



Research Article

Complementary Exams on Trunk Blunt Trauma: Is it Safe Perform only Radiographs and Fast?

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Abstract

Objective: To evaluate the effectiveness of the use of chest x-ray (RxT), pelvis (RxP) and FAST (Focused Abdominal Sonography in Trauma) to exclude significant lesions in blunt trauma trunk and abdomen. **Methods:** A prospective study involving 48 patients from September 2015 to February 2016 they made during the initial evaluation, the three tests (RxT, RxP and FAST). The results of these tests were compared to the trunk CT scan of the same patient or with their clinical outcome based on the observation time filed by the hospital. All patients were treated at the General Hospital of Guarulhos (HGG), Guarulhos-SP, Brazil. **Results:** We studied 48 patients in the period, the average patient age of 44 years, Glasgow Coma Scale (GCS) 13 and the Revised Trauma Score (RTS): 7.22. Of these, 33 (68.7%) had no lesions (radiographs and FAST), however, 3 patients in this group had severe injuries, suspected by clinical examination and confirmed by CT scan. The remaining patients, 15 (31.3%) had at least one change in the set of tests, and 12 had significant injuries and three minor injuries. The sensitivity of the set of tests was 80% and specificity of 90%. The positive predictive value of the test was 80% and the negative predictive value of 90% with a prevalence of 31% in the initial set of tests. **Conclusion:** We conclude that the use of x-rays and FAST associated with physical examination series is a screening option for patient's trunk of trauma victims with good sensitivity and specificity of screening being a reliable option in trauma centers.

Keywords: Multiple trauma; Radiography; Tomography; Process assessment

Introduction

Trauma is a frequent illness, being the fifth most common cause of death in the world and the leading cause of death in people under 40 years old. In Brazil, the frequency of trauma is bigger than the global one, corresponding to the third cause of death and the first one when considering data by age group under 44 years old [1].

Trauma is responsible for approximately 50% of all deaths from external causes and almost 74% considering an age group of 15 to 24 years old. [2] Therefore, trauma must be seen as a serious public health problem, requiring large investments in its prevention and treatment.

Due to its high prevalence, it is essential that the emergency team, even without definitive therapeutic resources, have experience in the care of traumatized patients [3,4].

To evaluate whether minimal investigation resources are sufficient in comparison to complex exams such as tomography, it was decided to assess how much basic radiological exams in trauma care (chest X-ray, pelvis X-ray and FAST – Focused Abdominal Sonography in Trauma) are effective approaches in the initial care of the traumatized patient [5,6].

Methods

The study involved 48 patients, victims of close abdominal trauma that upon admission, were submitted to RxT, RxP and FAST. The data were collected at the time of admission through a protocol developed for this purpose. The data collection period took place between September 2015 and January 2016, at the Hospital Professor Doutor Waldemar de Carvalho Pinto Filho (General Hospital of Guarulhos).

There is not a specific protocol about imaging methodology in the initial care of polytrauma patients at the General Hospital of Guarulhos; therefore, there was no interference in the conduct of the surgeon who was handling the case of each patient.

Abdomen and pelvis computed tomography was used selectively in each case as an initial investigation method, according to the severity of the case and the trauma mechanism. The study was based on data from medical records and exams, without interference from assistance, without patient identification and, therefore, without ethical-legal implications.

To determine if the conduct of requesting only the three exams (RxT, RxP and FAST) would be sufficient for the complementary study in patients victims of abdominal trauma, two observation criteria were considered: 1-evaluation of the abdominal and pelvis

CT scan from the same patient; 2-clinical evolution of patients who were not submitted to abdominal and pelvis CT scan in the initial examination, being followed up according to the following protocol: 5 days for intubated patients; 48 hours for those conscious, but who required hospitalization for another reason (orthopedic fractures or prolonged neurological observation); 12 hours for those who suffered minor trauma, without significant injury and remained in the hospital only for the minimum time of observation, according to the internal rules of the Emergency Service of the General Hospital of Guarulhos.

Results

A total of 48 patients were studied in the period, with a mean age of 44 years, Glasgow Coma Scale (GCS): 13 and Revised Trauma Score (RTS): 7, 22.

About the 48 patients studied, 68, 7% had exams without alterations to the methods (radiographs and FAST), however, 3 patients in this group had serious injuries (two liver injuries and one splenic injury), diagnosed by Computed Tomography (CT), which were performed within the first 24 hours after admission.

Patients who had alterations in exams in the set of images correspond to 31, 3%, which in this group the patients presented at least one alteration in the imaging methods, such as free fluid into the abdominal cavity or rib fractures. From this group, more than 90% of the patients had significant lesions diagnosed by the primary exams (pelvis fracture or pneumothorax). Significant injuries were those that required evaluation by other specialists, such as orthopedics and vascular surgery, a longer observation time, or some type of invasive procedure. The table 1 represents the association of lesions presented in each group compared to the initial positive exams.

Diagnosis	Rx/FAST +	Rx/FAST -	Total
SI +	12	3	15
SI -	3	30	33
Total	15	33	48

SI+: Diagnosed Serious Injury; SI-: No Serious Injury Diagnosed; Rx/FAST+: Set of Altered Exams; Rx/FAST-: No Alteration in the Set of Exams

Table 1: Association of the set of exams-chest radiography, pelvis radiography and FAST-with the diagnosis of trunk injuries.

The sensitivity of the set of exams for the initial screening of polytrauma patients showed a sensitivity of 80% and a specificity of 90%. The positive predictive value of the test was 80% and the negative predictive value was 90% with a prevalence of 31% in the set of initial tests.

Discussion

The study showed that the initial exams (chest radiography, pelvis radiography and FAST) presented sensitivity and specificity of 80% and 90%, respectively, therefore, making it clear that its use as an initial screening for patients with trunk trauma seems to be safe.

The group of patients, who initially presented the sets of normal exams associated with a serial physical examination and follow-up according to the trauma mechanism, can be inferred that this group do not present severe trunk injuries and can be forwarded for specific treatment according to associated injuries that present or hospital discharge according to specific protocols.

However, even if some of these patients present altered exams or if the initial physical examination is altered, it is necessary to advance the propaedeutic with other specific subsidiary exams such as computed tomography.

Some studies have already demonstrated the safety of conducting trunk trauma without the need to use tomography as an initial screening. In 2015, Botelho Filho et al carried out a similar study, finding sensitivity and specificity above 90% with initial exams as radiography and FAST, demonstrating that is safe only screening without the need of tomography for initial screening [7].

As a basis for this conduct it is not yet been fully established the use of whole-body CT scan as a supplement way and its reduction in mortality in the initial evaluation, and there are no large randomized studies to prove it [8,9].

Another variable to be considered is that the ATLS (Advanced Trauma Life Support) supports the use of radiographs and FAST as an acceptable initial conduct in polytraumatized patients. The use of whole-body CT has a sensitivity of around 85% in most studies, and it varies according to the region studied and may even present lesions unnoticed by the method, not excluding the need for follow-up with serial physical examination for these patients [4,10,11].

In the study, the use of initial exams on the primary evaluation associated with the physical examination has been capable of diagnosing all the alterations, discarding significant trunk injuries. Three patients had false-negative results and presented alteration during the physical examination and abdominal pain, which motivated the solicitation of supplementary CT scan confirming the diagnosis.

Most of recent studies report factors related to the use of whole-body CT scan, but there is no comparison between its use in comparison with tomography in a selectively way according to the trauma mechanism, and there is no evidence of which conduct is more effective in the evaluation of trauma victims [10].

In terms of public health, there is a lot of discussion about expenses in relation to the care of traumatized patients and the indiscriminate use of CT scan, which confronts the reality of our country today, making evident the necessity to establish specific protocols for the use of complex complementary exams, also considering the radiation risk and its long-term complications [10,12].

Conclusion

We concluded that the use of radiographs and FAST associated with serial physical examination are a screening option in patients suffering from trunk trauma with good sensitivity and specificity of screening, being a reliable option in trauma centers. The CT scan should be used in specific cases in a selectively way, being the full-body CT scan not indicated for routine use as a propaedeutic for initial screening in traumatized patients, being more realistic with Brazilian public health.

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