

CLINICAL IMAGE

Blunt cardiac rupture due to kicking on the lateral side of the right chest

Shinji Akishima¹  | Noriyuki Takeyasu²

¹Department of Cardiovascular Surgery, Ibaraki Prefectural Central Hospital, Kasama, Japan

²Department of Cardiovascular Medicine, Ibaraki Prefectural Central Hospital, Kasama, Japan

Correspondence

Shinji Akishima, Department of Cardiovascular Surgery, Ibaraki Prefectural Central Hospital, 6528 Koibuchi, Kasama-shi, Ibaraki 309-1793, Japan.
Email: akishima-ths@umin.ac.jp

Abstract

Blunt cardiac rupture can be caused by an indirect blow to the heart during sports. Clinicians should consider the possibility of cardiac injury regardless of the severity of trauma. Confirming the diagnosis and reaching a decision to operate as soon as possible is the only way to rescue the patient.

KEYWORDS

blunt cardiac rupture, percutaneous cardiopulmonary support, sports injury, transthoracic echocardiography

1 | QUESTION: CAN YOU IMAGINE CARDIAC RUPTURE WITHOUT APPARENT TRAUMA?

A 17-year-old boy was accidentally kicked on the lateral side of the right chest during soccer, following which he began losing consciousness and was brought to our institute. Upon arrival, he was in cardiopulmonary arrest without apparent trauma (Figure 1A) or a remarkably distended jugular vein. His heartbeat recovered via resuscitation but not blood pressure. Transthoracic echocardiography revealed nonobvious myocardial destruction but limited pericardial effusion (Figure 1B). Cardiac injury was strongly suspected in the presence of blood, and cardiac collapse was insufficiently improved using pericardiocentesis. Percutaneous cardiopulmonary support was established, and emergency open heart surgery was performed. Intraoperative findings included longitudinal cardiac rupture on the right ventricular antero-inferior wall (Figure 2); direct closure was performed. After receiving circulatory assistance for a day, he recovered without major brain damage.

Blunt cardiac injury is generally diagnosed while considering the results of different tests; however, its rupture must be diagnosed as soon as possible. In particular, blunt cardiac rupture is rare, except in high-energy trauma cases.¹ Therefore, diagnosis was challenging in the present case, highlighting the fact that trauma severity does not necessarily indicate the degree of blunt cardiac injury. In our case, two possible mechanisms of right ventricular rupture were suspected, which was caused by compression between the sternum or the costal cartilages and spine, or by significant elevation of venous pressure by an intensive blow to thorax on squatting during playing.² In both mechanisms, cardiac injury might be initially small; however, it shortly progressed to a severe injury as visible by the symptoms. We recommend that blunt cardiac rupture should be suspected in patients with blunt trauma, even if the trauma is sustained during playing sports, and unexplained shock that is incompatible with apparent injuries or is persistent despite aggressive resuscitation, even if obvious cardiac destruction or massive pericardial effusion is not apparent on echocardiography.

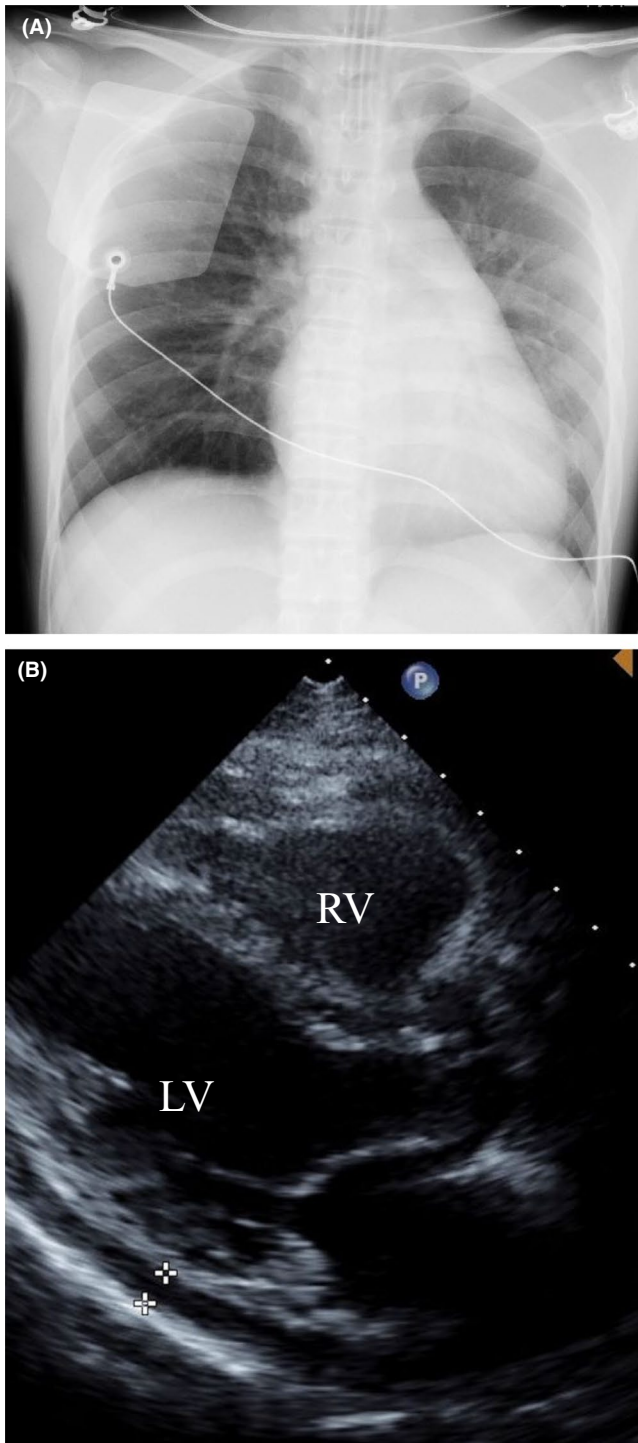


FIGURE 1 A, Chest roentgenography in supine position on arrival. No remarkably abnormal findings, such as rib fracture, were found. B, An image of transthoracic echocardiography on arrival at our institute, which revealed nonobvious myocardial destruction but limited extracardiac low echoic space (+). LV, left ventricle; RV, right ventricle

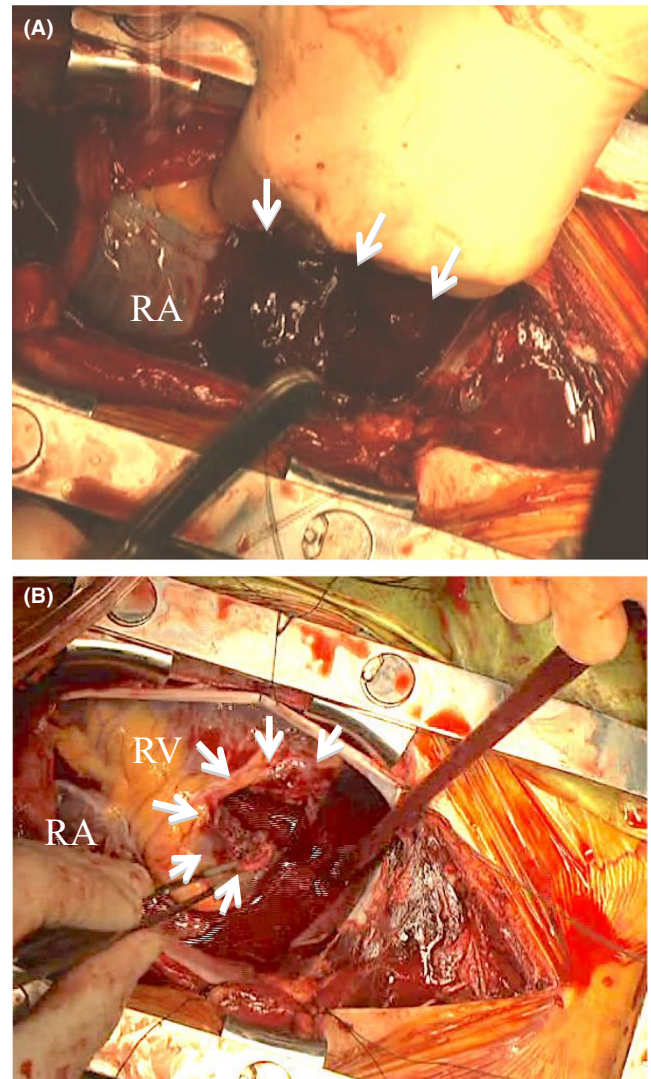


FIGURE 2 Intraoperative view. A, Just after pericardiotomy, a massive hematoma (arrows) was exposed, which was sighted on the anterior of the right ventricle covering the laceration. B, Longitudinal cardiac rupture was seen on the right ventricular antero-inferior wall (arrows). The severity of damage was out of proportion to the apparent injuries. RA, right atrium; RV, right ventricle

ACKNOWLEDGMENTS

None.

CONFLICT OF INTEREST

None declared.

AUTHOR CONTRIBUTIONS

SA: contributed to the clinical care and the conception of the work, revised the manuscript critically, approved the final version to be submitted, and wrote the first draft of the manuscript. NT: contributed to the clinical care and the conception of the work, revised the manuscript critically, and approved the final version to be submitted.

ORCID

Shinji Akishima  <https://orcid.org/0000-0002-0085-9160>

REFERENCES

1. El-Menyar A, Al Thani H, Zarour A, Latifi R. Understanding traumatic blunt cardiac injury. *Ann Card Anaesth.* 2012;15:287-295.
2. Muramatsu H, Umino K, Masuda H, Ishizawa F, Sugan Y, Honda K. Severe cardiac rupture by only one blow to the chest in a young boy: an autopsy case. *J Forensic Sci.* 2019;64(4):1238-1240.

How to cite this article: Akishima S, Takeyasu N. Blunt cardiac rupture due to kicking on the lateral side of the right chest. *Clin Case Rep.* 2019;7:1806–1808. <https://doi.org/10.1002/ccr3.2338>