Background: The approach of transcatheter aortic valve implantation (TAVI) is primarily guided by the assessment of iliac-femoral tract diameter. A minimal diameter of 6mm of the transfemoral tract is required for transfemoral TAVI. Currently, projection angiography (XA) and CT-angiography (CTA) are used interchangeably to evaluate suitability of the iliac-femoral tract. Discrepancies between XA and CTA remain to be elucidated. We aim to reveal differences in iliaco-femoral tract diameters of TAVI candidates assessed by XA and CTA.

Methods: Iliac-femoral tract diameters were measured in 538 patients by both XA and CTA (n=269) performed prior to aortic valve replacement and before discharge. MRI studies included axial diffusion weighted, T2 weighted, FLAIR-weighted images to detect new cerebral lesions. 44 consecutive patients (26 male, 18 female, mean age 81 years) were studied. We compared the rate of new periprocedural embolic cerebral insults and microbleeds in patients after TAVI and surgical AVR by MRI and their respective clinical outcome. We have previously shown that there is an increased rate of embolic cerebral insults after transcatheter aortic valve implantation (TAVI). Cerebral microbleeds have been identified as a marker for poor neurologic outcome. The aim of this study was to assess and compare the rate of new periprocedural embolic cerebral insults and microbleeds in patients after TAVI and surgical AVR by MRI and their respective clinical outcome.

Results: All patients had uneventful BAVs with this form of Impella support. The in-hospital mortality was 15% with mean hospital length of stay 6 days +/- 3. Mean Parsonnet predicted 30 day mortality 38.9%. Mean EuroSCORE II predicted mortality 52.42%. STS – mean Mortality or morbidity 87.1% +/- 23.7%. The maximal lesion size was < 5mm in 10 patients, < 10mm in 17 patients and > 10mm in 3 patients. Despite the high incidence of morphology detectable lesions only a single patient developed relevant neurologic symptoms of a stroke. Within both patient groups (TAVI or surgical AVR) microbleeds were only detected in 13% of the TAVI patients but in 64% of patients after surgical AVR. New embolic cerebral insults and microbleeds detected by MRI were seen in 3% patients. No clinically relevant strokes were seen in this group. In contrast, cerebral microbleeds were only detected in 13% of the TAVI patients but in 64% of patients after surgical AVR.

Conclusions: New embolic cerebral insults and microbleeds detected by MRI were seen in both patient groups (TAVI or surgical AVR). Patients after surgical AVR showed more microbleeds, whereas patients after TAVI showed more embolic ischemic insults. However, despite the high percentage of MRI detected lesions in both groups, relevant neurological symptoms were very rare and mostly transitory.

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Embolic Cerebral Insults and Microbleeds after Percutaneous Aortic Valve Replacement and Surgical Aortic Valve Replacement detected by Magnetic Resonance Imaging

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Background: We have previously shown that there is an increased rate of embolic cerebral insults after transcatheter aortic valve implantation (TAVI). Cerebral microbleeds have been identified as a marker for poor neurologic outcome. The aim of this study was to assess and compare the rate of new periprocedural embolic cerebral insults and microbleeds in patients after TAVI and surgical AVR by MRI and their respective clinical outcome.

Methods: 48 consecutive patients (18 male, 30 female, mean age 81±5 years, average log. Euroscore 13±10%) undergoing TAVI received a cranial MRI before and after the TAVI procedure to detect new cerebral lesions. 44 consecutive patients (26 male, 18 female, mean age 78±5 years, average log. Euroscore 13±10%) undergoing surgical AVR also received a baseline cerebral MRI scan preoperatively and MRI was repeated within 6 days after valve implantation. MRI studies included axial diffusion weighted, T2 weighted, FLAIR-weighted and T2 gradient echo sequences. Standardized clinical assessment of the neurologic status was performed prior to aortic valve replacement and before discharge.

Results: In 63% of the TAVI patients new cerebral embolic lesions could be detected in the postprocedural MRI. The maximal lesion size was < 5mm in 10 patients, < 10mm in 17 patients and > 10mm in 3 patients. Despite the high incidence of morphology detectable lesions only a single patient developed relevant neurologic symptoms of a stroke. Within both patient groups (TAVI or surgical AVR) microbleeds were only detected in 13% of the TAVI patients but in 64% of patients after surgical AVR.

Conclusions: New embolic cerebral insults and microbleeds detected by MRI were seen in both patient groups (TAVI or surgical AVR). Patients after surgical AVR showed more microbleeds, whereas patients after TAVI showed more embolic ischemic insults. However, despite the high percentage of MRI detected lesions in both groups, relevant neurological symptoms were very rare and mostly transitory.