

ITEA project results enhancing people's lives

Prevent rupture of a brain artery

Each day, lives of people are endangered by aneurysms. In the case of an aneurysm, the wall of a blood vessel gets weakened, so it can locally bulge and in some cases even rupture. If this happens in the brain, it may cause serious disabilities or even death.

Aneurysms can be treated by navigating a thin catheter, under X-ray guidance, to the location of the aneurysm and placing a perforated stent as a kind of 'inner tube' in the vessel. This reduces bloodflow into the aneurysm so that it will gradually clot there and consequently remove the pressure from the aneurysm.

Until now the physician could only predict the long-term success of the surgery by a subjective visual assessment of flow patterns, which could easily be influenced by several factors (e.g. the injection of less or more contrast fluid). Only after a check-up, a couple of months later, could the result of the surgery be assessed. In some cases, the stent appeared to be implemented inaccurately, which meant that the patient had been at risk for a longer period and needed to undergo another surgery on top of that.

In the ITEA project BENEFIT a quantitative method has been developed, which can objectively predict the chance of success by means of the 'Mean Aneurysm Flow Amplitude ratio'. It is the first interventional tool to visualise and quantify flow patterns in a vessel and an aneurysm. It is calculated from a fast sequence of X-ray images before and after stent placement. A ratio below 0.9 has proven to be a reliable indicator of successful treatment. If the outcome is higher, the surgeon can take additional measures (e.g. placing an extra stent) while the patient is still on the table and the catheter is in place. This way, the risk for the patient is reduced as well as the need for repeated treatments, saving money and lives at the same time, while improving the patient's wellbeing as well.

**ITEA 2 project
BENEFIT**

Diagnosis

aneurysm

