Navicross®

Support Catheter

CASE REPORTS

TERUMO
INTERVENTIONAL
SYSTEMS

Royal Liverpool University Hospital
Liverpool, UK

Operators:
Richard G McWilliams
Simon Neequaye

MESENTERIC REVASCULARISATION FOR **ACUTE MESENTERIC ISCHAEMIA**

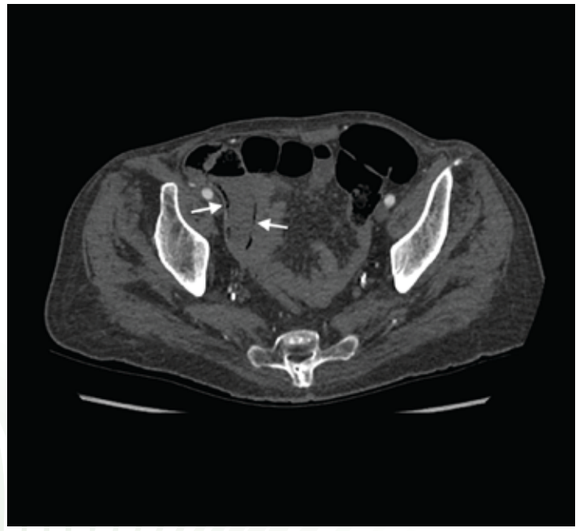

Fig. 1: Enhanced CT of the abdomen showing intramural gas (white arrows) in the caecum.

A 65-year-old patient presented with abdominal pain, vomiting, tachycardia and raised inflammatory markers. There was a history of chronic pancreatitis and chronic mesenteric ischaemia. Beger's operation involving resection of the pancreatic head had been performed six months earlier. Enhanced abdominal CT scanning revealed intramural gas in the caecum (Fig. 1). CT also showed stenosis of the coeliac axis (CA) and occlusion of the superior mesenteric artery (SMA) (Fig. 2). The SMA occlusion was longstanding and had been shown on previous CT studies.

Open surgery was considered of very high risk and thought unlikely to allow for mesenteric arterial bypass in view of the hostile abdomen due to the chronic pancreatitis and history of pancreatic surgery. Endovascular management of the SMA occlusion and CA stenosis was preferred although it was anticipated that bowel resection may be needed after this.

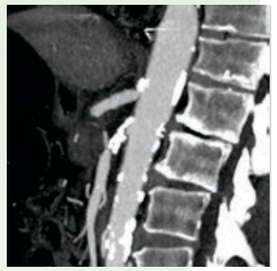

Fig. 2: Sagittal reconstructed view showing stenosis of the CA and chronic SMA occlusion.

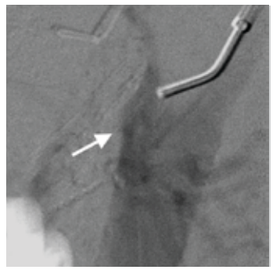

Fig. 3: Lateral aortogram showing short proximal stump of the occluded SMA (white arrow).

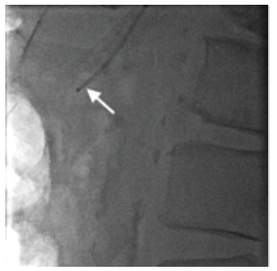

Fig. 4: Navicross® catheter used to cross the SMA occlusion over a Terumo wire.

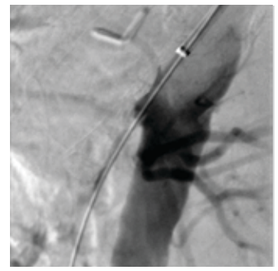

Fig. 5: The Navicross® catheter allowed the introduction of a stiff guidewire.

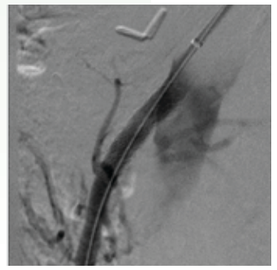

Fig. 6: A 7mm covered stent was used to revascularise the SMA.

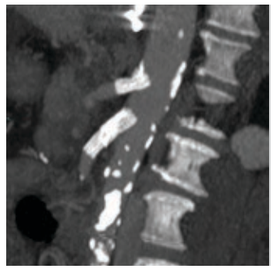

Fig. 7: Post-operative CT showing patent stents in the CA and SMA.

The procedure was performed under GA and involved surgical exposure of the left brachial artery and the introduction of a 55cm braided sheath. There was only a very small proximal stump of the SMA (Fig. 3) and it was difficult to cross this with a guidewire in view of the geometry. The chronic occlusion was crossed using a 5Fr multipurpose catheter and 180cm 0.035" angled Terumo wire. The catheter would not pass over this wire but a 90cm Navicross® catheter easily crossed (Fig. 4) and this allowed the introduction of a stiffer wire (Fig. 5). Pre-dilatation to 4mm was performed and then the SMA was stented with a 7mm x 38mm covered stent (Fig. 6). The CA was more easily stented with a 7mm x 22mm covered stent.

The ischaemic colitis settled following revascularisation without the need for colonic resection. Enhanced CT scanning showed widely patent stents in the CA and SMA (Fig. 7).

Conclusion:
The Navicross® catheter is an essential tool in endovascular procedures and was vital in this procedure to allow us to gain stable access to a chronic SMA occlusion with only a very small proximal stump.

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ACCESSING TARGET VESSELS DURING **FENESTRATED EVAR**

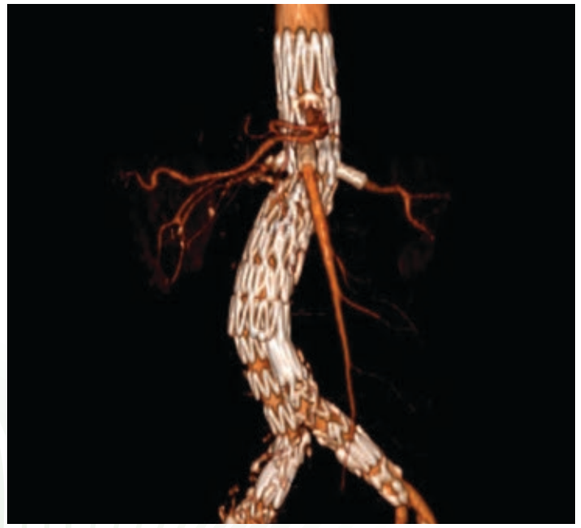

Fig. 1: Reconstructed 3D image after FEVAR showing patent visceral arteries with stented fenestrations.

Fenestrated EVAR is increasingly used for the endovascular treatment of complex aneurysms. A key part of the procedure is achieving stable access to the target vessels. The most complex grafts typically contain fenestrations for the coeliac trunk, SMA and both renal arteries. These vessels must be catheterized from the fenestrated graft and ultimately a stiff wire and sheath are required in the vessel to allow the deployment of a covered stent to maintain vessel patency (Fig. 1).

The difficulty achieving this depends on the three-dimensional angulation of the target vessel. There is a hierarchical approach to building up the strength of the platform in the target vessels which requires a stepwise increase in the strength of the wire and catheter system. This ultimately allows access for a wire which is sufficiently strong to allow a braided sheath to be tracked into the target vessel. The tapered tip of the Navicross® Support Catheter (Terumo Interventional Systems) has, in our hands, proven itself to be the best product for difficult cannulation. The design of the Navicross® has several beneficial features.

The crossing profile is low and there is little or no step between the wire and the catheter which prevents the catheter from catching on the margin of the fenestration. This tapered profile coupled with the hydrophilic coating allows for smooth passage of the device. The braided design in addition makes the catheter very pushable without the risk of it buckling as longitudinal force is applied.

The Navicross® tracks easily through fenestrations when other catheters sometimes catch on the margin of them. It tracks well over Terumo wires when other catheters are prone to dislodge the wire into the aortic graft. It also performs well when stiffer wires are introduced again speeding up the time taken to arrive at the goal of gaining stiff wire access so that the sheath and covered stent can be introduced and deployed.

In our experience the downward-pointing right renal artery, which also usually angles backwards as it passes behind the IVC, is the most difficult vessel to cannulate. We now use the Navicross® Support Catheter for access to target vessels which prove difficult to manage using our previous range of wires and catheters (Fig. 2,3,4).

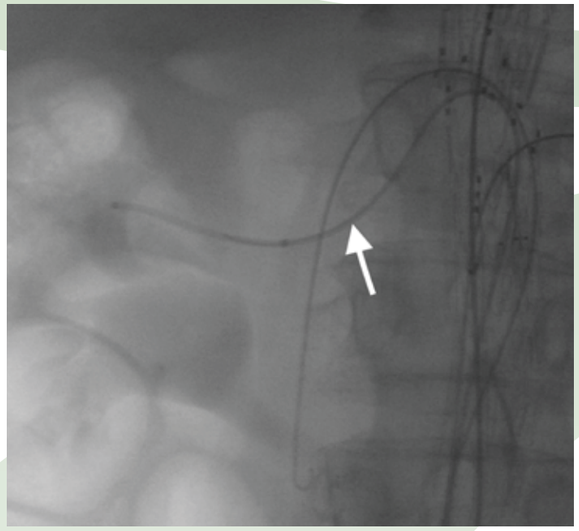

Fig. 2: The Navicross® catheter (white arrow) has tracked into a downward pointing right renal artery.

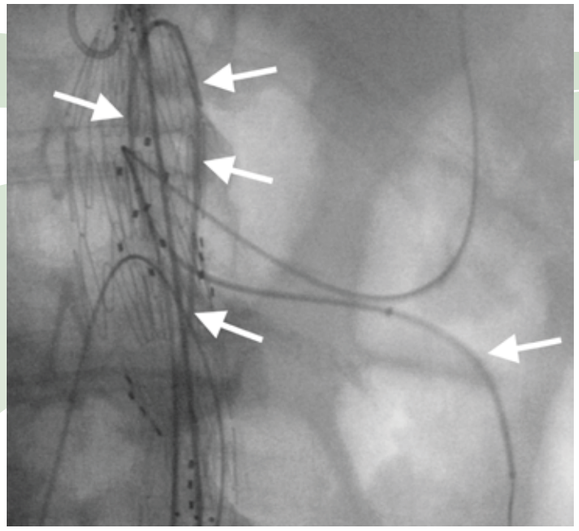

Fig. 3: Difficult left renal artery access with the Navicross® catheter (white arrows) required to loop at the top of the graft and come down into the renal artery.

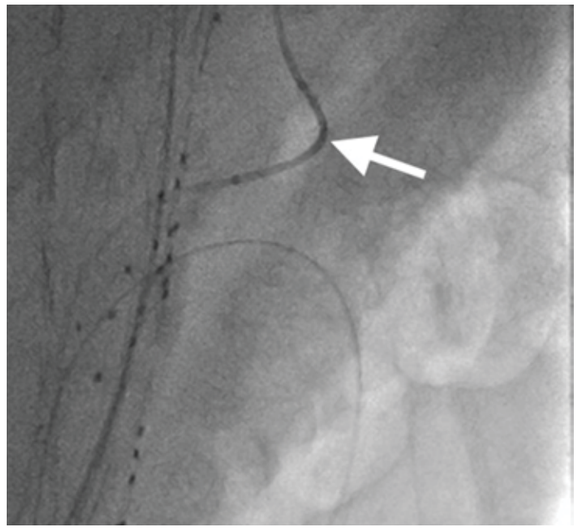

Fig. 4: Lateral view showing Navicross® catheter in the coeliac trunk.

Conclusion:
The Navicross® Support Catheter is an important ancillary product during FEVAR. It facilitates access to the target vessels and reduces the time required to achieve this.

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BELOW KNEE ANGIOPLASTY

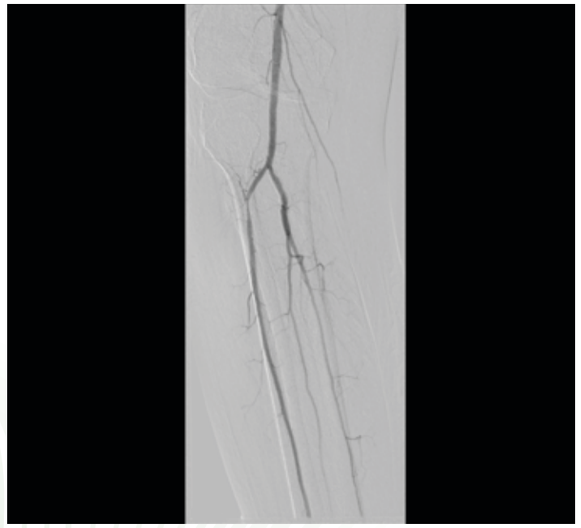

Fig. 1: Proximal AT stenosis.

Clinical History:

A 54-year-old diabetic patient presented with an ulcer and osteomyelitis which responded poorly to antibiotics. The ulcer extends from the medial to the plantar surface of the right foot. Ultrasound Doppler of the right lower limb identified a mild popliteal artery stenosis. The below knee vessels were heavily calcified and poorly visualised. We proceeded with an on table angiography and angioplasty.

Risk Factors:

Arterial hypertension, IDDM

Right antegrade CFA access was chosen. The procedure was started with a Terumo Radifocus 0.035" wire supported with a Navicross® catheter. Diagnostic angiography demonstrated a moderate to severe AT origin stenosis (Fig. 1). The PT and peroneal arteries were patent proximally but taper out into very small vessels in the foot and do not appear to communicate with the plantar arch. Distally, there was a tight stenosis in the distal dorsalis pedis artery (Fig. 2).

A long 55cm 6Fr sheath was introduced over a 0.035" Bentson wire and parked at the popliteal artery. The 0.035" wire was exchanged for a 0.018" Terumo advantage wire and a Navicross® catheter were used to cannulate and cross the proximal AT lesion.

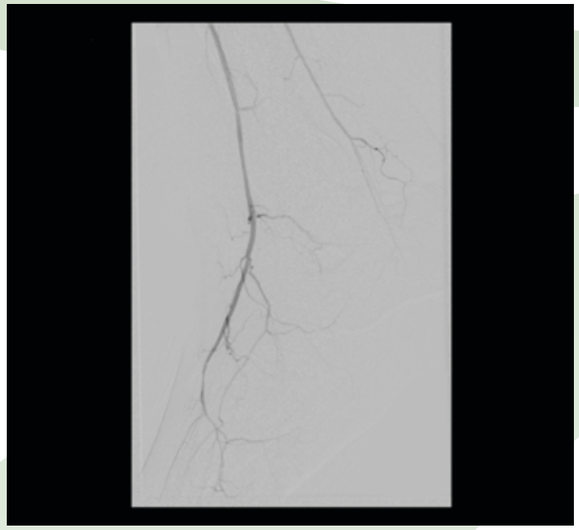

Fig. 2: DP stenosis reducing flow into the plantar arch.

The stenosis was angioplastied with a 3 x 40mm Senri PTA balloon catheter with good results (Fig. 3). The DP was seen to supply the plantar arch and it was felt that the patient may benefit from angioplasty of the DP lesion to improve supply to the plantar arch. This was treated with a 2x40mm Terumo Senri PTA balloon catheter with significant recoil. Further balloon angioplasty performed with a 2.5x40mm PTA catheter yielded satisfactory results (Fig. 4).

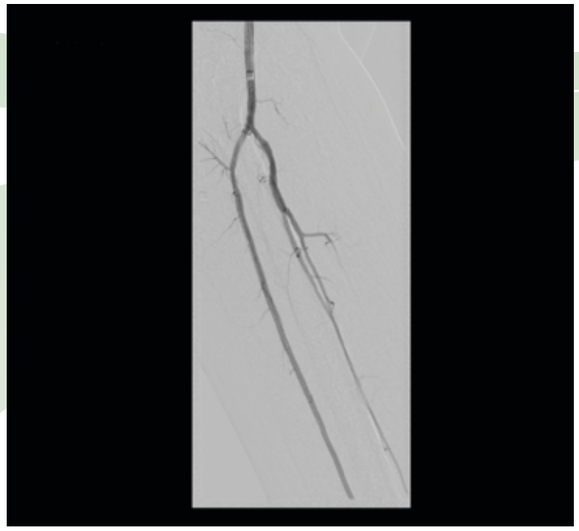

Fig. 3: Post PTA of proximal AT lesion.

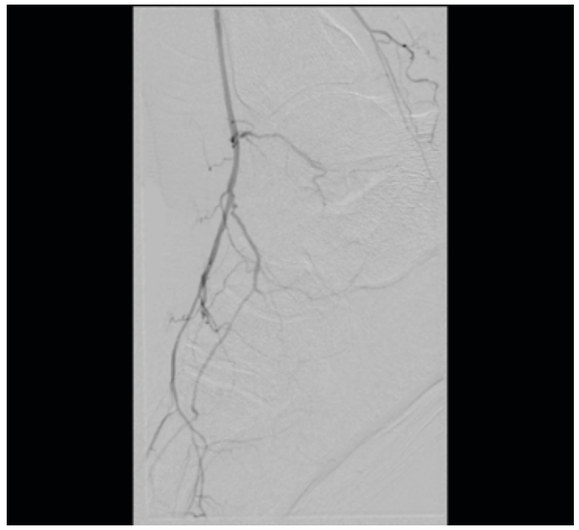

Fig. 4: Post PTA of DP lesion.

Conclusion:

The Navicross® catheter with the 30° angled tip is a useful workhorse catheter to start with a 0.035" system when intervening above the knee and converting to a 0.018" system below the knee.

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EXTERNAL ILIAC ANGIOPLASTY AND **SFA SUB-INTIMAL RECANALIZATION**

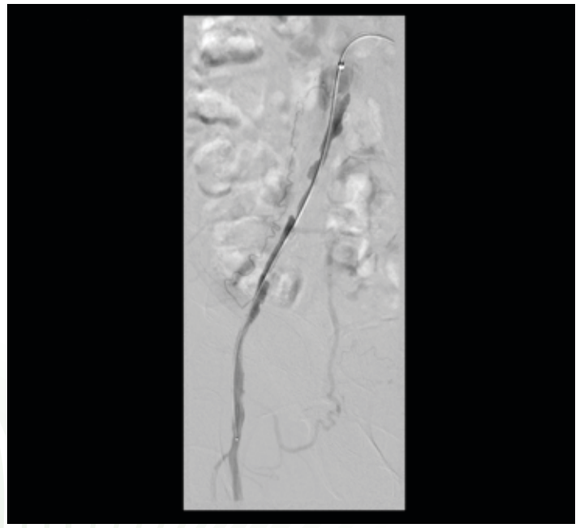


Fig. 1: Angiography from a 6Fr cross-over sheath demonstrated a long EIA stenosis.

Clinical History:
A 54-year-old diabetic patient presented with right foot ulcer. The CT angiography revealed long critical stenosis of the right EIA and a long SFA occlusion.

Risk Factors:
Arterial hypertension, IDDM, schizophrenia

Left retrograde CFA access with a 6 Fr crossover sheath was used to treat both lesions in one setting. The EIA was angioplastied with a 6x80mm PTA balloon catheter with good angiographic results.

The sheath was advanced with the tip parked within the common femoral artery. A subintimal recanalization of the SFA was performed with a 0.035" Terumo Radifocus wire and was supported with a 5Fr straight catheter.

The occlusion was crossed with a wire but the catheter would not track through the re-entry point due to lack of pushability. The catheter was exchanged for a 5x40mm PTA balloon catheter but attempts to track through the re-entry point were unsuccessful.

The PTA balloon catheter was exchanged for a Navicross® which successfully tracked through the re-entry point into the lumen. The Terumo wire was exchanged for a 0.035" Bentson wire and the entire SFA was angioplastied to 6mm with significant recoil of both the entry and re-entry points. The sites which recoiled were stented with self-expanding stents with good results.

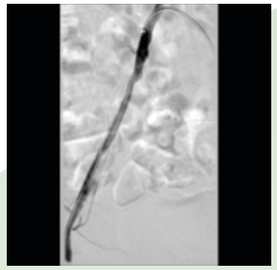


Fig. 2: EIA stenosis responded well to balloon angioplasty.

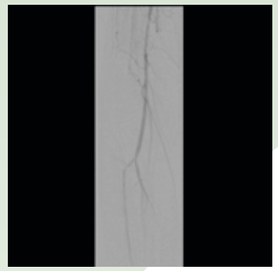


Fig. 3: Long SFA occlusion with a stenosed proximal SFA and origin. There is delayed filling of the distal SFA and P1 segment of the popliteal artery.

Fig. 4: Terumo wire successfully broke back into the P1 segment of popliteal artery but the supporting catheter would not track beyond the re-entry point.

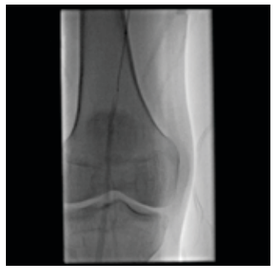


Fig. 5: Navicross® catheter successfully tracked across the re-entry point. Wire was removed to confirm intra-luminal position.

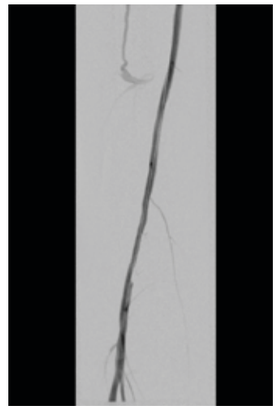


Fig. 6: Completion angiogram following balloon angioplasty and stenting.

Conclusion:
The Navicross® support catheter has excellent trackability and pushability which are essential in difficult cases especially with contralateral up and over access.

Navicross®

Support Catheter

STAINLESS STEEL DOUBLE BRAIDED SHAFT

- Provides excellent steerability and efficient push transition in complex lesions.
- Enhances torqueability and prevents kinking.

MINIMAL CROSSING PROFILE AND TAPERED TIP

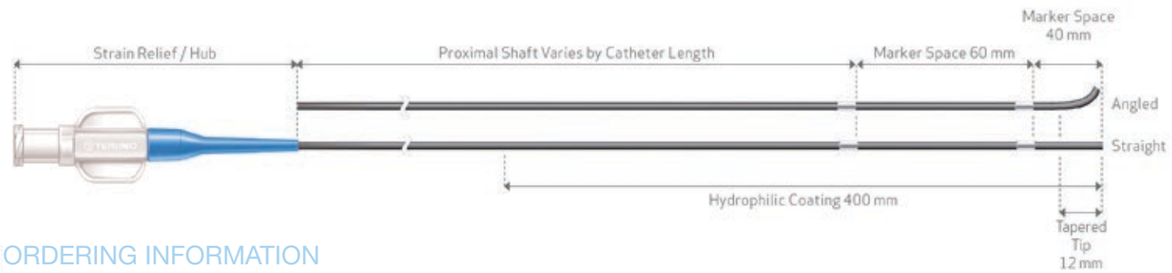
- Guarantees a seamless transition between guide wire and catheter facilitating successful lesion access and crossing.
- Angulated tip can be used for selecting the true lumen and navigating through bifurcated vessels.

UNIQUE THREE RADIOPAQUE SHAFT-MARKERS

- Feasibility of accurate intraluminal measurement (e.g. assessment of treatment dimensions/positions of balloons and stents), because embedded shaft markers are positioned 1 mm from distal tip - 40 mm and 60 mm from precedent marker band.

PRODUCT SPECIFICATIONS

- Double braided stainless steel shaft
- 65, 90, 135, 150 cm lengths
- 0.035" / 0.89 mm wire compatibility
- 1 embedded and 2 swaged radiopaque markers
- Straight and 30° angled tip
- 4 Fr sheath compatibility



ORDERING INFORMATION

	0.035" / 0.89 mm Wire compatibility	65 cm	90 cm	135 cm	150 cm
Tip shape	Straight	WS*NS350G3HM	WS*NS35093HM	WS*NS350N3HM	WS*NS35153HM
	Angled	WS*NA350G3HM	WS*NA35093HM	WS*NA350N3HM	WS*NA35153HM

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