

# Combined procedure involving thoracoscopic implantation of the epicardial left ventricular lead and removal of the His bundle pacing lead in a patient with heart failure

Jarosław Bis<sup>1,2</sup>, Kinga Gościńska-Bis<sup>3,4</sup>, Rafał Gardas<sup>3,4</sup>, Łukasz Morkisz<sup>1</sup>, Radosław Gocoł<sup>1</sup>, Adam Kowalówka<sup>1,2</sup>, Krzysztof S. Gołba<sup>3,4</sup>, Marek A. Deja<sup>1,2</sup>

1 Department of Cardiac Surgery, Upper Silesian Medical Centre, Medical University of Silesia, Katowice, Poland

2 Department of Cardiac Surgery, Medical University of Silesia, Katowice, Poland

3 Department of Electrophysiology, Upper Silesian Medical Centre, Medical University of Silesia, Katowice, Poland

4 Department of Electrophysiology and Heart Failure, Medical University of Silesia, Katowice, Poland

A 71-year-old man with ischemic heart failure (HF) presented with a failing His bundle pacing (HBP) lead of the cardiac resynchronization therapy defibrillator (CRT-D) system. He had had the system implanted for 8 years following anterior wall myocardial infarction which resulted in left ventricular ejection fraction (LVEF) reduction to 20% and New York Heart Association (NYHA) class III HF symptoms. Resynchronization therapy substantially improved patient's cardiac status with HF symptoms improving to NYHA class I and LVEF increasing to 49%. One year before the current admission, he had the CRT-D system explanted due to failure of the defibrillating lead. A new CRT-D system with atrial and defibrillating leads was implanted; however, due to thrombosis in the target branches of the coronary sinus, the re-implantation of the left ventricular (LV) lead was not possible. Therefore, a HBP lead was implanted instead and connected to the LV port of the device to maintain resynchronization therapy. The HBP lead pacing threshold which was acceptable (3.5V/0.5 ms) directly after implantation, rose gradually during the following 8 months, ultimately leading to ineffective pacing and return of HF symptoms (NYHA III) and low LVEF (26%).

To restore CRT, a combined procedure of thoracoscopic implantation of the LV lead and HBP

lead removal was attempted (FIGURE 1A-1E; Supplementary material, *Video S1* shows the key stages of the procedure).

The procedure was performed under general anesthesia with a double-lumen tube intubation and selective right-lung ventilation. The patient was positioned in a 45-degree right lateral decubitus position. Three 10-mm ports were created: 2 operating ports in the 7th and 10th intercostal spaces in the posterior axillary line and 1 camera port in the 8th intercostal space in the anterior axillary line. The carbon dioxide insufflation was started to improve surgical visualization.

The pericardium was incised posteriorly to the phrenic nerve to expose the lateral wall of the left ventricle. The MyoPore (Greatbatch Medical, New York, United States) sutureless screw-in epicardial pacing lead was delivered to the target area with the steerable FasTac Flex (Greatbatch Medical) delivery tool. Before implantation, satisfactory pacing and sensing parameters were confirmed by placing the lead in contact with the epicardium. After screwing-in, the lead was tunneled under the skin to the device pocket in the subclavicular area. The pocket was opened, the HBP lead was disconnected and removed by gentle traction (no mechanical extraction tools were necessary). Subsequently, the MyoPore lead was connected to

#### Correspondence to:

Jarosław Bis, MD, Department of Cardiac Surgery, Medical University of Silesia, ul. Ziołowa 47, 40-635 Katowice, Poland, phone: +48 32 359 80 00, e-mail: bisu@mp.pl

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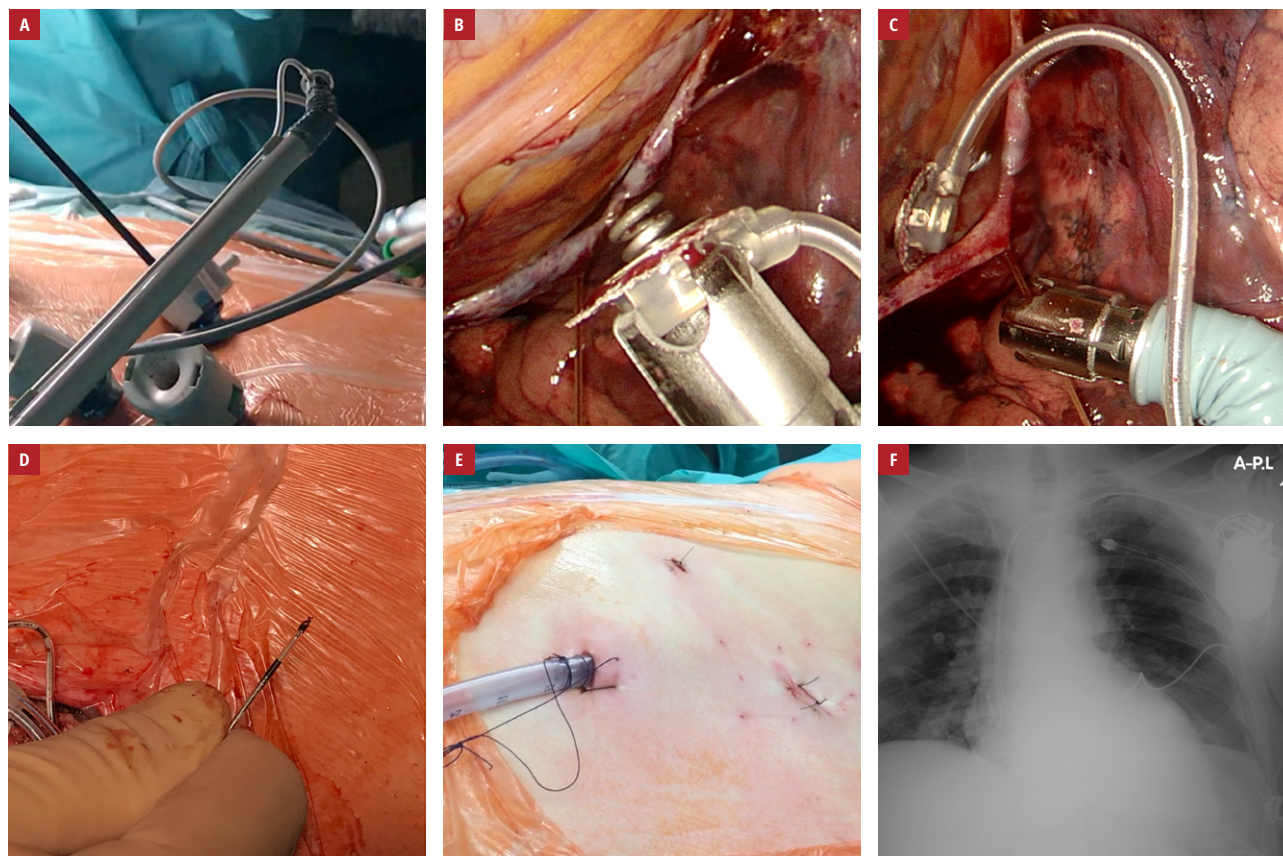
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**FIGURE 1** **A** – the MyoPore lead on the FasTac Flex delivery tool ready for implantation; **B** – the tip of MyoPore lead prior to screwing into the myocardium; **C** – the MyoPore lead implanted into the lateral wall of the left ventricle; **D** – the tip of the removed His bundle pacing lead; **E** – 3 operating ports used for surgical access; **F** – postoperative chest X-ray showing the outline of the MyoPore lead

the device and the pocket was closed. At the end of the procedure, satisfactory pacing and sensing parameters were recorded (pacing threshold of 1.2V/0.5 ms). Total procedure time was 64 minutes and no fluoroscopy was used. The patient was extubated in the operating room, and discharged home on day 4 after the procedure (FIGURE 1F). The LVEF at discharge echocardiography was 45%.

Beneficial effect of CRT-D in selected patients with ischemic HF has been demonstrated; however, optimal LV lead position is of paramount importance.<sup>1</sup> Thoracoscopic placement of the LV lead for CRT is a valuable option when transvenous implantation is impossible.<sup>2,3</sup> The use of steerable implant tool greatly improves access to the target area on the LV wall. To our knowledge, this is the first report to show that such a procedure can be safely combined with the removal of the HBP lead, which is beneficial for the patient and reduces healthcare costs.<sup>4</sup>

#### SUPPLEMENTARY MATERIAL

Supplementary material is available at [www.mp.pl/kardiologiapolska](http://www.mp.pl/kardiologiapolska).

#### ARTICLE INFORMATION

**CONFLICT OF INTEREST** None declared.

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