# Novel Brugada Syndrome treatment using para-hisian stimulation

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Introduction: Brugada syndrome (BS) is an inherited arrhythmogenic disorder characterized by an elevated ST-segment and J-point in the right precordial leads of an electrocardiogram in the absence of structural disease, and it may cause sudden cardiac death due to ventricular fibrillation. Brugada Syndrome was described for the first time in 1992.

The implantation of cardioverter defibrillator (ICD) is the only reliable therapeutic modality to prevent sudden cardiac death from cardiac arrest.

ECG Brugada pattern is present when the ventricular tachycardia occurs.

In a previous research, our group described an unusual treatment of electric storm in BS using para-hisian stimulation guided by Synchromax method. Currently in our group, all ICD implantation in BS are performed in para-hisian area guided by Synchromax method. Synchromax is a device used to evaluate non-invasive cardiac electrical synchrony. It is easy to understand, fast to obtain and reproducible. Synchromax was analyzed in previous studies and correlated with other methods.

Objective: Feasibility and usefulness evaluation of para-hisian ICD implantation guided by Synchromax method in BS patients.

Materials and methods: six patients with type 1 BS are presented. All patients had indication of ICD implantation. Ventricular lead was located in para-hisian area guided by Synchromax. Synchrony index and curves were analyzed. Type 2 curve and index between 0,1 and 0,4 were considered synchronous. Type 8 curve and index more than 0.7 were considered disynchronous.

Results

Patients	Age (y)	Gender	ECG patern	ICD Indication	Device implanted	Curve	Index
1	45	Male	Type 1	VT Induction	Para-His ICD	2	0,13
2	59	Female	Type 1	Syncope	Upgrade para-His ICD CRT	2	0,38
3	52	Male	Type 1	VT Induction	Para-His ICD	2	0,24
4	49	Male	Type 1	VT Induction	Para-His ICD	2	0,41
5	42	Female	Type 1	VT Induction	Para-His ICD	2	0,28
6	47	Male	Type 1	Syncope	Para-His ICD	2	0,21

Patients data.

Synchromax method shows different types of curves which are divided into three groups: Synchronous (index value betwen 0 and 0.4); intermediate (index value betwen 0.41 and 0.7); and dysynchronous (index value betwen 0.71 and 1). A type 2 curve is for parahisian stimulation.

Synchromax device used to measure non-invasive electrical disynchrony
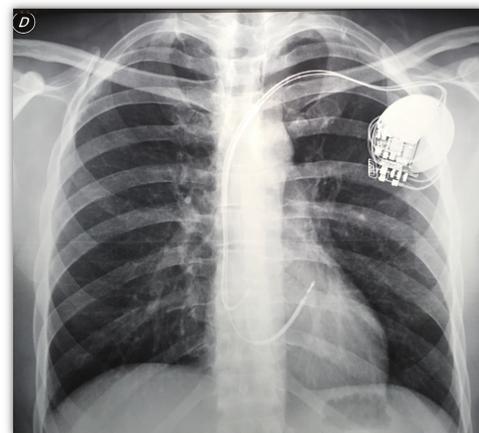
Posteroanterior projection Chest X-ray shows conventional ICD lead in para-hisian position

Synchromax study in a type 1 Brugada pattern patient . Right panel shows 12 leads ECG in real time. In left panel a type 1 curve is observed with 0,09 index. At the end the curves are separated (red arrow). An electric dyssynchrony is present in this area.
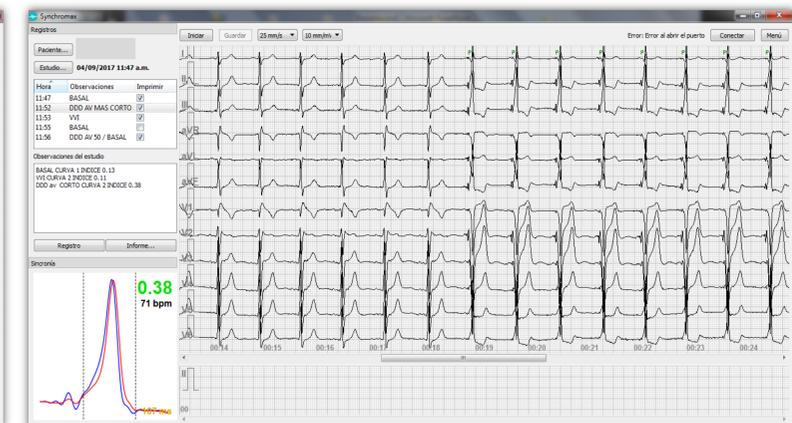
ICD Para-hisian stimulation in a SB patient using Synchromax method. Right panel shows ECG in the moment when the ICD is pacing. The Brugada pattern disapears. In left panel a type 2 curve is observed with 0,38 index.

Conclusions: Para-hisian ICD implantation guided by Synchromax method in Brugada Syndrome patients is feasible and useful. Para-hisian stimulation is an alternative treatment in Brugada Syndrome. It made ECG Brugada pattern disappear and suppresses ventricular arrhythmias. Para-hisian stimulation avoid apex stimulation deleterious effects.

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