

Real-Time Deflectable Tip Guidewire For Complex Intracranial Navigation—An Early Institutional Experience

Albert Q. Wu^{1*}, Priya Gaiha², Kyle Scott¹, Redi Rahmani¹, Sandeep Kandregula¹, Joshua S. Catapano¹, Omar Choudhri¹, Visish M. Srinivasan¹, Jan-Karl Burkhardt¹

¹Department of Neurosurgery, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA 19104

²Corporate Research, Artiria Medical SA, Canton de Vaud, CH

*Presenting author

INTRODUCTION

- Guidewires are used to select vessels and navigate tortuosity in endovascular procedures. The angle of most J-tip guidewires, such as Aristotle and Synchro, must be chosen or modified ex vivo. We report an early single-institution experience with the SmartGUIDE guidewire (Artiria Medical, Geneva, Switzerland), which allows real-time in situ distal tip deflection and locking.

STUDY OBJECTIVES

To present preliminary safety, efficacy, and usability data of a deflectable tip guidewire in neurointerventional procedures.

METHODS

- This was a single-arm, open label prospective study using an FDA cleared device for 23 procedures between August 2024 to May 2025.
- Data included target vessel access, first-line vs. rescue use, and device-related safety events.
- Usability was rated via a 5-point Likert scale on six domains: torque, pushability, navigation, shape retention, trackability, and radiopacity.
- Patients underwent standard postoperative imaging follow-up.

RESULTS

Table 1. Clinical and procedural descriptive characteristics of the cohort.

N = 23	
Age	
Median (IQR)	63 (49.5–70.5)
Gender	
Female	18 (78.3%)
Male	5 (21.7%)
Surgical indication:	
Aneurysm	21 (92.3%)
Unruptured	15 (65.2%)
Ruptured	2 (8.7%)
Recurrent	4 (17.4%)
Carotid artery stenosis	1 (4.3%)
Dural arteriovenous fistula	1 (4.3%)
Location:	
Circulation	
Anterior	17 (73.9%)
Posterior	6 (26.1%)
Side	
Left	10 (43.5%)
Right	10 (43.5%)
N/A or midline	3 (13.0%)
Lesion location	
ICA, cervical	1
ICA, petrous-cavernous junction	1
ICA, cavernous	1
ICA, cave (cavernous)	2
ICA, ophthalmic	4
ICA, superior hypophyseal	1
ICA, terminus	1
MCA, bifurcation	3
ACA-ACoA junction	1
ACoA	2
Vertebral, V4	1
Basilar	2
PICA	1
PCA	1
Torcular with right ECA feeders*	1

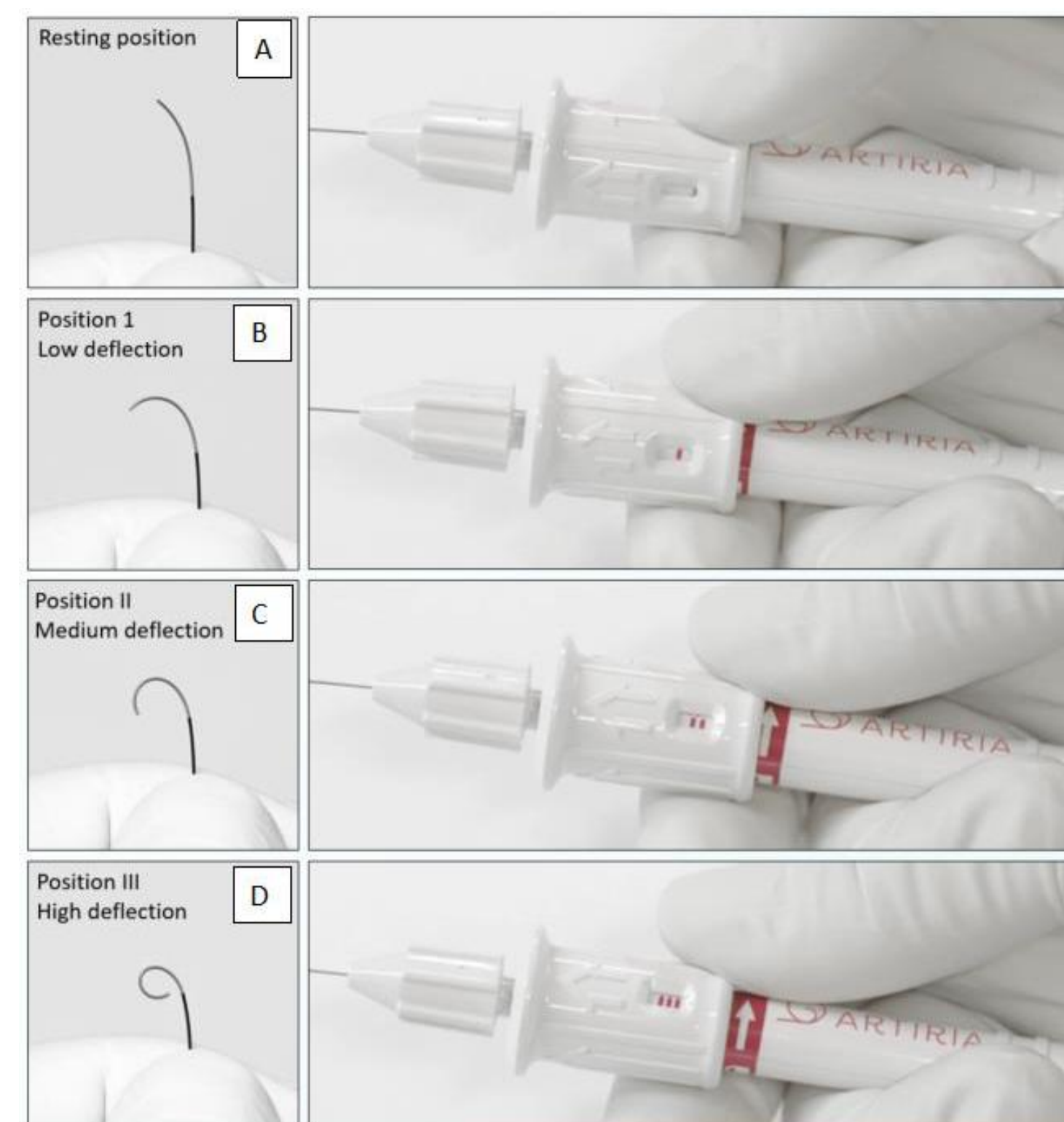


Figure 1. Picture of the SmartGUIDE guidewire tip in different deflection states, and the corresponding manipulator handle pusher states: A) Rest position, B) Low deflection (position I), C) Medium deflection (position II), D) High deflection (position III).

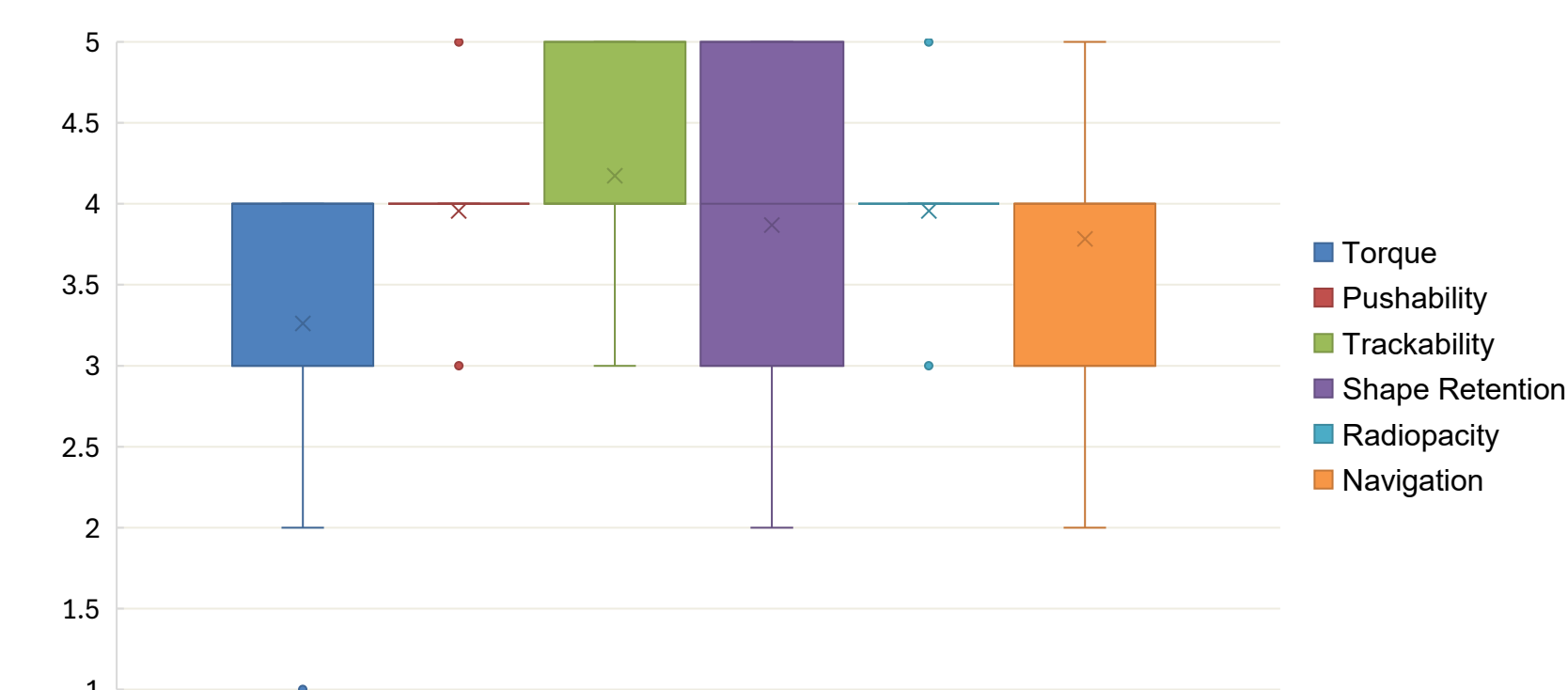


Figure 2. Usability study results based on a 5-point Likert scale.

- Twenty-three patients were treated: 21 aneurysms (15 unruptured, 2 ruptured, 4 recurrent), 1 carotid stenosis, and 1 dural AVF. Most lesions were anterior (74%) with equal left and right sides.
- No intraoperative complications occurred. Postoperative vasospasm occurred in both cases where aneurysms were ruptured at presentation, unrelated to SmartGUIDE use.
- At 6-month follow-up (n=4), three aneurysms had complete occlusion (RROC 1) and one had residual neck (RROC 2). The remaining patients have not yet reached this timepoint.
- Trackability scored highest (mean 4.17; SD=0.72) and torque lowest (mean 3.26; SD=0.92).

DISCUSSION / CONCLUSION

SmartGUIDE appears safe and effective, with favorable usability. Its *in vivo* tip control enhances navigation in complex vasculature. Ongoing evaluation and follow-up will provide further insight into its performance.

Abbreviations: ICA = internal carotid artery; MCA = middle cerebral artery; ACA = anterior cerebral artery; ACoA = anterior communicating artery; V4 = intradural segment of the vertebral artery; PICA = posterior inferior cerebellar artery; PCA = posterior cerebral artery; ECA = external carotid artery. *Anatomical location of the dAVF