



Case Report

Transient right bundle branch block: A rare manifestation in cardiac contusion



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ABSTRACT

Transient right bundle branch block following blunt cardiac injury is a known but under-recognized manifestation of cardiac contusion. The first case documented in the medical literature occurred in 1952 in a 22-year-old man who was thrown from a motorcycle. Due to their relatively anterior location, the right ventricle and right bundle branch are at particular risk of injury in contusion. We present here a case in which a 24-year-old man suffered a blunt chest trauma leading to a right bundle branch block and elevated troponin levels, consistent with cardiac contusion. His conduction system abnormalities rapidly resolved and he recovered completely, with no clinical sequelae.

<Learning objective: Cardiac contusion is a heterogeneous syndrome with widely variable clinical manifestations and severity. Transient right bundle branch block has been described as a self-limited and benign manifestation of cardiac contusion. This case highlights the need for a better understanding of the natural history and predictors of serious complications of cardiac contusion, which can aid in determining appropriate diagnostic studies, risk stratification, and treatment.>

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Introduction

Blunt cardiac trauma can lead to ventricular dysfunction, valvular regurgitation, aneurysm, and dysrhythmia through three mechanisms: (1) endocardial tear penetrating the myocardium; (2) myocardial bruising with extravasation of blood and leukocytic infiltration; (3) direct injury to the coronary arteries with secondary infarction [1]. Research into blunt chest trauma has shown that the incidence of myocardial contusion approaches 76% of cases, depending on whether the diagnosis is made clinically or post-mortem [2]. In a 10-year review of 70 cases of blunt cardiac injuries at a single trauma institution, 24% of patients developed rhythm disturbances within an average of 7 days of hospitalization, including new atrial arrhythmias, ventricular arrhythmias, and conduction abnormalities [3].

As a manifestation of myocardial contusion, the presence of a transient right bundle branch block (RBBB) is a described but under-recognized occurrence. First demonstrated in animal

experiments where a single external chest trauma caused transient intra-ventricular block, transient RBBB in humans was first documented in 1952 in a 22-year-old man who was thrown from a motorcycle [4,5]. He recovered, and within 3 months his electrocardiogram (ECG) had normalized without further evidence of conduction abnormality. A similar case in 2009 was reported in a 24-year-old man in a motor vehicle accident, also with a transient RBBB that resolved in 1–2 h after injury, associated with an elevated troponin, peaking at 7.0 ng/mL [2].

Case report

In August 2014, a healthy 24-year-old man was brought to our institution's emergency department after being struck in the chest with a metal pole while standing on a dock. He suffered loss of consciousness and fell into the surrounding water, but was quickly rescued by onlookers – he remained unconscious for approximately one minute. On hospital arrival, his only complaints were of shortness of breath and left-sided chest pain. On physical examination, he was an alert man with normal vital signs [afebrile, heart rate of 87 beats per minute (bpm), blood pressure of 110/80 mmHg, respiratory rate of 23 breaths per minute, and oxygen saturation of 98% on 10 L via facemask] and a bleeding 2.5 cm left-sided sternal laceration. The patient's cardiac examination was

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unremarkable. Pulmonary examination revealed left upper lobe rales.

The initial ECG showed sinus rhythm with a typical RBBB pattern at 83 bpm (Fig. 1a). An ECG repeated 3 h later showed a

heart rate of 101 bpm, resolution of the RBBB, and the new presence of 1-mm ST segment elevations in leads I and aVL with reciprocal ST segment depressions in the inferior leads (Fig. 1b). Of particular note is the absence of a full RBBB or of any delayed



Fig. 1.

(a) Electrocardiogram on the day of admission at 3:50 pm, showing a typical right bundle branch block pattern at 83 bpm. (b) Electrocardiogram from the day of admission at 5:43 pm, showing resolution of the right bundle branch block, in addition to ST segment elevations in leads I and aVL with reciprocal ST segment depressions in the inferior leads at 101 bpm. (c) Electrocardiogram from hospital day 3, showing persistent ST segment elevations in leads I and aVL with reciprocal ST segment depressions in the inferior leads.

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