Three dimensional rotational angiography for preprocedural imaging before atrial fibrillation ablation using second generation cryoballoon

Vedran Velagic
Domagoj Kardum
Borka Pezo-Nikolic
Mislav Puljevic
Marina Lovric-Bencic
Davor Puljevic
Davor Milicic

Introduction: Integration of left atrium (LA) images obtained by computer tomography or magnetic resonance could reduce atrial fibrillation (AF) ablation procedural time because it enables a more accurate reconstruction of the anatomy. Rotational angiography (RA) enables reconstruction of LA immediately before the procedure, but it is the least used method of LA imaging.

Methods: Data included in our analysis was retrospectively collected from the beginning of AF ablation program in our institution. Decision to use rotational angiography as preprocedural imaging was left to the first operator in nonrandomized way. Segmented reconstructions of left atria were merged to live fluoroscopy screen. A 28 mm second generation cryoballoon was used via single transeptal puncture guided by intracardial ultrasound. A single 180 seconds freeze strategy was employed. We sought to compare procedural characteristics and outcomes of cryoballon ablation procedures done with the help of rotational angiography (RA arm) versus ablations performed without preprocedural imaging (non-RA).

Result: We have analyzed 167 successional second generation cryoballon procedures, 67 in RA group and 100 in nonRA group (74.3% male, 56.9±11.2 years). Paroxysmal AF was present in 78.6% of patients and early persistent in the rest. Mean left ventricle ejection fraction was 60.7±7.1% and mean left atrium diameter was 42.5±5.6 mm. The mean procedure times were significantly shorter for non-RA group (77.5±30.45 min) than RA group (125.3±40.8 min) (p <0.001). The mean fluoroscopy times was also shorter for non-RA group (12.9±7.9 min) than RA group (22.3±10.6 min) (p <0.001). Furthermore X –ray dosage and contrast expenditure were also significantly lower in non-RA group. X ray dosage was 1005.2±850 mGy vs 355.9±421.5 mGy (p <0.001) and contrast expenditure was 190.1±32.5 mL vs 85.2±22.1 mL for RA and non RA group respectively. There was no significant differences in success rates between groups, after follow up of 1 year 77.9% of patients were free from any atrial arrhythmia. Furthermore there was no differences in complication rates, which consisted solely of phrenic nerve palsy and groin complications.

Conclusion: In our patient cohort, the use of rotational angiography significantly prolonged procedure times, X ray exposure and contrast expenditure. Omitting left atrium imaging did not influence the procedure safety and success rates. Preprocedural imaging is not mandatory for successful pulmonary vein isolation but it may be useful to inexperienced operators or in low volume centers.