

Haemostasis changes during percutaneous transcatheter isolation of the pulmonary veins in patients with atrial fibrillation

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Introduction: Silent or manifest cerebral thromboembolisation is a potential complication of left atrial (LA) ablation for atrial fibrillation (AF). The influence of different ablation techniques on different haemostasis parameters has not been explored.

Purpose: We evaluated haemostasis and endothelium activation parameters in the left atrium (LA) before and after pulmonary vein isolation (PVI) with cryoballoon (CB) or phased radiofrequency (RF) ablations.

Methods: 35 (CB: 17, RF: 18) consecutive patients undergoing PVI were enrolled. Any anticoagulant and platelet inhibitor was discontinued before the ablation. All patients underwent transesophageal echocardiography immediately before the ablation.

Blood samples were taken from the LA before and after ablation to measure haemostasis markers including FXIII activity, fibrin monomer, plasminogen activator inhibitor-1 (PAI-1) activity, plasminogen activity, D-dimer, plasmin-antiplasmin (PAP)-complex and endothelium activation marker soluble E-selectin.

Iv heparin was administered after taking the first sample from LA to reach a target ACT \geq 300 sec during the whole LA access time.

Results: Changes in hemostasis parameters were compatible with coagulation and fibrinolysis activation after the ablation with both techniques. This was indicated by a significant decrease in FXIII activity (%) (CB: from 128.27 \pm 32,25 to 119,83 \pm 26,42; p=0,04; RF: from 122,52 \pm 27,22 to 118,09 \pm 23,29; p=0,04), in the serum level of fibrin monomer (mg/L) (CB: from 68,82 \pm 40,80 to 31,86 \pm 29,54; p=0,0006; RF: from 99,4 \pm 41,65 to 33,04 \pm 14,66; p<0,0001), in PAI-1 activity (%) (CB: from 4,31 \pm 1,21 to 3,84 \pm 0,68; p=0,03; RF: from 4,75 \pm 1,23 to 3,87 \pm 0,82; p=0,002) and in

plasminogen activity (%) (CB: from 117,54±18,23 to 104,92±16,35; p<0,0001; RF: from 107,53±13,87 to 97,7±11,76; p=0,0002).

Further, an increase was demonstrated in D-dimer (mgFEU/L) levels (CB: from 0,60±0,42 to 1,12±0,59; p<0,0001; RF: from 0,63±0,40 to 1,46±0,89 p=0,004) as well as in PAP-complex (ng/mL) levels (CB: from 273,12±115,96 to 356,58±142,88; p=0,04; RF: from 275,50±123,50 to 414,69±166,97; p=0,01).

E-selectin (ng/mL), the marker of endothelium activation increased only with phased RF ablation (from 28,60±11,19 to 32,89±11,54; p=0,023).

Conclusions: Our results indicate that while both PVI techniques activate the coagulation cascade, significant endothelium activation occurs only after RF ablation.