Background and objective The Mehran classification is used to determine the presence of in-stent restenosis (ISR) and characterization of its subtypes in invasive coronary angiography (ICA). The utility of computed tomography angiography (CTA) for the assessment of Mehran classification is unknown. We aimed to compare the agreement and reproducibility of Mehran classification between ICA and CTA and evaluate the sensitivity and specificity of both imaging modalities.

Methods Consecutive patients who had ISR on ICA preceded with CTA as intervention were enrolled in our study. Modified Mehran’s classification was employed by CTA and ICA to classify ISR into four subtypes: focal (type I [A, B, C]), in-stent (type II [A, B, C]), proliferative (type III [A, B, C]), and total occlusion (type IV). Agreement between ISR classification and main vessel length, reference vessel diameter (RVD), and bifurcation angles were compared.

Results Four hundred and five patients with 431 bifurcation PCI’s with ISR were included in this investigation. The total agreement between CTA and ICA for assessment of Mehran class was poor (kappa=0.168). Proliferative ISR (25% vs. 10%; p-value 0.012) and total occlusions (24% vs. 5%; p-value < 0.001) were reclassified more often between ICA and CTA, respectively. CTA assessment of lesion length was significantly longer than that of ICA measurements in all subtypes of ISR (32.15 ± 5.23 vs. 27.41 ± 3.63; p-value 0.004). ROC curve expressed CTA to be more sensitive and specific than ICA in diagnosing ISR.

Conclusion In conclusion, Mehran classification was significantly affected by imaging modality, and CTA results were more reproducible compared to ICA. Therefore, CTA evaluation of ISR may facilitate treatment options and generate a sound plan before the procedure.

Conflict of Interest None to declare