A Modified Through and Through Guidewire Steerable Sheath Technique for Transfemoral Access to Visceral Arteries with Hostile Anatomy

Marcell Gyánó a,*, Csaba Csobay-Novák b

a Weba Heart and Vascular Center, Semmelweis University, Budapest, Hungary
b Department of Interventional Radiology, Semmelweis University, Budapest, Hungary

Article history: Received 26 January 2021, Revised 26 April 2021, Accepted 6 May 2021

Keywords: Hostile anatomy, Steerable catheter, Visceral stenosis, Endovascular technique

INTRODUCTION

A 69 year old woman was admitted with chronic mesenteric ischaemia. Her medical history included left subclavian transposition followed by a transthoracic endovascular aortic repair between zones 2 and 5, and a complete relining of the endografts years later owing to a type V endoleak. To avoid crossing the hostile arch and the descending aorta, and to achieve a stable position for cannulation of the superior mesenteric artery (SMA) with a steep take off, a steerable catheter was prepared from conventional devices based on the idea of the through and through suture technique.1

SURGICAL TECHNIQUE

An ultrasound guided right common femoral artery puncture was used. A 65 cm long 8 F sheath (Destination; Terumo, Tokyo, Japan) was advanced in the aorta up to the level of the visceral arteries. The valve and the side port were then removed and replaced with a cap for the time of the preparation. It is essential to use a sheath with a removable valve to use this technique. The 8 F side port was cannulated in a retrograde fashion with the soft tip of a 300 cm 0.014 guidewire and was secured with the side port pin. A 7 F guide catheter (Launcher AL2; Medtronic, Minneapolis, MN, USA) was pushed through the 8 F valve. The back end of the wire was then inserted into the 7 F catheter in a retrograde fashion. At the hub of the 7 F catheter a separate haemostatic valve was used (Radifocus Hemostasis Valve; Terumo). The wire was pulled through an off centre needle puncture of the 7 F valve and was bent in half at the tip of the guide catheter. The 7 F guide catheter was then inserted into the sheath with the 8 F valve positioned near the hub of the 7 F guide catheter, advanced completely, and, finally, the 8 F valve was reconnected to the sheath. The 7 F catheter could be steered with a pull on the steering wire (see Fig. 1).

DISCUSSION

Renovisceral arteries with a steep take off associated with a hostile arch or descending aorta (e.g., elongated or shaggy) can be handled more safely via femoral access, without the need for crossing the arch. This can be done using either a dedicated small calibre steerable sheath (6–8.5 F), which usually lacks strong antegrade support, or a large steerable sheath (16 F), which has better support but adds a non-negligible bleeding risk given the large bore arterial access. The advantage of the described technique is that it provides the best of both worlds: an antegrade approach for the caudally oriented visceral branches with the ease of more direct control using shorter devices from transfemoral access. The bowstringed guide catheter provides a strong support even for those occlusions and tight stenoses where dedicated steerable sheaths tend to lose support and straighten during lesion crossing. This is clearly the Achilles heel of every steerable sheath currently available and the reason why homemade steerable devices are gaining popularity in transfemoral access to branched endovascular aortic repair.

An additional advantage is that this setup can be produced from standard devices that are usually available in every catheterisation laboratory. It can be also useful in urgent settings when a dedicated steerable sheath is not readily available. Last, but not least, the devices used for

* Corresponding author.
E-mail address: mgyanostb@gmail.com (Marcell Gyánó).

2666-688X/© 2021 The Authors. Published by Elsevier Ltd on behalf of European Society for Vascular Surgery. This is an open access article under the CC BY license (http://creativecommons.org/licenses/by/4.0/).
https://doi.org/10.1016/j.ejvsvf.2021.05.001
this technique costs much less than the cheapest dedicated steerable sheath.

**Conclusion**

This cost effective, homemade setup provided a strong support for cannulation of a visceral artery with a hostile take off and to cross the ostial stenosis easily with all the devices needed. This setup can be use also in the treatment of primary atherosclerotic lesions and in cases with complications.

**FUNDING**

None.

**REFERENCE**

1 Panuccio G, Rohlf F, Makaloski V, Eleshra A, Tsilimparis N, Kölbel T. Through-and-through suture technique to stabilize a sheath in branched endovascular aortic repair. *J Endovasc Ther* 2019;26:805-9.