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Is stent thrombosis caused by patient-related factors or by operator-related factors?

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Background/Introduction: Stent thrombosis (ST) is the most feared complication of percutaneous coronary intervention (PCI).
Purpose: To analyze the patient-, lesion- and operator-related risk factors of ST.
Methods: Coronary angiograms of 1764 consecutive patients admitted between 2014–16 with an acute coronary syndrome (ACS) to a large tertiary center have been analyzed retrospectively for the presence of ST. ST was found in 29 of them (1,6% of all ACS patients). Paired angiograms (initial PCI from the time of stent implantation and second angiography done at the time of ST) from these 29 ST patients were analyzed by two independent observers with focus on lesion characteristics and procedure techniques. Clinical and laboratory data were included in the analysis.
Results: The following risk factors for ST were found: renal insufficiency (OR 4,30; p<0,001), type 2. diabetes (OR 2.24, p=0,03), stent implantation for STEMI (OR 1,75; p=0,009), left main or left anterior descending artery as culprit lesion (OR 2,80; p<0,001), absolute platelet count (p=0,005) and absence of antiplatelet therapy prior to ST (OR 1,87; p=0,01). The rates of lesion-/operator-related factors among ST patients were: bifurcation lesion (n=7; 24%), heavy coronary calcifications (n=13; 44%), wrong stent size selection (diameter undersizing or incomplete lesion coverage) (n=6, 20%). A combination of at least one clinical/laboratory and one lesion/operator risk factor was identified in 28 patients out of 29 with confirmed ST (96%).
Conclusion: Stent thrombosis usually occurs when clinical, laboratory, lesion and/or operator-related risk factors combine together. While clinical, laboratory and lesion-related factors are well described in the literature, operator-related factors need more detailed research.