Hospital Preparedness for Mass Casualty Incidents – the Role of the Trauma Team

© J ORTHOP TRAUMA SURG REL RES 3 (7) 2007
Review article

BENIN-GOREN O.[1], HALPERN P.[2], GUŁA P.[3]

[1] Director – Center for Ressuscitation and Emergency Medicine Education, Tel Aviv Sourasky Medical Center, The Tel Aviv Sourasky Medical Center, 6 Weizmann Street, Tel Aviv 64239, Israel
[2] Chair of Emergency Department, Tel Aviv Medical Center, The Tel Aviv Sourasky Medical Center, 6 Weizmann Street, Tel Aviv 64239, Israel
[3] The Provincial Hospital No. 5 of St. Barbara in Sosnowiec Plac Medyków 1, 42-200 Sosnowiec, Poland

Address for correspondence/Adres do korespondencji:
Przemysław Guła
The Provincial Hospital No. 5 of St. Barbara in Sosnowiec
Plac Medyków 1, 42-200 Sosnowiec, Poland
e-mail: przemyslaw.gula@ziz.com.pl; tel. +48323682166

Statistic

Word count	1228
Tables	0
Figures	2
References	0

Received: 10.08.2007
Accepted: 24.08.2007
Published: 07.09.2007

Summary
Based on experience of Tel Aviv Sourasky Medical Center , Emergency Department authors described Trauma Team procedures in Mass Casualty Situations. Paper focuses on medical triage problem and changing daily trauma procedures into MCI protocols.
This paper in mainly based on blast injury Mass Casualty Incidents and refers to widely accepted Advanced Trauma Life Support protocols.
Key words: Mass Casualty Incidents (MCI), Emergency Medical Services (EMS), Emergency Department, Trauma Team, Triage, Advanced Trauma Life Support (ATLS), Acute Stress Reaction (ASR)

Disasters occur all over the world. Man-made disasters and terror are becoming a part of the daily agenda of hospitals' preparedness for Mass Casualty Incidents (MCI).

There is no question whether or not terror will strike us, but when and where it will happen. While keeping the hospitals on constant alert for MCI and disasters there is a need for a clear definition of staff deployment and roles.

A hospital Trauma Team is created using a multi disciplinary approach based on the profession of each of the team's members. While providing medical care to trauma patients during „regular time" the trauma team may include: Medical Director, Head of General Surgery, trauma physicians and nurses, a trauma nurse coordinator, a social worker and a secretary. Additional staff may be involved depending on the sustained injuries (consulting doctors and technicians).

The team must be well organized which may only be achieved through training and application of the coordinated approach. The team members must also trust one another to be able to (i) identify and correct life threatening injuries; (ii) resuscitate the patient and stabilize his vital signs; (iii) determine the nature and the extent of other injuries; (iv) categorize the injuries in order of priorities; and (v) prepare and transport the patient to a place of definitive care.

In light of the above, all team members must be familiar both with their own roles and those of their colleagues. The roles must be clearly defined.

While working to identify and correct life threatening injuries, all team members:

- must have clear responsibilities and must be trained to fulfill them;
- must know their position, duties and have the skills necessary to perform them;
- should be familiar with the equipment and protocols in order to provide the best medical care to trauma patients and to support one another in the accomplishment of their tasks.

Compliance with the above requirements is extremely important in dealing with MCIs.

By definition, an MCI involves at least a temporary imbalance of resources. The staff involved in patient's care may have little experience and most of the experienced caregivers may be absent or may devote their attention to the logistics of the incident. In order to save as many lives as possible in an MCI the medical personnel should follow predetermined and clear orders, but remain flexible if required.

Trauma patients' care doctrine is related both to incident management and to patient care management. It is further related to key hospital personnel who may have no direct contact with the patient (such as personnel responsible for logistics, equipment, or administration). The Advanced Trauma Life Support (ATLS) constitutes the basis for trauma care in MCIs. Yet, not all ATLS protocols are applied in MCIs.

In an MCI, both Emergency Medicine Services (EMS) and hospitals are first dealing with Triage. Triage patients will be different from „regular" trauma patients as they may be classified either as „walking patients" or „laying patients". „Walking patients" may include also those who suffered from Acute Stress Reaction (ASR). „Laying patients" will be divided into those who require immediate life saving procedures and those whose treatment may be delayed. The cause of the incident must be defined just as the injury pattern. The patients' evacuation from the site of the incident will depend on the distance from the hospital and EMS availability. If patients are evacuated from a rural area, it may be required to apply life saving procedures on site due to the long time required for transportation. That may give hospital trauma teams time to organize themselves. In urban areas, the MCI's leading concept is „Scoop and Run" plus Airway Management and Bleeding Control. When the distance to the hospital is short, trauma teams may have no time to organize and must respond immediately based on MCI protocols and the well-trained and correctly deployed personnel.

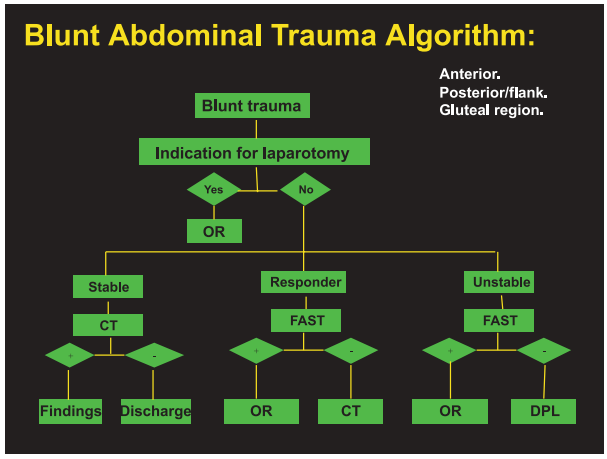
Hospital triage is short and based on the „Look, Ask, and Feel" principle. Patient are evaluated and subjected to repeated triage while at the Emergency Department (ED) and prior to admittance to hospital wards. This is particularly true when dealing with such patterns of injuries as those caused in any blast related MCIs.

Blast injuries are severe and complex mostly because they are caused by multi shrapnel. During the six years of the „Intifada'' in Israel the number of blast caused MCIs forced the trauma teams to define:

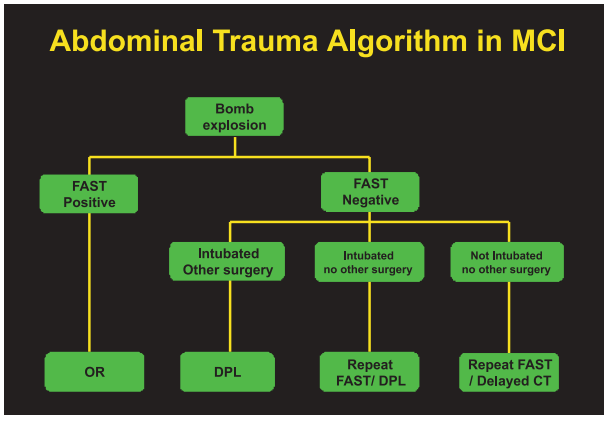
- unique patterns of injuries that required life saving intervention (about 3% - 5%) including intubation (6%), chest drain insertion (5%), and ED thoractomy (0.2%).
- ways of identifying patients who require immediate surgical procedures: (12%-18%). Among those patients there is a pattern of high incidence (8%) of laparotomies among indoor explosion victims, and high incidence of head & neck injuries among bus explosions victims (50%).

Blast injuries are also characterized by severe (ISS>16) injuries ranging between 7% and 11%. The mortality rate varies between 8% and 22%.

In light of the above it seemed necessary to develop new protocols for medical care for patients suffering from blast related injuries and the experience accumulated from all the incidents permitted to establish such protocols. For example, while dealing with „regular trauma" and following the ATLS protocol for Blunt Abdominal Trauma the protocol would be as follows:



However, Abdominal Trauma caused by blast would be treated using the following protocol:



While dealing with blast caused injuries, also other medical decisions taken by the trauma team may differ from those taken under "regular" trauma conditions:

- The diagnostic modalities are based on CT with real time interpretation and priority for head injuries. Total body CTs are sometimes the only viable diagnostic modality for multiple shrapnel injuries.
- US- FAST is becoming an important tool for abdominal blast injuries. It is operated by a senior surgeon at the bed side and does not disrupt patient's care.
- DPL may be used for diagnosing intubated stable patients, in lieu of CT.
- The pattern of blast caused injuries may involve vascular injuries with only minor external penetration. Angiography, though time and resource intensive, is often mandatory.
- Radiology is sparsely used and is not a standard examination. CXRs may be performed in a shock room with a mobile unit, exclusively after a physical examination and only if it is highly probable that it may prove a valuable tool in patient treatment. It must be approved by a senior trauma surgeon and incident commander.

Since most of the casualties are light they will be examined by junior staff under the guidance of a senior surgeon and subsequently released. Anyone suffering from ASR will receive psychological and social assistance offered on site by professional personnel besides being physically examined by junior medical staff under the guidance of a senior surgeon.

Only when it is ensured that full and complete treatment was received, the patients will be discharged from the ED under the guidance of nurses and social workers.

Finally, an independent team including a Trauma surgeon, an Orthopedic surgeon, a Psychiatrist, an ES nurse, and a Trauma Coordinator Nurse will conduct a tertiary survey of all the hospital wards that admitted casualties to find whether or not any injuries have been missed, to comply with the PTSR (?Postmobilization Training and Support Requirements), and to review the needs of medical personnel.

ACKNOWLEDGMENTS

To Lt col. Amir Blumenfeld MD, Head of Trauma Branch, Israel Defence Forces

References/Piśmiennictwo:

1. *Hospital preparedness for Mass Casualty Incident. A National Pilot Drill. Odeda Benin-Goren, Prehospital and Disaster Medicine Volume 22 number 2, 2007*
2. *Preparedness of Hospitals for MCI in Germany. F. Fisher, C. Burger, DC Wirtz Prehospital and Disaster Medicine vol 22 number 2, 2007*
3. *Zdarzenia Masowe, P.Guła, W. Hładki, L. Brongel. Przegląd Lekarski 2006/63 suplement 5. 2006*
4. *Simulation System for Preparedness of Emergency Departament Staff for Mass Casualty Incidents. L.Levi, D. Bergman. Prehospital and Disaster Medicine. Volume 22. Number 2. 2005*