

Conduction System Pacing for Restoration of Synchronous Ventricular Contraction

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Background: The restoration of synchronous ventricular contraction is an essential treatment for patients with pacing-induced left ventricular dysfunction. Herein, we present a case of utilizing lead extraction and conduction system pacing (CSP) in a patient with moderate left ventricular dysfunction.

Case: A 64-year-old female patient was presented at the emergency room with dyspnea, orthopnea, and generalized edema. She had received a conventional dual-chamber pacemaker implantation for a complete atrioventricular block 10 years ago. Recent echocardiography taken 2 months before admission revealed a decreased ejection fraction (EF) of 40%, resulting from dyssynchronous left ventricular contraction from apical pacing. A moderate degree of functional mitral regurgitation and aortic regurgitation were also found. In addition, an insulation break was suspected in the atrial lead. Although her EF did not meet the criteria for cardiac resynchronization therapy, due to significant heart failure symptoms (NYHA III) and functional MR despite heart failure medications, we tried CSP to restore synchronous ventricular contraction. Due to near-total obstruction of the subclavian vein, we extracted the dysfunctional atrial lead first. After extraction, the guidewire was advanced through the inner lumen of the mechanical extraction sheath. The left bundle branch area was targeted, and the lead was penetrated into the interventricular septum. The resultant pacing morphology met the non-selective left bundle branch capture criteria (left ventricular activation time 75ms, QRS duration 144ms). There were no significant complications during the procedure. In the outpatient clinic follow-up at one month, her dyspnea improved from NYHA class III to I, and edema had disappeared. The follow-up echocardiography revealed an improved EF of 45% and the disappearance of moderate functional MR.

Conclusion: In patients with moderate LV dysfunction from chronic right ventricular apical pacing, CSP can restore synchronous contraction and improve patient symptoms.

