LV DYSSYNCHRONY AND HEMODYNAMIC IMPROVEMENT WITH MULTIPOINT™ PACING AFTER THREE MONTHS. AN ANATOMICAL APPROACH

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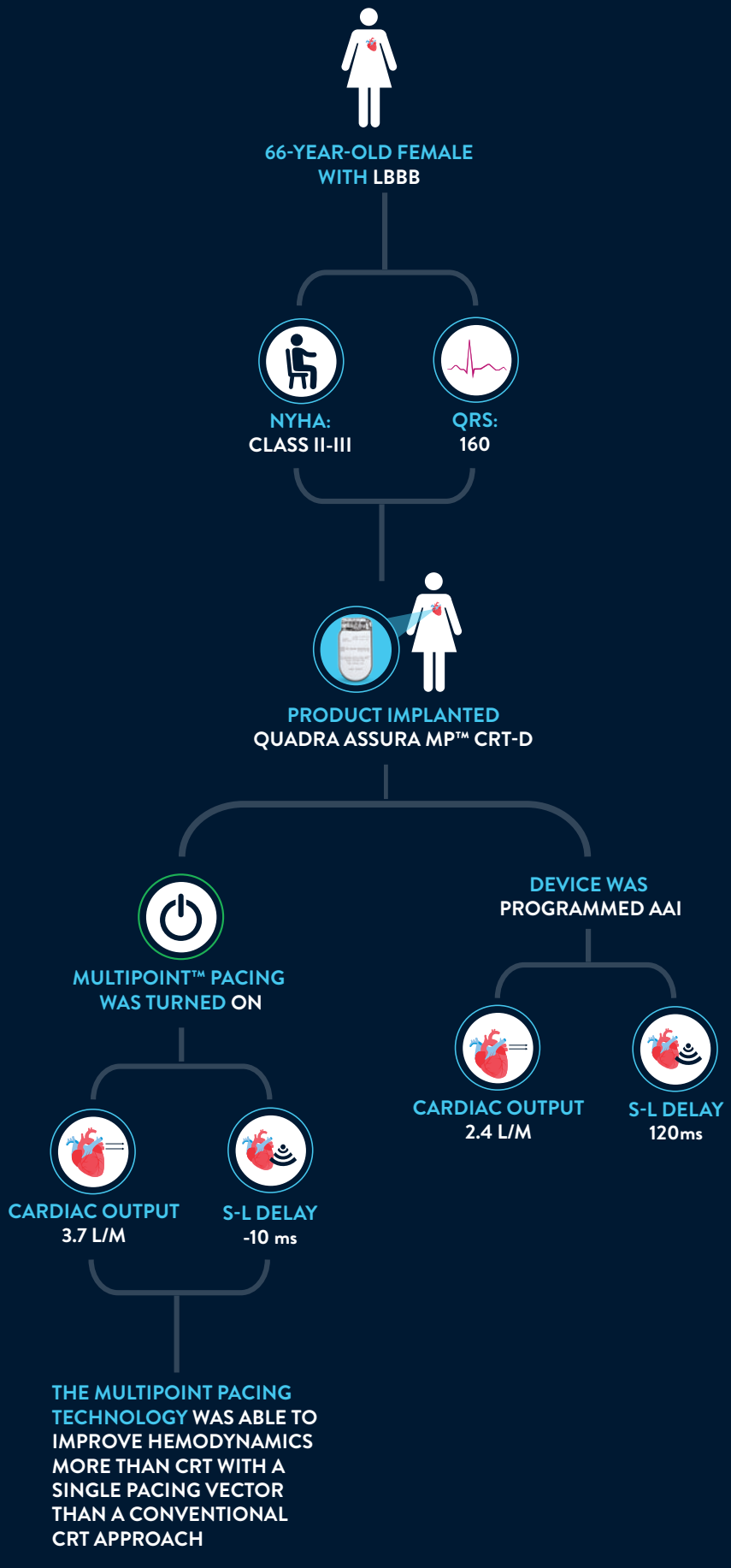
MULTIPOINT™ PACING CASE STUDY

HEMODYNAMIC CHANGES IN A PATIENT UNDERGOING CARDIAC RESYNCHRONIZATION THERAPY



CLINICAL HISTORY

- 66-year-old female
- Dilated cardiomyopathy
- Left ventricular ejection fraction (LVEF) 30%
- Left bundle branch block (LBBB) with QRS width of 160 ms
- NYHA functional class II to III

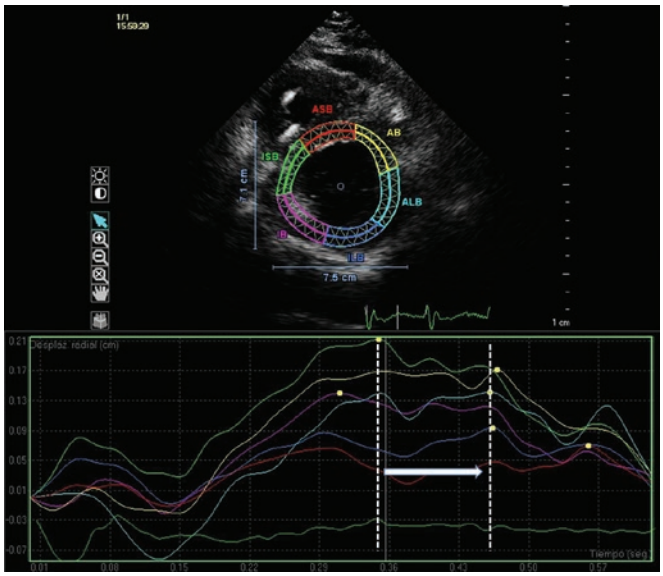
PROCEDURE

Dyssynchrony evaluation protocol

Three months after device implantation, transthoracic echocardiography was performed in a blind fashion to calculate haemodynamic parameters (LVEF and cardiac output). Radial dyssynchrony by speckle-tracking strain was defined as the time-to-peak difference between the septal and lateral wall segmental peak strains (S-L delay, Figure 1). Standard deviation of times to peak radial strain in the six basal segments was also measured as a global dyssynchrony parameter.

Baseline (AAI 90 bpm) was compared with different cardiac resynchronization therapy (CRT) pacing configurations.

Figure 1. Example of S-P calculation in baseline situation; S-L delay is indicated by white arrow and measured (124 ms).



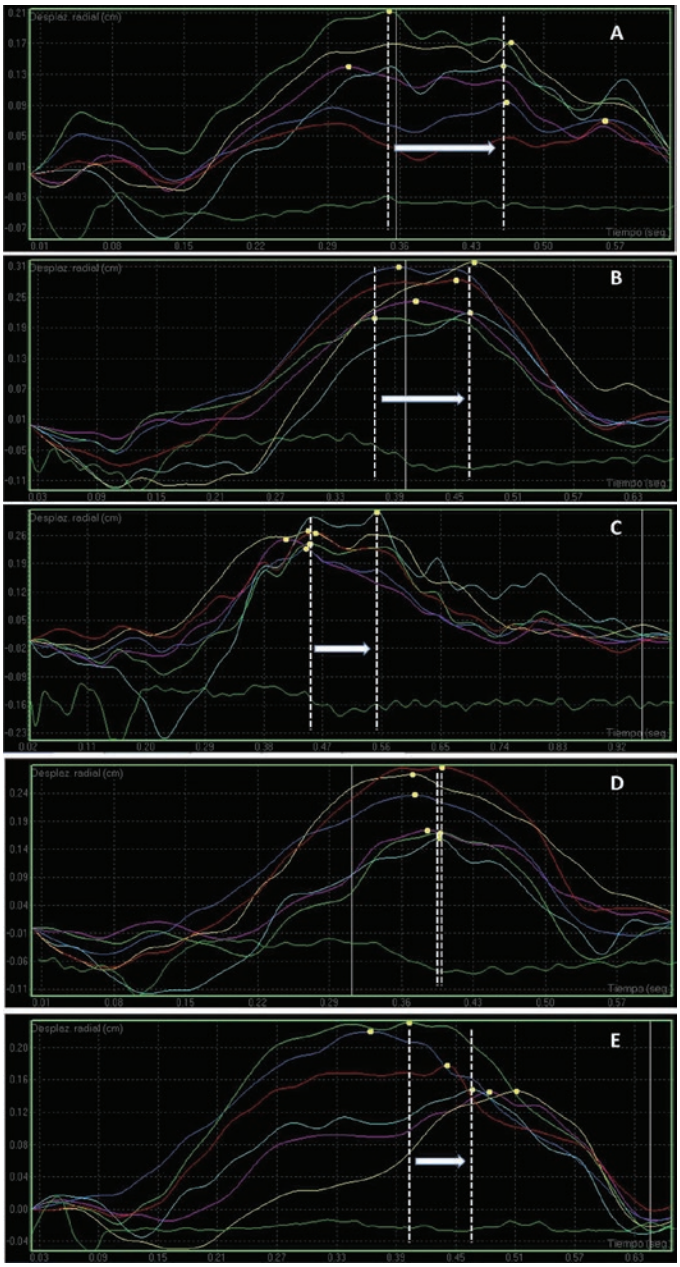
Vectors Configuration

- Distal vector: D1-RV coil
- Proximal vector: P4-RV coil
- MultiPoint™ Pacing technology anatomical-guided vector: D1-RVcoil → P4-RVcoil, to capture a broader area.
- MultiPoint Pacing technology electrical-guided vector: M3-RVcoil → P4-RVcoil, by using the electrodes with a greater delay between RV sensing.

Table 1. Programmed settings before and after MultiPoint Pacing

Pacing Configuration	Timing	Cardiac Output (l/m)	S-L Delay (ms)	RS-SD6 (ms)
AAI		2.4	120	82
P4-RV coil	Simult	2.6	110	81
D1-RV coil	Simult	2.7	95	64
D1-RV coil → P4-RV coil	5-5 (LV-LV-RV)	3.7	-10	12
M3-RV coil → P4-RV coil	5-5 (LV-LV-RV)	3.2	60	43

Figure 2. LV dyssynchrony analysis from basal short-axis views in the patient. In baseline conditions, the patient exhibited significant LV dyssynchrony (QRS width 160 ms). Furthermore, there was a delayed mechanical activation of the lateral wall compared with the septum (S-L delay 124 ms) (B and C). With conventional biventricular pacing configuration, a decrease in the value of LV dyssynchrony was shown (S-L delay 110 and 95 ms) (D and E). With MultiPoint™ pacing technology configuration, a higher decrease in LV dyssynchrony was shown. The highest LV dyssynchrony reduction was seen when anatomical approach (D) was employed (S-L delay 10 ms).



RESULTS

- The MultiPoint Pacing technology was able to improve haemodynamics more than CRT with a single pacing vector (see Table 1).
- The MultiPoint Pacing technology provided a higher correction of dyssynchrony than conventional CRT (see Figure 2).
- Anatomical approach showed better results (see Table 1).

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Brief Summary: Please review the Instructions for Use prior to using these devices for a complete listing of indications, contraindications, warnings, precautions, potential adverse events and directions for use.

Quartet™ LV lead
Indications and Usage: The Quartet lead has application as part of an Abbott Biventricular system.
Contraindications: The use of the Quartet lead is contraindicated in patients who:
- Are expected to be hypersensitive to a single dose of 1.0 mg of dexamethasone sodium phosphate.
- Are unable to undergo an emergency thoracotomy procedure.
- Have coronary venous vasculature that is inadequate for lead placement, as indicated by venogram.

MultiPoint™ Pacing and SyncAV™ CRT Technology
Indications: Abbott ICDs and CRT-Ds are intended to provide ventricular antitachycardia pacing and ventricular defibrillation for automated treatment of life-threatening ventricular arrhythmias. AF Suppression™ pacing is indicated for suppression of paroxysmal or persistent atrial fibrillation in patients with the above ICD indication and sinus node dysfunction. In patients indicated for an ICD, CRT-Ds are also intended: to provide a reduction of the symptoms of moderate to severe heart failure (NYHA Functional Class III or IV) in those patients who remain symptomatic despite stable, optimal medical therapy (as defined in the clinical trials section included in the Merlin™ PCS on-screen help)and have a left ventricular ejection fraction less than or equal to 35% and a prolonged QRS duration to maintain synchrony of the left and right ventricles in patients who have undergone an AV nodal ablation for chronic (permanent) atrial fibrillation and have NYHA Class II or III heart failure.
Contraindications: Contraindications for use of the pulse generator system include ventricular tachyarrhythmias resulting from transient or correctable factors such as drug toxicity, electrolyte imbalance, or acute myocardial infarction.
Adverse Events: Implantation of the pulse generator system, like that of any other device, involves risks, some possibly life-threatening. These include but are not limited to the following: acute hemorrhage/bleeding, air emboli, arrhythmia acceleration, cardiac or venous perforation, cardiogenic shock, cyst formation, erosion, exacerbation of heart failure, extrusion, fibrotic tissue growth, fluid accumulation, hematoma formation, histotoxic reactions, infection, keloid formation, myocardial irritability, nerve damage, pneumothorax, thromboemboli, venous occlusion. Other possible adverse effects include mortality due to: component failure, device programmer communication failure, lead abrasion, lead dislodgment or poor lead placement, lead fracture, inability to defibrillate, inhibited therapy for a ventricular tachycardia, interruption of function due to electrical or magnetic interference, shunting of energy from defibrillation paddles, system failure due to ionising radiation. Other possible adverse effects include mortality due to inappropriate delivery of therapy caused by: multiple counting of cardiac events including T waves, P waves, or supplemental pacemaker stimuli. Among the psychological effects of device implantation are imagined pulsing, dependency, fear of inappropriate pulsing, and fear of losing pulse capability.

Refer to the User's Manual for detailed indications, contraindications, warnings, precautions and potential adverse events.

27412-EM-MLP-0615-0019(3) | Item approved for U.S. and OUS.

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