“Shock-Pella”: Combined management of an undilatable ostial left circumflex stenosis in a complex high-risk interventional procedure patient

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A 67-year-old woman with stage 4 chronic kidney disease, implantable cardioverter-defibrillator and a history of multiple coronary interventions, both percutaneous (stenting of anterior descending artery [LAD], ramus and right coronary artery [RCA]) and surgical left internal mammary artery [LIMA] graft on LAD and saphenous vein grafts [SVG] on ramus and RCA, was admitted because of congestive heart failure with evidence of severe left ventricular ejection fraction decrease (25%). Coronary angiography showed occluded LIMA and SVG to ramus, patent SVG to RCA and a critical ostial left circumflex artery (LCx) stenosis (Fig. 1A). Since myocardial perfusion scintigraphy showed no viability on anterior wall and apex (Fig. 1B), a protected LCx lesion revascularization was attempted, positioning a circulatory mechanical support (Impella CP; Abiomed, Danvers, MA). Non-compliant balloons did not fully expand during lesion predilatation, probably due to severe fibro-calcification and protruding ramus stent struts (intravascular ultrasound catheter did not cross the lesion) (Fig. 1C). Intravascular lithotripsy (IVL) was then performed (Shockwave Medical, Fremont, CA), inflating a 3.0 × 12 mm balloon (at 4–6 atm for 8 cycles of 10 pulses each) with angiographic evidence of complete device expansion (Fig. 1D) and subsequent optimal lesion predilation with non-compliant balloon (Fig. 1E). A 3.5 × 15 mm drug-eluting stent was successfully implanted (Fig. 1F). This is a case of complex, high-risk interventional procedure managed with combined strategy “Impella-assisted IVL” to prevent the risk of hemodynamic compromise in a time-demanding procedure where an optimal and aggressive lesion debulking was required.

Conflict of interest: None declared

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Figure 1. A. Severe ostial left circumflex lesion (yellow arrow); yellow box shows a second angiographic view confirming the critical lesion entity; B. Absence of anterior myocardial viability at myocardial perfusion scintigraphy; C. Impella CP positioned in the left ventricle across the aortic valve (withe arrow); “dog-bone” sign for an undilatable lesion by multiple non-compliant balloon inflations (red arrow and box); D. Optimal Shockwave balloon inflation (green arrow), confirmed in a second angiographic view (green box); E. Full 3.5 × 20 mm non-compliant balloon expansion after intravascular lithotripsy (blue arrow and box); F. Excellent final angiographic result following ostial left circumflex lesion stenting (pink arrow and box).