Novel 3-dimensional electroanatomic mapping software to find gap more easily compared
with conventional software version: the early experience of high definition coloring

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Introduction: Signal-guided gap mapping is sometimes challenging even assisted by multi-electrode
catheter and conventional 3-dimensional electroanatomical mapping (3D EAM) software. High
definition (HD) coloring (Biosense Webster, Diamond Bar, CA), a new feature of 3D EAM system
CARTO 3 version 6.0, allows the high-quality display of EAM and highlights areas of potential
conduction block, called extended early-meets-late (EEML). We aimed to validate this software whether
it could provide a better interpretation of the local activation time (LAT) and propagation map to find a
gap.

Methods: This was a single-center retrospective analysis. We applied HD coloring in 15 patients with
atrial fibrillation or atrial flutter for 17 lesions (7 for cavo-tricuspid isthmus [CTI] lines, 2 for roof linear
lines, and 9 for pulmonary vein [PV] lesions). Pentaray catheter (Biosense Webster, Diamond Bar, CA)
was used for 3D EAM mapping. In HD coloring map, lower threshold (LT) is the value of calculating
LAT differences of 2 points to highlight areas of possible conduction block.

Result: In 3 lesions (2 for CTI and 1 for roof line), bidirectional block was displayed in white line in
HD coloring map (Figure A). For 15 lesions (5 CTI lines, 9 PV lesions, and 1 roof lines), we found gap
sites using HD coloring module. Figure B and C showed right inferior PV gap after PV circumferential
ablation and CTI gap after CTI ablation. HD coloring map was well-correlated with voltage map and
ablation of these gap sites allowed to achieve linear line block or PV isolation immediately. Applying
lower or higher LT compared to optimal LT might create “pseudo” conduction block in HD coloring map
(Figure D).

Conclusion: Finding a gap site, the HD coloring module with multielectrode mapping technology
provide additional map to find a gap area more easily after PV isolation or linear line ablation. Although
there are a few pitfalls to avoid wrong interpretation, this novel module might shorten procedure time
and help to facilitate effective ablation to achieve linear block or PV isolation.