Robotic Routing in Complex Aortic Interventions

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Objectives:
The robotic navigation system Magellan / Northstar was used as an adjunct for intravascular routing during TAA-EVARs with complex anatomies and early experiences are presented.

Methods:
Magellan (HansenMedical Inc., US) is a robotic navigation system for vascular use consisting of a steerable sheath/catheter combination, that allows to control deflection of the catheter-tip up to 180° and 90° of the sheath tip as well, both in a full 360° rotation range. The sheaths come with 9F OD and 6F ID. The wire manipulation unit works with all common gages.

We report about the usage in 9 TAA-EVARs with complex anatomies. 6 robotic procedures were performed via a left axillary and 3 via a transfemoral access.

Example:
- 62 y active farmer
- accidental found TAAA IV (max. 67mm), bilateral common iliac and popliteal arteries aneurysmic as well
- Comorbidity:
  - CHD, MI in history, asymptomatic
  - hypertension

Case Planning:
- TEVAR feasible with off-the-shelf TBRANCH-graft (COOK) and additional double tapered tube proximally (COOK)
- preservation of both hypogastrics with 2 iliac bifurcated devices (COOK)
- MAGELLAN for robotic navigation
- staged surgical approach for popliteal artery repair

Results:
In 9 patients (72 ± 8 y.) with 3 juxtarenal and 6 TAAA EVAR was performed by implantation of 3 fenestrated and 6 branched endografts (COOK). Technical success was 100%. Mechanical overload effected in replacement of 2 robotic catheters. Mean wiring time was 20 min transfemorally and 24 min transaxially. Magellan was in use for 22 min/fenestration and 77 ± 15 min/branch. Mean fluoroscopy time was 7 min/fenestration vs. 8 min/branch. One renal artery dissection resulted from manual sheath exchange and could be stented. Hospital mortality was 2/9 with 1 paraplegic among the deaths.

Conclusions:
Magellan is a promising vascular navigation tool providing additional possibilities for better control of endovascular maneuvers in complex EVARs. Antegrade usage is feasible and beneficial. In this series Magellan enhanced the technical success rate.