MISALIGNMENT IN FEVAR. TECHNIQUE TO ENSURE CANNULATION OF TARGET ARTERIES IN PMEG: IN VITRO TEST. PROPOSAL FOR AN OFF THE SHELF DEVICE.

Ciro Baeza, PhD, M.D., Universidad Autónoma, Madrid, Spain

Objective:

FEVAR can be a technically demanding procedure, especially when the stent graft and its fenestrations are not aligned precisely with the intended target arteries. Misaligned fenestrations lead to longer procedural and fluoroscopy times; increase of contrast used; and intraoperative target vessel complications or impossibility of cannulation. A further evaluation of the incidence and causes of stent graft misalignment is needed as well as the use of adjunctive technologies and techniques that can improve alignment. In physician modified endograft techniques (PMEG), the use of aortic models manufactured in 3D printers can provide benefit to adjust the location of fenestrations, but this doesn't assure target vessels canulation. We describe a new technique that achieves this objective by a system of preloaded guides on a PMEG.

Methods:

The entire procedure is performed coaxially through a single access point. We describe the technique in a series of steps that, in summary, consist of preloading, through each fenestration performed in a PMEG, a modified guidewire in the form of a slipknot (Illustration 1) and performing a kind of "through&through" maneuver (Illustration 2), achieving tension in these guidewires with a catheter inserted into the destination artery.

Results:

We have tested the technique in anatomical models. The technique allows that, even if the fenestrations are slightly misaligned with the target vessel, the interlocking guide system has already gained the target vessel prior to prosthesis deployment. This technique not only limits its use to cannulation of visceral arteries but could also be used to cannulate vessels of the aortic arch, hypogastric arteries and, in general, any area of arterial bifurcation.

Conclusion:

We describe a resource technique for urgent cases that require the use of PMEG. It offers several advantages, but mainly it offers a greater security, above all for the surgeon, as it assures the canalization of the target vessels before the release of the graft and that increase the reliability of the procedure as it assures a pathway regardless of the fenestration and the target vessels are aligned or not. We believe that this technique could be standardized by the use off-the-shelf devices.

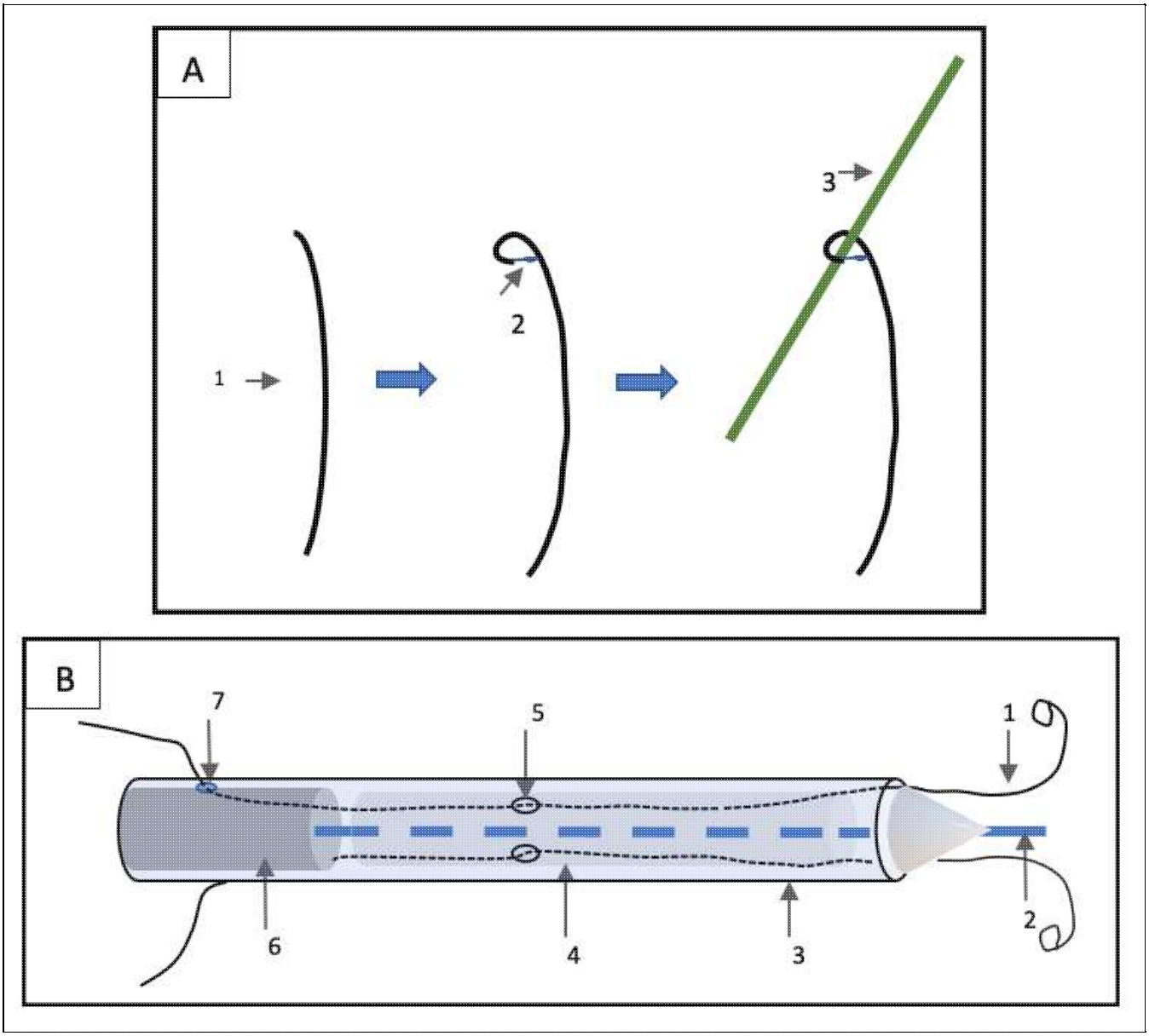

Fig 1 Illustration 1. A.On a guide of conventional nitinol (1), we performed a loop assisting with a 6/0 polypropylene suture (2), so that we create a slipknot in wich another guide can be threaded (3). B. PMEG. Preloaded slipknot guidewire (1), rigid support wire (2), delivery sheath(3), modified endograft (4), fenestrations (5), stent stopper (6), sheath hole to insert de slipknot guidewire

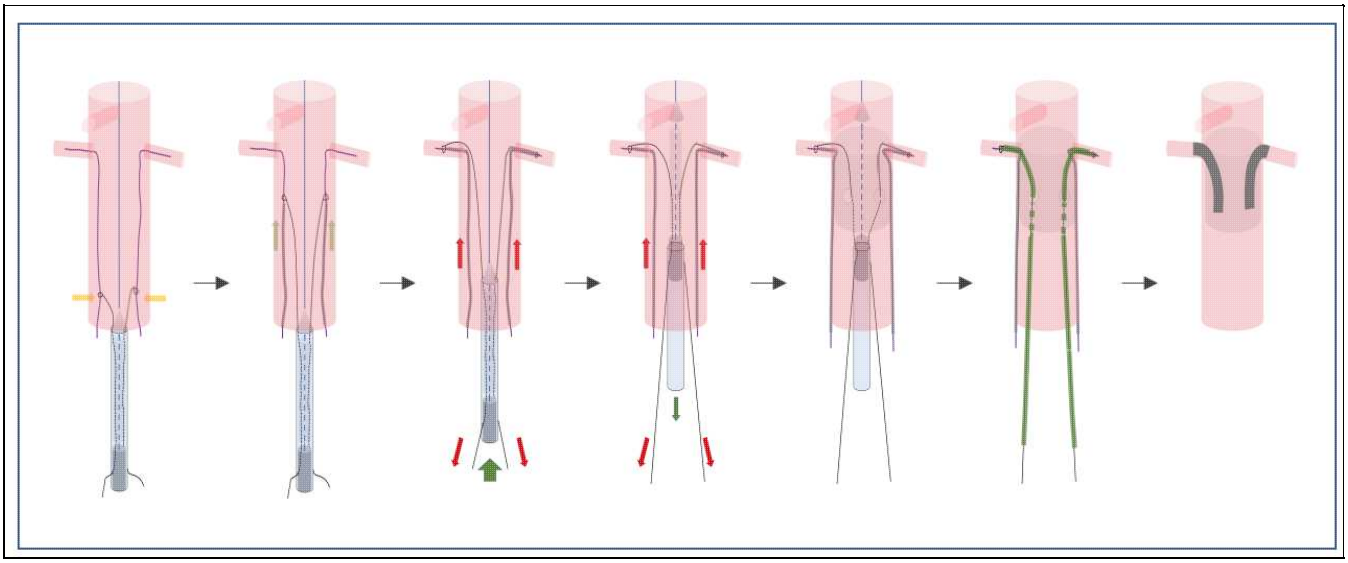

Fig 2 Illustration 2. Conventional guidewires are introduced to channel the target arteries. With the prosthesis system already modified, the slipknot guidewire are threaded into de precanulated guides and progressed pushing through a catheter. At this point, the back side of the slipknot guidewire is pulled as the catheter is pushing the knot, that makes a kind of through & through maneuver so the device can be progressed. Then the graft is released. Through the slipknot a sheath can be progressed as the catheter is stopping the knot. The sheath will follow the pathway created progressing inside the graft, crossing the fenestration and landing in the target vessel. The procedure finish with the deployment of stent graft in a periscope configuration.