ORIGINAL ARTICLE

Back to the Roots: Retrospective Fatal Event Due to Simultaneous Multivessel Coronary Spasm

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ABSTRACT

Introduction: Hibernating myocardium due to multivessel coronary spasm was first described in 1991. **Methods and Results:** In 1997, we saw the female patient after hysterectomy with profound hypotension in the cath lab. An ischemic event was suggested, the electrocardiography revealed ST elevation in all leads. A multivessel coronary spasm was found, after initial solution of spasm with i.a. verapamil, no coronary lesions were seen. **Conclusion:** Retrospectively, this was one the first reports with fatal event. As in the follow-up, the multivessel spasm could not be constantly solved the patient died.

Key words: Hibernating myocardium, multivessel coronary spasm, takotsubo syndrome, verapamil

INTRODUCTION

Hibernating myocardium due to simultaneous multivessel coronary spasm was first described by Dote *et al*.[1] in 1991. Not until 2000 and 2001, the term "takotsubo cardiomyopathy" was initiated describing left ventricular appearance with apical ballooning with non-obstructed coronary arteries.

METHODS AND RESULTS

Retrospectively, in 1997, we saw a female patient 68 years of age directly from the surgical theatre in the cath lab of the hospital of Quedlinburg, Germany.

At the end of surgical hysterectomy, the patient developed hypotension requiring maximum dosage of catecholamines (noradrenaline). The blood pressure in the cath lab was 60/40 millimeter of mercury. Electrocardiography revealed ST-segment elevation in all 12 leads. Coronary angiography revealed severe spasm of dominant left and small right coronary artery. Merely, the ostia or left and right coronary artery was filled with contrast media. After intracoronary administration of verapamil at a dosage of 6.25 ml in both ostia, coronary angiography could be done without any lesions. Paradoxically, blood pressure after verapamil infusion was 80/60 mm of mercury. The examination was finished and the patient went to the intensive care unit. Four hours later, the patient died of acute development of recurrent hypotension.

DISCUSSION

Prolonged, post-ischemic left ventricular dysfunction due to spasm,[1] myocardial bridging,[2] recurrent segment of the left anterior descending coronary artery,[3] and transient thrombi of the coronary arteries not leading to myocardial infarction[4] can lead to cardiac complications. Acute heart failure or sudden cardiac death can appear. Not until 2000 and 2001, respectively, the name of takotsubo cardiomyopathy (or syndrome) was mentioned. Far beyond 1990, the term hibernating myocardium was described.[5] Takotsubo cardiomyopathy and multivessel coronary spasm are completely different etiologies in the MINOCA strategy,[6] although in the first cases of takotsubo cardiomyopathy coronary spasm, myocardial bridging, recurrent segment of

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the left anterior descending coronary artery, and transient thrombi were discussed as possible leading causes. The publication of Dote *et al*.[1] in 1991 leads years ago to one of the reasons of takotsubo cardiomyopathy, characterized by typical contraction abnormalities (apical ballooning, midventricular, or basal ballooning) in cases of non-obstructive coronary arteries.

In our case, physical stress (hysterectomy) leads to extreme hypotension due to simultaneous multivessel coronary spasm initially partially reversed by intracoronary administration of verapamil, but in the end with fatal outcome. Echocardiography or left ventricular angiography was not done, the finding of apical ballooning or other features of the left ventricular dysfunction resembling takotsubo cardiomyopathy or syndrome were totally missed. Takotsubo syndrome as a clear-cut diagnosis was non-existent in the year 1997.

The continuous infusion of high-dose catecholamines reinduced coronary spasm finally lasting in the fatal outcome. The recommendation to administer diltiazem to break through coronary spasm was not done in intensive care unit thus leading to death.

CONCLUSION

This case represents an early example of how multivessel coronary spasm can lead to left ventricular hibernating after a post-ischemic event. Myocardial hibernating is early described in the literature far beyond 1990 and must be discussed as possible precursor of takotsubo-like syndrome or stress-related cardiomyopathy.

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