

Traumatic Heart Disease

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Traumatic heart disease must have existed from the earliest times, and the vital function of the heart have been recognised by our ancestors as exemplified by the wall carvings of the prehistoric caves of Spain and France.

The Egyptians as far back as 3000 B.C. attempted a hieroglyphic description of the heart and later represented it as a heart-shaped amulet with three blood vessels at the base.

Both the Bible and Classics of Mythology make reference to wounds of the heart. In the Iliad (about 950 B.C.), for instance, Patroklos wounded Sarpedon with a javelin which pierced his body "where the midriff claps the beating heart" and "then drew the weapon from his panting heart, the reeking fibres clinging to the dart. From the wide wound gushed a stream of blood, and the soul issued in the purple flood."

In the early 16th Century Hollerius questioned the belief that all heart wounds were fatal, and in 1650 Riolanus declared that trephining the sternum and withdrawing liquid from the pericardial cavity was beneficial.

Not until 1829 was the first successful pericardiocentesis for haemopericardium performed by Larrey who as Napoleon's surgeon had considerable experience with war wounds.

In 1895 Del Vecchio and one year later Rehn of Frankfurt discussed suturing of cardiac wounds.

Since then several surgeons contributed to the knowledge of traumatic heart disease, and one may mention Ricketts, Matas, Fischer, Escard and Claude Beck.

During the Second War Harken achieved greater technical advance in the removal of foreign bodies from the heart.

The accepted classification of injuries to the heart is into:-

- (a) Penetrating such as bullets, stab-wounds, fractured ribs and objects ejected from high-speed machinery and
- (b) Non-penetrating i.e., compressive forces from direct blows to the chest, steering-wheel of cars, blasts and explosives.

The wound may be immediately fatal or may allow the patient to reach hospital and receive treatment. One of several structures may be affected i.e. the pericardium, myocardium, septum, valves, chordae and coronary arteries. The actual injury may be laceration, perforation, contusion, rupture, aortic tearing and arrhythmias.

Sugg in 1968 analysing 459 penetrating wounds of the heart showed that there was a pre-hospital mortality of 81%.

Cardiac tamponade is the basic lesion in heart wounds that survive long enough to allow for treatment, although it has been shown that if more than 250 c.c. of blood is poured into the pericardial sac, a fatal tamponade is produced as it interferes with both venous and arterial circulations.

The causes of death may be immediate due to haemorrhage, cardiac tamponade or arrhythmias, or delayed, due to massive cerebral embolism or from congestive cardiac failure secondary to valvular or septal injury, or from constrictive pericarditis.

The clinical examination includes besides the usual signs of tamponade, the nature of the wound, the state of heart and lungs. X-Ray of the chest is, naturally helpful to confirm haemopneumothorax and the electrocardiogram may point to pericardial or myocardial injury.

Treatment, of course, has to be prompt and, without going into details, consists principally in:

- (a) Antishock measures,
- (b) Aspiration of the pericardial cavity, and
- (c) Thoracotomy with pericardiotomy and suturing of the wound.

A blood oxygenator should be available for emergency cardiopulmonary bypass. Post-operative management follows the pattern of other cases of thoracic surgery.

The legal aspects of trauma to the heart assume great importance and the minimal criteria for acceptance of the diagnosis of T.H.D. adopted by Segall and Reed are:-

- (a) Satisfactory demonstration of exposure to traumatic experiences involving either penetrating wounds of the heart or non-penetrating mechanical forces recognised as capable of producing cardiac injuries.
- (b) Demonstration by clinical means or postmortem study of organic cardiac lesions and/or alteration of heart action of a type generally recognised as possible resultants of mechanical trauma.
- (c) Demonstration of time sequence between exposure to trauma and occurrence of cardiac lesions or disorders consistent with a cause - and - effect relationship between the two.

Since non-penetrating injuries are the more common form encountered because of the high

incidence of traffic or similar accidents and as they are not readily recognised as are the penetrating ones, it is very important to establish a diagnosis.

In fact, claims may be contested because of a difference of opinion regarding diagnosis and causation of the injury causing disability or death, especially in cases of myocardial contusion from steering-wheel injuries in car accidents.

Basically the reasons for missing these injuries are:

- (a) The absence of any visible outward evidence of trauma of the chest wall, like erythema, ecchymosis or haematoma.
- (b) The attention of the doctor being diverted from the possibility of heart damage because the more prominent symptoms and signs of chest wall injury mask or overshadow those of cardiac injury, although the potential complications of the latter are of greater legal significance.

It is, therefore, very important that persons subjected to severe, non-penetrating chest trauma should be kept under medical (and legal) observation for a minimal period of several months.
