

Posttraumatic tricuspid valve injury and severe tricuspid valve regurgitation

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ABSTRACT

A 66-year-old male was brought to our hospital following a car accident. He had subarachnoid hemorrhage, multiple rib fractures, and left hemopneumothorax. He was referred to the Cardiology Department for elevated troponin levels (42 ng/ml, reference 0-1 ng/ml). The electrocardiogram was free of ischemia, whereas the transthoracic echocardiography revealed dilated right heart chambers, enlarged tricuspid annulus and coaptation failure of the tricuspid valvular leaflets. There was rupture on the subvalvular apparatus of the anterior leaflet of the tricuspid valve with accompanying prolapse, causing severe tricuspid valvular regurgitation. The patient did not present right ventricular failure signs and symptoms; he was referred to surgery after the resolution of associated thoracic and cranial injuries.

Key words: Tricuspid valve injury, trauma.

INTRODUCTION

Posttraumatic tricuspid regurgitation is a rare complication of non-penetrating chest trauma.^[1] The hemodynamic consequences are often well tolerated, and some cases may even be diagnosed several years after the incidental trauma.^[2,3] In this case report, we present a patient who developed severe tricuspid valve regurgitation following a car accident.

CASE REPORT

A 66-year-old male was brought to our hospital following a car accident. He had no previously reported medical problem. He had subarachnoid hemorrhage, multiple rib fractures, and left hemopneumothorax. There were no penetrating injuries over his chest. His hemodynamic status was stable after performance of tube thoracostomy. He was consulted to the Cardiology Department for elevated troponin levels (42 ng/ml, reference 0-1 ng/ml). His physical examination showed diminished breathing sounds over his left hemithorax, and a systolic murmur on the left lower sternal border. The electrocardiogram was normal without an ischemic finding, but

the transthoracic echocardiography revealed dilated right chambers, enlarged tricuspid annulus, and coaptation failure of the tricuspid valvular leaflets and flail of the tricuspid valvular leaflets (Figure 1). There was rupture on subvalvular segments of the anterior tricuspid valve leaflet with accompanying prolapse leading severe tricuspid valvular regurgitation (Figure 2). The patient was not demonstrating right heart failure symptoms and signs; after managing his multiple post-traumatic injuries, he was referred to the surgery.

DISCUSSION

In recent decades, we have been encountering cardiac injuries caused by blunt trauma more often as a result of increase in vehicle accidents. Blunt cardiac trauma may also occur after cardiopulmonary resuscitations or falls.^[4] Traumatic cardiac injuries vary from simple myocardial contusion to severe damage of intracardiac structures, leading life-threatening hemodynamic instability.^[5] Right atrium is the most vulnerable part of the heart in case of a blunt trauma because of its relatively thin wall. Cardiac valve damage is less common, and the most frequent traumatic valvular injury occurs on aortic valve, followed by mitral and tricuspid valves.^[6,7]

Traumatic tricuspid insufficiency is rare, but the frequency of this disease is probably underestimated, as tricuspid regurgitation has generally slowly progress and causes few symptoms.^[7] The main mechanism is the compression of the right ventricle between the sternum and spine, when the valves are closed and the ventricular pressure is high.^[5,8] That generates severe tension on both leaflets and subvalvular structures, causing subsequent rupture. Patients generally are asymptomatic, and the disease can progress insidiously, while right cardiac chambers and the annulus dilate progressively.^[9]

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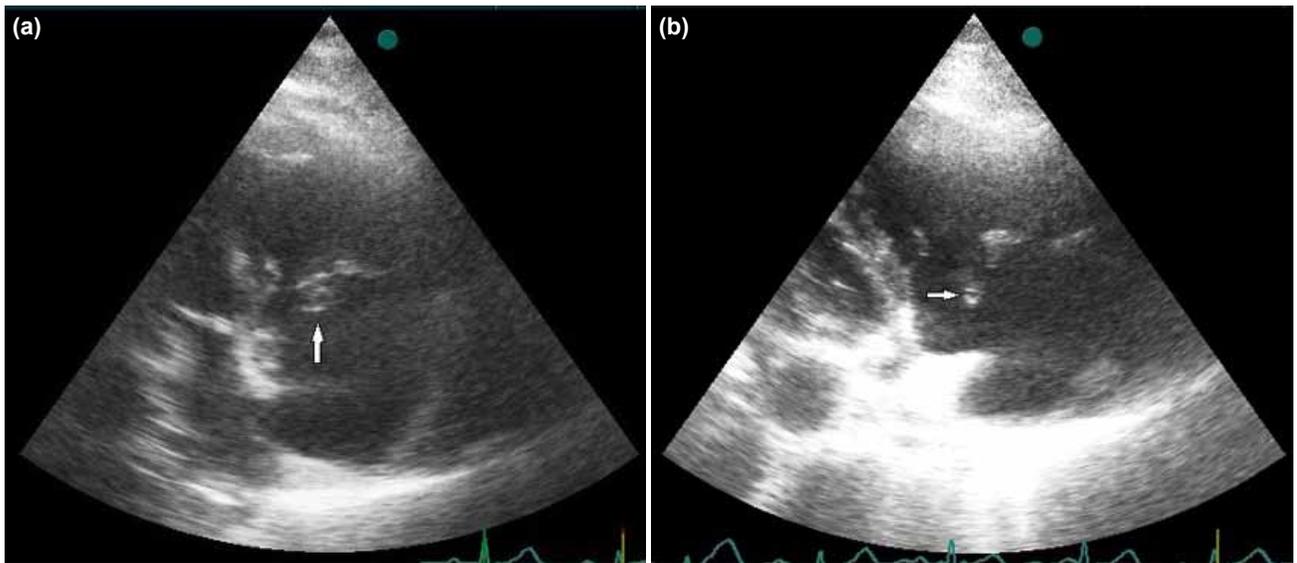


Figure 1. (a, b) Two-dimensional transthoracic echocardiographic views showing dilated right chambers, coaptation failure and flail of the tricuspid valve with prolapsing subvalvular segments.

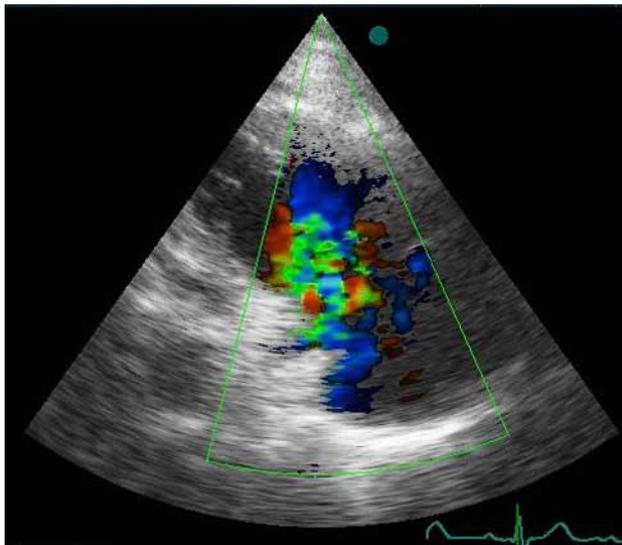


Figure 2. Color Doppler view demonstrating severe tricuspid valvular insufficiency (color Doppler regurgitation area/right atrial area >0.4).

Progressive dilatation increases tricuspid valve regurgitation, which consequently induces right ventricular failure.

The timing of surgical intervention after traumatic tricuspid regurgitation is controversial. Symptomatic heart failure is a strong indication for surgery. Even if the patient is not symptomatic, severe tricuspid regurgitation can result in right ventricular myocardial dysfunction and ventricular dilatation. Hence, an early operation allows preservation of myocardial reserve by preventing secondary myocardial changes.^[10] With favorable surgical anatomy, repair of the tricuspid valve is preferred strategy.^[10] In delayed cases, excessive fibrosis and shortening of the chordae can occur, and repair cannot be performed, in which case replacement of the prosthetic valve is the only choice of treatment.^[9]

In conclusion, transthoracic echocardiography should be performed in all patients with non-penetrating chest wall trauma if cardiac injury is suspected. Early detection of tricuspid valve damage with an optimal timing of surgical intervention will prevent right ventricular failure and increase the probability of valvular repair.

Conflict of interest: None declared.

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OLGU SUNUMU - ÖZET

Travma sonrası gelişen triküspit kapak hasarı ve önemli triküspit kapak yetersizliği

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Altmış altı yaşında erkek hasta araç içi trafik kazası sonrası hastanemize getirildi. Travmaya bağlı subaraknoid kanama, çoklu kosta kırığı ve sol hemopnömotoraks mevcuttu. Troponin değerlerinin yükselmesi (42 ng/ml, referans 0-1 ng/ml) nedeniyle kardiyoloji bölümüne konsülte edilen hastanın elektrokardiyografisinde iskemi bulgusu yoktu ancak yapılan transtorasik ekokardiyografide sağ boşluklar ile triküspit kapak anulusu genişlemiş, triküspit kapak koaptasyonu bozulmuş olarak izlendi. Triküspit kapak anterior leaflete ait subvalvuler yapılarda rüptür ve prolapsus mevcuttu; buna bağlı önemli triküspit yetersizliği prolapsusa eşlik ediyordu. Sağ ventriküler yetersizlik bulguları bulunmayan hasta travmaya ait diğer tedavilerin tamamlanmasının ardından cerrahi kliniğine gönderildi.

Anahtar sözcükler: Triküspit kapak hasarı, travma.

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