Essential Medical. The other authors have no conflicts of interest to declare.

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## Supplementary data

**Moving image 1.** Ultrasound-guided percutaneous transaxillary access.

**Moving image 2.** Arteriotomy depth measurement.

**Moving image 3.** Inserting the femoral safety wire.

**Moving image 4.** Successful transaxillary closure with the MANTA device.

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