MANGEMENT OF MASS CASUALTY

Essay
Submitted for Partial Fulfill of Master Degree
in General Surgery

By

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Sherif Mohamed Ali

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List of abbreviation

ATLS	***Advanced life trauma support***
BTLS	***Basic Trauma life support***
BP	***Blood pressure***
CDC	***Centers for Disease Control***
CERT	***Community Emergency Response Team (Australia)***
ED	***Emergency Department***
EMAC	***Emergency medical assistant concept***
EMS	***Emergency medical surfers***
EMS	***Emergency Medical System***
DSP	***Disaster management plan***
FH	***Failed hospital***
FICEMS	***Federal interagency committee on emergency medical surface***
GIS	***Geographical Information System***
GCS	***Glasgow coma scale***
ICU	***Intensive care unit***
Hazmat	***Hazardous Material***
HAC	***Health Action in Crises***
HCF	***Health Care Facility***
HICS	***Hospital incidence command system***
MCE	***Mass casualty management***
MCCC	***Medical command control center***
MCM	***Mass casualty event***
MIC	***Mass incident causalty***
MOU	***Memorandum of Understanding***
MUCC	***Modal of uniform core criteria***
NGO	***Non-Governmental Organization***
ORs	***Operation room***
PHTLS	***Pre hospital care stabilized per hospital trauma life support***
RAV	***Rural Ambulance Victoria (Australia)***
SERPs	***Supplemental Emergency Response Plans***
STERT	***Simple triage and rapid treatment***
SMART	***Specific measurable attainable relevant time bound***
TWG	***Technical working group***
TUE	***Terrorist use of explosive***
TCS	***Trauma Care Systems***
WHA	***World Health Assembly***
WHO	***World Health Organization***

List of Contents

Introduction

Major incidents, such as natural disasters, accidents and terrorist attacks, affect millions of lives each year. In 2011, natural disasters alone killed more than 30 000 people and injured 244 million people worldwide. The 332 natural disasters in 2011 caused the highest economic damage ever recorded; Asia was the continent most often hit, followed by the Americas, Africa and Europe ***(Fattah S et al., 2013).***

The successful medical response to a mass casualty event (MCE) depends on effectively coordinating three areas: pre hospital care, patient distributionand hospital care. Although the pre hospital and hospital areas are reasonably well established, patient distribution is often neglected particularly in countries with limited experience with terrorist bombings ***(AshkenaziL et al.,2010).***

A mass casualty incident(MIC)can be as varied as your imagination. It can be defined as any incident with more patients than you can manage. Not having the available resources or person-power puts you into a MCI situation. Even if your community has a wealth of resources, when those resources are expended or you are unable to reach the scene, you are entering the MCI zone. Such incidents can include fire and collapse ***(Sideras J ,2007).***

Major emergencies, crises and disasters have become more frequent during recent decades, especially in middle and low income countries. They affect more and more people, disrupting health sector programmers and essential services, and slowing the process of sustainable human development.Many lives could be saved if the affected

communities were better prepared, with an organized scalable response system already in place **(*World Health Organization,2007).***

Mass casualty triage is the process of prioritizing multiple victims when resources are not sufficient to treat everyone immediately. No national guideline for mass casualty triage exists in the United States. The lack of a national guideline has resulted in variability in triage processes, tags, and nomenclature. This variability has the potential to inject confusion and miscommunication into the disaster incident, particularly when multiple jurisdictions are involved ***(Lerner E et al., 2011).***

Mass casualty triage is a critical skill. Although many systems exist to guide providers in making triage decisions. There is little scientific evidence available to demonstrate that any of the available systems have been validate The proposed guideline, entitled SALT (sort, assess, life-saving interventions, treatment and/or transport) triage, was developed based on the best available science and consensus opinion. It incorporates aspects from all of the existing triage systems to create a single overarching guide for unifying the mass casualty triage ***(Schwartz R et al., 2008).***

National Incident Mass System uses a systematic approach to integrate the best existing processes and methods into a unified national framework for incident management. Incident management refers to how incidents are managed across all homeland security activities, including prevention, protection, response, mitigation, and recovery***(Chertoff M .,2008).***

The goal of healthcare personnel during mass casualty events is to increase survivability with minimal disability within a context of restricted resources. Organizational systems must have the capability and flexibility to respond in a manner that positively influences these outcomes***(Culley J, 2011).***

Aim of work

To spot light on incidence of mass casualty and how to manage this situation when happened.

HISTORICAL REVIEW

Emergencies can arrive fast and furious like a tornado, or slow and low like a flood. Mass gathering sports events will give you time to plan ahead, while a multi-car crash on mass casualty incidents can shake even the most seasoned first responder. Weather the highway will not. Mass casualty incidents may require a fire department response for hazardous materials, or a law enforcement response for an active crime scene ***(Rommine D,2013).***

Most common mass casualty incidence experienced by rural hospitalsfrom most to least frequent: vehicular crash severe weather ,bus crash hazardous materials (Hazmat)power failure tornado or hurricane ,multiple gunshot wounds, fire ,heat, flood , explosions airplane crash and other natural cause***(Heighthman J, 2012).***

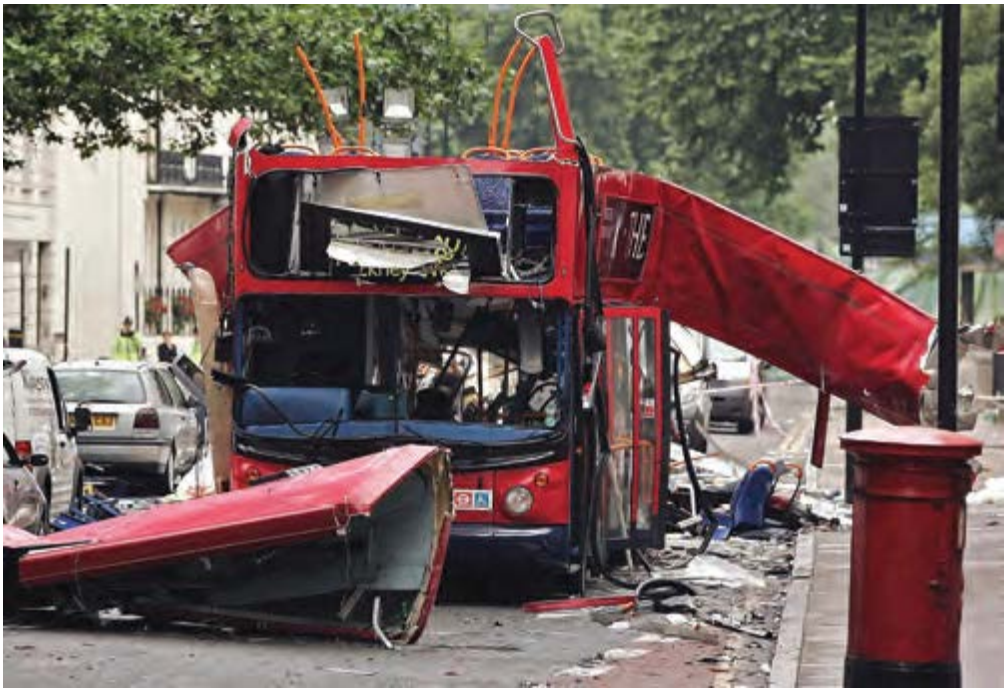
The most common mass casualty are eruptions beneath earth surface. landslides, avalanches' at earth surfaces. windstorms cyclones, typhoon, hurricane , hailstorms, snowstorms, sea surges, floods, droughts, biological phenomena locust swarms, epidemics of diseases. man made disorder- conventional warfare, nuclear, biological and chemical warfare. caused by accidents- vehicular (plane, train ,ship, boat and bus). drowning , collapse of building, explosions, fires ,biological and chemical

(including poisoning)in mass causality situations , the demands always secedes the capabilities of both personnel and facilities. the concept of mass causality management has occupied the attention of surgeons since the 17thcentury. War causalities and sailing ship disasters were the prime concerns in those eras. over the last decades , the spectrum of possible catastrophe has dramatically increased as result of an increasingly technologically sophisticated society

(Haripriya A ,2010) .

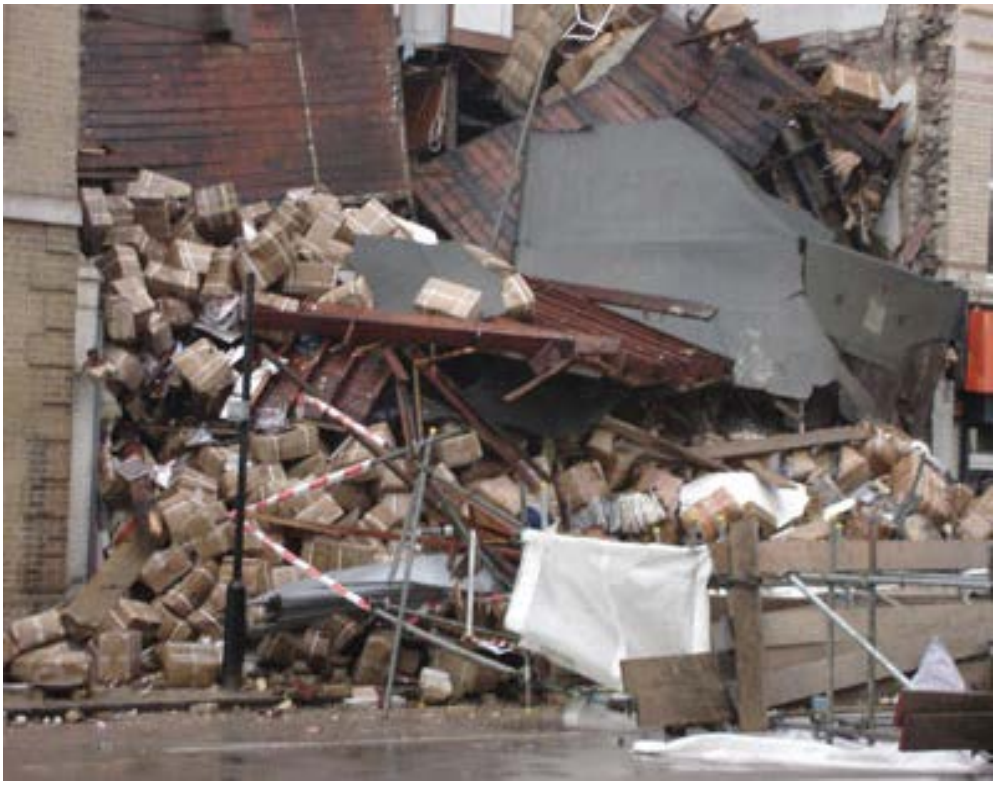
An explosion is caused by the sudden chemical conversion of a solid or liquid into a gas with resultant energy release. explosive devices are categorized as either high-order explosives (HE, such as Cc4 and TNT) or low-order explosives (le, such as pipe bombs, gunpowder, and Molotov cocktails). He detonation involves supersonic, instantaneous transformation of the solid or liquid into a gas occupying the same physical space under extremely high pressure. these high-pressure gases rapidly expand outward in all directions from their point of formation as an overpressure blast wave. the extent and pattern of injuries produced by an explosion are determined by several factors:

- amount and composition of the explosive material.
- delivery method.
- distance between the victim and the blast.
- setting (open vs. closed space, structural collapse, intervening barriers ***(Ashkenazi I et al ., 2010)***.



***Figure*(1)**Bus crush in England

(***Ashkenazi I et al ., 2010***).



Figure(2) Building collapse in Unite State America

(Chuwa R et al., 2009)..

Figure(3)bombing in underground in madrid inSapian

(***Frykberg E, 2006).***

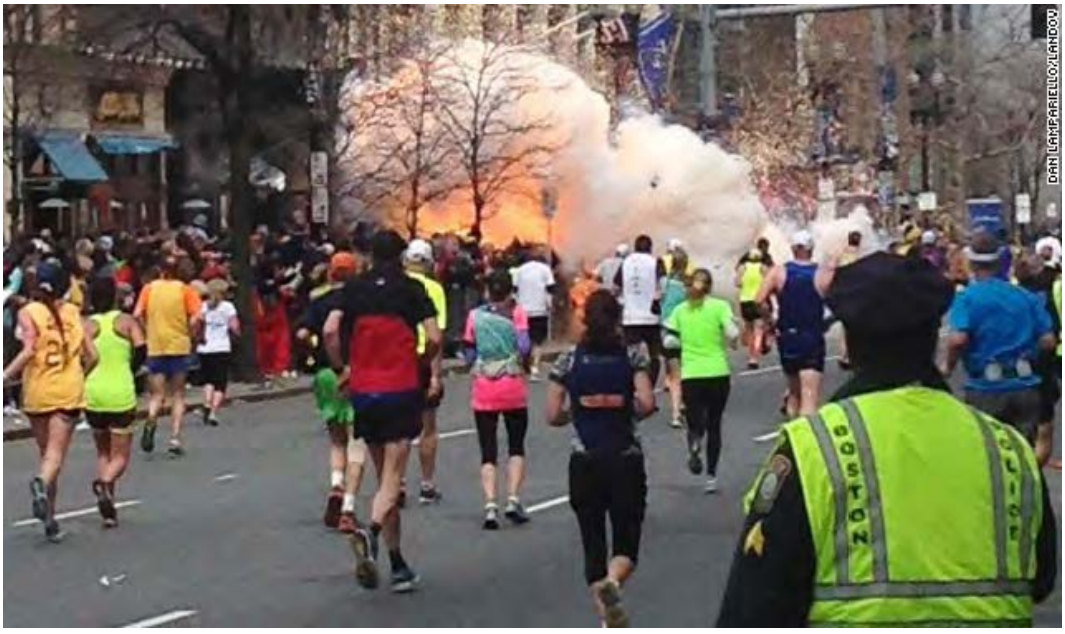
Figure (4) Air plane Turkish crush due to error in motors

(*Simiyu T et al .,2009*)

Figure (5) Train crush in France ***(William R ,2010)***.

Blast injuries are categorized as primary, secondary, tertiary, or quaternary. Primaryblast injuries result from HE detonations and the impact of the blast wave on the victim's body. Damage occurs primarily in gas-containing organ systems (e.g., lungs, ears, gastrointestinal tract) at the air fluid interface. Also, increasing evidence shows primary blast injury to the brain. Secondary blast injuries result from penetrating and blunt trauma caused by fragments and flying objects striking the victim. Tertiary blast injuries include blunt and penetrating trauma caused by displacement of the victim (e.g., being thrown against a wall). Quaternary (formerly miscellaneous) blast injuries are other injuries resulting from detonation of an explosive device and exacerbation of chronic diseases resulting from the blast. These injuries include burns caused by the thermal effect of the explosion or consequent fires, crush injuries caused by structural collapse, and toxic inhalations from a component of the explosive device or the resultant spillage of hazardous materials

(Ashkenazi I., et al ., 2010)



Figure(6)Bostonmarathon bombing***(Qeames,2103).***

Origin triage Although used today in reference to the “sorting” of patients, the French origin for the term “triage” initially referred to the sorting of agricultural products Current triage strategies arose from advances in military medicine in times of war, and the French military surgeon Baron Dominique-Jean Larry is generally credited with developing the first battlefield triage system .In his 1812 memoirs, Larry explained his then-novel method of immediately treating the most severely wounded first without waiting for the battle to end, as was previously customary. Differing triage principles emerged in subsequent decades, and in 1846, British surgeon John Wilson proposed that treatment be deferred for both those with minor wounds and those with severe injury, instead offering therapy first to those patients who were most likely to benefit from immediate treatment. During world war I, the United States adopted a triage approach that maximized the number of soldiers who could return to service. Those who could return to combat quickly were treated first in order to maintain the numbers of the fighting force. During the Korean and Vietnam wars, and most recently in