Japanese Society of Pediatric Cardiology and Cardiac Surgery The 54th Annual Meeting of Japanese Society of Pediatric Cardiology and Cardiac Surgery

一般口演 | 画像診断

一般口演01(I-OR01)

画像診断1 座長:石川友一(福岡市立こども病院循環器センター循環器科) 座長:脇研自(倉敷中央病院小児科) Thu. Jul 5, 2018 5:30 PM - 6:40 PM 第2会場(301)

[I-OR01-07]ヒト剖検心における位相差 CTイメージングによる刺激伝導組 織密度の評価

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Keywords:Cardiac conduction system, phase-contrast imaging, 刺激伝導系

[Objective] Phase-contrast computed tomography (PCCT) enables imaging the atrioventricular (AV) conduction axis. In the present study, densities of AV conduction axis and its adjacent heart tissue were evaluated, with the aim to establish the benchmark to more objective analysis of the cardiac conduction system (CCS).

[Methods] Formalin-fixed human whole heart specimens obtained by autopsy from four neonates were used. A PCCT imaging system based on an X-ray Talbot grating interferometer at beamline BL20B2 in a SPring-8 synchrotron radiation facility was used (voxel size, 12.5 μm; target density range, 0.9 - 1.2 g/cm3; density resolution, 1 mg/cm3). Linear contiguous areas containing conduction tissue in three major subdivisions of AV conduction axis, compact node; penetrating bundle; branching bundle, and these surrounding tissues: working myocardium in interatrial septum, inter ventricular septum, central fibrous body, and other surrounding fibrous tissue were sampled with adequately thinness (3 pixels of width). Tissue density per voxel of 12.5 to 25 μm cubic was measured from averaged value of each 3 pixels along the line.

[Results] The CCS composed of specialized cardiomyocytes is low-density tissue, compared to IVS myocardium with statistical significance in all four specimens (p < 0.05). The insulating fibrous tissue around the AV conduction axis is remarkably high-density tissue (p < 0.01).

[Conclusion] Mathematical analysis based on the tissue density would allow to evolve semi-automatic segmentation as an objective identification method.