

The Use of a Single ProGlide for Large Sheath Delivery Systems

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A percutaneous approach to EndoVascular Aortic Repair (EVAR) for aortic aneurysms requires large size sheaths. Access site management, however, remains a technical challenge. Several techniques have been described for access site hemostasis and post-procedure closure of the femoral vessels, both using open cutdown suture and percutaneous closure devices. The ISAR-CLOSURE and PEVAR trials have demonstrated that the use of vascular closure devices is non-inferior to manual compression or open femoral exposure, respectively, in terms of access-site complications and reduced time to hemostasis [1,2]. Maniotis et al. have demonstrated, through a systematic review, the benefits of using double Perclose ProGlide (Abbott Vascular, Santa Clara, CA, USA) suture mediated closure devices for sheath sizes larger of than 8 Fr [3]. The use of double or, in some cases, triple ProGlide devices may have several disadvantages because of technical complexity and increased time and cost, which are highly relevant in cases of ruptured aortic aneurysms. By utilizing a single ProGlide device placed at a 12 o'clock position, the access site can be continuously titrated per-procedure, allowing the downgrading of sheath size when necessary and distal flow to the lower extremities. After the procedure the access site can safely be closed by tightening the knot with the knot pusher after complete removal of both the sheath and

guidewire. If oozing bleeding is observed, this is controlled by upward tension of the ProGlide sutures and simultaneous downward compression using a mosquito hemostat curved forceps, as displayed in Figure 1. A small



Figure 1 Hemostasis control after EVAR using bilateral single ProGlide devices with additional upward tension of the ProGlide sutures and simultaneous downward compression using mosquito hemostat curved forceps.

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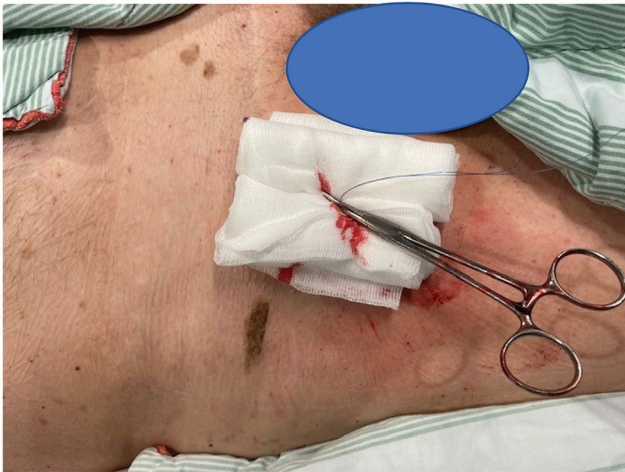


Figure 2 A small hemostatic or normal compress can also be used in the wound by tying the ProGlide sutures around it and tightening to minimize blood oozing.

hemostatic compress can also be used in the wound and, by tying the ProGlide sutures around the compress after they are tightened, oozing bleeding can be controlled, as seen in Figure 2. If adequate closure is not achieved, this is often observed before guidewire removal and another ProGlide can therefore be placed in the 12 o'clock position after the first one has been tightened as displayed in Figure 3; this may result in more effective closure as it allows the sutures to be placed further from each other.

At Örebro University Hospital we have adopted this technique for the closure of large bore accesses between 12 and 24 Fr after EVAR, thoracic EVAR (TEVAR) and fenestrated EVAR (FEVAR) in both elective and emergent cases. During 2021 this technique was used in around 40 cases of endovascular aneurysm surgery at our institution, with only one case failing (suture failure and stentgraft placement to cover the bleeding femoral artery access) and one requiring an adjunct fascia suture technique. We therefore believe that it is a safe and durable technique for closure of large bore access. It is now used routinely in all larger-bore access (as of today 24 Fr) and has been used also in smaller vascular access in non-aortic procedures (for example, 8 Fr).

Ethics Statement

- (1) All the authors mentioned in the manuscript have agreed to authorship, read and approved the manuscript, and given consent for submission and subsequent publication of the manuscript.
- (2) The authors declare that they have read and abided by the JEVTM statement of ethical standards including rules of informed consent and ethical committee approval as stated in the article.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

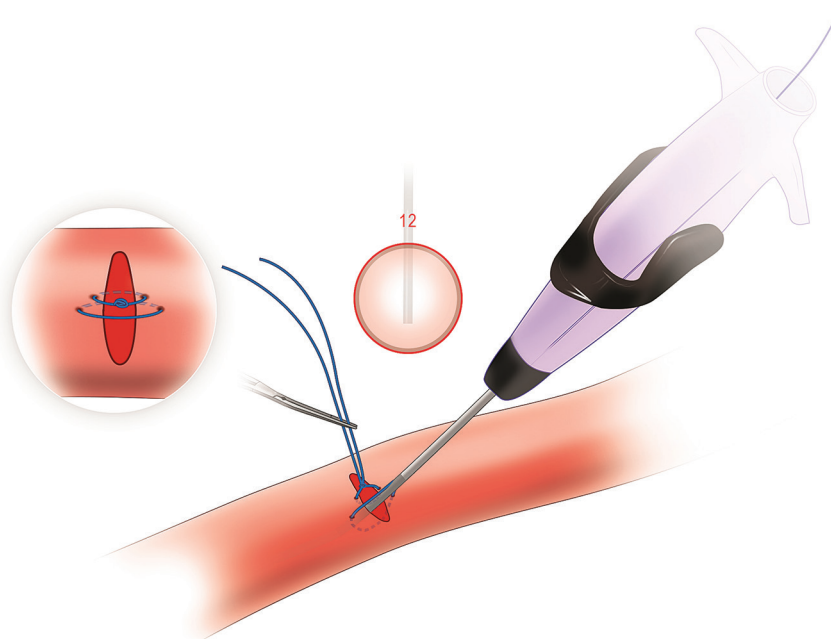


Figure 3 The placement of a second ProGlide suture, also at a 12 o'clock position. This can be performed as long as you still have the guidewire in place.

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Author Contributions

David McGreevy drafted and wrote the manuscript. Tal Hörer and Claes Forssell wrote and revised the manuscript.

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