

Table 1. Pre-ablation and post-ablation scar measurements

Parameters	Pre-ablation	Post-ablation
Total scar, %	19.53	23.41
Heterogeneous zone, %	12.94	8.20
Scar core, %	6.60	9.77
Non-reflow area, %	0	5.43

gaps in RF ablation lines after pulmonary vein isolation for atrial fibrillation ablation. They correlate magnetic resonance imaging with invasive electro-anatomical mapping in a patient with recurrent atrial fibrillation after multiple unsuccessful ablations for atrial fibrillation. In a study by Estner et al. (6) ablation of the heterogeneous zone resulted in no inducible VT in animals.

Our case demonstrated that; 1) MRI identifies the presence of heterogeneous zone that contains critical substrate for VT, 2) Ablation lesions can be visualized by CMR as no-reflow areas, 3) Ablation decreased the heterogeneous zone percentage, which eliminated the VT. To the best of our knowledge this is the first human report identifying that heterogeneous zone ablation seen by CMR may eliminate VT. Therefore, decrease in the heterogeneous zone may be a criterion for successful ablation of ischemic VT and it needs to be studied.

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Severe tricuspid regurgitation after blunt chest trauma due to chordal rupture: a rare complication

Künt göğüs travması sonrası korda rüptürüne bağlı ciddi triküspit yetersizliği: Nadir bir komplikasyon

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Introduction

Tricuspid insufficiency is a rare complication of non-penetrating chest trauma (1, 2). The growing number of this complication has been encountered due to more frequently encountered motor vehicle accidents. The early diagnosis of traumatic tricuspid regurgitation is important because traumatic tricuspid injury could be effectively corrected with reparative techniques, early operation is considered to relieve symptoms and to prevent right ventricular dysfunction (3). Echocardiography can reveal the cause and severity of regurgitation. This complication is usually unthinkable and missed out.

We report a case of severe traumatic tricuspid regurgitation secondary to rupture of chordae tendineae following blunt chest trauma.

Case Report

A 17 years old male patient was admitted with complaints of increasing shortness of breath and fatigue for the last 3 months. On the history, he had motorcycle accident five months ago. He had no any complaint before trauma. Hepatomegaly and the holosystolic murmur,



Figure 1. Flail of anterior tricuspid leaflet

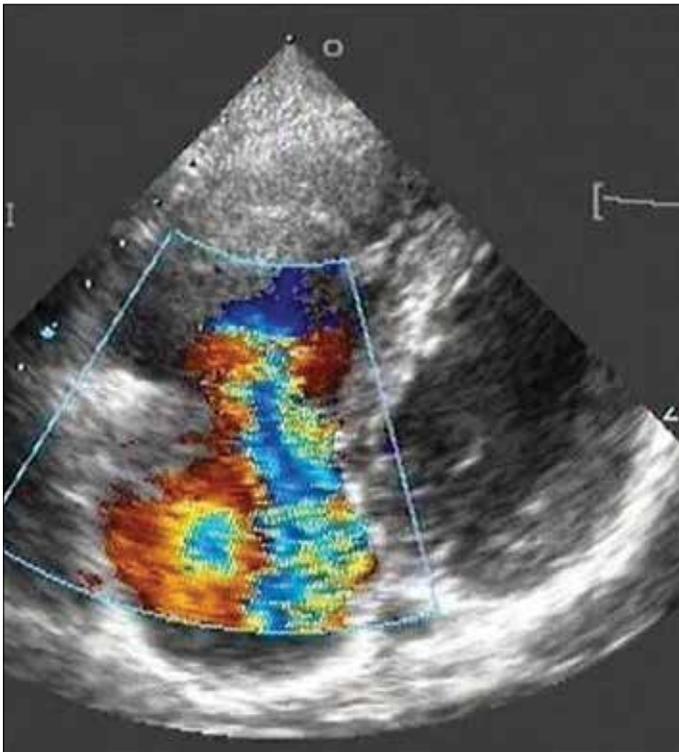


Figure 2. Severe tricuspid regurgitation

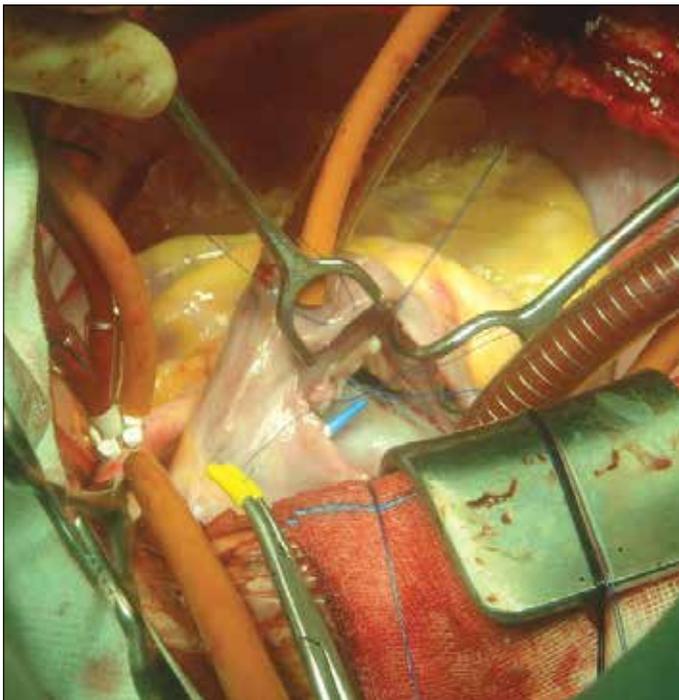


Figure 3. Valve repair

heard left lower sternal border, were determined. On his echocardiographic evaluation the right-sided cardiac cavities were enlarged and paradoxical motion of the interventricular septum was observed. Color-flow Doppler echocardiography disclosed severe tricuspid valve regurgitation. A flail of the anterior tricuspid leaflet was present and rupture of the chordae was suspected (Fig. 1, 2). Transesophageal echocardiography confirmed prolapse of the anterior tricuspid valve leaflet into the

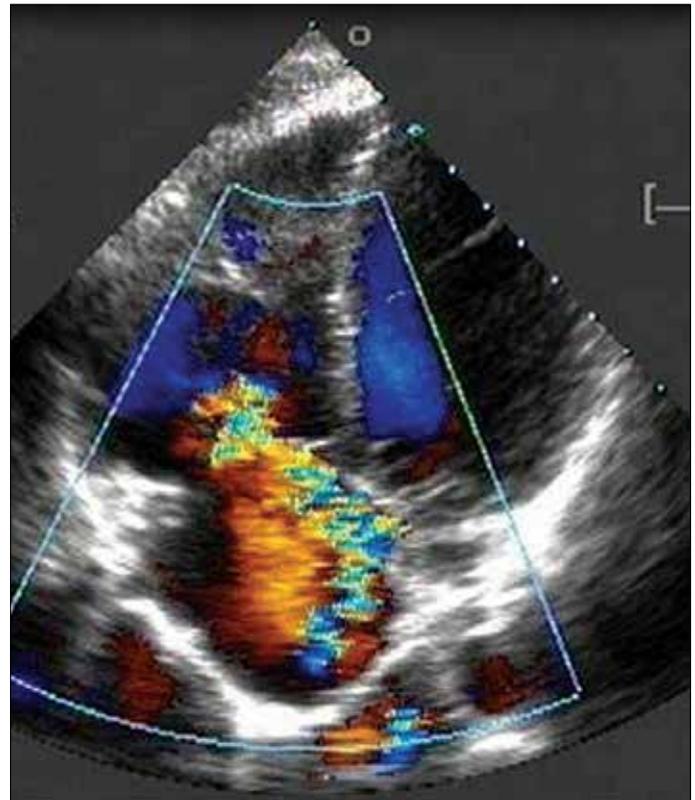


Figure 4. Postoperative moderate tricuspid regurgitation

right atrium. We decided to repair tricuspid valve and referred to thoracic surgery department. Intraoperative findings confirmed the echocardiographic diagnosis (Fig. 3). Tricuspid valve repair was performed with double-orifice technique and a ring annuloplasty. Postoperative echocardiography showed only mild regurgitation (Fig. 4).

Discussion

Traumatic tricuspid regurgitation most often occurs in patients involved in car accidents. The mechanism of disease is an antero-posterior compression of the chest with a sudden increase in the right ventricular pressure during the end-diastolic phase (4). Major reasons for this problem are the general rarity, the absence or inhomogeneity of symptoms and the presence of coexisting life-threatening injuries. For this reason, symptoms may present years after the trauma. In our patient, the diagnosis was delayed for 5 months. Chordal rupture is associated with a more benign natural history, while papillary muscle rupture becomes symptomatic rapidly and usually leads to surgery within 6 weeks to 9 months (5).

The timing of surgery is a subject of debate. The traditional indication for operation is symptomatic heart failure (6, 7). However, severe tricuspid regurgitation can result in right ventricular myocardial dysfunction and ventricular dilatation so that operation should be performed before development of myocardial dysfunction and symptom onset.

Surgical repair was made in 1958 for the first time by Parmley (8). Valve replacement was performed in selected patients, which was amended with valve repair. Valve repair method to be applied was determined according to valve anatomy and accompanying pathology as well. Surgical procedures included Carpentier ring implant, posterior annuloplasty, implantation of artificial chordae, papillary muscle reinsertion, commissuroplasty and artificial double orifice technique (9). The pressure is reduced at the suture line and coaptation of valve is increased with annuloplasty (10). We performed double-orifice technique and ring annuloplasty in our patient.

Conclusion

We aimed alert all clinicians to consider traumatic tricuspid valve injury even if they initially focus on acute injuries. Transthoracic or transesophageal echocardiography is mandatory in this setting and even if it is not possible in the situation of an acute trauma, it may be planned as a follow-up screening.

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