

The Outcome of the Treatments of Chest Trauma Patients

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Ninety-nine patients with chest trauma were clinically evaluated in terms of their prognoses. In accordance with advances in thoracic surgery, the survival rates were remarkably improved. However, six deaths were encountered in this series.

The causes of deaths were attributable to associated injuries extend to two or three regions including the head and the abdomen so that precise detection and proper treatments should be made as quickly as possible.

In conclusion, the prognoses of serious chest trauma patients are influenced by the presence and the degree of concomitant injuries as well as proper urgent managements.

Introduction

Chest trauma occurred not infrequently in association with traffic accident and industrial calamity. Recently chest trauma has become severe by increasing speed of traffic facilities and highly developed industry. Nevertheless, development of thoracic surgery enabled injured patients to save their lives on the basis of knowledge of the elucidated pathogenesis. Needless to say, the surgical treatment is indispensable for lifesaving.

The aim of this study is to clarify how surgery contributes to lifesaving and also how surgery serves to maintain a high quality of life in the analysis of our clinical experience with management of injured patients.

Results

The injured modes were rib fractures in 21, hemo-pneumothorax in 14, pneumothorax in 12, hemothorax in 10, pulmonary contusion in 5, pulmonary laceration in 6, laceration of the trachea and the bronchus in 10, cardiac injuries in 8 and others in 13, respectively. Of all 99 patients, 41 (41.4%) patients underwent surgery, the surgical treatments were required for all who sustained pulmonary laceration and cardiac injury and for 70% of patients who suffered tracheobronchial injuries. In this series, one third of patients underwent surgery and the remaining patients received conservative therapy as shown

in Table 1. The traffic accidents as the causes of chest traumas were common in all ranges of ages. According to patients ages, chest trauma accidents occurred in a range of 40 to 59 of ages in reflection of active social life as shown in Table 2. Most of the patients with chest trauma in this series survived and returned to active social life. In this series, six patients had expired in five with traffic accident and one with penetrating wound. All patients had accompanying multiple organ injuries, and causes of death were based on MOF. This facts suggest that management for patients with severe chest trauma should be extended to the whole body whether would sustain concomitant injuries or not. Adequate early cares contribute to the survival of patients.

Table 1 The Modes of Chest Trauma and Treatment

Mode	Cases (%)	Thoracotomy (%)
rib	21 (21.4)	
hemo-pneumothorax	14 (14.3)	1 (7.1)
pneumothorax	12 (12.2)	4 (33.3)
hemothorax	10 (10.2)	3 (30.0)
pulmonary contusion	5 (5.1)	
pulmonary laceration	6 (6.1)	6 (100)
trachea and bronchus	10 (10.1)	4 (70.0)
heart	8 (8.2)	4 (100)
others	13 (13.3)	4 (15.4)

Treatment	
conservative	39
thoracotomy	28
T-tube	21
thoracentesis	3
wound care	2
respirator	2
laparotomy	1
tracheal reconstruction	3

Table 2 Patient's age and the causes

causes ages	~9	~19	~29	~39	~49	~59	~69	70~	total
traffic accident	5	6	5	4	6	4	7		37
penetrating wound		1	5	7	5	1			19
fall	1		3		2	5	1		12
industrial injuries					5	5			10
others	1	3	1	4	4	3	3	2	21
	7	10	14	15	22	18	11	2	99

Discussion

Recently chest traumas have become more and more serious. Pathogenesis of severe chest trauma also has been clarified, in particular, it is defined that the modality of blunt chest traumas is characteristic of younger patients, revealing massive hematoma, pneumothorax and injury to the great vessels and the diaphragma without rib fracture¹⁾. In infant, it is very rare in occurrence that three or more ribs are fractured²⁾. Crush injury is concomitantly accompanied by injuries of the heart and the great vessel and extensive pulmonary contusion which induces an increase in extravascular water content of the lung and small air way obstruction as reported by Drinker and Warren³⁾. Recent respirator is far advanced and divided to force impaired gas exchange to improve in help of elucidation of the pathogenesis, avoiding an increase of P_{CO_2}

which provokes hypoxic vasospasms⁴⁾. Sometimes it is essential to utilize extracorporeal circulation for selection of the modality of the management as one of therapeutic options for ARDS. Concomitant cardiac contusion with chest trauma can not be disregarded for physicians, which happens in 20% of chest trauma patients⁵⁾ and also it is one of the influential factors on traumatic asphyxia and poor prognosis of patients with severe chest trauma.

In this series, the results of the management for chest trauma patients were reviewed. The outcome was not unsatisfactory in the aspect of the life-saving. It was worthy of note that careful examination should be made not to overlook the existence of concomitant injury and appropriate treatment be timely required.

Advances in thoracic surgery contributes to improved surgical outcome for severe chest trauma patients. On the other hand, the outcome of patients with associated injuries extending to multi-organs is pessimistic on account of MOF in spite of development of new therapeutic device and aggressive treatments. Deaths were encountered on day 3 to 11 after chest trauma. In this study, complex traumatic injuries in two or three regions of brain, abdomen and chest were contributory to death directly related to traumas except for stab wound of the heart.

In conclusion, it is emphasized that the survival rates should be improved by enhancement of rapid transportation and integration of medical cooperation in all special fields even in advanced surgical management.

Deaths of chest trauma patients

age	moment of injury	modes of injury	associated injuries	treatment	interval after trauma
32	traffic	rib	abdominal organ injury	conservative	day 0
66	traffic	hemopneumothorax rib	subdural hematoma	T-tube craniotomy	day 11
17	traffic	hemothorax esophageal rupture	stomach, liver spleen reapture	T-tube thoracotomy	day 5 renal failure
5	traffic	pulmonary contusion pneumothorax	general body contusion	T-tube respirator	
20	traffic	pulmonary contusion hemopneumothorax	subdural hematoma	T-tube respirator	
18	stab wound	stab wound	(-)	thoracotomy	

References

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