Semi-Automated Data Extraction and Analysis for Medical Data

Abdominal aortic aneurysms (AAAs) are an often asymptomatic occurrence when the aorta, the largest artery in the body, becomes abnormally large and is at risk of rupturing. Current surgical treatment may include insertion of an endograft to keep the artery from swelling further. Regular post-surgery surveillance must continue in order to detect any later complications, such as endoleaks. Research in computational sciences at Oak Ridge National Laboratory is being done in conjunction with vascular surgeons at University of Tennessee Medical Center with the idea that, by having access to computer-analyzed medical information, better diagnosis and further endoleak prevention can be accomplished.

Several tools, including the data mining software Piranha, were used to extract and analyze patient medical information, and the statistical analysis tool JMP verified correlations between certain conditions and a higher risk of endoleak occurrence. The results showed that patients from the reviewed population were at a significantly higher risk of endoleak occurrence when comorbidities included atrial fibrillation (Chi-Square test, p=0.0049) or angina (p=0.03). A significantly higher risk of endoleak persistence was also found in patients suffering simultaneously from chronic obstructive pulmonary disease and depression/other psychiatric problems (Fisher’s Exact Test p=0.03). The research presented will contribute to better prediction of risks associated with endoleaks and the need for further surgical intervention, as well as a more efficient analysis of medical data.

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