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## Myocardial injury assessed by T1 mapping after on-pump and off-pump coronary artery bypass grafting. a pre-specified analysis of mass V trial

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**Background:** Myocardial structural damage may occur during coronary artery bypass grafting (CABG) surgery and is identified by the significant release of cardiac biomarkers. However, the evidence of these structural myocardial changes after CABG by current imaging methods remains unknown. To evaluate myocardial structure, we used the T1 mapping of cardiac magnetic resonance (CMR) before and after on-pump and off-pump CABG.

**Methods:** Patients with multivessel coronary artery disease and preserved ventricular function were included and underwent on or off-pump CABG. CMR and T1 mapping were performed using the MOLLI technique (modified Look-Locker inversion-recovery). Values of native T1 and extracellular volume fraction (ECV) were compared before and after on and off-pump procedures.

**Results:** Of 110 eligible patients, 34 were excluded due to the presence of new late enhancement or edema. Of 76 patients remained, 32 (42%) underwent on-pump (Group A) and 44 (58%) off-pump CABG (Group B).

All baseline characteristics were similar between groups, besides the Syntax Score that was higher in Group A ( $25 \times 21$ ,  $p=0.002$ ). For group A, native T1 before and after procedures was 1013 ms (998–1043) and 1004 ms (793–1048),  $p=0.19$ , and ECV was 26.4 (23.9–27.6) and 31.2 (27.6–33.9),  $p<0.001$ . For group B, native T1 before and after procedures was 1015 ms (970–1044) and 992 ms (867–1051),  $p=0.003$ , and ECV 27.5 (25.3–29.9) and 30.3 (26.5–34.3),  $p=0.02$ . The comparison of native T1 difference before and after procedures between groups A and B was not significant (Delta T1  $-9.8$  ( $-102$  to  $51.8$ )  $\times$   $-25.4$  ( $-119$  to  $51.2$ ),  $p=0.87$ ). However, the difference of ECV between groups was statistically significant (ECV Delta  $3.8$  ( $2.2$  to  $7.1$ )  $\times$   $1.3$  ( $-1.1$  to  $4.9$ ),  $p=0.039$ , respectively, for groups A and B).

**Conclusion:** In this sample, T1 mapping identified significant myocardial structural changes in both surgical revascularization procedures. Additionally, a marked myocardial injury generated by ECV changes were observed after on-pump CABG.

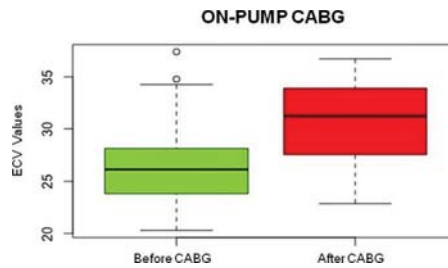


Figure 1