

ROSES, a game changer in Endovascular Surgery

Guido Danieli

Università della Calabria - 87036 Rende (CS) – Italy

Calabrian High Tech – CHT S.r.l. – Via Svezia 151 - 87036 Rende (CS) – Italy

ABSTRACT

ROSES, a Robotic System for Endovascular Surgery, is characterized by a unique system to measure forces opposed by the body to catheters and guide wire advancements, always active and without the need for special additions. It is configured as a series of robotic actuators (up to three) placed in line on slides running on a rail, tilted toward the patient, on which another slide hosts a pair of step motors enabling movement of the relative position between the various actuators, while the proximal actuator is fixed to the motor slide by a lateral bar. A force transducer is connected through a wire to the motor slide, subject to the g component of whatever is sitting on a rail, which does not change even if the actuators move, but the force changes if something external blocks the progress of the catheter and guide wires, alerting the doctor.

Small purely mechanical disposables are used, designed for any type of intervention using catheters and guide wires commercially available, from angioplasty to brain and carotid surgery (aneurysms or thrombi), TAVI, not to forget general lower and upper limb interventions. Able to guide the introduction of pre-curved first catheters, in a short period will have also animated catheters able to change shape configuration on console control.

Since the system also measures the length of penetration of each device, passing this information to a workstation, together with X-ray images, the system becomes the black box of endovascular surgeries, which also separates doctors from patients during the entire surgery. The system is protected by various international patent applications about to be released.