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Research Article

Left Branch Cardiac Stimulation. Beginning of a Program in Icu

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Received date: March 22, 2022; **Accepted date:** March 28, 2022; **Published date:** April 20, 2022

Citation: I Baig, A Eslami, A Berger, C Nordberg, J Blankenship (2022) Left Branch Cardiac Stimulation. Beginning of a Program in Icu. *Cardiology Research and Reports*. 4(4); DOI: 10.31579/2692-9759/037

Abstract

Cardiac pacing is the only treatment available for patients with Symptomatic bradyarrhythmias in the absence of reversible causes. For about 50 Apical right ventricular pacing has been used for years.

Keywords: cardiac stimulation; symptomatic bradyarrhythmias; hispanic stimulation

Introduction

Cardiac pacing is the only treatment available for patients with Symptomatic bradyarrhythmias in the absence of reversible causes. For about 50 Apical right ventricular pacing has been used for years. However, this technique can produce asynchrony in patients who require frequent stimulation, being associated with an increased risk of heart failure, mitral dysfunction and fibrillation handset. Pacing at alternative sites in the right ventricle, such as the septum or outflow tract, has not been shown to be superior to apical stimulation.

For this reason, interest in techniques that simulate physiological stimulation has gone growing in recent years. Within this type of technique, the most physiological and up-to- date Today the most used is Hispanic stimulation (HE), with multiple studies that support its feasibility and clinical benefits. HD has been associated with a lower risk of pacing cardiomyopathy, heart failure, and mortality compared with apical right ventricular pacing.

However, there are factors that limit the use of HE routinely: the success of a HD implantation requires a long learning curve even for implanters considered experts, high capture thresholds must be assumed during implantation and there is even the risk of maintaining high thresholds in subsequent reviews. Besides, the HE may not be successful in patients with distal Hisian blocks, or may require Unacceptably high thresholds to correct bundle branch blocks.

Huang et al. demonstrated in 2017 the feasibility of stimulation below the area Left bundle branch block (LBB) in a patient with complete bundle branch block left and heart failure, achieving cardiac resynchronization. Others have been capable of reproducing the feasibility of ERI in small series of cases.

Today ERI is a growing cardiac pacing technique, more reproducible than HD and with promising results. The objective of our study is to corroborate the feasibility and reproducibility of this technique, as well as showing the results of the follow-up during the first three months after implantation.

Patients and Methods:

Prospective descriptive study of 20 patients and their follow-up in consult during the first three months. During the intervention, ultrasound-guided puncture of the left axillary vein was performed. Medtronic Select Secure 3830-69 Electrode Implantation, Advanced Over Sheath fixed curve C315 for His, from Medtronic. The objective was to position the cable in the interventricular muscle septum until a right bundle branch block pattern is achieved (qR or qRS in V1) with the stimulation performing the monitoring of the technique in portable electrophysiological measurement system with fully integrated stimulator EP- TRACER 2 Portable.

The radiological image is used as a reference for the correct position of the electrode. In right anterior oblique at 30o dividing the cardiac silhouette into nine segments starting the division at the level of the tricuspid valve and segment nine being the apex. (Image 1). We carry out a 1.5 cm sampling on said segment towards the septum baseline and / middle septum until the required electrocardiographic pattern is obtained at the beginning of the stimulation in 5 V at 0.4 ms.

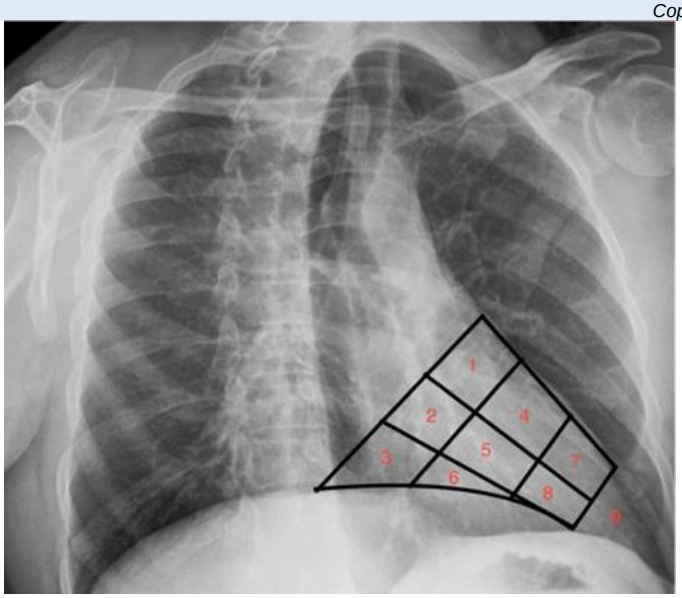

Image 1: Right lateral oblique segments.

Image 2: Continuous ECG recording in left branch pacing polygraph, right branch image

Image 3: ECG evolution continues when penetrating the electrode in the area of the left branch

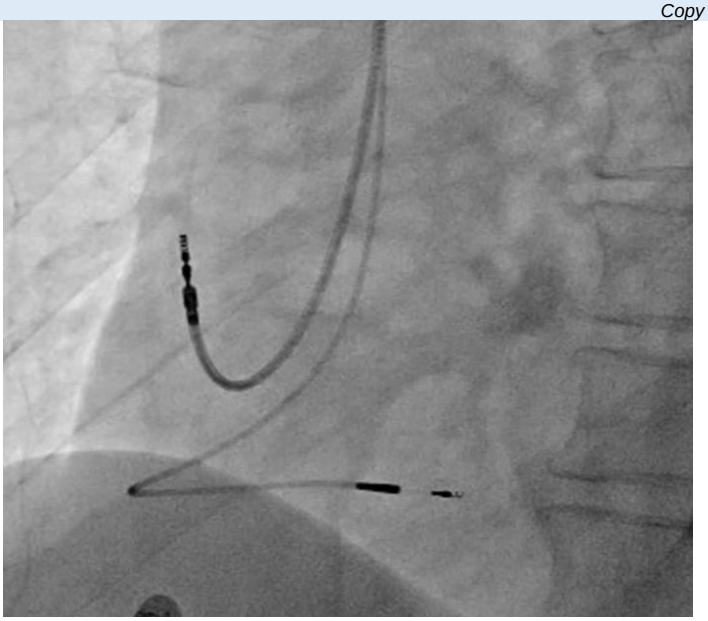

Image 4: 30º left lateral oblique. Basal septum electrode.

If we maintain this pattern (qR or qRS in LV) by lowering the stimulation threshold between 3 V and 5 V and after making a first measurement of the impedance, we begin to penetrate the electrode into the intraventricular septum in an oblique X-ray view left at about 30o. (Picture 4).
After verifying that the electrode penetrates the septum satisfactorily, we perform new measurements until the narrowest possible paced QRS is obtained with a stimulation threshold always <2 V at 0.4 ms and with impedances <1100 Ohm. (Picture 2)
A total of 12 dual-chamber and 8 single-chamber pacemakers were implanted.

Results:

Of the 20 patients analyzed, 40% (8) were women and 60% (12) were men. The mean age was 74 years (63rd-86th). The most common bradyarrhythmia has been complete AV block with BCRIHH (block complete left bundle branch of His) followed by slow AF (Atrial Fibrillation) with associated complete bundle branch block and Mobitz II. Two UPGRADE have been performed (new pacing in the left bundle branch and cancellation of the previous electrode in the apex of the right ventricle) in patients who required a change of generator due to battery depletion and showing clinical signs and Echocardiograms of Heart Failure Associated with Previous Pacing. The duration of the procedure was 140 ± 60 minutes, with a mean of 15.3 minutes of is a copy. The mean native QRS was 146 ms (120ms-178ms), the mean QRS being 116 ms paced (97ms-130ms). Improving the width of the same in all cases. The mean LVAT (left ventricular activation time) was 78 ms (60ms – 95ms). The mean LVEF prior to implantation was 56% (37% -69%), the control at one month of the Mean LVEF was 61% (55% -70%) and at three months it was 62% (57% -70%). The mean stimulation threshold (RV) at the implant was 1 V to 0.4 ms (0.25V-2V), in the control at one month the mean decreased to 0.45 V at 0.4 ms (0.25V-0.75V) staying in control at three months in the same parameters. The mean impedance (RV monopolar) after implantation was 644 Ohm (371 Ohm-900 Ohm) lowering the same in the control of the month 441 Ohm (300 Ohm-721 Ohm) and even more in the three-month period, 420 Ohm (295 Ohm-720 Ohm). The mean detection threshold (DV) at the end of the implant was 11 mV (3.1 mV-21 mV) improving the same to the control of the month 13.3 mV (3mV-20mV) staying at the three-month control.

There were no complications associated with the implantation of the device. One patient required electrical cardioversion after implantation due to atrial flutter.

Discussion:

Left bundle branch pacing in patients with an indication for Cardiac resynchronization is a novel technique, arising from the greater evidence of the deleterious effects on the heart caused by sustained apical stimulation of the Right ventricle. Despite the lack of studies that corroborate the safety and The long-term efficacy of this technique, in our unit, has been shown to be a safe procedure, with good results after three months of follow-up.

In this observational study, left bundle branch stimulation is shown as a effective procedure, managing to improve ventricular function, safe and reproducible, carried out by Intensivistas, in a Regional Hospital.

Financing:

The study and the article have not received any funding.

Conflict of interest:
There is no conflict of interest.

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DOI: 10.31579/2692-9759/037