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TAVR — A new way to treat ventricular storm and ventricular fibrillation

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Letter to the Editor

Ventricular tachycardia and ventricular fibrillation are the cause for most of the cardiac deaths. The death rate is estimated to be around 300,000 deaths per year in the United States making up for 50% of all of cardiac mortality [1]. Ischemic cardiomyopathy is the main cause of ventricular tachycardiac arrhythmias, but other common etiologies, such as electrolyte imbalances, channelopathies or hypertrophic cardiomyopathy exist.

Aortic stenosis is the most common valvular disease in the developed world. Its most common cause is degenerative destruction of the valve and the incidence and its severity are increasing with age [2]. The most common symptoms of aortic stenosis are dyspnea and congestive heart failure, while syncope is the hallmark finding [3]. Common arrhythmias seen in aortic stenosis are left bundle branch block, bradycardia due to AV-block or atrial fibrillation. Hemodynamically ventricular arrhythmias seem to be rare [4].

1. Case report

An 84-year-old male was admitted for an arrhythmogenic storm by polymorphic ventricular tachycardia, causing hemodynamic

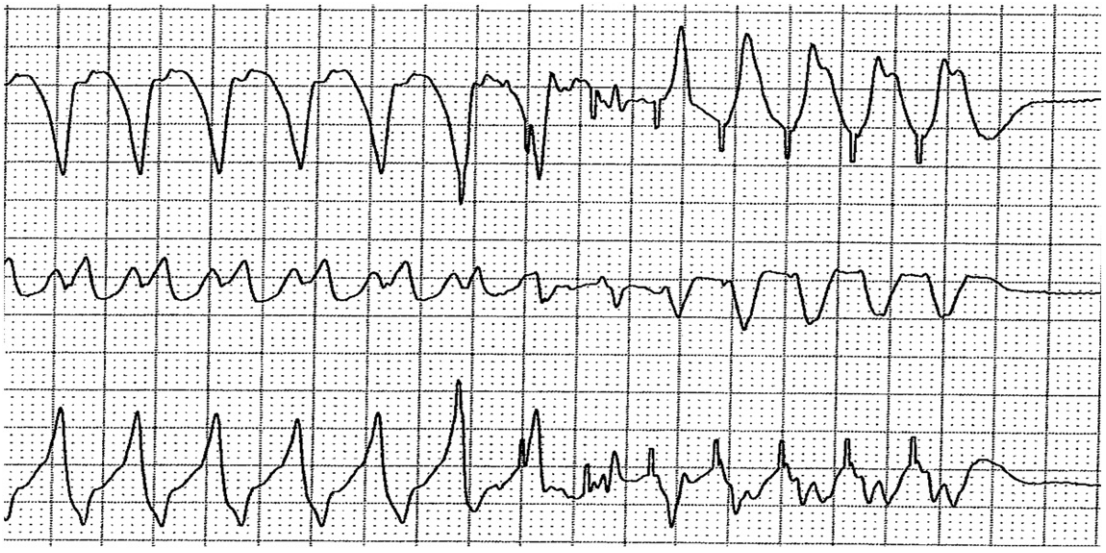

Fig. 1. Polymorphic ventricular tachycardia as recorded by patient's ICD. Feed rate 25 mm/s.

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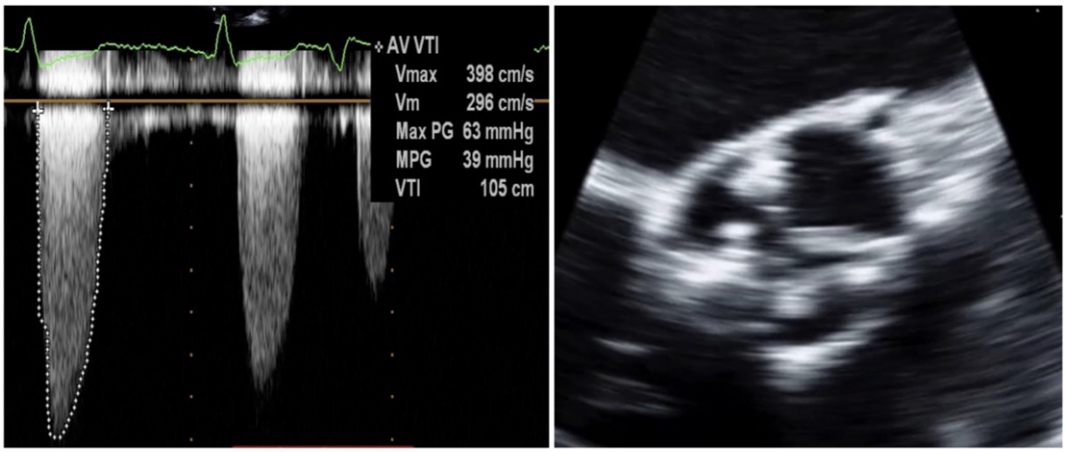

Fig. 2. TTE showing severe aortic stenosis (right panel) with a high flow velocity of 4 m/s and a mean and max. gradient of 60 mm Hg and 40 mm Hg, respectively (left panel).

instability and multiple discharges of his defibrillator/cardioverter (Fig. 1). The device had been preventively implanted for moderate reduced ejection fraction caused by coronary artery disease. Unexpectedly, coronary angiography showed stable CAD with a proper flow over the coronaries and bypass on RIVA and RPLA, respectively (Fig. 3). No target lesions were present. Echocardiography showed the LVEF to be stable as well but a severe aortic stenosis was appreciated (Fig. 2). Other obvious causes for the tachycardiac arrhythmias, such as electrolyte imbalance were not found. Using the theory of global ischemia, caused by the severe aortic stenosis, triggering the ventricular tachycardias, emergency valvuloplasty was performed and the VTs suspended immediately. The peak transoartic gradient was reduced by 20 mm Hg from 55 mm Hg to 35 mm Hg (Fig. 4). 3D CT angiogram was performed prior to surgery for aortic valve replacement (Fig. 5). Soon after, new VTs and ventricular fibrillation developed (Fig. 6), and TTE showed restenosis with a mean gradient of 30 mm Hg. Emergency transaortic valvular replacement was performed. Since then, the patient was stable and ventricular arrhythmias did not occur again.

Hemodynamic relevant ventricular tachycardias, such as sustained VT and VF are most commonly caused by cardiac ischemia in the setting of coronary artery disease. Also electrolyte imbalances,

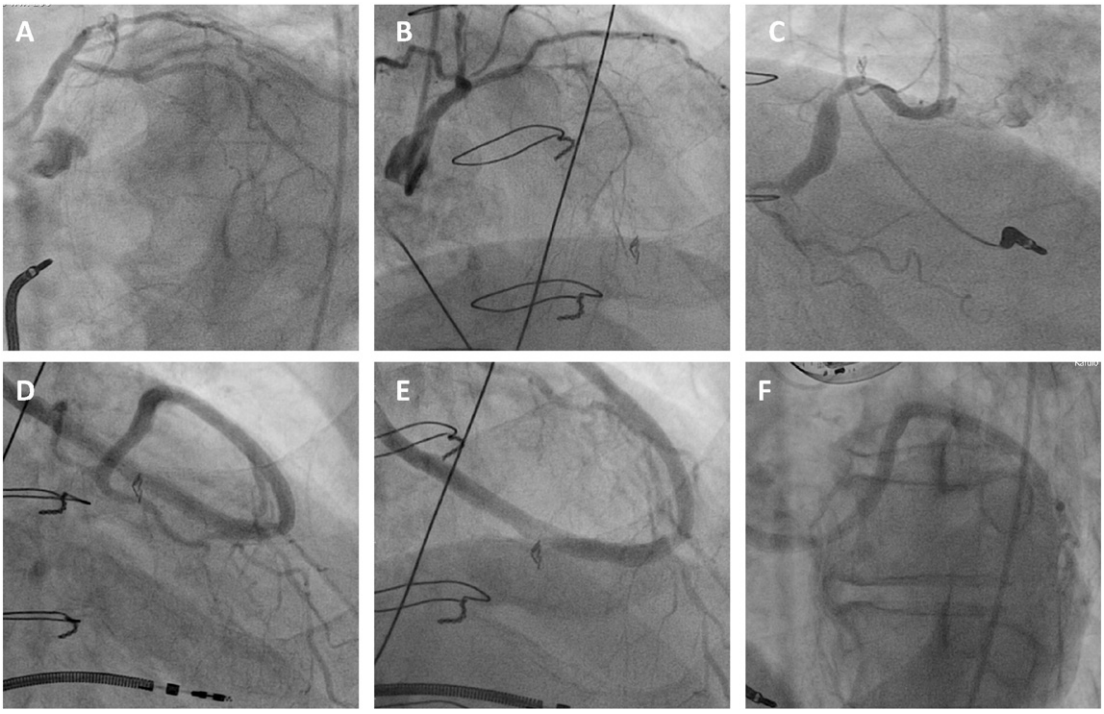

Fig. 3. Coronary angiogram. LAD and LCX show diffuse relevant CAD (A, B). RCA is occluded in its mid-section (C). The jump-bypass to LAD and to RPLA (D, E) and the bypass to RCA (F) are patent and the targeted-vessels are without relevant stenosis.