Ultra-low contrast coronary angiography and zero-contrast coronary intervention as a prevention of contrast-induced acute kidney injury in a haemodialysed patient with residual renal function

Authors:
J Sacha¹, M Gierlotka¹, P Feusette¹, ¹University Hospital, University of Opole, Department of Cardiology - Opole - Poland,

Topic(s): Coronary Intervention: Primary and Acute PCI

Citation:
Contrast-induced acute kidney injury (AKI) is a severe complication of percutaneous coronary intervention (PCI) in patients with chronic kidney disease (CKD). Zero-contrast PCI is a new emerging method for the prevention of AKI among patients with CKD, however nothing is known whether such an approach plays any positive role in preserving residual renal function in haemodialysed patients. We present a case of 64-year-old man who was admitted to our hospital due to symptoms of non-ST-segment elevation myocardial infarction. In addition, the patient suffered from heart failure, moderate aortic stenosis, atrial fibrillation, hypertension, peripheral vascular disease and stage G5 renal failure – he was haemodialysed 3-times per week but presented preserved residual renal function (diuresis 800 mL/day). At admission, the patient was stable without chest pain and dyspnea. Due to his renal history, ultra-low contrast coronary angiography was performed by using only 13 mL of contrast media, which revealed a 3-vessel disease (Fig. 1ABC), i.e. 80-90% stenosis in the proximal, medial and distal portion of left anterior descending artery (LAD); 70-80% obstruction in the proximal and medial part of circumflex artery (Cx); and 99% stenosis in proximal right coronary artery (RCA). According to the Heart Team decision, the patient was qualified to percutaneous coronary revascularization. To preserve his remaining renal function, staged zero-contrast PCIs were performed guided by intravascular ultrasound (IVUS). At the end of each PCI, due to legal issues, small amount of contrast was injected into a coronary artery in order to exclude complications (especially distal perforation or embolization) and document final angiographic result, i.e. 5 mL, 7 mL and 12 mL of contrast dye were injected into LAD, Cx and RCA, respectively (Fig. 1A’B’C’). Thus for the whole procedure, total amount of contrast was 37 mL for coronary angiography and full 3-vessel revascularization. After the procedure, daily diuresis remained at the constant level and the patient was discharged home in a good condition. Several weeks later, his physical performance improved and daily diuresis increased to 1000 mL/day, consequently the rate of haemodialysis was reduced to twice per week. During 7-month observation, there was no coronary event nor other major clinical event, the patient was free of angina and dyspnea, and he started his passion again, i.e. car racing. This case shows, that ultra-low contrast coronary angiography and zero-contrast PCI are effective measures to prevent AKI in haemodialysed patients with residual renal function. This is even more important, since residual renal function is a prognostic and independent factor of quality of life, morbidity and survival in dialysis patients.

Authors: J. Sacha 1, M. Gierlotka 1, P. Feusette 1

1 University Hospital, University of Opole, Department of Cardiology – Opole – Poland,

Topic(s): Coronary Intervention: Primary and Acute PCI

Citation: Contrast-induced AKI is a severe complication of percutaneous coronary intervention (PCI) in patients with chronic kidney disease (CKD). Zero-contrast PCI is a new emerging method for the prevention of AKI among patients with CKD, however nothing is known whether such an approach plays any positive role in preserving residual renal function in hemodialysed patients. We present a case of a 64-year-old man who was admitted to our hospital due to symptoms of non-ST-segment elevation myocardial infarction. In addition, the patient suffered from heart failure, moderate aortic stenosis, atrial fibrillation, hypertension, peripheral vascular disease and stage G5 renal failure – he was hemodialysed 3 times per week but presented preserved residual renal function (diuresis 800 mL/day). At admission, the patient was stable without chest pain and dyspnea. Due to his renal history, ultra-low contrast coronary angiography was performed by using only 13 mL of contrast media, which revealed a 3-vessel disease (Fig. 1ABC), i.e. 80-90% stenosis in the proximal, medial and distal portion of left anterior descending artery (LAD); 70-80% obstruction in the proximal and medial part of circumflex artery (Cx); and 99% stenosis in proximal right coronary artery (RCA). According to the Heart Team decision, the patient was qualified to percutaneous coronary revascularization. To preserve his remaining renal function, staged zero-contrast PCIs were performed guided by intravascular ultrasound (IVUS). At the end of each PCI, due to legal issues, small amount of contrast was injected into a coronary artery in order to exclude complications (especially distal perforation or embolization) and document final angiographic result, i.e. 5 mL, 7 mL and 12 mL of contrast dye were injected into LAD, Cx and RCA, respectively (Fig. 1A'B'C'). Thus for the whole procedure, total amount of contrast was 37 mL for coronary angiography and full 3-vessel revascularization. After the procedure, daily diuresis remained at the constant level and the patient was discharged home in a good condition. Several weeks later, his physical performance improved and daily diuresis increased to 1000 mL/day, consequently the rate of hemodialysis was reduced to twice per week. During 7-month observation, there was no coronary event nor other major clinical event, the patient was free of angina and dyspnea, and he started his passion again, i.e. car racing. This case shows, that ultra-low contrast coronary angiography and zero-contrast PCI are effective measures to prevent AKI in hemodialysed patients with residual renal function. This is even more important, since residual renal function is a prognostic and independent factor of quality of life, morbidity and survival in dialysis patients.