

EMERGENCY MANAGEMENT OF CARDIAC TEMPONADE RESULTING FROM BLUNT TRAUMA

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INTRODUCTION

Cardiac temponade is a real emergency. It sometimes presents with non specific symptoms, if treated in wrong way (diuretics) or delayed it may prove fatal.

We report a case of cardiac temponade which followed blunt trauma to the chest, which was saved by an emergency thoracotomy.

CASE REPORT

A nine year old girl was brought to emergency reception in shock. Her attendant gave history of blunt trauma chest by falling on a pair of scissors while playing with her brother. She was pale, sweating and had cold peripheries. Her pulse was 170 beats per minute with very low volume. Her blood pressure was 40/30 mmHg and JVP was raised. On auscultation her heart sounds were muffled. On local examination, there was a bruise, 1/2 x 2 cm in the fourth intercostal space just lateral to left sternal edge. Her X-Ray chest was non-conclusive and cardiac temponade was diagnosed on echocardiography.

Case was shown to cardiac surgeon who with mutual consultation with paediatric cardiologist decided to go for an emergency thoracotomy as they were suspecting big tear or trauma to the big vessel, so it was decided for definitive repair. Intravenous lines maintained and blood arranged. Patient was resuscitated with intravenous fluids, inotropic support and oxygen with face mask in

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intensive care unit. After about half an hour patient improved slightly and was shifted to operation theatre. Invasive blood pressure monitoring by 22 G intra-arterial cannula in right radial artery was started. After induction with Ketamine and tracheal intubation, central venous lines were established with one double lumen catheter and one 16 G cannula passed in the right internal jugular vein. Mid sternal thoracotomy was performed. It revealed pericardial cavity full of clots and fresh blood. There was an injury mark about 1/4 x 1/2 cm just lateral to left anterior descending artery on right ventricle and blood was spurting from the wound which was stitched. Haemostasis secured and chest closed. She was transfused with two units of blood during the operation. She remained haemodynamically stable afterwards. Post op day-1 she was weaned off from ventilator & extubated after about 4hrs. She was shifted to the ward.

DISCUSSION

An increase in the quantity of pericardial fluid by whatever the cause, results in rise in pericardial pressure. The initial portion of the pericardial pressure-volume curve is relatively flat i.e., relatively large volume of fluid can produce small rise in intra pericardial pressure. The curve becomes steeper as the fibrous and relatively inelastic parietal pericardium is stretched. Eventually intra pericardial pressure rises to the level which exceeds the normal filling pressure of ventricles resulting in temponade [1].

The point at which cardiac temponade occurs depends upon:-

- Rate of fluid accumulation
- Pericardial compliance

- Intra vascular volume

Cardiac tamponade should be suspected in haemodynamically compromised patients with:-

- Known pericarditis
- Following open heart surgery or cardiac catheterization
- Known intra thoracic neoplasm
- Dissecting aortic aneurysm

Physical examination commonly reveals decreased systolic blood pressure with narrow pulse pressure, pulsus paradoxus and absent Y decent with rapid X decent in jugular venous pulsation. Pulsus paradoxus may be absent if patient is hypovolemic (low pressure tamponade) [2,3]. Left ventricular dysfunction resulting in elevated left ventricle diastolic pressure [4] or a patient has atrial septal defect [5].

Investigations reveal:-

- Chest X-ray: Enlargement of cardiac shadow
- Electrocardiography: Low voltage QRS complexes, ST segment elevation and electric alternans
- Echocardiography: Intrapericardial fluid (Heart Swing) in pericardial space, obliteration of right ventricular cavity, right atrium compression [6,7]
- Cardiac catheterization: Equalization of right atrium, right ventricle, pulmonary artery, pulmonary capillary wedge pressures, left atrial and left ventricle end diastolic pressure temporarily

Definitive treatment is by life saving procedure i.e. pericardiocentesis or open thoracotomy.

In case of heart trauma, Pericardiocentesis, as initial therapy for hemopericardium followed by prompt

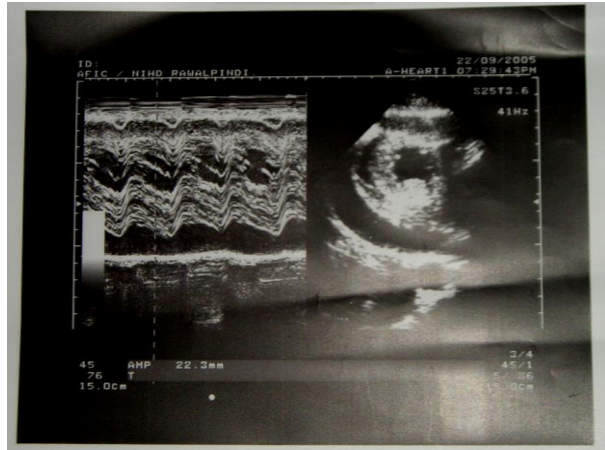


Fig: Echo showing cardiac tamponade

definitive surgical intervention is preferable to conservative management by aspiration. Pericardiocentesis for acute hemopericardium or tamponade helps to tide the patient over hazardous period of shock until surgery can be done.

Reasons for preferring surgery over conservative treatment with aspiration as definitive therapy are [9,10]:

- Site of injury can be determined with precision.
- Type of injury can be ascertained.
- In about 50% patients large clots are found, these prevent effective aspiration of blood.
- Secondary hemorrhage (delayed hemopericardium) has occurred variously even after weeks.
- Risk of laceration of Myocardium or Coronary artery by aspiration still there.
- Incomplete evacuation of clots can lead to pericardial effusion or later constrictive pericarditis.
- The patients who do well with aspiration may continue to survive, but patients who do badly or are not helped by aspiration either dies due to profound shock. These types of

patients may only survive by early surgical intervention.

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