

## Differences in the temporal pattern of early AF after Cryo-Balloon versus RF ablation: different healing processes involved in the pathophysiology of AF during the "blanking period"?

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### Introduction

Radiofrequency (RF) and Cryo are fundamentally different energy sources for catheter ablation of the pulmonary veins (PV). In contrast to all other types of arrhythmias amenable to catheter ablation, AF recurrences can occur only transiently in the early phase following ablation. These are often explained by healing processes of the ablated tissue. The goal of the current study was to examine possible differences of the temporal pattern of AF recurrences during the first 3 months after RF versus Cryo PV ablation

### Methods

Twenty patients (pt) undergoing cryo-balloon ablation were matched for sex, age, left ventricular ejection fraction and AF history to 20 pt undergoing RF ablation during the same time period. A minimum of 2 cryo-energy applications of each 360 sec duration were delivered per PV. PV isolation was confirmed by 20-pole Lasso™ mapping. Redundant breakthrough sites were ablated with a linear 8mm cryo catheter. RF ablation was performed using an externally irrigated 3.5 or 5mm tip electrode catheter under electrophysiological guidance of a 20-pole Lasso™ catheter. All 40 patients underwent daily and additional symptom-triggered transtelephonic ECG monitoring starting the day after the ablation procedure.

### Results

The temporal pattern of early AF recurrences during the usually applied 3-months blanking period was significantly different between Cryo-balloon and cooled tip RF catheter ablation (figures 1 and 2). Early recurrences after cryo ablation clustered in the first quartile of the 3-months observation period ( $p < 0.001$  for difference in the 1st quartile compared to each of the following quartiles). In contrast, early recurrences after RF ablation had a, statistically not significant, trend to cluster in the fourth quartile of the 3-months observation period ( $p = 0.07$ ).

### Conclusion

Early recurrences in the usually applied blanking period cluster early after cryo ablation, whereas recurrences after RF ablation are much more evenly distributed. This difference may be caused by different structural healing processes after ablation-induced alterations to the arrhythmogenic substrate of AF.



