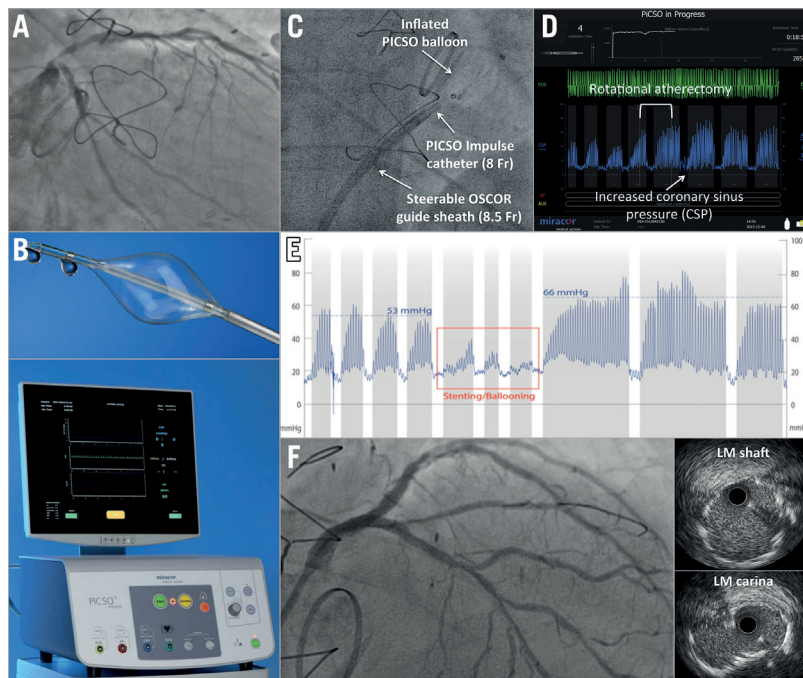


High-risk left main percutaneous coronary intervention supported by pressure-controlled intermittent coronary sinus occlusion



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Pressure-controlled intermittent coronary sinus occlusion (PICSO) improves microvascular perfusion in ischaemic areas of the myocardium by intermittently increasing wedge pressure, using a balloon-tipped catheter introduced into the coronary sinus (CS). No experience exists using PICSO to relieve myocardial ischaemia during PCI.

A 75-year-old man with severe left ventricular dysfunction (ejection fraction 25%) and prior mechanical aortic valve replacement presented with heart failure. Critical calcified distal left main (LM) stenosis (Medina 1,1,1) (**Panel A**) was diagnosed. As coronary bypass surgery was deemed too risky (EuroSCORE 32%), LM PCI under mechanical support was chosen. Severe peripheral vascular disease and mechanical aortic valve prosthesis contraindicated intra-aortic balloon-pump and Impella® (Abiomed, Danvers, MA, USA) use. Therefore, the PICSO® Impulse System (Miracor Medical Systems, Vienna, Austria) (**Panel B**) was used. The PICSO balloon was delivered into the CS through the right femoral vein, and was left in place (intermittently occluding the CS)

throughout the procedure (**Panel C**). Rotational atherectomy on the LM-circumflex and culotte stenting with two drug-eluting stents were performed. PICSO activity increased during and immediately after rotational atherectomy, thus leading to increased CS pressure (**Panel D**). CS pressure (a surrogate of coronary flow) improved after stenting (**Panel E**). The final result was optimal (**Panel F**). The patient remained stable throughout the procedure and no complication occurred. PICSO quantity was 816 mmHg (values >800 mmHg have been associated with increased myocardial salvage in primary PCI). Peak troponin T was 144 ng/l (normal values: <14 ng/l). The hospital stay was uneventful. This case suggests the feasibility and safety of PICSO as microcirculatory support during high-risk PCI.

Conflict of interest statement

A. Colombo serves as a member of the scientific advisory council of Miracor Medical Systems. The other authors have no conflicts of interest to declare.

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