Coronary venous angioplasty to a ring- like stricture preventing left ventricular lead insertion

Sol ventrikül lead implantasyonunu önleyen striktüre uygulanan koroner venöz anjiyoplasti

Introduction

Cardiac resynchronization therapy (CRT) is an alternative therapy in patients with severe systolic heart failure with dyssynchronous ventricular contraction and severe symptoms (NYHA III-IV) despite optimal medical therapy (1). The operators sometimes confront limitations to implant left ventricular lead in coronary veins. These include unsuitable branching angle of coronary veins and tortuosity of coronary sinus anatomy, postoperative deformation, presence of venous valves, absence of vessel in target location, and coronary venous stenosis (2, 3).

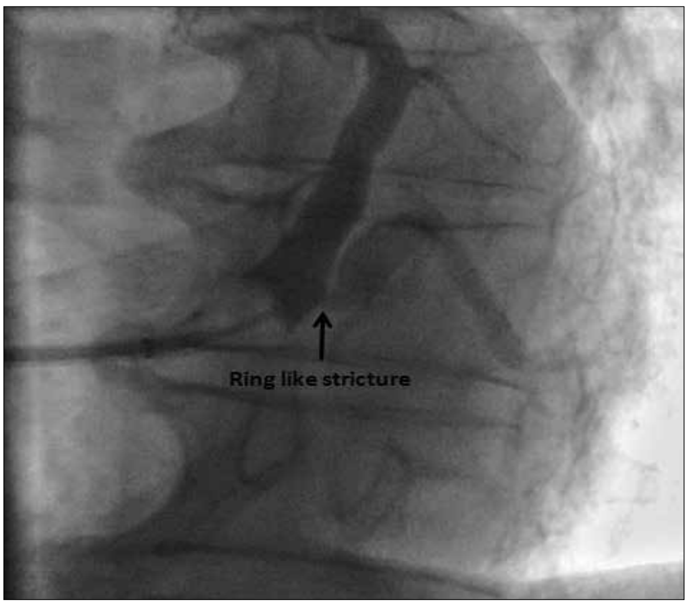

Figure 1. A ring-like stricture at the ostium of target coronary vein preventing left ventricular lead insertion

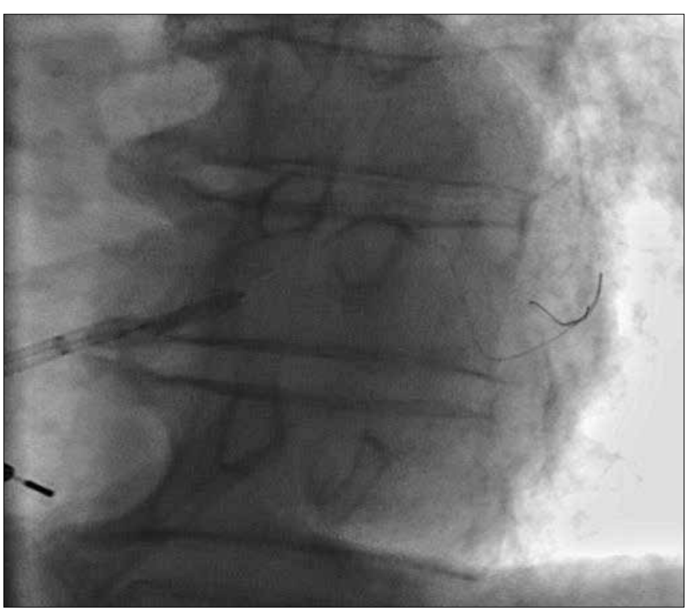

Figure 2. Application of balloon angioplasty to dilate stricture

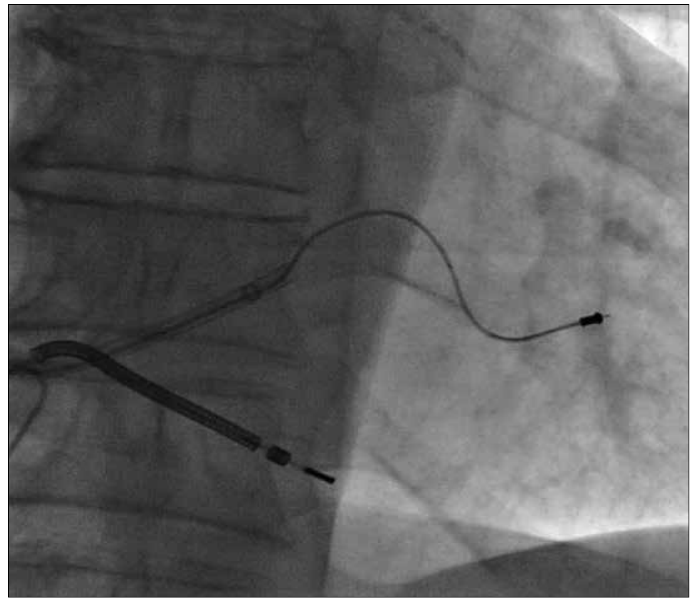

Figure 3. Successful implantation of left ventricular lead after dilatation of the stricture

We here describe coronary venous angioplasty before left ventricular lead insertion in a patient with coronary venous stenosis.

Case Report

A 57-year-old male patient with drug refractory heart failure underwent biventricular pacemaker implantation. During the procedure, guiding catheter was engaged into the coronary sinus ostium, and coronary venography was undertaken to choose target coronary vein for left ventricular lead insertion. A posterior coronary vein was found to be appropriate for lead implantation. The lead could not be introduced into the distal posterior coronary vein due to a stenosis caused by ring like stricture in the proximal portion of the vein (Fig. 1, Video 1. See corresponding video/movie images at www.anakarder.com). A coronary wire was advanced through the narrowing. The stenotic portion of the coronary vein was dilated with 2.5x10 mm angioplasty balloon with 9 atm pressure (Fig. 2, Video 2. See corresponding video/movie images at www.anakarder.com). Following dilatation, left ventricular lead was easily introduced into the posterior coronary vein without any complication (Fig. 3). Duration of the procedure was 50 minutes. Length of hospitalization was 3 days. Postoperative echocardiography did not reveal any pericardial effusion. Pacemaker follow-up showed effective biventricular stimulation.

Discussion

The target coronary vein should be carefully selected for optimal left ventricular stimulation during CRT (4). However, there are some limitations preventing optimal lead implantation to target vein such as branching and tortuosity of coronary veins, postoperative deformation, presence of venous valves, and venous stenosis (2, 3).

The incidence of venous stenosis has been reported to be approximately 2-3.5% (3, 5-7). Venous stenosis may be due to scarring from myocardial infarction, coronary artery bypass graft surgery, previous implantation of venous leads, or ring like strictures (5, 6). Although venous angioplasty is considered to be safe and effective method to overcome venous stenosis, serious complications may ensue such as rupture, perforation, dissection and thrombosis of the coronary vein (3). Therefore, close hemodynamic monitoring and control echocardiography should be done whenever coronary venous angioplasty is performed. Overinflation should be avoided, and smaller balloon compared to target vein should be chosen for angioplasty to minimize the risks of the procedure (7). This procedure should be applied by physicians who are experienced in the field of coronary angioplasty, and it should be reserved for cases whenever it is strictly necessary.

Conclusion

Implantation of coronary venous lead is technically the most difficult part of biventricular pacing. Strictures in the target vein are rare abnormalities impeding left ventricular lead implantation. Angioplasty for dilation of strictures seems to be the most appropriate solution. However, angioplasty also carries some risks of complications, therefore it should be applied by experienced operators.

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Video 1. A ring-like stricture at the ostium of target coronary vein preventing left ventricular lead insertion
Video 2. Application of balloon angioplasty to dilate stricture

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Electroanatomic mapping-guided radiofrequency ablation of multifocal atrial tachycardia in a child

Multifokal atriyal taşikardi'li bir çocuğun elektroanatomik haritalama sistemi eşliğinde radyofrekans kateter ablasyonu

Introduction

The incidence of multifocal atrial tachycardia (MAT) in infants and children is very low, accounting for approximately 1% of supraventricular tachycardia (SVT) substrates. MAT is a relatively benign disease, and long-term health depends mostly on the underlying conditions (1, 2). Recently, three-dimensional (3D) mapping systems have been used in pediatric patients. Herein, we report a case, which was successfully used 3D mapping in a child during catheter ablation of MAT originating from right pulmonary veins.

Case Report

A 12-year-old girl who had recurrent paroxysmal palpitation attacks despite three years of beta-blocker treatment was referred to our center for an electrophysiology study (EPS) and ablation. On admission, the patient's physical examinations were unremarkable. Surface 12-lead electrocardiogram (ECG) findings were consistent with focal atrial tachycardia (Fig. 1). Echocardiographic examination was normal.

The electrophysiological procedure was performed using 3D mapping system (EnSite mapping system-St. Jude Medical, St Paul, MN). Quadripolar catheters were placed in the high right atrial and right ventricular (RV) and a decapolar catheter in the coronary sinus. Wenckebach cycle length was 260 ms. Activation mapping during focal atrial tachycardia attacks (tachycardia cycle length 320 ms) showed earliest atrial activation in the upper left region of the right atrial septum. After a short application of radiofrequency (RF) catheter ablation (7F- 4 mm tip) the tachycardia speed up and became sustained. As the signals seen here were low-voltage, we considered the possibility of left focal atrial tachycardia. During SVT, atrioventricular dissociation was achieved by RV pacing, and at the site of earliest activation, local atrial electrogram was only 5 ms ahead of the P-wave, which pointed to the origin of tachycardia from the left atrium. As no patent foramen ovale was found, transseptal punction was used to reach the left atrium (Fig. 2), where mapping was continued. Patient received 4000 IU heparin intravenously. As the tachycardia cycle lengths and earliest activation sites were different during activa-

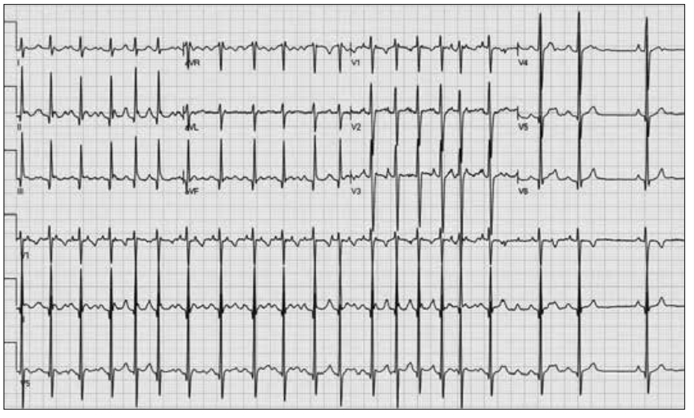

Figure 1. The 12-lead ECG findings consistent with focal atrial tachycardia
ECG - electrocardiogram