

## Implantation of a cardioverter defibrillator on the side of a hemodialysis fistula to prevent loss of the alternative arterio-venous access

*Alternatif arteriovenöz girişin korunması amaçlı hemodiyaliz fistülü olan tarafa implantabl kardioverter defibrilatör implantasyonu*

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### Introduction

Implantation numbers for implantable cardioverter defibrillators (ICDs) are on the increase with better understanding of the pathogenesis of cardiac arrhythmias, patient ageing, and increasing evidence for primary prevention such as the multicenter automatic defibrillator implantation trials (1). We report on a patient with indication for the implantation of an ICD who had been on hemodialysis via a left sided atrio-ventricular (AV) radial fistula for 8 years.

### Case report

A 62-year old male patient on hemodialysis for the past 8 years for chronic renal failure due to diabetic nephropathy was admitted to our hospital with progressive dyspnea on minor exertion one month after ST-segment elevation myocardial infarction treated by recanalisation of and stent implantation in the right coronary artery. An echocardiographic examination revealed a markedly reduced left ventricular ejection fraction of 35%. The ICD device was implanted on the ipsilateral side of the 8- year old fistula after cardiac recompensation. We performed venography after the procedure, which showed no evidence of stenosis (Fig. 1). Before implantation there were no clinical signs of subclavian vein stenosis. Despite higher perfusion pressure in the cephalic vein there were no perioperative bleeding complications. Fourteen months after ICD implantation blood flow during hemodialysis via the left sided fistula became insufficient and the patient developed swelling and pain of the left arm. Angiography revealed a venous stenosis near the AV fistula. After percutaneous dilatation of the stenosed segment near the fistula, a reduction of pain and arm swelling was not achieved despite improved flow in the distal part of the vein on venography. A well functioning dialysis fistula was obtained by creation of the new AV fistula on the opposite arm.

### Discussion

Pacemaker leads can be considered as permanent cannulation. Central vein stenosis (CVS) after pacemaker implantation occurs in 30-60 % of cases and is usually asymptomatic (2). Aside from the initial trauma at the time of central venous catheter placement, many factors stimulate

pathological process within the vessel wall. These factors include the presence of foreign body in the vein the sliding movement of the catheter with respiration, postural and head movements, and increased flow and turbulence from AV fistula, alone or in combination (3). Throughout the literature there seems to be a consensus for creating a new AV fistula on the opposite arm to the pacemaker to prevent the development of CVS and dysfunction of the AV access (4). No rules can be stipulated and each specific case has to be discussed. If the cephalic vein is amenable to fistula construction, provided that a good quality venography rules out any stenosis in the central vein, it may be far preferable to create an autologous fistula on the side of pacemaker instead of placing a prosthetic graft on the contralateral side (5). There are no data available for new ICD implantation in patients already having AV fistula for a longer period. On the one hand the function of AV fistula is limited, and many patients treated with hemodialysis need two or



**Figure 1. Vena cephalica sinister illustrated with contrast medium injection. A dual chamber ICD is implanted.**

ICD- implantable cardioverter defibrillator

more AV accesses throughout their life (6). In 298 patients, in whom lower-arm radiocephalic fistulas were created, the fistula patency was 74.1%, 64.2%, 49.8%, 33.7%, and 4.1% after 1, 2, 3, 4, and 5 years, respectively (7).

In this presented case with diabetes the patency is much lower, so the risk for CVS is higher. In most of the papers reporting on CVS after fistula creation on the ipsilateral arm of the pacemaker, the authors suggest that phlebography should systematically be performed before the fistula is created, in order to diagnose pre-existing CVS (8). On the other hand the risk of bleeding complications is much higher in ICD implantation in a vein perfused by an AV fistula because of increased blood flow and reduced vessel compliance. With these considerations in mind we decided to implant the device on the side of the fistula protecting the other side for future AV fistula access.

### Conclusion

We recommend the implantation of a rhythm device on the side of the AV fistula in relatively young patients with old AV fistula due to the expected requirement for a new AV access, as it seems feasible despite a higher risk of perioperative bleeding complications.

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## Persistent atrial fibrillation associated with gastroesophageal reflux accompanied by hiatal hernia

*Hiatal herni ile birlikte gözlenen gastroözofajiyal reflü ile ilişkili dirençli atriyal fibrilasyon*

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### Introduction

Atrial fibrillation (AF) may be related to temporary causes and successful treatment of the underlying condition often eliminates AF (1). In this article, we present a case of persistent AF resistant to pharmacological and direct-current cardioversion and converted to sinus rhythm with a proton pump inhibitor (PPI) in a patient with paraesophageal hernia and gastroesophageal reflux (GER).

### Case report

A 79-year-old woman presented to our department with complaints of palpitations for 10 days. The patient also complained of long-standing heartburn and daily acid regurgitation. She had history of hypertension and chronic obstructive pulmonary disease. The patient was an ex-smoker and was receiving amlodipine 5 mg once daily and budesonide turbuhaler 200 µg twice daily. Besides, he had not used any anti-acid drug regularly. On physical examination, her blood pressure

was 120/80 mm Hg, and pulse rate 160 beats per minute, arrhythmic. Examination of the heart revealed no abnormality except a rapid rhythm. Her electrocardiography showed AF with rapid ventricular response (Fig. 1A). There were no pathological findings on the laboratory examinations including arterial blood gas analysis. Thyroid disease and any other potential metabolic causes for tachycardia were excluded. Mild tricuspid and mitral regurgitation and mild to moderate pulmonary hypertension (pulmonary systolic artery pressure 40 mm Hg) were detected on transthoracic echocardiography. Left ventricular ejection fraction was 65% and left atrial end-diastolic diameter was 45 mm. Transesophageal echocardiography revealed left atrial spontaneous echo contrast without thrombus in left atrium and left atrial appendage. Upon this, firstly, heparin and intravenous verapamil was administered. But, it failed. Subsequently, electrical cardioversion was attempted. Sinus rhythm could not be achieved and we decided to rate control with verapamil and oral anticoagulation. Computed tomography (CT) scan of the thorax was performed due to complaint of non-productive cough. CT showed large hiatal hernia into the chest and barium swallow confirmed