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Miguel Cainzos-Achirica, Martin Bødtker Mortensen, Michael J. Blaha

Original Research Articles

- 174 Differences in left ventricular measurements: Attenuation versus contour based methods
Yici Liu, Sophia Bourgeois, Yeung Yam, Gary R. Small, Benjamin J.W. Chow

Left ventricular (LV) measurements differ depending on the post-processing method used. Two common methods are the contour (CON) and attenuation (ATT) based methods, which use the sub-endocardial wall tracing and the density within the LV cavity, respectively, to determine the volume of interest. In this study, we demonstrated that there are significant differences in volume measurements between CON and ATT based methods ($20.4 \pm 7.4\%$). Thus, the results suggest measurements obtained from different post-processing methods are not interchangeable, and reference values derived using certain post-processing software may not be applicable to values obtained from another.

- 179 The association of coronary lumen volume to left ventricle mass ratio with myocardial blood flow and fractional flow reserve
P.A. van Diemen, S.P. Schumacher, M.J. Bom, R.S. Driessen, H. Everaars, W.J. Stuijzand, P.G. Raijmakers, P.M. van de Ven, J.K. Min, J.A. Leipsic, J. Knuuti, P.R. Boellaard, C.A. Taylor, A.C. van Rossum, I. Danad, P. Knaapen

The ratio of coronary lumen volume to left ventricle mass (V/M) derived from coronary computed tomography angiography has been proposed as factor contributing to impaired myocardial perfusion. In the present study an abnormal hyperaemic myocardial blood flow (hMBF) and fractional flow reserve (FFR) were more frequently observed among patients with a low V/M in comparison to patients with a high V/M. Furthermore, V/M was weakly associated with vessel specific hMBF and FFR. In the absence of obstructive coronary artery disease, V/M was independently predictive for FFR while not for MBF parameters.

- 188 Is waist-to-height ratio better than body mass index as a predictive indicator of coronary atherosclerosis disease? A cohort study
Zhi-hui Hou, Bin Lu, Zhen-nan Li, Yun-qiang An, Yang Gao, Wei-hua Yin, Matthew J. Budoff

- 190 Cardiovascular morbidity and mortality in patients with aortic valve calcification: A systematic review and meta-analysis**
Matteo Nicola Dario Di Minno, Paolo Poggio, Edoardo Conte, Veronika Myasoedova, Paola Songia, Saima Mushtaq, Laura Cavallotti, Donato Moschetta, Alessandro Di Minno, Gaia Spadarella, Paolo Pizzicato, Gianluca Pontone, Mauro Pepi, Daniele Andreini
- 196 Non-invasive fractional flow reserve derived from coronary computed tomography angiography in patients with acute chest pain: Subgroup analysis of the ROMICAT II trial**
Maros Ferencik, Michael T. Lu, Thomas Mayrhofer, Stefan B. Puchner, Ting Liu, Pal Maurovich-Horvat, Khristine Ghemigian, Alexander Ivanov, Elizabeth Adami, John T. Nagurney, Pamela K. Woodard, Quynh A. Truong, James E. Udelson, Udo Hoffmann
- We determined feasibility of non-invasive fractional flow reserve (FFR_{CT}) in the population of acute chest pain patients from the ROMICAT II trial who had $\geq 50\%$ stenosis on coronary CTA or underwent additional non-invasive stress test. We assessed the relationship of FFR_{CT} with outcomes of acute coronary syndrome (ACS) and revascularization and with plaque characteristics. We found that abnormal FFR_{CT} was associated with the presence of ACS, coronary revascularization, and high-risk plaque. FFR_{CT} measurements correlated with anatomic severity of stenosis on coronary CTA and were feasible in population of patients with acute chest pain.
- 203 Using a genetic risk score to calculate the optimal age for an individual to undergo coronary artery calcium screening**
Lauren M. Severance, Francisco J. Contijoch, Hannah Carter, Chun C. Fan, Tyler M. Seibert, Anders M. Dale, Elliot R. McVeigh
- A genetic risk score is associated with non-zero CAC in a multi-ethnic cohort and improves the positive yield of CAC as a screening tool in younger individuals. The genetic risk score can be used to calculate the optimal age for an individual to receive a first CAC scan and can be derived from inexpensive, “direct-to-consumer” technology.
- 211 Effects of obesity on noninvasive test results in patients with suspected cardiac ischemia: Insights from the PROMISE trial**
Sheldon E. Litwin, Adrian Coles, Neha Pagidipati, Kerry L. Lee, Patricia A. Pellikka, Daniel B. Mark, James E. Udelson, Udo Hoffmann, Pamela S. Douglas
- Obesity may mimic symptoms of CAD and reduce the accuracy of diagnostic testing. In the PROMISE trial (n=8889), 20% of patients had BMI ≥ 35 . The rate of test positivity with coronary CTA was not different (10% vs. 12%) in patients with BMI ≥ 35 vs. < 35 . In contrast, MPI was significantly more likely to be positive in those with BMI ≥ 35 vs. < 35 (18% vs. 13%; $P=0.001$). Among MPI patients undergoing invasive angiography, obstructive CAD was found in only 29% with BMI ≥ 35 vs. 48% with BMI < 35 ($P=0.005$). The findings suggest that obesity affects the results of CTA less than MPI.
- 219 Effect of tube potential and luminal contrast attenuation on atherosclerotic plaque attenuation by coronary CT angiography: In vivo comparison with intravascular ultrasound**
Hidenari Matsumoto, Satoshi Watanabe, Eisho Kyo, Takafumi Tsuji, Yosuke Ando, Yuka Otaki, Sebastien Cadet, Piotr J. Slomka, Daniel S. Berman, Damini Dey, Balaji K. Tamarappoo

226 Evaluation of ventricular septal defects using high pitch computed tomography angiography of the chest in children with complex congenital heart defects below one year of age

David Nau, Wolfgang Wuest, Oliver Rompel, Matthias Hammon, Martin Gloeckler, Okan Toka, Sven Dittrich, André Rueffer, Robert Cesnjevar, Michael M. Lell, Michael Uder, Matthias S. May

Aim of this study was to assess the accuracy of congenital ventricular septal defect (VSD) evaluations by high-pitch CT angiography (CTA) of the chest in patients younger than one year. Differences between CTA and intraoperative measurements were not statistically significant (10.8 vs. 12.0 mm, $p = 0.9$) whereas echocardiographic values were significantly lower (9.6 mm, both $p < 0.01$). The location matched the intraoperative situs in 96.4% of all cases for CT and in 87.3% for Echocardiography. Radiation dose was as low as 0.32 mSv. Therefore, VSDs should be thoroughly evaluated whenever a high-pitch CTA is performed for preoperative evaluation of congenital heart disease.

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