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# Identification of arrhythmic isthmus in patients with transposition of the great arteries treated with atrial switch surgery using a new high-definition wavefront-activation-orientation grid catheter

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**INTRODUCTION:** Patients with D- transposition of the great arteries (TGA) treated with Senning or Mustard surgeries have several atrial scars that predispose them to develop atrial tachycardias (AT). Identification of scar zones and possible arrhythmic isthmus in voltage mapping will help to guide the ablation.

**AIM:** To describe the feasibility of using a specific mapping catheter to identify possible arrhythmic isthmus in this set of patients.

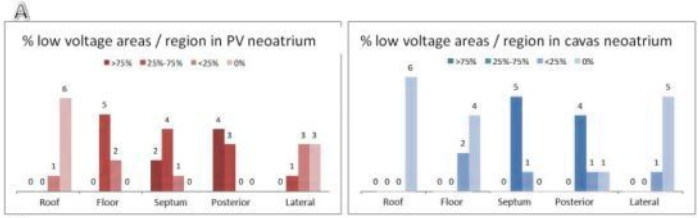
**METHODS:** Prospective observational study in patients with history of SVT and atrial switch surgery, that underwent electrophysiologic study (EP) and electroanatomic (EA) mapping with a new 8Fr deflectable, multipoint wavefront-activation-orientation independent Grid catheter, in a third level hospital since April 2018 until May 2019, with medium-term follow-up.

**RESULTS:** A total of 8 EPs were performed in 7 patients (3 (57%) Female, median age 35 ± 6,3 y.o.). Figure 1A shows the localization and percentage of scar identified in both atria. A total of 6 AT were induced. In this, an arrhythmogenic isthmus was identified and, in all patients, at least one non-arrhytmogenic isthmus was documented. Figure 1B shows anatomical and electrophysiological characteristics of the isthmus. Arrhythmogenic isthmus had slower conduction velocity than non-arrhytmogenic ( mean 0,44m/s (IQI 0,17-0,62) vs 1,05 m/s (IQI 0,86-1,39) p = 0.008) and fractionated potentials were detected more frequently (100% vs 50% p = 0.089)

**CONCLUSION:** EA mapping with a new a multipoint, high-definition, Grid Cather is feasible and allows the identification and electrophysiological characterization of arrhythmogenic and non-arrhytmogenic isthmus in patients with TGA treated with atrial switch surgery.

Abstract Figure 1

A




B

| Nº patient . EPS | Isthmus | Atrium | Region | Type of isthmus | Length, mm | Width, mm | Conduction speed, m/s | Fractionated pot | Minimal conducted pot (mV) |
|---|---|---|---|---|---|---|---|---|---|
| 1.1 | Arrhythmogenic | 1 | PVs | CTI | A-A | 17 | 17 | 0.6296 | Yes | 0.07 |
| | Non arrhythmogenic | 2 | Cava Vs | Post-Inf | S-A | 13 | 19 | 0.8125 | No | 0.06 |
| | Non arrhythmogenic | 3 | Cava Vs | MA-IVC | A-A | 31 | 15 | 1.24 | Yes | 0.42 |
| 2.1 | Arrhythmogenic | 1 | PVs | CTI, gap | S-S | 31 | 11 | 0.1713 | Yes | 0.11 |
| | Non arrhythmogenic | 2 | Cava Vs | IVC-Sept | A-S | 15 | 11 | 0.9375 | Yes | 0.12 |
| 3.1 | Non arrhythmogenic | 1 | PVs | Lateral | S-S | 13 | 9 | 1.1818 | No | 0.32 |
| 4.1 | Arrhythmogenic | 1 | Cava Vs | Post-Sept | Localized Reentry | | | - | Yes | 0.72 |
| | Non arrhythmogenic | 2 | PVs | CTI | A-A | 21 | 12 | 4.2 | No | 0.15 |
| | Non arrhythmogenic | 3 | Cava Vs | IVC-Sept | A-S | 14 | 21 | 1.56 | No | 0.17 |
| | Non arrhythmogenic | 4 | Cava Vs | Septum | S-S | 12 | 12 | - | Yes | 0.11 |
| 5.1 | Arrhythmogenic | 1 | PVs | CTI | A-A | 10 | 15 | 0.1449 | Yes | 0.10 |
| | Non arrhythmogenic | 2 | Cava Vs | SVC-Sept M | A-S | 24 | 13 | 0.4528 | No | 0.25 |
| 6.1 | Arrhythmogenic | 1 | PVs | CTI | A-A | 15 | 24 | 0.7895 | Yes | 0.30 |
| | Non arrhythmogenic | 2 | Cava Vs | Inf Septum | S-S | 11 | 16 | 0.9167 | Yes | 0.13 |
| 6.2 | Arrhythmogenic | 1 | PVs | CTI, gap | S-S | 15 | 12 | 0.4412 | Yes | 0.07 |
| 7.1 | Non arrhythmogenic | 1 | Cava Vs | IVC-SVC | A-A | . | 24 | - | Yes | 1.16 |

PV = Pulmonary vain. S= Scar A= Anatomical CTI= Cavo Tricuspid isthmus Sep= Septal IVC= inferior vena cava SVC= Superior vena cava