Usefulness of coronary computed tomography angiography (CCTA) as a new success predictor for percutaneous coronary intervention (PCI) in coronary total occlusions (CTOs)

Authors:
M Garcia De Yebenes Castro¹, FM Caballeros Lam², A Suarez¹, F Hernandez Hernandez¹, JI Garcia Bolao¹, E Refoyo Salicio¹, ¹Clinica Universidad de Navarra, Cardiología - Madrid - Spain, ²Clinica Universidad de Navarra, Radiodiagnóstico - Madrid - Spain.

Topic(s):
Coronary CT Angiography

Citation:
We present a 69-years-old male patient who came to our department referring dyspnea on exertion in the last two months. Clinical records showed hypertension and smoking habit. No chest pain or other important symptoms were referred. The echocardiogram showed inferior akinesia with normal global ejection fraction and valvular function. The coronary CT was performed at a dual source with the following acquisition parameters: 120 kVp, 200 mAs with dose modulation and maximum intensity in 30-75% of the cardiac cycle, rotation time of 0.33 seconds and pitch 0.2-0.43 adapted to the heart rate. In the anatomic evaluation of the coronary CT, a high take-off of the right coronary ostium was seen (approximately 2 cm above the aortic sinotubular junction), showing an anterior origin with vertical course. This anomaly is benign most of the time, but may complicate coronary catheterization and its identification is important before PCI. Cronical total occlusions of proximal right coronary artery (RCA), and mid-distal circumflex coronary artery (Cx) were observed (22mm, and 15mm respectively). Regarding stenosis evaluation, the total occlusion of the proximal segment of the RCA and the situs distal segment of the Cx showed no significant calcification in the proximal or distal cap of the occlusion, with good distal vessels. Staged PCI was performed, and revascularization with three overlapping drug eluting stents (DES) was carried out in RCA, and successful PCI with one DES in the Cx artery. Two months after PCI, patient referred no shortness of breath, more exercise capacity and remains in CCS class I.

Discussion. PCI is a less frequent option in patients with chronic coronary occlusion. Nevertheless, in recent years, the success of PCI has increased thanks to the development of new therapeutic approaches and stents reaching 80-90% of success in referral centres. Continued improvements in multidetector computed tomographic (CT) scanners have made cardiac CT an important clinical tool that is revolutionizing cardiac imaging. CCTA can characterize features that predict the success rate of percutaneous coronary intervention (PCI) for CTOs such as the severity of calcification, persence of several occlusions, vessel and stump morphology, and lesion length. Single features and combined scoring systems based on CCTA may be developed to grade the level of difficulty of the CTOs before PCI. Further research is clearly needed, but many experienced hospitals are integrating CCTA into routine planning and guiding for CTO procedures.
Usefulness of coronary computed tomography angiography (CCTA) as a new success predictor for percutaneous coronary intervention (PCI) in coronary total occlusions (CTOs).

Authors: M Garcia De Yebenes Castro¹, FM Caballeros Lam², A Suarez¹, F Hernandez Hernandez¹, JI Garcia Bolao¹, E Refoyo Salicio¹

1 Clinica Universidad de Navarra, Cardiología - Madrid - Spain, 2 Clinica Universidad de Navarra, Radiodiagnóstico - Madrid - Spain

Topic(s): Coronary CT Angiography

Citation: We present a 69-year-old male patient who came to our department referring dyspnea on exertion in the last two months. Clinical records showed hypertension and smoking habit. No chest pain or other important symptoms were referred. The echocardiogram showed inferior akinesia with normal global ejection fraction and valvular function. The coronary CT was performed at a dual source with the following acquisition parameters: 120 kVp, 200 mAs with dose modulation and maximum intensity in 30-75% of the cardiac cycle, rotation time of 0.33 seconds and pitch 0.2-0.43 adapted to the heart rate. In the anatomic evaluation of the coronary CT, a high take-off of the right coronary ostium was seen (approximately 2 cm above the aortic sinotubular junction), showing an anterior origin with vertical course. This anomaly is benign most of the time, but may complicate coronary catheterization and its identification is important before PCI. Cronic total occlusions of proximal right coronary artery (RCA) and mid-distal circumflex coronary artery (Cx) were observed (22mm, and 15mm respectively). Regarding stenosis evaluation, the total occlusion of the proximal segment of the RCA and the situ distal segment of the Cx showed no significant calcification in the proximal or distal cap of the occlusion, with good distal vessels. Staged PCI was performed, and revascularization with three overlapping drug eluting stents (DES) was carried out in RCA, and successful PCI with one DES in the Cx artery. Two months after PCI, patient referred no shortness of breath, more exercise capacity and remains in CCS class I.

Discussion. PCI is a less frequent option in patients with chronic coronary occlusion. Nevertheless, in recent years, the success of PCI has increased thanks to the development of new therapeutic approaches and stents reaching 80-90% of success in referral centres. Continued improvements in multidetector computed tomographic (CT) scanners have made cardiac CT an important clinical tool that is revolutionizing cardiac imaging. CCTA can characterize features that predict the success rate of percutaneous coronary intervention (PCI) for CTOs such as the severity of calcification, presence of several occlusions, vessel and stump morphology, and lesion length. Single features and combined scoring systems based on CCTA may be developed to grade the level of difficulty of the CTOs before PCI. Further research is clearly needed, but many experienced hospitals are integrating CCTA into routine planning and guiding for CTO procedures.