Pulmonary veins isolation in a patient with atrial fibrillation and pronounced vagal response: Is it enough?

Izolacija plućnih vena kod bolesnika sa fibrilacijom pretkomora i naglašenim vagalnim odgovorom: Da li je to dovoljno?

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Abstract

Introduction. Pulmonary vein isolation (PVI) by antral circumferential ablation is the standard procedure for patients with symptomatic and drug-refractory paroxysmal atrial fibrillation (AF). In some patients addition of ganglionated plexi (GP) modification in anatomic locations to PVI confers significantly better outcomes than PVI alone.

Case report. We reported a patient with paroxysmal, symptomatic AF and severe bradycardia a month prior to ablation. The patient was treated with antiarrhythmic drugs without success. Because of severe bradycardia the patient was implanted with a temporary pacemaker two days before PVI. During PVI the decision was made to also do a modification of the left GP. Three months after the procedure the patients was in stable sinus rhythm without any symptoms.

Conclusion. In selected patients with paroxysmal AF and pronounced vagal response PVI by circumferential antral ablation combined with GP modification during single ablation procedure can produce higher success rates than PVI or GP ablation alone.

Key words: atrial fibrillation; pulmonary veins; catheter ablation; vagotomy.

Apstrakt

Uvod. Izolacija plućnih vena (PVI) antrumskom cirkumferentnom ablacijom je standardna metoda za bolesnike sa simptomatskim AF. Kod pojedinih bolesnika dopunska modifikacija anatomskih lokacija autonomnih gangliona ganglionated plexi (GP) dovodi do značajno boljeg ishoda od onih kojima je učinjena samo PVI. Prikaz bolesnika. Prikazali smo bolesnika sa parokszimalnom AF i epizodama teške bradikardije koje je imao u poslednjih mesec dana. Bolesnik je lečen antiaritmijskom terapijom bez značajnijeg uspeha. Zbog teške bradikardije bolesniku je implantiran privremeni vodič srčanog ritma dva dana pre elektrofiziološkog ispitivanja i radiofrekventne ablacije. Tokom radiofrekventne ablacije zbog izraženog vagalnog odgovora odlučeno je da se učini i modifikacija anatomskih lokacija GP sa leve strane. Tri meseca kasnije bolesnik je bio u stabilnom sinusnom ritmu i bez simptoma. Zaključak. Kod pojedinih bolesnika sa parokszimalnom AF i naglašenim vagalnim odgovorom, PVI cirkumferentnom antrumskom ablacijom udruženom sa modifikacijom GP, može imati veći uspeh od PVI ili modifikacije GP samostalno.

Ključne reči: fibrilacija pretkomora; vv. pulmonales; ablacija preko katetera; vagotomija.
contrast to some other arrhythmias, like ventricular tachycardia, where sympathetic activation is proarrhythmic, parasympathetic activation is antiarrhythmic. PVI is the standard catheter ablation procedure for patients with recurrent, symptomatic or drug-refractory paroxysmal AF. Adjunctive ablation such as performing linear lesions, ablating complex fractionated atrial electrograms or ganglionated plexi (GP) are still used only for improving procedural efficacy in selected patients.

Case report

A 37-year old man with severe sinus bradycardia (pulse under 40/min), was admitted to our Clinic, complaining to headache, dizziness and postural instability. One month prior to admission, the patient was admitted to another hospital because of paroxysmal AF and bradycardia. He was treated briefly with antiarrhythmics (amiodaron, beta blockers) but due to profound bradycardia, pulse under 35/min, they were discontinued. His CHA2DS2-VASc score (Birmingham stroke risk stratification algorithm) was 0, but regarding preparation for the radiofrequency (RF) ablation the patient was commenced onto warfarin therapy. Transesophageal echocardiography was performed to rule out the presence of left atrial or left atrial appendage thrombus. Left ventricular ejection fraction and the left atrial diameter were normal and no significant valvular lesions were found. Subsequent Holter monitoring revealed episodes of short paroxysmal AF not longer than 5 min triggered by atrial premature beats (APBs) with episodes of bradycardia (minimal frequency on Holter was 35/min). On the third hospital day, due to bradycardia, a temporary pace maker was implanted through femoral vein. On the fourth hospital day the patient underwent electrophysiological study. In terms of analgesedation through the right femoral vein a decapolar electrode catheter was inserted and positioned at the distal coronary sinus. The transseptal access was achieved under fluoroscopic guidance applying the standard technique. Intravenous unfractionated heparin was administered till the end of the procedure (a starting dose of 70 IU/kg and then 1,000 IU per hour). Then, spiral computed tomografy was performed and the resulting image of the left atrium (LA) was integrated with the electroanatomic map of the LA. PVI was performed using the Ensite Velocity electroanatomic mapping system (St Jude Medical, Minnesota, USA). First RF application in the posterosuperior part of circumference around left veins produced profound bradycardia which was then followed by AF initiation. Ablation was carried out at the antral part of all four pulmonary veins (PVs). They were successfully isolated and sinus rhythm was restored spontaneously (Figure 1). After that, ablation was carried out near the areas of anatomic location of GP (Figure 2). As an endpoint for GP ablation we selected abolition of inducibi-
le vagal response (induction of AF and/or bradycardia and/or atrioventricular (AV) block. Presumed locations of the four major left atrial GP were ablated outside the junctions of PVs and LA at the following sites: left superior GP (SLGP), left inferior GP (ILGP), right anterior GP (ARGP) and right inferior GP (IRGP) and ligament of Marshall. The procedure was performed without complications. During a 3-month follow-up period the patient was in stable sinus rhythm without episodes of atrial fibrillation or sinus bradycardia.

Discussion

In published studies the success rate of GP ablation alone was not significantly superior to pulmonary vein isolation alone, but GP ablation plus PVI significantly increased freedom from AF after a combine procedure both in paroxysmal alone, but GP ablation plus PVI significantly increased freedom was not significantly superior to pulmonary vein isolation without complications. During a 3-month follow-up period the patient was in stable sinus rhythm without episodes of atrial fibrillation or sinus bradycardia.

Conclusion

PVI by circumferential antral ablation with GP modification performed in a single ablation procedure in selected patients with paroxysmal AF and pronounced vagal response has higher success rates than PVI or GP ablation alone. A short follow-up period in the presented patient is the major disadvantage regarding this conclusion. The long-term benefit and risk in patients with PVI and GP modification ablation deserve further evaluation.

References


Received on February 12, 2016.
Accepted on March 10, 2016.
Online First April, 2016.