Efficacy of High Dose Adenosine Triphosphate Administration for Detecting the Extra Pulmonary Vein Foci of Patients Who Had Underwent Pulmonary Vein Isolation Before and No Pulmonary Vein Reconnection.

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Introduction : Electrophysiological studies during repeat procedures revealed that besides pulmonary vein (PV) reconnection, extra PV foci play an important role in atrial fibrillation (AF) recurrence. However the detection of extra PV foci is sometimes difficult because the induction of extra PV foci is sometimes difficult. On the other hand, it is known that injection of adenosine triphosphate (ATP) exposes possible extra PV foci of AF. The aim of this study is detecting the extra PV foci of patients who had underwent PV isolation before and no PV reconnection with high dose ATP plus isoproterenol (ISP) injection.

Methods : 32 consecutive patients (16 males, (64.2±11.7) years) with drug-refractory, symptomatic AF, who had no PV reconnection, and underwent a second or third catheter ablation between November 2015 and January 2019 at our center, were enrolled. Each patient underwent the electrophysiological study. At first, external cardioversion was attempted to convert the AF to sinus rhythm and observe the spontaneous re-initiation of AF. The spontaneous initiation of AF was mapped and recorded with Basket catheter (Constellation™, Boston Scientific) etc. If spontaneous AF did not appear, AF was provoked with ISP (20 μg) bolus injection. If there are no initiation, AF was provoked with ATP (20 mg) plus ISP (20 μg) bolus injection. If there are no initiation, we increased the dose of ATP up to 60mg.

Result : 16 (13 patients) extra PV foci was provoked with ISP (20μg) bolus injection. 6 (6 patients) with ISP plus ATP (20mg) bolus injection. 3 (2 patients) with ISP plus ATP (40mg) bolus injection. 1 (1 patients) with ISP plus ATP (60mg) bolus injection. 5 (5 patients) was occurred spontaneously after cardioversion to terminate the AF. Overall, 31 (27patients) extra PV foci could be induced and we could localize all the extra PV foci with basket catheter. We ablated the extra PV foci till it couldn't be inducible. The locations of extra PV foci were various, including left atrial septum (8/31), superior vena cava (6/31), left atrial posterior wall (4/31), right atrial lateral wall (4/31), left atrial anterior wall (3/31) etc.

Conclusion : High dose ATP bolus injection may induce the extra PV foci which cannot be induced by any other methods.