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**Introduction**: Retrograde transaortic method is widely used in pediatric population during ablation for left arrhythmia substrate using fluoroscopic guidance. Zero or near-zero fluoroscopy (ZF) technique has been advocated but the safety and feasibility for left side lesion are not well delineated.

**Methods**: All patients received ablation of left side arrhythmia substrate in our hospital between Jan 2014 and May 2018 were enrolled. The study group consisted of 21 procedures in 20 patients (male/female 14/6) using ZF guidance and control group consisted of 33 procedures in 30 patients (male/female 18/12) using fluoroscopy guidance. Echocardiographic studies were performed before and after the ablation procedure.

**Result**: The mean procedure time was 68.24±32 minutes in control group and 83.48±42.78 minutes in study group (P = .141). The mean fluoroscopy time (FT) was significantly lower in study group (1.33±3.53 vs. 27.03±18.86 minutes, P < .001). Acute procedural success rate was 100% in both groups, and the recurrence rate was 12.1% in control group and 4.7% in study group (P = .363) after median of 17 and 13.9 months follow-up. Six procedures (one in study group and 5 in control group) involved multiple arrhythmia substrates. For single left side accessory pathway (20 in control and 18 in study group), the procedure time was longer in study group (58.6±28.68 minutes v.s. 85.56±45.6, P = .034). For left ventricular ventricular tachycardia ablation (three in study and 8 in control group), the procedure time showed no significant difference. Echocardiography after ablation revealed no progression of aortic regurgitation in all patients.

**Conclusion**: Utilizing ZF guidance for left arrhythmia substrate ablation through retrograde transaortic method is safe and feasible without increase incidence of aortic valve damage in mid-term follow-up.