



## Case Report

# A Case of Blunt Chest Trauma and Delayed Severe Tricuspid Regurgitation

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### ABSTRACT

Blunt chest trauma could lead to the cardiac valves damage. Flail anterior leaflet with severe tricuspid regurgitation is usually due to blunt chest trauma. This condition is very rare and can lead to deformation and failure of the right ventricle. The tricuspid regurgitation is usually easily diagnosed with transthoracic echocardiography. In this study, we want to present a case with delayed tricuspid damage following blunt chest trauma.

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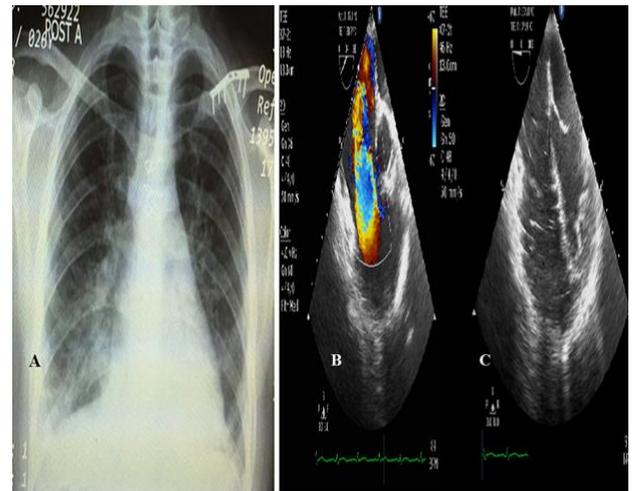
### Introduction

In recent years the number of car accident injuries is increasing. Cardiac damage due to blunt chest trauma occurs in 0.25% cases [1]. The most common injury is damage to the mitral followed by aorta and tricuspid valves [2, 3]. The isolated traumatic tricuspid injury is an extremely rare condition [4]. In this study, we want to present a case with delayed tricuspid damage following blunt chest trauma.

### Case Report

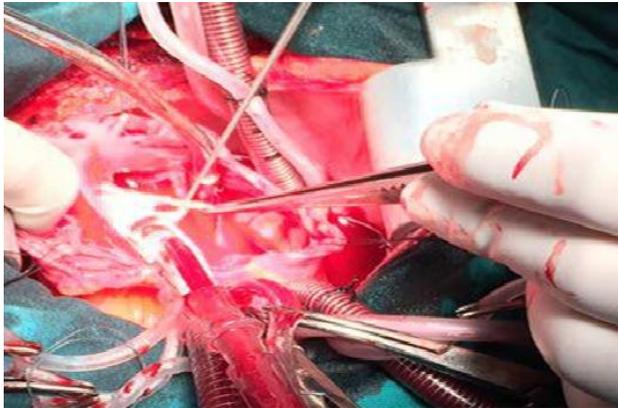
A previously healthy, 26-year-old man presented with chest pain to the cardiac clinic. Patient does not have any history of chronic diseases. He had a history of blunt chest trauma and clavicle fracture, 15 years ago, treated with open reduction and plate screw (Figure 1A). A 3/6 systolic murmur was heard in tricuspid region. The electrocardiography showed a sinus rhythm with RBBB. Transthoracic echocardiography revealed a severe enlarged right ventricle with reduced function and moderate to severe tricuspid regurgitation caused by chordal rupture of the anterior leaflet, requiring surgery (Figures 1B & 1C). Surgery was done using the cardiopulmonary bypass. First the anterior leaflet of the tricuspid was repaired by neochordae implantation and then annuloplasty was done using a 32-mm rigid ring (Figure 2). Patient was weaned from cardiopulmonary bypass easily. Intraoperative transesophageal

echocardiography showed mild tricuspid regurgitation and annuloplasty ring was seen in the tricuspid valve (Figure 3). In the follow up postoperative transthoracic echocardiography the patient had a mild tricuspid regurgitation and was free of symptom. The patient was discharged uneventfully.

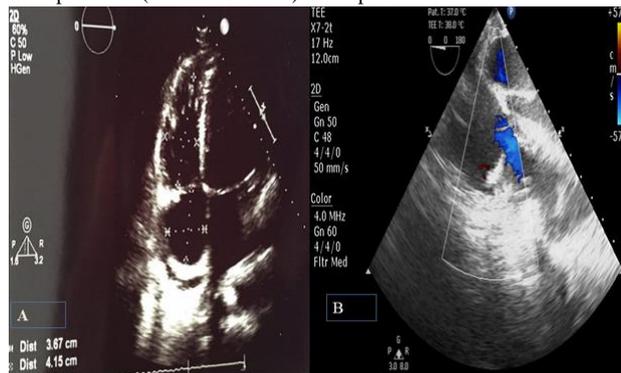


**Figure 1:** A) Clavicle fracture that is treated with open reduction and plate screw in chest X ray. B & C) Preoperative TTE showing severe tricuspid regurgitation.

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**Figure 2:** Intraoperative image showing the anterior leaflet of the tricuspid valve (white arrowhead) and ruptured chordae.



**Figure 3:** A) Intraoperative TEE showing adequate coaptation of the tricuspid valve with ring annuloplasty and B) mild tricuspid regurgitation after repair shown by TEE.

## Discussion

Tricuspid regurgitation following blunt chest trauma usually is due to the damage to the heart and increasing the right ventricle pressure and subsequently damage to the tricuspid [5-7]. Based on the available reports, tricuspid regurgitation is extremely rare [4, 8]. Given that in many cases the symptoms are mild, and progression is slow, diagnosis may be delayed for years or missed [3, 9]. In some cases, the cause of tricuspid regurgitation is not found. Therefore, due to increased traffic accidents it seems that the number of cases is more [10]. In most cases severe TR and flail anterior leaflet is seen [11]. Flail anterior leaflet with severe tricuspid regurgitation is usually due to blunt chest trauma. The TR is usually easily diagnosed with transthoracic echocardiography and surgery is needed in most cases [12, 13]. Despite the severity of regurgitation, in most cases the repair of the tricuspid valve is the preferred surgical strategy [1]. Some studies report that in delayed cases, excessive fibrosis and shortening of the chordae can occur, and the chance of successful repair is low [11]. So, the replacement of the prosthetic valve is the treatment of choice. In our case, despite the long passage of time from the chest trauma, the valve repair was done easily without any complication.

The appropriate time of surgical intervention after traumatic tricuspid regurgitation is controversial. Traumatic tricuspid regurgitation can lead to deformation and failure of the right ventricle [11, 14]. Hence, an early operation allows preservation of myocardial function. In general, the

symptomatic heart failure is a strong indication for surgery. Surgery may be not indicated in asymptomatic patients [15].

In conclusion, in all patients with non-penetrating chest wall trauma if cardiac injury is suspected, transthoracic echocardiography should be done.

## Implication of the Manuscript

This study discusses about one of the important complications following blunt chest trauma. Flail anterior leaflet with severe tricuspid regurgitation is usually due to blunt chest trauma. The tricuspid regurgitation is usually easily diagnosed with transthoracic echocardiography and surgery is needed in most cases. Given that in many cases the symptoms are mild, and progression is slow, diagnosis may be delayed for years or missed. In conclusion, in all patients with non-penetrating chest wall trauma if cardiac injury is suspected, transthoracic echocardiography should be done.

## Author Contributions

Study concept and design: Seyed Mohammad Saeid Ghiasi, Seyed Tayeb Moradian; Acquisition of data: Seyed Mohammad Saeid Ghiasi; Analysis and interpretation of data: Seyed Tayeb Moradian, Seyed Mohammad Saeid Ghiasi; Drafting of manuscript: Seyed Tayeb Moradian; Critical revision of the manuscript for important intellectual content: Seyed Mohammad Saeid Ghiasi.

## Role of the Sponsor

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## Conflicts of Interest

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