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Editorial

Diagnostic Imanging in Shock Room of Emergency Department in Primary Survey of Politraumatized Patients: Importance of E-Fast in Decision Making in Hemodinamically Unstable Patients

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Keywords

Primary Survey; Politrauma; Damage Control Resuscitation; E-FAST

Abbreviations

ATLS: Advanced Trauma Life Support; DCR: Damage Control Resuscitation; DCS: Damage Control Surgery; CT: Computer Tomography; E-FAST: Extended – Focused Assessment with Sonography for Trauma; ACOI: Associazione Chirurghi Ospedalieri Italiani

Editorial

In recent years, studies of clinical evidence and ATLS have always emphasized how the "golden hour" of severe polytrauma represents the time that will be influenced the prognosis.

More simply, the "golden hour" is the time available we have to try to save the patient's life and/or improve his prognosis and outcome.

Out of hospital, at the scene of accident, according to experiences of war surgery, we passed from the "stay and play" concept to "scoop and run" strategy. Differently from the past the politraumatised patient was no transported to the neareresthospital, but in the more appropriate Trauma Center, according to the principle of centralization (trans port to referenced trauma center) with the coordination of operations emergency rescue center at the time of call until the arrival in hospital.

In trimodal curve of survival of the trauma patients described by ATLS, resuscitation care obtains the major successes just in second peak of the "golden hour" which, over the years, according to studies of clinical evidence has clearly shortened its duration.

Actually we can sintetized all these with a single phrase: "Make Less, Make Better and Fastest as Soon as Possible!"

The Damage Control Surgery therefore falls within to be part of the resuscitation of severe polytrauma patients, enabling control of the bleeding and the continuation of the intensive care until hemodynamic stabilization.

To achieve this goal the first level diagnostics is an indispensable element in the decision of the subsequent therapeutic approach, reaffirming that in case of hemodynamic stability the gold standard in the diagnosis of lesions of polytrauma patients is the CT scan.

The dr. Tugnoli, director of Surgery of Trauma Unit in Bologna in his lessons in the ACOI School of Surgery of politraumatizated patient, does not speak of "golden hour" but of "five hundredth of a second of Diamond", identifying the time needed to surgeon to decide the diagnostic approach in therapeutic severe polytrauma patients.

Deciding whether to do a CT scan or going directly in the operating room depends on this fraction of time, based on the information of the clinical and radiological diagnosis of first level performed in shock room.

Recently, in a scheme exposed in reports on the activityof the Emergency Department in my hospital (S.Chiara Hospital Trento), the chain of survival was reviewed and described as in Figure 1.

This sequence of events is currently the minimum level of quality requie, but all we need to start the patient in the correct manner at the right place.

From the time of dispatch, alerted the Trauma Team in Hospital, the responsible of operating center of the emergency service territory, after sending appropriate crew, can begin to collect the necessary information about clinical medical history to be transmitted on line to the emergency physician in shock room (dynamics of the accident; clinical condition of patient history and clinical staff as comorbidity and / or allergies).

The patient on the scene must be managed according to ATLS guidelines, providing for finding two peripheral large caliber venous access, the administration of tranexamic acid and appropriate infusion with adequate immobilization and / or placement of pelvic binder in case of clinical suspicion of fracture of the pelvis.

In hemodynamically unstable patients the possibility to perform an E-FAST already on the scene, would allow, in hemodynamically unstable victims, the identification of two groups (Table 1) :

1. Hemodinamically unstable patients with positive E-FAST ;
2. Hemodinamically unstable patients with negative E-FAST.

Execution of E-FAST on the scene, in hemodynamically unstable

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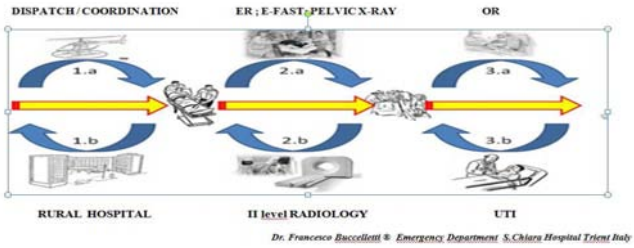

Figure 1: Modified Chain of Survival.

Table 1: Treatment of Patients on Scene of Trauma.

SCENE	E-FAST	TREATMENT
Hemodynamically unstable patient (SBP <90; HR> 120)	Positive	OPERATING ROOM DAMAGE CONTROL SURGERY
	Negative	SHOCK ROOM STABILIZATION DAMAGE CONTROL RESUSCITATION

patients, would save valuable time in case of positive avoiding the shock room of emergency department, sending the patient directly to the operating room from the territory, according to principles of Damage Control Surgery.

The real unknown factor, would eventually represented by the presence of a fracture of the pelvis when the same appears stable physical examination.

The presence of an E-FAST positive associated with clinical instability of the pelvis physical examination at the scene should be described and treated with placement of pelvic binder sending the patient in the operating theater, eventually delaying to the execution of an anteroposterior pelvic X-ray directly on the surgical bed for deciding the surgical strategy and an eventual making a preperitoneal pelvic packing before the opening of the peritoneum.

The E-FAST allow us to explore the chest and abdomen with high specificity and sensitivity for free fluid in abdomen or chest and is highly sensitive in the diagnosis of pneumothorax, and chest x-rays may be delayed in these patients.

This is the future goal and the "gold standard" applied in this small percentage of patients.

If the execution of E-Fast is not possible on the scene, hemodinamically unstable patients, should be sent to the trauma center in the fastest time possible to be evaluated in primary survey in

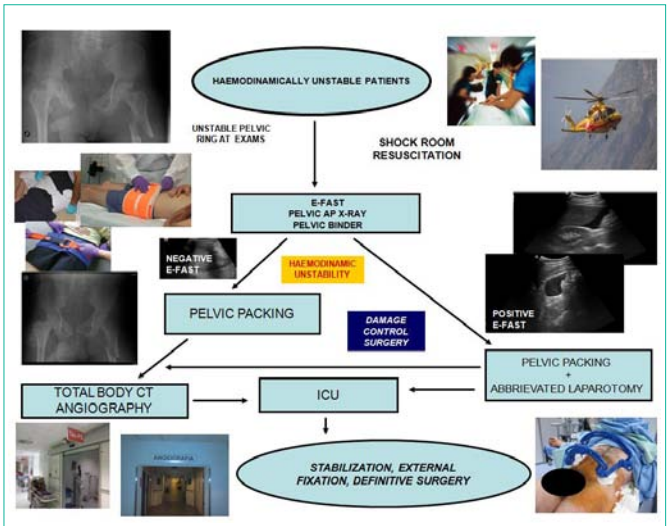

Figure 2: Decision Making In Hemodinamically Unstable Patients – Operative Algorithm.

shock room through anteroposterior X-ray of the pelvis and E-FAST, and this, as already described, can completely replace all the effects anteroposterior radiography of the chest.

In severe hemodynamically unstable polytrauma patients, with E-FAST negative, the diagnostic target is directed to fractures of the pelvis for which in addition the clinical diagnosis is necessary the execution of the radiograph of the pelvis.

There is debate on the mode of execution of the X-ray of the pelvis.

Some orthopedic argue about whether or not to perform in addition the anteroposterior radiograph of the pelvis, other oblique projections, which are not executable in shock room.

For the purpose of stabilization in emergency, more information in addition the standard radiological, would not change the therapeutic strategy of orthopedists.

In hemodynamically unstable patient, costs and time involved for the specific diagnosis of lesions and then perform a diagnostic II level at any cost is not useful because they do not need to modify treatment, so it is necessary increase the use of the first level diagnostics as described in the flow chart in Figure 2. This approach will surely lead to an increase in survival of critical patients.

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