Projet EndoVx : Nouvelles technologies pour une prise en charge rapide et personnalisée des lésions de l'aorte

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Résumé
Abstract
Abdominal Aortic Aneurysms (AAA) are the most common type of aortic lesions, with a worldwide prevalence estimated at between 1.2 and 7.6% in populations above 50 years old. Once an AAA reaches a certain diameter threshold or ruptures, surgical repair is performed either by open surgery (OSR) or by minimally invasive endovascular repair techniques (EVAR), using endovascular delivery of covered stent-grafts. This procedure can be complex when visceral and renal arteries have to be incorporated into the repair needed for patient-specific endoprostheses (FEVAR or BEVAR).
Access to patient-specific endoprostheses required to perform EVAR on complex aortic aneurysms is currently limited due to the high costs of medical devices and equipment, training of the medical staff, a high rate of post-surgical complications, and long and expensive manufacturing processes.
The objective of the EndoVx project is to improve endovascular management of aortic lesions, in particular complex Aortic Aneurysms (AA), by deploying an innovative and integrated clinical workflow, thereby reducing the time between aortic lesion measurement and the surgical intervention from 3-6 months to 15 days.
Thanks to major innovations and advances in AI developed by Incepto, PrediSurge and GE Medical Systems, digital simulation and 3D printing will be leveraged in order to provide all patients with a rapid access to the best, fully personalized treatment. Utilizing the expertise of the Groupe Hospitalier Paris Saint-Joseph for the realization of clinical studies and the strong scientific support of CentraleSupe?lec and Mines Saint-Etienne for medical image analysis and biomechanical numerical simulation, an integrated digital platform will be set up to provide advanced digital tools for the detection, diagnosis and follow-up of AAs. Patient-specific endoprostheses designed using the digital platform will be manufactured in a time- and cost-efficient manner thanks to a new material/manufacturing combination developed by 3D Medlab and the CNRS. Furthermore, the surgical implantation of these devices will be made more secure thanks to innovative training paths based on the use of life-like 3D-printed models developed by Biomodex (also developed to replace animals for pre-clinical testing) in collaboration with CentraleSupe?lec, and new per-operative decision-making support tools developed by GE Medical Systems.

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