What should we do in redo ablation procedures?

Elimination of recurrent pulmonary vein potentials is sufficient.

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Pulmonary vein (PV) isolation (PVI) of paroxysmal atrial fibrillation (PaAF) is a well established approach, with a success rate of ≤80% during the long-term (LT) follow-up (FU). However, in patients with recurrence of AF after ablation, a common finding during redo procedures is reconnections of the PV conduction. Ouyang et al. reported the LT results of PV isolation in 161 patients with symptomatic PaAF that underwent circumferential PVI (CPVI). Sinus rhythm was 46.6% after the initial procedure during a median FU of 4.8 years. A 2nd procedure was performed in 41%, and 3rd procedure in 7%. Recovered PV conduction was observed in 94% of patients during the 2nd and in 67% during the 3rd procedure.[1] Their high LT success rate was due to a wide CPVI. Recently, Teunissen et al. reported a single center LT FU study, with a five year efficacy of the PV antrum isolation (PVAI). A total of 509 consecutive patients with AF underwent PVAI. In the redo procedure, ablation was restricted to a re-PVAI in the case of PV reconnections. A single PVAI was sufficient in restoring and maintaining LT sinus rhythm in 41.3% (n=210) of patients. Multiple re-PVI procedures (mean 1.5) increased the LT success up to 58% (n=297). Additional substrate modification in patients without PV reconnections, (n=70) increased the success rate to 63% (n=318). So in the redo procedures, re-isolation of the PV antrum was sufficient in almost all cases except for those who had persistent PV disconnections. Predictors of arrhythmia recurrences were non-PaAF and a history of AF. A meta-analysis of 13 studies showed that non-PaAF, female, hypertension, and the BMI, age, and LA size were independent predictors of recurrence after the last ablation. For a durable PVI or PVAI, adenosine has been used to identify dormant residual PV conduction after ablation. The initial results of adenosine were promising, but recently, several trials have shown negative results of adenosine's beneficial effect on a durable PV isolation and LT AF recurrence. Recent introduction of contact force ablation catheters can make more durable PVAIs than previous irrigation only catheters. It is important to identify non-PV foci especially during redo PVI procedures, but if patients have remaining PV conduction, a re-PVI itself is sufficient for PaAF. In redo procedures, isolated PVs were more often found in non-PaAF patients. In patients who had non-PV foci, substrate remodeling was important especially in non-PaAF patients. However, non-PV foci sites were usually located close to areas covered by the PVAI such as the posterior LA, septal and anterior walls of the right PVs, and LAA base, and these areas are usually covered by a wide circumferential antral ablation. Because of that, a durable wide PVAI was sufficient in most redo cases. In rare cases, patients with persistent PV disconnections with non-PV foci, targeting of non-PV foci was needed. Especially in non-PaAF patient, substrate modification was needed for targeting non-PV foci, but it requires a more extensive ablation, which has the risk of inducing regular left side atrial flutter or AT in up to 40% of patients. Those are often more difficult to manage with drugs or ablation than the original tachycardia itself.