A case report of an effective ethanol infusion to vein of marshall for peri-mitral flutter patient after AF ablation

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**Introduction**: Recently chemical ablation of vein of marshall (VOM) is recognized as one option when treating AF ablation. We experienced an impressive case as effective chemical ablation for uncommon atrial flutter (AFL).

**Methods**: This case is 60s male who underwent AF ablation at two times due to persistent AF with low LV EF. First procedure was done at approximately 5 years ago, which were ipsilateral PV isolation, RA isthmus linear ablation (complete block line), mitral posterolateral linear ablation (incomplete block line) and chemical ablation to his VOM. However, AF was sustained after blanking period and 3 months later 2nd procedure was performed, which were re-ipsilateral pulmonary vein isolation and LA roof and re-mitral postero-lateral linear ablation. After the 2nd procedure he had no history of AT/AF without anti-arrhythmic drugs for 4.5 years but uncommon AFL was documented when he had a palpitation attack. On 3rd procedure CS angiography revealed shortened VOM suffered with 1st chemical ablation and it looked like dead-end vessel. Initial rhythm of 3rd procedure was uncommon AFL (CL 170 ms) and AFL mapping revealed peri-mitral flutter. Endocardial ablation to remnant potential and epicardial ablation via coronary sinus weren’t effective to stop the AFL. Next, we crossed 0.014 wire to very short VOM and engaged over the wire (OTW) balloon whose diameter was 2 mm. Very little perfusion area was surmised after VOM angiography, but ethanol infusion to VOM remnant stopped the flutter and mitral block line got to be complete bidirectional block line. After then no inducibility of any supra-ventricular tachycardia.

**Result**: Sometimes the treatment of mitral isthmus block line was challenging because of anatomical reasons although adding epicardial approach via CS. Recently the efficacy of chemical ablation of VOM is reported as not only reducing arrhythmogenicity but also supporting technique to achieve complete mitral postero-lateral block line. Generally, 2nd attempt of VOM chemical ablation is difficult because of degeneration of VOM. In this case 2nd ethanol infusion area of VOM might be alive since no ethanol injected area existed, that was induced by being jailed branches by OTW balloon. VOM ethanol infusion is tried from distal VOM and infusion area will be toward to proximal site by pulling OTW balloon step by step. Final occlusion area is usually just above CS where is unstable area to fix.

**Conclusion**: This is good case to show how important just proximal OTW balloon occlusion technique is on chemical ablation to VOM and to show how efficient chemical ablation to VOM is on mitral isthmus dependent flutter ablation.