

Case Report

Ventricular Tachycardia, Ventricular Fibrillation and Atrioventricular Blok Duo to Multivessel Coronary Spasm in a Young Woman; Implantable Cardioverter Defibrillator as Therapeutic Option: Case Report

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1. ABSTRACT

1.1. Background: Vasospastic angina can cause malign arrhythmias that despite full medical treatment, the sudden death is not guaranteed.

1.2. Case Presentation: We report a case of a 36-year-old woman with angina at rest followed by sudden cardiac death secondary to ventricular fibrillation. Our case experienced ventricular fibrillation, ventricular tachycardia, and atrioventricular block at different times. Coronary angiography showed spontaneous and simultaneous multivessel coronary artery spasm. Despite full medical treatment, repeat episode of chest pain was. Finally, the patient received an implantable cardioverter defibrillator to avoid the risk of sudden cardiac death.

1.3. Conclusions: Implantable cardioverter defibrillator should be considered for patients who remained symptomatic despite optimal medical therapy.

2. Keywords: Cardiac arrest; Coronary spasm; Implantable cardiac defibrillators

3. LIST OF ABBREVIATIONS:

ECG: Electrocardiogram; ICD: Implantable Cardioverter Defibrillator; LAD: Left Anterior Descending Artery; OM: Obtuse Marginal; RCA: Right Coronary Artery

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4. BACKGROUND

Vasospastic angina (variant angina), first described by Prinzmetal, is a syndrome of chest pain caused by myocardial ischemia secondary to reversible coronary artery vasospasm that typically occurs at rest and is associated with transient ST segment elevation.^[1] Serious complications can result due to spasm such as myocardial infarction, ventricular arrhythmias, atrioventricular conduction block, and sudden death. Long-term survival of vasospastic angina is generally good, as long as the patients remain on calcium channel blockers. Despite full medical treatment, the prevention of ventricular arrhythmias or sudden death is not guaranteed.^[2,3]

5. CASE PRESENTATION

A 36-year-old woman fainted after a brief sensation of tightness in the chest while resting at home. She had no history of cardiovascular disease and risk factors. She transported to a regional district hospital within seven minutes. The patient was unconscious on arrival, with ventricular fibrillation on electrocardiogram. Basic life support maneuvers and defibrillation restarted sinus rhythm and endotracheal intubation was performed. One day later, ventricular tachycardia developed and terminated by cardioversion. Two weeks after admission, the patient discharged with minimal neurological sequelae and transported to our hospital for advanced research. On admission, cardiopulmonary examination was normal. Electrocardiogram (ECG) showed normal sinus rhythm. Laboratory tests did not show abnormalities. Transthoracic echocardiogram demonstrated normal systolic function and regional wall motion. A few days after admission, the patient had a new episode of chest discomfort. ECG showed ST segment elevation in inferior leads and ST segment depression in right precordial leads. Within five minutes, symptoms and ECG abnormalities reverted spontaneously. Initial coronary angiography revealed severe coronary spasm at proximal Right Coronary Artery (RCA) and first Obtuse Marginal (OM1) artery (Figure 1). Process was terminated because of patient noncompliance. No vasodilator was injected into heart. A week later coronary angiography was done under general anesthesia. Second coronary angiography showed simultaneous coronary artery spasm of the entire Left Anterior Descending artery (LAD) and first Obtuse Marginal (OM1) (Figure 2). After intra coronary administration of isosorbide dinitrate, there was normalization of the coronary artery diameters. Since despite intensive medical therapy including calcium canal blocker and nitrate did not avoid vasospasm, an implantable cardioverter defibrillator (ICD) was implanted (Figure 3).

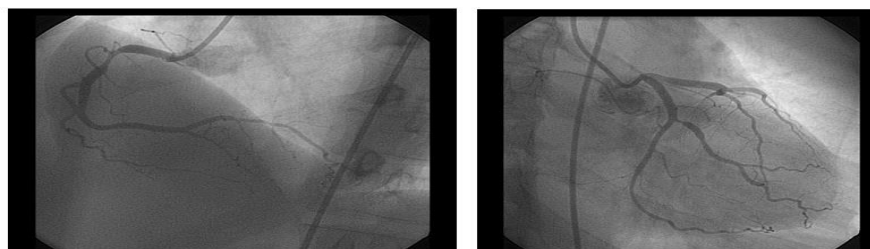


Figure 1: A) Initial coronary angiogram, showing coronary spasm at the proximal right coronary. B) First Obtuse Marginal (OM1) artery.

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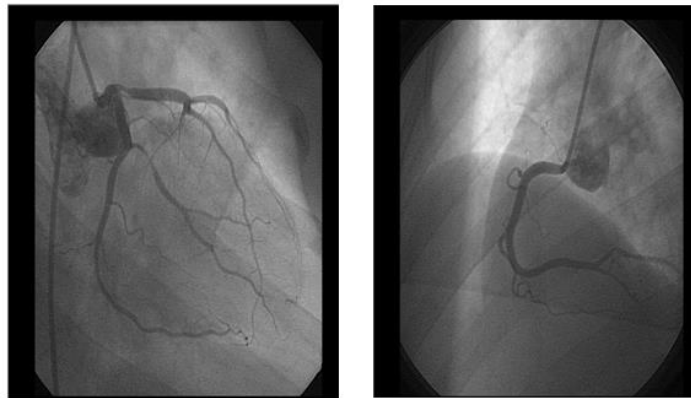


Figure 2: A) Second coronary angiogram, showing coronary spasm at the entire Left Anterior Descending artery (LAD) and first Obtuse Marginal (OM1). B) Normal right coronary artery.

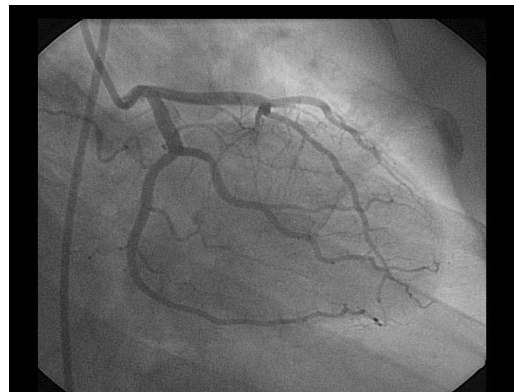


Figure 3: The coronary angiogram, showing the spasm relieved after intracoronary nitroglycerin infusion.

6. DISCUSSION

Variant angina usually occurs at rest and is worse in the early morning, responds quickly to sublingual nitrates, and is associated with transient ST segment elevation. Coronary vasospasm may be associated with syncope and serious arrhythmias, including atrioventricular block, asystole or ventricular tachyarrhythmia.^[4,5] The most common arrhythmia at the time of cardiac arrest is ventricular fibrillation, followed by ventricular tachycardia.^[6,7] Contrary to other reports, in 2007 M.-J. Hung et al.^[8] reported six patients with coronary vasospasm-induced acute coronary syndrome and episodes of cardiac arrest, complete atrioventricular block were the most common complication.

We reported a case; she experienced ventricular fibrillation, ventricular tachycardia, and atrioventricular block at different times. Provocative test (used to ergonovine or acetylcholine) should be in survivors of unexplained sudden cardiac death. It not recommended using them in patients with known structural or coronary heart disease and they are not necessary when spontaneous vasospasm has already been documented, as in our case. Coronary artery spasm-induced sudden cardiac death has previously described in patients without flow-limiting structural coronary artery disease. However, angiographically normal coronary arteries with spam are usually found to occur in atherosclerotic segment when further assessed with more advanced techniques such as intravascular ultrasound.^[9]

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Calcium channel blockers and nitrates are the conventional medical treatment for coronary spasm. Despite full medical treatment, the prevention of ventricular arrhythmias or sudden death is not guaranteed.^[2,3] Patients with vasospastic angina having an ICD implantation for secondary prevention showed a higher risk of malignant ventricular arrhythmias than patients with atherosclerotic coronary stenosis.^[10] Appropriate ICD shocks were determined in 24 % of patient's experienced sudden cardiac death as a result of coronary spasm.^[11] ICD implantation is considered an effective treatment for preventing the fatal arrhythmias in these patients.^[11-13] Our case has experienced two episode of chest discomfort while receiving full medical treatment.

7. CONCLUSIONS

Patients, who remained symptomatic with recurrent ventricular tachyarrhythmias despite optimal medical therapy, should be considered candidates for ICD. In particular, symptomatic patients with vasospastic angina and previous ventricular fibrillation remain a high-risk group that is at a lifelong risk for sudden cardiac death and should receive an ICD.

REFERENCES

1. Prinzmetal M, Kenamer R, Merliss R, Wada T, Bor N. Angina pectoris. I. A variant form of angina pectoris: preliminary report. Am J Med. 1959;27:375-88.
2. Nakamura M, Takeshita A, Nose Y. Clinical characteristics associated with myocardial infarction, arrhythmias, and sudden death in patients with vasospastic angina. Circulation. 1987;75(6):1110-6.
3. Koyanagi S, Takeshita A, Nakamura M. Clinical characteristics of sudden cardiac death in patients with vasospastic angina. Jpn Circ J. 1989;53(12):1541-5.
4. Tsurukawa T, Kawabata K, Miyahara K, Kawano R, Sohara H, Amitani S, et al. Sudden death during Holter electrocardiogram monitoring in a patient with variant angina. Intern Med. 1996;35(12):966-9.
5. Unverdorben M, Haag M, Fuerste T, Weber H, Vallbracht C. Vasospasm in smooth coronary arteries as a cause of asystole and syncope. Cathet Cardiovasc Diagn. 1997;41(4):430-4.
6. Myerburg RJ, Kessler KM, Mallon SM, Cox MM, deMarchena E, Interian A, et al. Life-threatening ventricular arrhythmias in patients with silent myocardial ischemia due to coronary-artery spasm. N Engl J Med. 1992;28;326(22):1451-5.
7. Chevalier P, Dacosta A, Defaye P, Chalvidan T, Bonnefoy E, Kirkorian G, et al. Arrhythmic cardiac arrest due to isolated coronary artery spasm: long-term outcome of seven resuscitated patients. J Am Coll Cardiol. 1998;31(1):57-61.
8. Hung MJ, Cheng CW, Yang NI, Hung MY, Cherng WJ. Coronary vasospasm-induced acute coronary syndrome complicated by life-threatening cardiac arrhythmias in patients without hemodynamically significant coronary artery disease. Int J Cardiol. 2007;12;117(1):37-44.

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9. Yamagishi M, Miyatake K, Tamai J, Nakatani S, Koyama J, Nissen SE. Intravascular ultrasound detection of atherosclerosis at the site of focal vasospasm in angiographically normal or minimally narrowed coronary segments. J Am Coll Cardiol. 1994;23(2):352-7.
10. Ogino Y, Ishikawa T, Minamimoto Y, Kiyokuni M, Kimura Y, Akiyama E, et al. Characteristics and prognosis of patients with vasospastic angina diagnosed by a provocation test with secondary prevention implantable cardioverter defibrillator. Int Heart J. 2021;30;62(2):224-9.
11. Sueda S, Kohno H. Optimal medications and appropriate implantable cardioverter-defibrillator shocks in aborted sudden cardiac death due to coronary spasm. Intern Med. 2018;57(10):1361-9.
12. Meisel SR, Mazur A, Chetboun I, Epshtein M, Canetti M, Gallimidi J, et al. Usefulness of implantable cardioverter-defibrillators in refractory variant angina pectoris complicated by ventricular fibrillation in patients with angiographically normal coronary arteries. Am J Cardiol. 2002;89(9):1114-6.
13. Matsue Y, Suzuki M, Nishizaki M, Hojo R, Hashimoto Y, Sakurada H. Clinical implications of an implantable cardioverter-defibrillator in patients with vasospastic angina and lethal ventricular arrhythmia. J Am Coll Cardiol. 2012;60(10):908-13.