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Case Report

RIGHT VENTRICULAR RUPTURE DUE TO BLUNT TRAUMA TO CHEST IN 10 YEAR OLD BOY: A RARE PRESENTATION

Dr. Luke Shankar[1], Dr. Mohammed Shabbir P[2], Dr. Pradeep Kumar Mk[3]

1. 2nd year MEM Resident, Department of Emergency Medicine, BGS Global Hospital, Bangalore

2. HOD, Department of Emergency Medicine, BGS Global Hospital, Bangalore

3. 1st year MEM Resident, Department of Emergency Medicine, BGS Global Hospital Bangalore, India

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For Correspondence
Email ID:
lukeacn1@gmail.com

Abstract:
A 10 years old male child brought to emergency department with the history of blunt trauma to the chest wall and abdomen due to fall of a heavy metal rack. On arrival patient was in shock and neck veins were distended, he was suspected to have cardiac tamponade. Intravenous fluid 20ml/kg bolus was given. Patient's *BP* improved. FAST scan was positive and transthoracic echocardiography showed pericardial hematoma. Immediately patient was shifted to OT, where explorative sternotomy was done, hematoma was removed and right ventricular tear was found which was repaired. A protocol combining diagnostic tools, like FAST, CT, transthoracic echocardiography, and TEE, are best in diagnosing and managing suspected blunt traumatic cardiac rupture. Early diagnosis and appropriate timely intervention will decrease morbidities and mortality in patients with blunt traumatic cardiac rupture.

Keywords: Cardiac contusion, Right ventricular rupture. FAST scan and EFAST, Blunt trauma, to chest, Non penetrating cardiac trauma, early detection & prompt attention

Introduction:

Blunt traumatic cardiac rupture is associated with a high rate of mortality. Most of the patients die before reaching hospital. The mortality rate from myocardial rupture is very high. Blunt cardiac rupture is very rare; the cardiac portion of the FAST exam should still be done on all patients with significant blunt chest trauma, especially those who are hypotensive. A protocol combining many diagnostic tools, which including FAST, transthoracic echocardiography, TEE and CT, and prompt surgical intervention contribute to survival in these patients. Two distinct syndromes are apparent--haemorrhagic shock and cardiac tamponade. Any patient with severe chest trauma, hypotension disproportionate to estimated loss of blood or with an inadequate response to fluid administration should be suspected of having a cardiac cause of shock. For patients with severe hypotension or in extremis, the treatment of choice is resuscitative thoracotomy with pericardiotomy[5].

Case Report

On 13/12/2014 at 5:00 pm a 10 years old male child was brought to emergency department with the history of blunt trauma to the chest wall and abdomen due to fall of a heavy metal rack. , on the way to hospital in ambulance patient had 2 episodes of vomiting and later he become drowsy.

Patient arrived to emergency department at 5:00 pm, the child was drowsy.

Primary survey:

Airway: patent and C spine stabilization was done.

Breathing: Bilateral chest rise presented, bilateral air entry equal, bilateral basal fine crackle present, respiratory rate of 35/min, SPO2: not recordable, started on O2 through face mask.

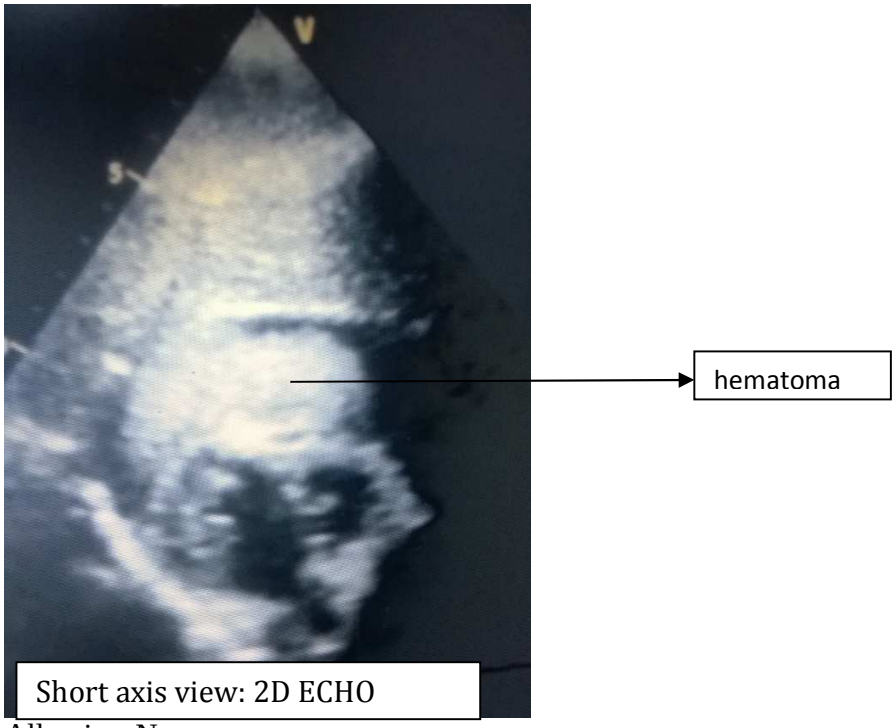
Circulation: peripheries were cold & peripheral pulses not felt, central pulse present CRT more than 4 sec, HR-140/min, SBP- 60 mm Hg, Neck veins were distended. 2 large bore peripheral IV line placed, blood sample collected. IV NS 20ml/kg bolus given, repeat was BP: 80/40mm hg. Patient sensorium improved. CBG: 105mg/dl.

Disability: GCS- E3V4M6, pupils 2mm BERL, moving all four limb, no external injuries noted,

Exposure: no external injury was seen.

Actions:

1. FAST scan showed pericardial hematoma and free fluid in Morrison pouch.
2. Inj. Transexamic acid 500mg IV given.
3. Inj. Fentanyl 25 microgram IV given (pain score :10)
4. Chest x ray AP: showed normal study.
5. 2D Echo showed: pericardial hematoma.
6. Informed cardiothoracic surgeon.



Short axis view: 2D ECHO

Allergies: None

Past medical/ surgical history: not on any medications.

Last meal: 2 pm on 13/12/2014. Birth history: uneventful

Immunization history: up to date
Developmental history: as per age
Family history: Nothing significant.

Secondary survey couldn't be completed as patient was shifted directly to OT from ER.

Management in OT and ICU

Cardiothoracic surgery team was informed and patient was shifted to OT for emergency explorative sternotomy and in OT sternotomy was done, hematoma was removed and right ventricular tear was found, it was repaired.

Discussion:

The incidence of this injury in patients presenting alive is very low[3]. Incidence of traumatic cardiac rupture is only 0.5% among patients sustaining blunt chest trauma[3]. Most of the patients with large tear die at the spot or during transit. The very small groups of patients who survive to hospital presentation usually have tears in a cavity under low pressure and prompt diagnosis and surgery can now lead to a survival rate of 70-80% in experienced trauma centers.[5]. Echocardiography is the diagnostic method of choice for pericardial tamponade, whether it is the result of penetrating or blunt trauma, and that early use of this modality may improve survivability[6]. Although blunt cardiac rupture is rare, the cardiac portion of the FAST exam should still be performed on all patients with significant blunt chest trauma, especially those who are hypotensive[4]. Two distinct syndromes are seen in patient with blunt cardiac trauma--haemorrhagic shock and cardiac tamponade. Any patients with severe chest trauma, hypotension disproportionate to estimated loss of blood or with an inadequate response to fluid administration should be suspected of having a cardiac cause of shock. For patients with severe hypotension or in extremis, the treatment of choice is resuscitative thoracotomy with pericardiotomy[5.]

This Patient present with clinical features suggestive of cardiac tamponade: hypotension and neck vein distension. IV fluid resuscitation was done. Early fast scan and 2D echo detected pericardial hematoma : feature suggestive of rupture of free wall of heart. Immediate exploratory sternotomy was done. Hematoma was removed and right ventricular tear was found, which was repaired. Child survived.

Conclusion:

In all patients with chest trauma, cardiac injures should be suspected. A protocol combining many diagnostic tools including FAST, CT, transthoracic echocardiography, and TEE for the early diagnosis and early appropriate and timely intervention will decrease morbidities and mortality, in patients with cardiac trauma.

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