# Para-hisian pacemaker implantation technique guided by Synchromax method

**Authors:** Logarzo Emilio[1], Ortega Daniel[2], Barja Luis[3], Paolucci Analía[1], Revollo Gerson[3], Mangani Nicolás[3], Paladino Carlos[1] .

(1) Clínica San Camilo, Buenos Aires, Argentina (2) F.I.B.A., Buenos Aires, Argentina (3) Hospital Universitario Austral, Buenos Aires, Argentina

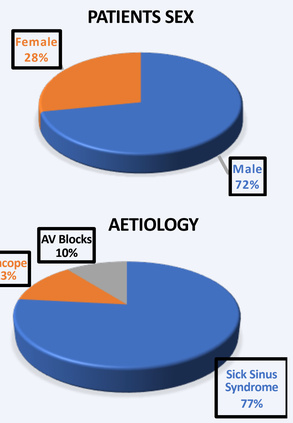
**Introduction:** Increasing advance in the last decades was presented in cardiac stimulation. Current devices use new technologies. Conventional cardiac stimulation solves electrical disorder but electrical dyssynchrony can be generated. When heart failure is generated a device upgrade is needed. Para-hisian stimulation generates a physiological cardiac activation through normal conduction system. Sheaths, special leads and different devices are used with current techniques. We developed an implantation technique guided by electric synchrony using conventional screw-in leads. Synchromax is a device used to evaluate cardiac electrical synchrony. It is easy to understand, fast to obtain, non-invasive and reproducible. Synchromax was analyzed in previous studies and correlated with other methods.

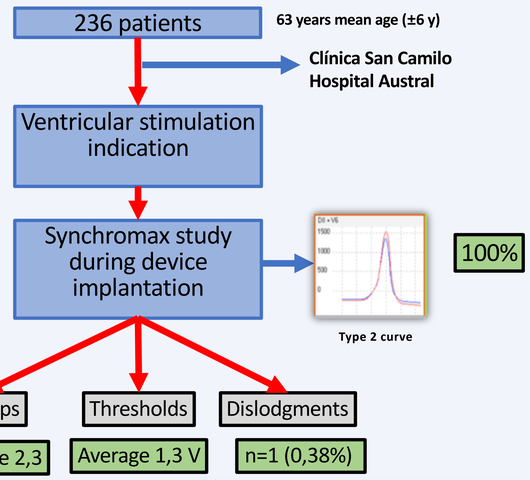
**Objective:** Usefulness and safety evaluation of para-hisian pacemaker implantation guided by Synchromax method using conventional screw-in leads.

**Materials and Methods**: 236 patients were evaluated in two institutions in Argentina. All patients had indication of ventricular stimulation. Synchromax study was performed during the device implantation in all patients. 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. Attempts numbers, thresholds and dislodgment were analyzed.

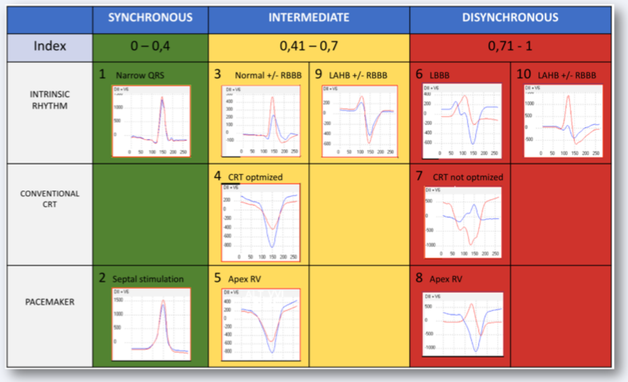
**Results**: Mean age 63 years (±6 years). 72,1% males. Sick sinus syndrome was the main aetiology. Conventional screw-in leads were used in all cases. An implant technique was designed. A J-shaped curve is performed with the stylet and a small curve is formed at the tip perpendicular to the fisrt one. On average 2,3 attemps were made. Thresholds were adequate. On average 1,3 mV. Only one ICD lead dislodgment was evidenced. Type 2 curve and index under 0,4 was obtained in all cases.

## Results




## Synchromax curves

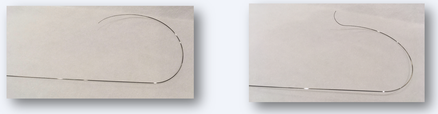



Synchromax method shows different types of curves which are divided into three groups: Synchronous (index value betwen 0 and 0.4); intermediate (index value betwen 0.41 and 0.7); and dysynchronous (index value betwen 0.71 and 1). A type 2 curve is for parahisian stimulation.

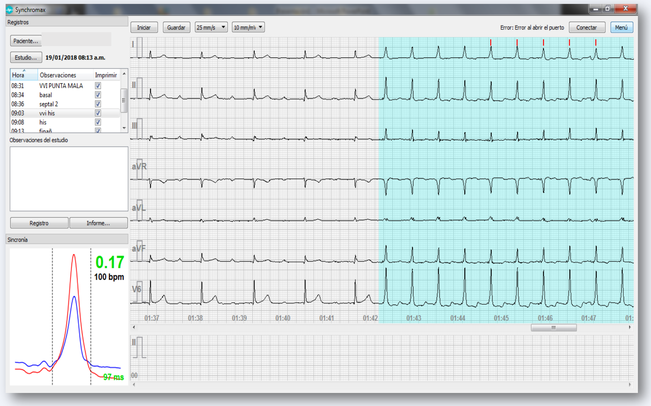

Synchromax device used to measure non-invasive electrical disynchrony

### Our implantation technique. Steps

- Cephalic, subclavian or axillary venous access (left or right side).7Fr sheath placed over a short guidewire.
- Standard active fixation lead is advanced with a bipolar configuration.
- J-shaped curve stylet is used.
- Lead is located in septal area.
- Pacing is performed at 5V and 1 ms to ensure capture.
- Synchromax curves are evaluated.
- Active fixation lead is implanted. A loop is formed in the right ventricle.
- Pacing threshold is tested (<2V a 1 ms)



Different stylet curves




Para-hisian stimulation using Synchromax method. Right panel shows ECG in the moment when a pacemaker is conected. In left panel a type 2 curve is observed with 0,17 index.

Different proyections Chest X-ray show para-hisian leads in final position

**Conclusions:** Para-hisian pacemaker implantation guided by Synchromax method using conventional screw-in leads is safe and useful achieving a physiological stimulation. Only a few attempts were needed with this new technique. Thresholds were similar to those used in conventional technique.