Rate Response Function of Pacemaker with Closed-Loop Stimulation (CLS) to Blood Pressure Variation during Dialysis in a Bradycardia Patient

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Purpose: The patient was a 70-year old male under maintenance dialysis because of diabetic nephropathy. For his advanced atrioventricular block, we implanted a pacemaker (PM) with CLS function (Entovis DRI/CLS, Nihon Kohden, BIOTRONIK) (DDD-CLS, basic rate 60 ppm) and then monitored heart rate response during dialysis. Results: Until 120 minutes after start of dialysis, systolic blood pressure (Ps) and heart rate (HR) shifted in the ranges of 158 to 167 mmHg and 60 to 63 bpm in the pacing behavior of As-Vp. About 130 to 140 minutes after start of dialysis, Ps suddenly dropped from 178 to 159 mmHg, then As-Vp changed to Ap-Vp with an increased atrial pacing rate of up to 69 ppm earlier than an increase of patient’s sinus rate, so that Ps had a tendency of early recovery. Discussion: It may be possible that when Ps dropped suddenly, CLS function detected intracardiac impedance changes which reflected changes in myocardial contraction dynamics yielded by circulating blood volume reduction due to water removal during dialysis. Conclusion: When blood pressure drops during dialysis with little body motion, an increase of atrial pacing rate by PM with CLS function may help recover blood pressure early. We will accumulate data further in order to investigate effectiveness of cardiac pacing for dialysis hypotension. Keywords: CLS, hemodialysis, blood pressure