Friday, November 22nd, 2013, 4:00 P.M.
Room No. 115, DASAN bldg. 1st Floor

(Host: Prof. Kim, Jae Gwan / Language: English)

Fluid-responsiveness based on heart-lung interaction and Doppler tissue Imaging for cardiac performance

Prof. Tae-Yop Kim

Department of Anesthesia, Konkuk University School of Medicine

Meticulous non-invasive and invasive monitor devices are required for managing hemodynamic status and cardiovascular performance in cardiac anesthesia as well as managing critically ill patients.

Intravascular fluid optimization is one of the most important parts of the patient management. For this, stroke volume variation (SVV) and pulse pressure variation (PPV) in arterial pressure waveform have been introduced. These dynamic indices based on heart-lung interaction showed much greater efficacy in determining intravascular filling status (cardiac preload) and predicting "fluid responsiveness", compared to conventional pressure-derived static indices, such as central venous pressure and pulmonary artery occlusion pressure. Photo plethysmography (PPG) is a simple optical technique that has been widely used to monitor changes in blood oxygenation at the skin surface or regional tissue, as in pulse oximetry and cerebral oximetry, and blood in pulmonary artery (SvO_2), as in pulmonary artery catheter. Recently, pleth variability index (PVI) and surgical pleth index (SPI) based on PPG technology have been introduced to predict "fluid responsiveness" in critically ill patients and the balance between nociception and anti-nociception during general anesthesia, respectively.

Transesophageal echocardiography (TEE) is an important intraoperative monitor for evaluating patient's cardiac pathophysiology as well as managing intraoperative cardiovascular performance. In addition to the 2-dimensional (2D) and Doppler imaging of cardiovascular system, tissue Doppler imaging (TDI) of cardiac structure (mitral annulus) using TEE showed considerable efficacy in continuous evaluation of intraoperative changes in systolic (contraction) and diastolic (relaxation) function of the left ventricle.

There may be a great potential for expanding the application of these advanced technologies to the area beyond their current clinical usage.

To facilitate further progress in terms of developing newer analysis technique and achieving additional applications, much wider and deeper understanding of the current application is required in both sides of medical engineering and clinical practice.

Biosketch

Dr. Tae-Yop Kim is Professor of Anaesthesiology at the Konkuk University School of Medicine, Seoul, Korea. He has been a Chief of the Cardiac Anaesthesia Team in Konkuk University Medical Centre and has been served to provide the Cardiac Anaesthesia Service with various up-to-date patient monitors and advanced intraoperative transesophageal echocardiography (TEE). He has expertise in intraoperative echocardiographic evaluation of cardiac valve repair surgery and real-time 3-dimensional TEE.

His major interest includes fast-track cardiac anesthesia, intraoperative intravascular volume optimization using recent less-invasive hemodynamic monitors, intraoperative point-of-care coagulation monitors, intraoperative use of recent-generation hydroxyethyl starch, impact of anesthesia regimens on left ventricular function and myocardial injury using tissue Doppler imaging, intraoperative evaluation of cardiac valve procedures using 3-dimensional TEE. He also published many original articles and case reports in many international journals and presented many outstanding abstracts in the major meetings of anaesthesiology and echocardiography.