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Complications of Acute Myocardial Infarction or Takotsubo Cardiomyopathy: from Intravascular Thrombus Formation to Disseminated Intravascular Coagulation.

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Highlights

Two cases of suggested Takotsubo syndrome and severe complications have been described. It has been discussed whether these two cases are complications of acute myocardial infarction or suggested Takotsubo syndrome.

Keywords: Thrombus formation; disseminated intravascular coagulation; Takotsubo cardiomyopathy.

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Introduction

Takotsubo cardiomyopathy or syndrome is a stress-mediated syndrome of left ventricular dysfunction, mostly in female patients of older (postmenopausal) age [1]. In few cases myocardial oedema has been described [2]. Spasm [3] or myocardial bridging [4] of the left anterior descending coronary artery contributes to basal (about 1%), mid-ventricular (about 14 – 35%) or apical ballooning (about 64 – 84%) depending on the length of the left anterior descending coronary artery (wrap-around phenomenon). The rate of myocardial perforation is high (about 4%, [1]) and much higher than in myocardial infarction. Criteria of Takotsubo cardiomyopathy have been described in recent years [5]; newer diagnostic criteria were published in 2016 [6].

Thromboembolic events are often discussed [7] but seldom reported [8]. Here we present two cases of definite thromboembolic events with tragic outcomes.

Case No. 1

In the cardiological department of the second author a 52-year-old female patient developed ventricular fibrillation, was successfully resuscitated and reached the hospital in a stable condition. Because of syncope and a traumatic fall a cerebral haematoma developed. On ECG, ST-segment elevation in the anterolateral leads was detected. Coronary angiography was initiated. Significant coronary heart disease could be ruled out with only very distal thrombotic occlusion of the LAD and the first diagonal branch; left ventricular angiography revealed typical apical ballooning. During follow-up an acute abdomen developed. Laparotomy revealed a necrotic duodenum and colon, to a large extent due to thromboembolic occlusion of abdominal vessels via disseminated intravascular coagulation. The patient died.

Case No. 2

In the same department a 50-year-old female patient was admitted to hospital with acute chest pain and acute anterior ST-segment elevation with anterolateral predominance. Urgent coronary angiography was initiated. There was large thrombus formation in the proximal LAD and in the first diagonal branch; left ventricular angiography revealed typical apical ballooning. Stent implantation was initiated in the LAD with resulting TIMI II flow. The theory was that LAD was occluded from the distal segments to their proximal part. On the same day the patient presented with myocardial perforation and suffered a fatal outcome.

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Discussion

It is often discussed that Takotsubo cardiomyopathy is caused by thromboembolic events [7]. Only a few reports have been published, however [8]. In most patients without ST segment elevation coronary angiography is postponed and direct thromboembolic events are missed. Also in many catheter laboratories left ventricular angiography is not performed when acute cases of chest pain reveal ST segment elevation.

In the two cases being reported in this paper left ventricular angiography was performed; both angiographies revealed apical ballooning in cases with thrombembolic events without significant atherosclerotic lesions, thus satisfying the diagnostic criteria of Takotsubo syndrome [5, 6].

Takotsubo syndrome presents as a mixture of different origins: spasm [3], myocardial bridging [4], wrap-around phenomenon of the LAD [4] and thromboembolic events as presented in this paper. Theoretically, apical or mid-ventricular ballooning can effect transient thrombotic occlusion of the LAD or a large diagonal branch. The pathophysiology of Takotsubo cardiomyopathy can be antegrade flow reduction of the LAD [5] leading to subsequent (in most cases reversible) thrombus formation, thus producing malignant ventricular arrhythmia and sudden cardiac death.

Takotsubo syndrome can lead to different complications in a range of 5 – 10% [1] including acute transient mitral insufficiency, acute reversible hypertrophic cardiomyopathy with outflow tract obstruction, recurrent ventricular fibrillation and acute myocardial perforation.

Although both cases present with typical apical ballooning one is not sure whether these two cases really represent Takotsubo cardiomyopathy, as a reversible nature of these cases cannot be demonstrated due to the tragic outcome.

Limitations

In this study it is difficult to clarify whether these two cases really represent Takotsubo cardiomyopathy, a syndrome with reversible functional impairment of the left ventricle. Both cases have a characteristic appearance of the shape of the left ventricle, both with ST-segment elevation and no significant coronary atherosclerotic lesions. As both patients died the clinical course cannot be demonstrated.

The left ventricular angiography in the first case could be the cause of thromboembolic occlusion of abdominal vessels. In both cases it is not easy to decide whether complicated acute myocardial infarction or Takotsubo syndrome is the correct diagnosis.

Conclusions

Complications of acute myocardial infarction or Takotsubo syndrome may be similar and could confuse the differential diagnosis of these two conditions.

Declarations of Interest

The authors declare no conflicts of interest.

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The authors state that they abide by the „Requirements for Ethical Publishing in Biomedical Journals“ [9].

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