CORONARY ARTERY PLAQUES IN MAINTENANCE DIALYSIS PATIENTS: HISTOPATHOLOGICAL FEATURES AND EX VIVO OPTICAL COHERENCE TOMOGRAPHY IMAGING

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Background: It is well known that coronary artery (CA) in maintenance dialysis patients demonstrates diffuse stenosis and severe calcified plaques. Recently, diabetic nephropathy is a major course of hemodialysis. Although previous study indicated medial calcification of muscular arteries in these patients, characteristics of CA plaques may change into the different phenotype, due to the alteration of patient’s background.

Methods: Twenty-one CA plaques of 7 autopsy cases, who underwent maintenance dialysis due to diabetic nephropathy were examined (HD group). Largest plaques in each major coronary branch were selected, and areas of whole vessel, media, intima, lumen, calcification, and necrotic core were evaluated morphometrically. Plaques of CA disease in diabetes mellitus without hemodialysis were also analyzed as control (non-HD group). Furthermore, 5 dialysis cases were examined ex vivo optical coherence tomography (OCT) to interpret the vascular imaging to histopathology.

Results: Mean area stenosis and vessel area were similar in HD vs. non-HD groups (89.6% vs. 84.9%, 11.9mm2 vs. 9.7mm2). Media was atrophic and intima was larger in HD group (0.97mm2 vs. 2.33mm2, p<0.001; 10.9mm2 vs. 9.4mm2, p<0.05). In all plaques, calcification was identified in the intima in both groups. Necrotic core was less and calcified area was larger in HD group (0.07mm2 vs. 1.24mm2, p<0.05; 3.57mm2 vs. 0.56mm2, p<0.005). Calcification was distributed close to the lumen in HD group, which was confirmed by ex vivo OCT imaging.

Conclusions: Phenotype of CA atherosclerosis in maintenance dialysis patients may change due to the increasing number of diabetic nephropathy. Understanding of CA plaque pathology in dialysis patients is important to treat these lesions.