

# PENETRATING CARDIAC INJURY

Dublin N, Chow H K and Y C Lim

Department of Surgery, Faculty of Medicine, University of Malaya, 50603 Kuala Lumpur, Malaysia

**ABSTRACT:** A case of penetrating cardiac injury is reported where cardiorrhaphy is done without cardiopulmonary bypass and via a right thoracotomy even though median sternotomy is the usual approach. It is also stressed that all precordial stabwounds must be carefully explored. (JUMMEC 1999; 2: 117-118)

**KEYWORDS:** Penetrating cardiac injury, Without cardiopulmonary bypass, Right posterolateral thoracotomy, Centrally placed chest injury.

## Introduction

Penetrating cardiac injury account for about 5% of penetrating chest injuries. The injuries are most commonly caused by stab injuries and gunshots. Gunshot injuries tends to be worse prognosis.

Up to 70% do not make it to the hospital and for those who made it to the hospital, overall mortality rate exceeds 10% (2).

We report a case of penetrating cardiac injury whom we repaired via a right thoracotomy without cardiopulmonary bypass.

## Case

A 45 years old man was admitted to our hospital with multiple stab wounds over the chest. He was assaulted 7 hours earlier. Clinically he was pale with pulse rate of 120 beats per minutes and blood pressure of 85/56 mmHg. Four superficial stab wounds each measuring 0.5cm in diameter were noted over the precordium. Two deep penetrating stab wounds each measuring 0.5cm in diameter were noted over right sixth intercostal space just medial to the midclavicular line and another over the right tenth intercostal space along the mid axillary line. There were no engorged neck veins and auscultation reveals normal heart sounds with reduce air entry over right side with overlying subcutaneous emphysema. The abdomen was guarded. His haemoglobin was 5g/dl and chest radiograph showed a right haemothorax.

A right thoracostomy was inserted initially draining 1.0 litre of blood and subsequent drainage was minimal. In view the guarded abdomen and hypotension an exploratory laparotomy was performed and the right thoracostomy was monitored closely. No abdominal injury was detected. During the laparotomy, the right thora-

costomy drained a further 900 mls of blood. With a continous thoracostomy drainage, two deep penetrating wound and with no intraabdominal injuries, the right thorax was explored. With no signs of cardiac tainponade from the four superficial praecordial stab wounds, we chose the right posterolateral approach over median sternotomy.

A 1 cm laceration of the right lower lobe which was not actively bleeding and a pericardial fat pad haematoma were found. As the lung injury could not account for the amount of bleeding, we decided to explore the intrapericardial structures. Minimal haemopericardium and two right ventricular stab wounds measuring 1 cm and 0.5 cm were found. The 1 cm wound penetrated into the right ventricular cavity, while the 0.5 cm wound only involved partial thickness of the right ventricle. The 1 cm wound was repaired with buttress horizontal mattress suture. No cardiopulmonary bypass support was needed.

Post operative two dimensional echocardiogram showed normal intracardiac structures. The patient was discharged well on seventh post-operative day.

## Discussion

Penetrating cardiac injury should be suspected in all centrally placed penetrating chest injury (located between the midclavicular lines) (1). Beck's triad of hypotension, raised jugular veins pressure, muffled heart sounds are unreliable signs for pericardial tainponade. The triad is present in only a third of patients with cardiac tamponade.

Indications (1) for thoracotomy and/or cardiorrhaphy are:

Corresponding address:

Dublin N,  
Dept. of Surgery, Faculty of Medicine,  
50603, Kuala Lumpur, Malaysia.

1. Mediastinal location of the entrance wound;
2. BP < 90 mmHg on admission;
3. Initial thoracostomy blood loss > 800 mls;
4. Radiographic evidence of retained haemothorax;
5. Evidence of cardiac tamponade.

Right ventricular laceration and wound size less than 1 cm tends to bleed slower. It has been postulated that ventricular injury has better prognosis because of its lower pressure and thick muscular wall that becomes occluded during systole (3). Cardiac tamponade was absent in our patient because blood escape out of the pericardial cavity into the capacious right pleural cavity.

The majority of major cardiac or great vessel injuries would die en route. Those that survive should be operated without delay, even if the centre is without cardiopulmonary bypass facility and always maintaining a high index of suspicion in centrally placed thoracic injuries as early thoracotomy as the primary treatment yields high survival rates (3). Attempts to transfer patient to specialize cardiac centres will only delay surgi-

cal treatment and will reduce survival.

Median sternotomy (2) is the recommended approach, however our case illustrates that cardiorrhaphy can also be performed through a posterolateral thoracotomy and without cardiopulmonary bypass (2,3) support which can be done in any non cardiothoracic centre.

Our case also illustrates that all praecordial penetrating wounds should not be taken lightly but should be explored carefully.

## References

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