Abstract number: Lond19A-POS004
Abstract type: Poster
Reference: This abstract was presented at PCR London Valves 2019, 17-19 November 2019, London
Link: https://abstractbook.pcronline.com/export/pdf/id/150044
Published on: 25 October 2019

The iliofemoral tortuosity score predicts access and bleeding complications during transfemoral TAVI

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THEME: Interventions for Valvular Disease
TOPIC(S): TAVI

AIMS
Reliably predicting vascular complications after transcatheter aortic valve implantation remains one of the significant challenges up until today. The iliofemoral tortuosity is a known potential risk factor for vascular complications during transfemoral transcatheter aortic valve implantation, yet has been difficult to quantify. Therefore, this study evaluated the impact of novel scoring methods of iliofemoral tortuosity on the prognosis of vascular access complications and patient outcome.

METHODS AND RESULTS
Between June 2009 and December 2016, 237 TF-TAVI patients were examined retrospectively. Tortuosity of iliofemoral arteries was assessed by 3mensioValvesTM software analysis of preoperative MDCT-scans. The main access vessel has been assessed between the aorto-iliacal bifurcation and the femoral bifurcation. Single angels were measured every 15mm in all spatial directions. Tortuosity was assessed by three quantitative methods: 1 - the maximum single angle (MSA) along the entire vessel length, 2 - the sum of all angles (SAA) as well as the 3) Iliofemoral tortuosity (IFT) score [((true vessel length/ideal vessel length)-1)*100]. ROC-Analysis has been performed, and cut-off values were calculated using the Youden Index. The primary study endpoint was a composite of bleeding and access complications as defined by the Valve Academic Research Consortium 2 (VARC-2) criteria. The secondary study endpoints were 30-day mortality and a composite safety endpoint. Access and bleeding complications occurred in 73 patients (13.7%). While the MSA and the SAA did not correlate with the composite primary endpoint (p=0.990; p=0.224) the IFT score proved to be a good predictor (p=0.016; cut off: 21,2; sensitivity 0.77, specificity 0.43), especially of overall bleeding events (p=0.005; cut off: 21.2; sensitivity 0.79, specificity 0.42). Furthermore, both the IFT and the MSA positively correlated with minor minor bleeding events (IFT: p=0.009, cut-off 26.6; sensitivity 0.56; specificity 0.69; MSA: p=0.032; cut-off 35.5°; sensitivity 0.78; specificity 0.40). For the secondary endpoints, no relation between 30-day mortality or the composite safety endpoint with neither one of the measures has been observed.

CONCLUSIONS
Vascular tortuosity is an underestimated risk factor during transcatheter aortic valve implantation. The IFT-score is a valuable tool in risk stratification prior to TF-TAVI positively predicting access and bleeding complications. As major adverse events are rarely seen nowadays in the transfemoral approach, further research is needed to validate our study's findings.