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Digital zoom decreases radiation exposure dose up to 30% in percutaneous coronary interventionN. Umemoto¹, K. Hasegawa², Y. Iio¹, I. Inoue¹, T. Sumi¹, T. Sugiura¹, T. Taniguchi¹, T. Asai¹, M. Yamada¹, H. Ishii³, T. Murohara³, K. Shimizu¹¹Ichinomiya Municipal Hospital, Department of Cardiology, Ichinomiya, Aichi, Japan; ²Ichinomiya Municipal Hospital, Department of Radiology, Ichinomiya, Aichi, Japan; ³Nagoya University Hospital, Department of Cardiology, Nagoya, Japan

Background: Interventional cardiology is gaining greater popularity worldwide with each passing year. Reduction of exposure dose is a very imminent and an important issue in cardiology procedure. Although a newer radiation reduction technique, device and procedure are very valuable and expected, we should consider about therapy technique, radiation technique, devices, and the way to protection. Digital zoom digitally enlarges images in real time by up to 2.5-fold at lower doses than those used with traditional field of view changes. In our phantom examination the average dose reduction of digital zoom was 27%.

Methods and results: This study is designated as single-center, retrospective, not-randomized, observation study. 2101 eligible cases were collected. We assigned the cases of PCI without the use of Digital zoom to the Conventional group and those involving the use of Digital zoom to the Digital zoom group. There were 806 patients in the Conventional group and 1195 in the Digital zoom group. Because we had begun using Digital zoom from January 2015 onwards, all patients in the Conventional group had undergone PCI from January 2013 to December 2014 and all patients in the Digital zoom group had undergone PCI from January 2015 to December 2016. In addition, we calculated the RAK/minute and DAP/minute

for an accurate assessment. To minimize the difference of characteristics between two groups, propensity score including all baseline variables was performed. Furthermore, Predictors of radiation exposure were investigated using multivariable least square methods. Inter group differences were observed in DAP, RAK, DAP/min, and RAK/min (Digital zoom group vs conventional group: DAP, 16000 cGy cm² [from 1st quartile to 3rd quartile; 10300–24400] vs 20700 [13400–29500], $p < 0.001$; DAP/min, 557 cGy cm²/min [392–737] vs 782 [571–1010], $p < 0.01$; RAK, 1590 Gy [990–2410] vs 1850 [1220–2720], $p < 0.01$; RAK/min, 54.7 Gy/min [38.5–73.2] vs 71.2 [51.5–93.0], $p < 0.01$). Even after propensity score matching, intergroup differences in DAP (810 cases), DAP/min (811 cases), RAK (746 cases), and RAK/min (744 cases) persisted. Furthermore, the least squares method showed that Digital zoom is an important predictor of DAP ($\beta = 0.17$, $p < 0.01$) and RAK ($\beta = 0.12$, $p < 0.01$).

Conclusion: Digital zoom is an old and cost-free technique, but one of most powerful reduction of exposure method. Propensity score adjustment and least square methods show that digital zoom is one of independent effective method.