

## Direct comparison of bioabsorbable and biodurable polymer everolimus-eluting stent in neointimal stent coverage and in-stent thrombus using high-resolution angioscope

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**Background/Introduction:** Although second-generation drug eluting stent (DES) employing biodurable polymer drastically shortened the duration of dual antiplatelet therapy (DAPT), previous reports raised concerns that switching from DAPT to single antiplatelet therapy increased rates of subsequent stent thrombosis with time. Third-generation DES employing bioabsorbable polymer has been introduced so as not to hinder the healing process of the vessel wall, however, at present, both DES with bioabsorbable polymer and those with biodurable polymer are used in parallel. It means there is no conclusive evidence regarding pros and cons of these two types of polymers.

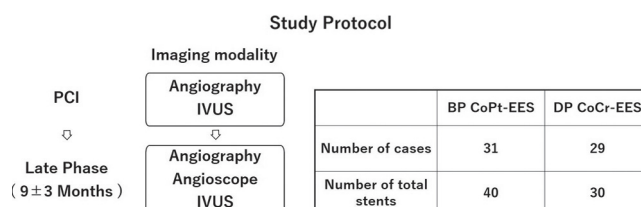
**Purpose:** This study aims to clarify how bioabsorbable polymer and biodurable polymer act on the human coronary artery by observing neointimal stent coverage (NIC) and in-stent thrombus by comparing the third-generation DES with bioabsorbable-polymer cobalt-platinum everolimus-eluting stent (BP CoPt-EES), and the second-generation DES with biodurable-polymer cobalt-chromium everolimus-eluting stent (DP CoCr-EES).

**Methods:** This is a multicenter observational study including 11 hospitals. We investigated 70 stents (BP CoPt-EES: 40, DP CoCr-EES: 30) of 60 cases, who underwent stent implantation followed by simultaneous observation by coronary angiography, IVUS and angioscopy within 6 to 12

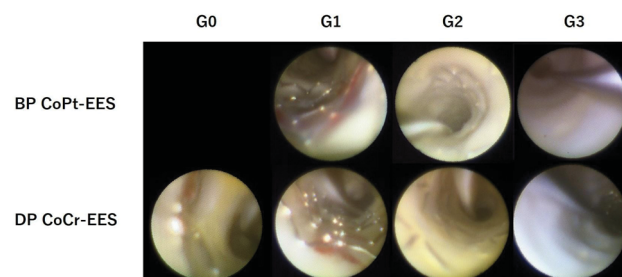
months. For angioscopy, we used a recently available, high-resolution angioscope with a pixel count of 9,000 which realized both stent coverage analysis and planar thrombus detection precisely. Neointimal stent coverage was graded from G0: non coverage to G3: full coverage, and heterogeneity value of neointima was measured as the difference between maximum and minimum NIC grade.

**Results:** A strong relationship was observed between NIC grade and in-stent thrombus in all stents ( $p=0.0011$ ), and between the heterogeneity value and stent thrombus ( $p=0.012$ ). There was no statistical difference in NIC grade between BP CoPt-EES vs. DP CoCr-EES; grade 0: 0 (0.0%) vs. 2 (6.7%), grade 1: 13 (32.5%) vs. 11 (36.7%), grade 2: 6 (15.0%) vs. 6 (20.0%), grade 3: 21 (52.5%) vs. 11 (36.7%),  $p=0.17$  and neither in the heterogeneity value of neointima ( $p=0.49$ ). The ratio of stent thrombus did not reach statistical difference; 16 (40.0%) in BP CoPt-EES vs. 17 (56.7%) in DP CoCr-EES ( $p=0.23$ ).

**Conclusion:** The existence of stent thrombus was associated with the neointimal stent coverage. There was no significant difference both in neointimal stent coverage and stent thrombus between bioabsorbable polymer cobalt-platinum EES and biodurable polymer cobalt-chromium EES after 6 to 12 months following stent deployment.



### Stent coverage and thrombus observed by high-resolution angioscopy



\*No stent of NIC G0 was observed in BP CoPt-EES group