Methods: This observational study recruited the first 50 patients planned for OFP surgery and the first 50 patients planned for ONP surgery. Patients referred for CABG with the following exclusion criteria: age <18 or >80 years, previous atrial fibrillation/flutter, previous treatment with Amiodarone, previous cardiac surgery, emergency surgery. Included patients were equipped with long-duration (7 days) Holter ECG monitoring. POAF was defined as an AF episode lasting >30 seconds. All patients underwent pre-operative echocardiography to assess LVEF and left atrial diameter. GDF-15 levels were assessed at induction of anaesthesia and 12 hours after the end of surgery.

Results: Among the 100 patients, 34 developed POAF. In Cox multivariate regression analysis, the EuroSCORE, left atrial diameter>45mm and low GDF-15 levels at induction (<1200 ng/l) were independently associated with the onset of POAF. When comparing the incremental prognostic value of GDF-15 according to the time of blood sampling, we found that a low circulating level of GDF-15 at induction was a better predictor of POAF than that 12h later. In contrast, pre-operative NT-proBNP levels did not predict POAF. The use of ONP surgery was not associated with a higher incidence of POAF, even though baseline and follow-up characteristics in ONP and OPF patients were identical.

Conclusion: In patients with no history of AF, a low plasma level of GDF-15 before CABG surgery was a strong and independent predictor of POAF. Moreover, preoperative plasma GDF-15 levels added an incremental predictive value to classical risk factors of POAF.

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Usefulness of multiple proteinchip arrays for proteomic profiling using surface enhanced laser desorption ionization – time of flight – mass spectrometry (SELDI-TOF-MS)

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Background: Multiple proteinchip arrays have been developed to selectively bind proteins with diverse physical and chemical properties before the profiling step with SELDI-TOF-MS. However, the additional value of each array is poorly described.

Methods: A proteomic analysis has been performed in plasma of 198 patients with chronic heart failure with a left ventricular ejection fraction <45%. Plasma samples were profiled with CM10 (Weak Cation Exchanger) and H50 (Hydrophobic) proteinchip arrays in a PBS 4000 SELDI-TOF-MS (BioRad Laboratories). To ensure sufficient coverage of the entire mass range, the acquisition settings for low-mass (LM, 2500-30000 Da) and high-mass (HM, >20000 Da) m/z peaks were optimized separately. Correlation between peaks was analysed face to face by the test of Pearson.

Results: We detected 203m/z peaks: 109 (52 LM and 42 HM) peaks with the CM10 array and 94 (69 LM and 40 HM) peaks with the H50 array. Among the peaks detected on the H50 array, 28 LM and 8 HM peaks were also present on the CM10 array. In the mass range 20000-30000 Da, peaks can be detected with both, LM and HM acquisition settings. We found 6 of the 13 HM peaks on the CM10 array and 7 of the 15 HM peaks on the H50 array also detected with LM settings. 093We then analysed the correlation among the 203m/z peaks detected with both types of arrays. We found that 56 (27.5%) peaks were highly correlated with at least one other peak with a correlation coefficient r>0.9. Altogether, 30 out of these 56 peaks were correlated with 1 other peak, 14 with 2 other peaks, 7 with 3, 3 with 4, 1 with 5 and 1 with 6 other peaks. These highly correlated peaks may correspond to a unique protein.

Conclusion: Profiling with multiple proteinchip arrays provides data with high redundancy and colinearity. This finding may be useful for chosen the SELDI-TOF-MS peaks to be purified and identified. In addition, a unique array (CM10) may be sufficient to obtain a relevant profiling of plasma proteins.