KTH BioMEx CENTER SEMINAR; Friday, June 5th, 10.15; Seminar room Faxén, KTH, Teknikringen 8

Natzi Sakalihasan

"Functional imaging of aortic aneurysms, and how it impacts outcomes (PET/CT)"

Rupture of abdominal aortic aneurysm (AAA) is the 13th leading cause of death in western society. Moreover, AAA is generally asymptomatic, so precise prediction of AAA rupture risk is essential. AAA diameter is the most usual predictor factor for the risk of rupture. Surgery is recommended when the maximum diameter of an AAA is higher than 55 mm. Currently a conservative approach is often considered for patients with small AAA. However, some small aneurysms could rupture and many large aneurysms may remain stable or grow to a considerable size without rupture. So diameter is neither the sole nor the most determinant factor to predict the risk of rupture. The remodeling of the wall leading to the expansion and rupture of AAA is characterized by chronic local inflammation, extracellular matrix degradation and smooth muscle cells apoptosis. The inflammatory infiltrate is compounded by a majority of lymphocytes and macrophages. These immune cells produced and/or activated proteolytic enzymes and different cytokines. These enzymes are matrix metalloproteinases (MMP) causing the degradation of elastin and collagen in the aneurysmal wall leading to the remodeling of the wall and rupture. The evaluation of inflammation could be a predictive tool for rupture of AAA. The positron emission tomography (PET), using 18F-Fluorodeoxyglucose (FDG), a derivative of glucose, as radiotracer, allows the detection of hypermetabolic activity of cells as seen in inflammatory process. Preliminary data shows focal uptake of FDG within the aneurysmal wall in patients with large, rapidly expanding or symptomatic aneurysms that are prone to rupture. Moreover, the site that had incorporated the FDG corresponded in some cases with the site where AAA rupture occurs. Recent studies performed in Liege confirmed that the metabolically active spots detected by the uptake of 18F-FDG display striking alterations potentially related to medical degeneration and significant degradation of the fibrillar structures of the adventitia, which may ultimately lead to rupture.

Professor Natzi Sakalihasan is a cardiovascular and thoracic surgeon, Clinical Professor and the director of the "Center of the research and experimental surgery" (CREDEC) at the University of Liege, GIGA cardio-vascular sciences Liege, Belgium. He received his medical school diploma from Cerrahpasa medical school of the University of Istanbul, and its equivalence from University of Liege. From 1986 up to date, Natzi Sakalihasan is working as cardiovascular surgeon in the department of cardiovascular and thoracic surgery at the University Hospital of Liege. He defended his PhD and Aggregation thesis on aortic aneurysms in 1994 and 2005, respectively. Professor Sakalihasan authored/coauthored about 90 scientific papers including about 50 papers on abdominal aortic aneurysms. His interest in research focused specially on the all aspect of abdominal aortic aneurysm and functional imaging of the aortic diseases.

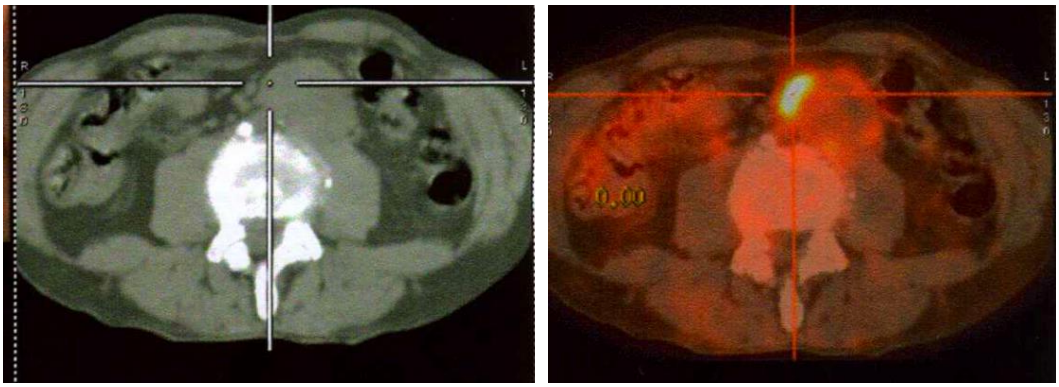

Figure 1: Small unstable abdominal aortic aneurysm (AAA) with 18F-Fluorodeoxyglucose (FDG) uptake. Left: Computer tomography (CT) scan. Right: positron emission tomography (PET).