

Three Dimensional Visualization of Right Ventricle Provides Important Information for Treatment of Patients with Tetralogy of Fallot, According to a Study in The American Journal of Cardiology

Model Created Using Piecewise Smooth Subdivision Surface Provides Both Shape and Volumetric Evaluation of Tetralogy of Fallot Patients

SEATTLE, April 8, 2008 /PRNewswire/ -- Three dimensional visualization of the right ventricle provides important shape and volumetric insights that help cardiologists diagnose and treat patients with tetralogy of Fallot (TOF), according to a paper published in the American Journal Cardiology (2008; Vol. 101, Issue 1, 107-113).

TOF is a disease that impacts the heart in multiple ways, such as creating a hole between the ventricles and developing levels of obstruction from the right ventricle to the lungs known as pulmonary stenosis. The three dimensional models created in the study provided volumetric data that was used to determine that patients with TOF had dilated right ventricles compared to individuals with normal function (end-diastolic volume index 216+/- 99 vs 81 +/- 16 ml/mm, $p < 0.001$). The three dimensional models also provided an understanding of changes to the shape of the right ventricle that doctors can use to analyze how the heart adapts to hemodynamic overload.

Entitled "Three-Dimensional Analysis of Right Ventricular Remodeling in Repaired Tetralogy of Fallot," the paper was authored by Dr. Florence H. Sheehan, M.D. The research was a collaboration between investigators at Texas Children's Hospital, Oregon Health & Science University, University of Iowa, and University of Washington in Seattle, Wash. The study used piecewise smooth subdivision reconstruction to create three dimensional models of the hearts of 8 normal subjects and 15 patients with repaired TOF.

"Right ventricle measurement is a critical component in understanding the effectiveness of TOF repair," said Dr. Florence Sheehan, M.D., who is a professor at the University of Washington and chief scientist of VentriPoint Diagnostics Ltd. "We hope to now fully develop the novel diagnostic tools that make the process of accurately obtaining this information easier and much quicker."

Researchers apply the piecewise smooth subdivision surface method by tracing heart borders from many two dimensional images of a heart. VentriPoint Diagnostics is developing a new product, the VentriPoint Diagnostic System (VDS), that enables a similar analysis after a medical professional enters a small number of anatomical points on the heart images. The VDS uses Knowledge Based Reconstruction to automatically compare the points to a database and generate a three dimensional model. This model provides volumetric and anatomical data for the cardiologist.

"The VentriPoint Diagnostic System's ability to rapidly and easily provide right ventricle measurement in multiple disease areas, including tetralogy of Fallot, shows us that this technology will have broad potential once fully developed," said Joseph Ashley, CEO of

VentriPoint Diagnostics. "Based on results similar to these from our working prototype, we hope to move into beta testing later this year."

About VentriPoint Diagnostics

VentriPoint creates diagnostic tools to monitor patients with heart disease - the number one cause of death in developed countries. Its lead technology, the VentriPoint Diagnostic System, improves existing medical imaging systems to rapidly and cost effectively obtain measurements that are critical but currently unavailable. Through its technology license and research and development agreements with the University of Washington, VentriPoint is developing this breakthrough diagnostic tool that can provide measurement of a heart's volume and ventricular ejection fraction. The VentriPoint Diagnostic System, together with its associated online service, is being developed for a variety of heart related disease states, including congenital heart disease.