

# Takotsubo cardiomyopathy or hidden cardiotoxic event by rituximab

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## Introduction

Rituximab is a genetically engineered chimeric mouse/human monoclonal antibody representing a glycosylated immunoglobulin (Ig) with human IgG1 constant regions and murine light-chain and heavy-chain variable region sequences. The antibody is produced by mammalian cell suspension culture and purified by affinity chromatography and ion exchange, including specific viral inactivation and removal procedures.

It is used for:

- > non-Hodgkin's lymphoma
- > chronic lymphocytic leukaemia
- > granulomatosis with polyangiitis and microscopic polyangiitis
- > pemphigus vulgaris
- > Epstein–Barr virus infection.

Takotsubo cardiomyopathy is a syndrome characterised by transient regional systolic dysfunction, principally, of the left ventricle, mimicking myocardial infarction but in the absence of angiographic evidence of obstructive coronary artery disease or acute plaque rupture.

The onset of stress cardiomyopathy is frequently, but not always, triggered by intense emotional or physical stress (eg death of relatives, particularly if unexpected; domestic abuse; arguments; catastrophic medical diagnoses; devastating financial or gambling losses; natural disasters; or acute medical illness).<sup>1</sup>

Infusion-related reaction by rituximab were reported in more than 50% of patients in clinical trials, and were predominantly seen during the first infusion, usually in the first one to two hours. These symptoms mainly comprised fever, chills and rigors. Other symptoms included flushing, angioedema, bronchospasm, vomiting, nausea, urticaria/rash, fatigue, headache, throat irritation, rhinitis, pruritus, pain, tachycardia, hypertension, hypotension, dyspnoea, dyspepsia, asthenia and features of tumour lysis syndrome. Severe infusion-related reactions (such as bronchospasm or hypotension) occurred in up to 12% of the cases.<sup>2–4</sup>

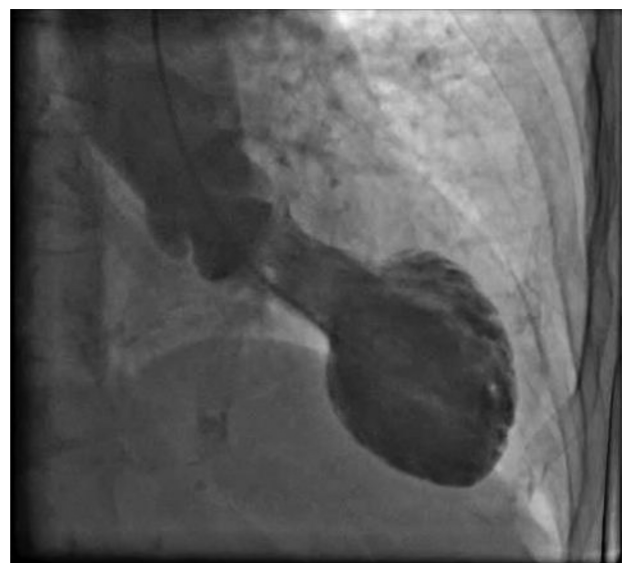
## Materials and methods

A retrospective study of a clinical case of cardiac reaction caused by rituximab infusion in a haematological day unit by history taking,

physical examination, electrocardiography (ECG), blood tests and coronary angiography report was performed.

## Case presentation

A 52-year-old man presented to haematology unit with a fever of unknown origin was found out to have Epstein–Barr virus active infection. He had previous medical history of unstable angina and treated acute myeloid leukaemia with allogenic stem cell transplant. Intravenous (IV) rituximab treatment was given according to multidisciplinary team discussion. 10 mins after the start of IV rituximab infusion (15 mL has been given already), the patient developed fever, rigors and hypotension that is normally found as an infusion-related reaction. However, contrary to usual reactions, the patient also complained of cardiac sounding chest pain with unstable haemodynamic status. ECG was performed and there was evidence of ST elevation myocardial infarction. The patient was transferred immediately to a tertiary centre for urgent coronary angiography and later was diagnosed with Takotsubo cardiomyopathy with typical appearance of apical ballooning findings on left ventriculography in the absence of angiographic evidence of obstructive coronary artery disease or acute plaque rupture (Fig 1).



**Fig 1.** Left ventriculography showing typical appearance of apical ballooning.

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## Conclusion

An acute infusion-related reaction can be considered as a medical stress in causing Takotsubo cardiomyopathy, an unusual and hidden side effect of rituximab infusion. There was reported evidence of angina pectoris, cardiac arrhythmias (such atrial flutter and fibrillation), heart failure and/or myocardial infarction. Therefore, a patient with a history of cardiac disease and/or cardiotoxic chemotherapy should be monitored closely during rituximab infusion and also should have a proper and thorough pre-assessment of cardiovascular risks before rituximab infusion. ■

## References

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