

EMBARGOED FOR RELEASE: June 10, 2016

EVOLVING RESEARCH SHOWS THAT 3D PRINTING HAS THE POTENTIAL TO REVOLUTIONIZE THE WAY HEART CONDITIONS ARE TREATED

Seattle, WA – While 3D printing has been around since the mid-1980s, there is accumulating evidence that this technology has the potential to revolutionize the understanding and management of heart conditions. A team of researchers from the Cleveland Clinic created a 3D model of an aortic valve from a patient with a severe case of calcific aortic stenosis (AS) – narrowing of the aortic valve – to simulate the patient’s beating heart and assess the blood flow, or “hemodynamics.”

“In order to better understand the physiology of AS (which can be complex), we produced a true replicate of the valve using 3D printing technology. Then, to assess the valve hemodynamics, we placed the 3D printed valve into a “circuit” where flow can be “controlled” and we can try out different flow conditions. In this research, we present a “proof of concept” case of severe AS where the pressure gradients, obtained by cardiac ultrasound, were successfully replicated in the “circuit” built around the 3D printed version of the stenotic valve,” said lead author Serge Harb, MD, of Cleveland Clinic, Cleveland, Ohio.

The hemodynamic results using this 3D printed valve in the flow circuit simulating the pumping action of the heart, were confirmed by Doppler echocardiography, the technique used in daily practice to evaluate patients with AS. Harb said, “This technology shows a lot of promise. Not only will it help us better understand the mechanisms of the disease, but it also has the potential to provide a more personalized treatment where the particular valve of the affected patient is 3D printed, guiding its optimal management. This may be particularly helpful for surgical planning, or when using new catheter-based technologies for non-surgical valve replacement.”

Researchers on the study, *Three Dimensional (3D) Printing and Functional Assessment of Aortic Stenosis Using a Flow Circuit: Feasibility and Reproducibility*, include Serge C. Harb, Ryan Klatte, Brian P. Griffin, and Leonardo L. Rodriguez, from the Cleveland Clinic Foundation, Cleveland, Ohio.

Dr. Harb will present a poster based on this research on Sunday, June 12, 2016 during the American Society of Echocardiography 27th Annual Scientific Sessions at the Washington State Convention Center in Seattle, WA. To schedule an interview with Dr. Harb, please contact [Angie Porter](#).

As the largest global organization for cardiovascular ultrasound imaging, the American Society of Echocardiography (ASE) is the leader and advocate, setting practice standards and guidelines. Comprised of nearly 17,000 physicians, sonographers, nurses, and scientists, ASE is a strong voice providing guidance, expertise, and education to its members with a commitment to improving the practice of ultrasound and imaging of the heart and cardiovascular system for better patient outcomes. For more information about ASE and the 2016 Scientific Sessions, visit ASEScientificSessions.org/.

###