Introduction: The leadless pacemaker is delivered into the right ventricle of the heart directly through the femoral vein by using a transcatheter delivery system. Leadless pacemaker have many advantages for some patients with complex vascular complications such as superior vena cava (SVC) occlusion.

Methods: A 96-year-old woman with small body habitus (weight: 35kg, height: 141cm, body mass index [BMI]: 17.4, body surface area [BSA]: 1.17m2) was referred to our hospital presented with frequent syncope. She had no history of cardiovascular disease, and also had no frailty and dementia. But she had a benign large anterior mediastinal tumor. An electrocardiogram (ECG) showed normal sinus rhythm, on the other hand, Holter ECG recorded transient complete atrioventricular block (CAVB) for maximum 10 seconds. The left ventricular ejection fraction (LVEF) on echocardiography was 55% without any structural heart disease. The cause of syncope was considered due to CAVB, we decided to implant a permanent pacemaker. Before the procedure, computed tomography (CT) scan demonstrated a huge anterior mediastinal tumor with a maximum diameter of 11 cm that seems to squeeze superior vena cava. The traditional transvenous lead system approaches were unavailable because of SVC occlusion, so we selected to implant a leadless pacemaker.

Result: The procedure was performed under conscious sedation, and the starting rhythm was sinus rhythm. The temporary pacemaker was inserted into the right ventricle via the left femoral vein. The leadless pacemaker was implanted on the right ventricular septum via the right femoral vein. There were no associated complications with the leadless pacemaker implantation. The leadless pacemaker is a useful option in patient with complex vascular complications. Previous studies found that low BMI and high age may be one of the risk factors associated with complication. We could performed implantation of leadless pacemaker safely.

Conclusion: We experienced the case of successful implantation of leadless pacemaker in patient with anterior mediastinal tumor.