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Kasuistika | Case report

Cardiac implantable devices and takotsubo syndrome. A rare but potential eventuality

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SOUHRN

Tako-tsubo kardiomyopatie (rovněž stresem navozená kardiomyopatie) je syndrom připomínající akutní infarkt myokardu (AIM); k rozvoji tohoto syndromu často dochází po emoční nebo fyzické zátěži. Popisujeme případ pacientky, u níž došlo k rozvoji tako-tsubo kardiomyopatie, kdy se po implantaci kardiostimulátoru vytvořila koronární píštěl. Tuto možnost musí mít implantující chirurg vždy na mysli; lze jí zabránit vhodným psychologickým screeningem a použitím sedace při vědomí.

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ABSTRACT

Takotsubo cardiomyopathy is a syndrome which mimics acute myocardial infarction (AMI) occurring often after an emotional or physical stress. We report the case of a female patient who suffered from takotsubo cardiomyopathy associated to a coronary fistula after pacemaker implantation. Its occurrence should be always remembered by the implanters, avoiding it by an appropriate psychological screening and use of conscious sedation.

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Introduction

Takotsubo syndrome is a clinical pattern consisting of transient, regional left ventricular (LV) contraction abnormalities with acute hemodynamic deterioration and electrocardiographic (ECG) features, mimicking an acute myocardial infarction (AMI) but without significant coronary artery disease. Typically it is characterized by apical ballooning of the left ventricle, with reduced apical contractility and hyperkinesia of the basal segments. Potentially life-threatening complications include cardiogenic shock, arrhythmias or acute pulmonary edema [1–3]. It is well-known that it often follows an emotionally or physically stressful episode and that most of the patients are women in post-menopausal age [1,4]. Its incidence is not known but it seems to be from 1% to 2% of all patients presenting with an AMI. In-hospital mortality is about 2% and long-term prognosis is mostly favorable with complete resolution [1,5–7].

Case presentation

A female patient of 68 years underwent the cardiac evaluation because of two episodes of syncope during last month. In her history there were mild obesity, dyslipidemia, psoriasis and arterial hypertension from two years. About six months earlier she underwent stress echocardiography which resulted negative for LV kinetic abnormalities [8–10]. The basal ECG was normal and the echocardiogram showed normal left ventricle diameters and preserved ejection fraction (EF = 58%), so she underwent

Holter registration. The registration recorded a second degree Mobitz type II atrioventricular block associated with syncope. A permanent dual-chamber pacemaker implantation was performed. The procedure was accomplished without any complications [11–13]. 24 h later she complained of retrosternal pain, sweating and dyspnea. An ECG showed mild ST elevation in the chest leads from V3 to V5 which was associated with a echocardiographic pattern of akinesia of the LV apical and medium segments with preserved kinetics of the basal ones and reduced ejection fraction (EF = 38%). She immediately underwent coronary angiography, which showed coronary tree free from injuries and normal coronary flow, with the presence of a arterio-arterial fistula emerging from both the anterior descending and the right coronary arteries and connected with the pulmonary artery (Fig.1). The ventriculography showed a pattern of “apical ballooning” so the final diagnosis was “takotsubo like” cardiomyopathy [7,14–17]. She was treated with furosemide i.v. and beta blockers with progressive reduction of symptoms and normalization of ejection fraction in few days. An echocardiogram was performed 4 weeks later, showing complete resolution of wall motion abnormalities.

Discussion

It is well known that the takotsubo syndrome is preceded by a strong emotional or physical stress [1,4].

Most authors consider the catecholamine overload as the key contributor to development of takotsubo syndrome.

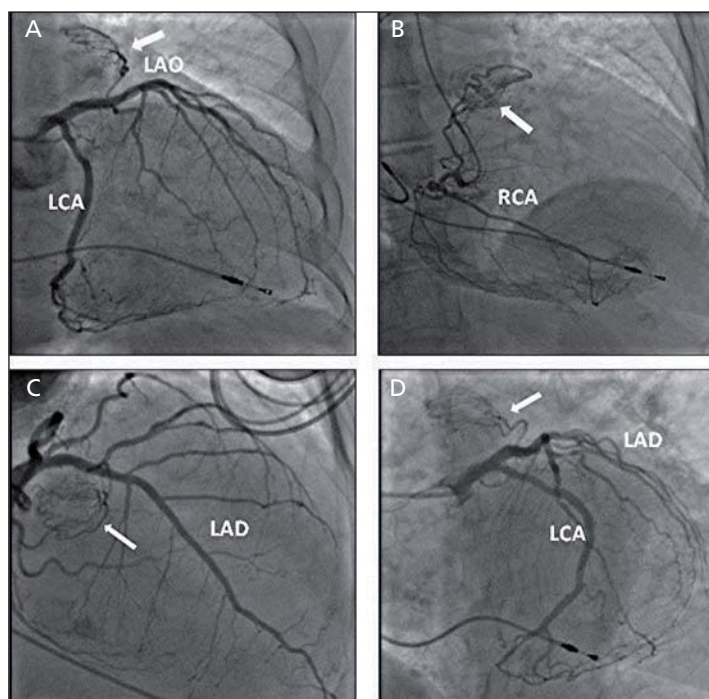


Fig. 1 – Fluoroscopic images of the coronary tree during Heart Catheterization procedure. (A) RAO 1° CAU 26° Arterio-arterial fistula (arrow) emerging from the LAD. (B) RAO 1° CRA 3° Arterio-arterial fistula (arrow) coming out from RCA proximally to the pulmonary artery. (C) (RAO 2° CRA 37°) and (D) (LAO 38° CAU 16°): evidence of an anastomosis between the two emerging extremities (arrow) from LAD and RCA.

me [4,18]. Another possible mechanism could be microvascular vasoconstriction. This effect is mediated by both α_1 - and α_2 -adrenergic receptors [19,20]. A typical feature of takotsubo syndrome is unequal distribution of incidence between males and females. About 90% of patients with takotsubo syndrome are women, especially those ones in the postmenopausal period, during which there is the highest risk [1,4].

Research is continuing its investigation on the pathophysiological substrate. Young women have lower adrenaline and noradrenaline plasmatic concentration compared to men, but its increase with age is higher. Lower levels of estrogens after the menopause that are linked to higher sympathetic activity, may play the role [21,22].

A pacemaker implantation procedure undoubtedly exposes the patient to an emotional stress that, in subjects at risk, could determine a takotsubo syndrome [23,24]. This is the first case in literature of a takotsubo cardiomyopathy associated with a coronary fistula after a pacemaker implantation. This case focuses on the fact that takotsubo syndrome can manifest also in the setting of minimally invasive procedures (like a pacemaker implantation). Probably a predisposing factor is often needed. In fact our patient had also an arterio-arterial fistula which could be a phenotypic expression of a genetic predisposing pattern. We think that takotsubo cardiomyopathy should be always kept in mind by the implanters as a possible eventuality in the peri-procedural setting, especially in those patients with a psychological profile exposing to emotional stress. These patients are probably those ones that could benefit of a conscious sedation.

Conflict of interest

None

Funding body

None.

Ethical statement

Authors state that the research was conducted according to ethical standard.

Informed consent

Informed consent was obtained from the patient.

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