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Extremely high-risk percutaneous coronary intervention in the elderly with multiple comorbidities and good biological condition

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Short title: Frailty scores in high-risk PCI decision-making

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An 86-year-old female with typical stenocardia was admitted to hospital due to non-ST segment elevation myocardial infarction (NSTEMI). The medical history revealed prior history NSTEMIs treated without coronary interventions, chronic kidney failure, arterial hypertension and prior history of transient ischemic attack. Echocardiography disclosed moderately decreased left ventricle ejection fraction (39%) and segmental wall contractility disorders. The patient was directly transferred to the catheterization laboratory. Coronary angiography revealed multi-vessel disease with critical stenosis of left main coronary artery (LMCA) and heavily calcified arteries [Figure 1 A,B]. The cardiovascular risk assessed in Syntax II was 55.8 points for percutaneous coronary intervention (PCI) and 43.3 points for coronary artery bypass grafting (CABG). Mortality risk assessed with the Society of Thoracic Surgery Risk Score (STS) was 6.6%. The Euroscore II risk was 15.6%. The patient was in a very good mental and cognitive state. Frailty tests assessed by PRISMA-7 and Fried questionnaires did not indicate severe frailty syndrome.

Initially, after a Heart Team consultation the patient was qualified for PCI. However, due to several doubts raised by experienced intervention cardiologists, the patient was requalified for CABG. Unexpectedly, the patient refused cardiac surgery and finally underwent PCI. The procedure was performed via right femoral artery access, 6 French system. The lesion in LMCA and the left descending artery (LAD) was crossed with the Whisper low support guidewire (Boston Scientific, Marlborough, Massachusetts, USA). The BMW Universal wire (Abbott Vascular, Abbott Park, Illinois, USA) was inserted into the circumflex artery. Then, by applying Sprinter Legend over-the-wire balloon catheter 1.25 x 10 mm (Medtronic Vascular, Dublin, Ireland) the guidewire in LAD was exchanged for Rotawire Floppy guidewire (Boston Scientific, Marlborough, Massachusetts, USA). Rotablation was performed by means of Rotablator™ Rotational Atherectomy System using 1.25 burr diameter (Boston Scientific, Marlborough, Massachusetts, USA). After predilatation, the drug-eluting stent
Orsiro 2.5 x 18 mm (Biotronic, Berlin, Germany) was implanted into the medial segment of LAD. The intravascular ultrasound was used to assess the LMCA and LAD diameter [Figure 1 C]. Based on this, implantation of the next two drug-eluting stents was proceeded from the ostium of LMCA to LAD (Orsiro 3.0 x 26 mm and 4.0 x 12 mm). Finally, the proximal optimization technique with non-compliant balloon 3.5 x 15 mm and 4.5 x 15 mm was applied with an optimal stent apposition, as confirmed by intravascular ultrasound [Figure 1 D]. After a couple of days of intensive hospital rehabilitation, psychological care and pharmacological treatment, the patient was discharged home in a good general condition.

At the time of aging society, therapeutic decision-making issues related to patients suffering from many comorbidities and complex coronary artery diseases are becoming a serious concern. Current risk scores may have limitations in the elderly because they were calibrated for middle-aged population. Therefore, cognitive testing and frailty risk scores seem to be complementary and indispensable elements of assessing this group of patients during consultations with cardiac surgeons and interventional cardiologists before qualifying for revascularization. It is worth emphasizing that multiple comorbidities and advanced age are not a contraindication for high-risk PCI involving highly advanced percutaneous techniques such as rotablation and in the case of selected patients, advanced and complex PCI procedures enable revascularization and patients’ survival. Following the recommendations by the European Society of Cardiology due steps undertaken during the procedure may help prevent severe complications[1].

References:

Figure 1.

A – Baseline coronary angiography revealed heavy calcifications, 99% stenoses in the left main coronary artery (LM) and the ostium of the left ascending artery (LAD), 90% narrowing in the medial and distal LAD, 99% stenoses in the proximal and medial circumflex artery.
B – Right coronary artery occluded in the medial segment.

C – Significant stenosis of the LM imaged in intravenous ultrasound (IVUS).

D – IVUS of LM after implantation of a stent.