

## **Risk of deep venous thrombosis after different treatment strategies of femoral artery pseudoaneurysm**

Joerg Herold<sup>1</sup>, Jonas Jünger<sup>1</sup>, Sophie Peters<sup>1</sup>, Maria Stolt<sup>1</sup>, Roland Prondzinsky<sup>2</sup> and R. C. Braun-Dullaes<sup>1</sup>

<sup>1</sup>Department of Cardiology and Angiology of the University of Magdeburg, Germany

<sup>2</sup>Department of Cardiology and Angiology Carl-von-Basedow-Klinikum Saalekreis GmbH

**Introduction:** Pseudoaneurysm (PSA), with a rate up to 4%, represents the most common iatrogenic complication after coronary angiography. The therapeutic management of PSA ranges from ultrasound-guided compression followed by pressure bandage (PB) to thrombin injection (TI) up to surgical intervention. All techniques suggest an increased risk for deep venous thrombosis (DVT). However, a systematic analysis of DVT and the direct comparison of different strategies have not been realized until now.

**Aim:** In this study we analyzed the efficiency of PB-treatment and TI-treatment in patients with PSA, evaluated number and localization and compared the strategies to each other. **Methods:** From 2010 until 2015, 350 patients with PSA at our University were examined of which 220 patients were included into the study. When PSA was detected, compression sonography of superficial, deep and muscle veins of the lower and upper limb was done at both legs for presence of DVT. We only included patients without DVT at the time of PSA-detection and excluded all patients with a simultaneous occurrence of PSA and DVT. Patients were treated with PB (n=150) for average 24h or TI (n=66; Tissuecol, Baxter USA) followed by a PB for 2h. Four of the patients were transferred to vascular surgery. All patients were screened intensively by duplex- and compression sonography after 24h to control sufficient PSA treatment and incidences of DVT.

**Results:** Thirty-five of 220 patients presented with new DVT (16%). The DVT appearance was ipsilateral in two of three cases (69%), in 22% contralateral and in 9% within both legs. The baseline-characteristic showed no significant differences regarding cardiac risk factors such as diabetes (PB 33% vs. 44% TI, p=0.11), hypertension (PB 91% vs. 94% TI, p=0.49), and age (mean: PB: 70.3 years vs. 71.0 years TI, p=0.68). BMI was higher within the TI-group (mean: PB 27 vs. 29 TI, p<0.06). TI treatment was successful in 56 of 66 first-time attempts (success-rate of 84.8%; 95%-confidence interval: 73.9% -92.5%) and no arterial embolism was caused by TI. There were far less DVT-appearances in the TI-group (10.6%) as compared to the PB-group (18.7%; Odds ratio 1.8; p<0.01; chi-square-test with n= 216). In the PB-group, compression was successful in 79 of 150 patients (success-rate of 52.7%, with a 95%-confidence interval: 44.4%-60.9%), which was significantly lower compared to TI-treatment (p<0.001, chi-square-test with n= 216).

**Summary:** Our study clearly demonstrates the safety of therapeutic TI for treating PSA. TI is superior to PB-treatment both in success-rate and the incidence of DVT. TI treatment was demonstrated to have nearly twice the success rate of PPG and reduced DVT cases by half.