

CRT-306

Comparison of Stentboost, Stentboost Subtract and Stentboost Angiogram Imaging Software

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Background: StentBoost (SB) and StentBoost Subtract (SBSub) are part of Philips interventional tool programs in the catheterization laboratory. These two programs enhance stent visibility during stent procedures: SB acquires images at 30 fps for 30 frames, while SBSub acquires at 15 fps for up to 30 seconds (can be stopped after 2-3 seconds). We have added another term StentBoost Angio (SBAngio) to allow visualization of the vessel wall and stent using SB. The objective of this study was to assess whether the pair line resolutions are the same with SB, SBSub and SBAngio.

Method: Philip Allura Xper - FD 20 system with Interventional Tools program (Philip, Netherland. Software release 8.3.1.10200) was used. Three modes of imaging were tested: SB, SBSub (3 seconds acquisition) and SBAngio. Different contrast concentrations 30-100% (Omnipaque at 10% increments) were filled into a clear IV tubing system with Xience 2.25mm x 23mm stent (Abbott Vascular). Pair Line resolutions were measured using etched lead slide (Nr 94054, Nuclear Assoc. - Carle Place, NY). Motion resolution was tested by rotating and shifting axis by 1 and 3 cm during cine. Visual contrast and stent imaging were assessed by cardiologists with a scale 1-5 (1=not visualized, 5=excellent). Maximum pair line resolutions were recorded as line pairs/mm (LP/mm).

Result: With different concentrations of contrast, visual contrast rating was 4 for 30-80% and 5 for 90%-100%. The stent visualization quality was uniform at 4. The line pair resolutions (LP/mm) are as follows:

	SB (LP/mm)	SB Angio (LP/mm)	SBSub (LP/mm)
Resting	3.1	3.1	3.1
1 cm motion	2.8	2.8	2.5
3 cm motion	2.5	2.5	2.1 *

*SBSub had 2.5 LP/mm (after correcting for 6 missed frames).

Conclusion: Imaging qualities were similar between SB, SBAngio and SBSub on different contrast concentrations. SBSub had 11%-16% lower resolution due to 15 fps.

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Left Ventricular Mass Index and Septal E/E' Ratio is Associated with Coronary Artery Calcium Score Severity in Subjects with Normal Left Ventricular Ejection Fraction

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Objectives: There have been little data regarding the association between composite of both left ventricular mass index (LVMI) and LV diastolic function and CACS. The objective of this study is to determine whether there are association between the composite of both LVMI and septal E/E' ratio (E/E') and coronary artery calcium score (CACS) severity in subjects with normal LV ejection fraction.

Methods: We investigated 1230 consecutive subjects that CACS, LVMI and E/E' were measured by coronary computed tomography (CT) and echocardiography. LVMI and septal E/E' ratio were compared between the CACS=0 group and CACS>0 group. Further, severity of CACS (no, mild, moderate, and severe calcification) were evaluated according to LVMI and septal E/E' ratio. According to the composite of LVMI≥90 g/m² and E/E'≥15, three groups were categorized as follows; 'echo scoring system'=0,1,2.

Results: In multivariate regression analysis, both LVMI, and E/E' were independent predictors of CACS>0. Each CACS of the 3 groups was 155.99±386.50,

287.51±745.52, and 489.00±913.49, respectively (p<0.001). In the post hoc analysis, there was statistically significant difference among the three groups. In the multivariate linear regression analysis, 'echo scoring system' was an independent predictor of CACS. **Conclusions:** In our study, LVMI and E/E' were associated with presence and severity of CACS. The combination with LVMI and E/E' can be more accurate predictors of CASC than LVMI or E/E' alone.

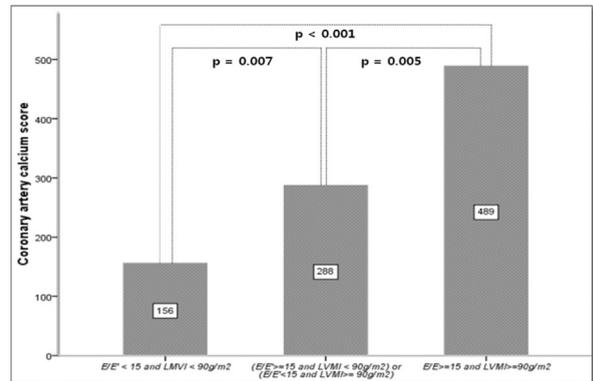


Figure 1. The association of coronary artery calcium score severity and the composite of LVMI and E/E' in the presenting data, the median value of LVMI was 89.9 g/m². In the criteria of E/E' ≥ 15 and LVMI ≥ 90 g/m², the CACS of three group was 155.99±386.50, 287.51±745.52, and 489.00±913.49 irrespectively.

IVUS

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Detection by Intracoronary Near-Infrared Spectroscopy of Lipid Core Plaque at Culprit Sites in Survivors of Cardiac Arrest

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Objectives: We sought to describe the intracoronary near-infrared spectroscopy (NIRS) findings in survivors of sudden cardiac arrest.

Background: Sudden cardiac death remains a major public health problem. Autopsy studies have established that sudden death is often attributable to rupture of an intracoronary lipid core plaque (LCP) with subsequent thrombosis. Similar observations linking LCP to sudden cardiac death have not been firmly established in vivo.

Methods: We studied five consecutive patients who presented with a sudden cardiac arrest, were successfully resuscitated, had a culprit lesion thought to be responsible for the cardiac arrest, and who underwent combined NIRS and intravascular ultrasound (IVUS) imaging prior to stent placement. To quantify the amount of lipid present by NIRS, we scanned each culprit and non-culprit segment for the maximum lipid core burden index in any 4-mm region (maxLCBI4mm).

Results: NIRS-IVUS identified the presence of a large lipid core plaque within the culprit segment of all five sudden cardiac arrest victims. The maxLCBI4mm of the culprit segment was 604 ± 174 and the culprit lesion was characterized by a maxLCBI4mm >400 in all 5 cases. In contrast, of the 28 non-culprit segments imaged with NIRS-IVUS in the present analysis, only 1 (3.6%) had a maxLCBI4mm >400.

Conclusion: The novel observation in the present study is that NIRS imaging permitted identification of a large LCP underlying sudden cardiac arrest in vivo. These in vivo observations are in striking accord with prior autopsy observations implicating ruptured LCP in the pathogenesis of sudden cardiac death.