The Role of Radiology in Trauma Situations

Introduction

When there is a trauma, most often paramedics will show up to the accident scene and begin triaging patients by who is critical and non-critical. Patients may be taken to a trauma level I or II center. Organized and clean areas are important when caring for a patient as the treatment process is more effective.[1] Clear communication between everyone on the trauma team, and the lead doctor announcing what is happening will make sure there is no confusion. Everyone knows what is happening during the entire duration of the trauma. Radiology is a very important department to have involved in a trauma. There must be someone readily available to take x-rays or computed tomography scans (CT's) to aid in the complete diagnosis of the patient. Without radiology, the doctors would not be able to see critical injuries, such as broken bones, internal bleeding, hematomas, or other diseases or injuries a patient may suffer from.

Trauma Environment

A trauma environment is staffed with personnel who are specialized for emergency situations. The parts of the trauma team that are required to be present are Emergency Room (ER) doctors, ER nurses, care techs, a pharmacist, respiratory therapist, x-ray techs, a mid-level provider, and Operating Room (OR) staff must be on standby. If the patient has more critical injuries, there is an OR lead surgeon and OR anesthesiologist that must be present in the ER during the trauma.[2] A trauma is a naturally chaotic situation, and the only way to treat the patient and stay organized is clear communication between everyone involved. Nobody can ever know when there is going to be a trauma, so the supplies and personnel must be readily available 24/7.[1] in the radiology department, there must be someone who is available to take any x-rays or any CT exam when a trauma patient comes in. At least one CT scanner also must be free of patients so the trauma patient can get their exams dome immediately.[2] (See Figure 1).

Common Trauma Injuries

Traumatic injuries can be caused by several different types of accidents. They can come from car accidents, especially ones causing blunt force injuries, sports injuries, natural disasters, physical injuries sustained at home or on the street, and also falls.[3] Common types of traumatic injuries include:

- Spinal cord injury
- Facial or acoustic trauma
- Crush injury
- Blunt trauma (See Figure 2).
- Burns
- Cuts and puncture wounds
- Broken bones
- Collapsed lung
- Blunt myocardial injury
- Electrical injury
- Hypovolemic shock
- Subarachnoid hemorrhage
- Subdural hematoma[3] (See Figure 3).

Figure 1. The trauma teat prepares a patient for a CT exam.[4]

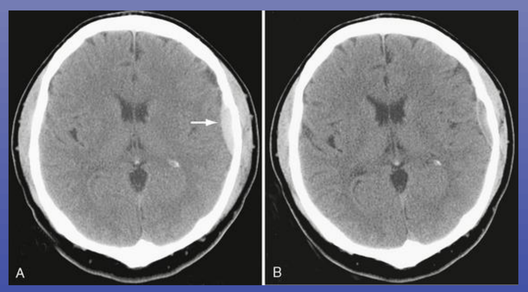

Figure 3. Left image shows acute left frontal hematoma. Right image is a follow-up showing resolving hematoma.[6]

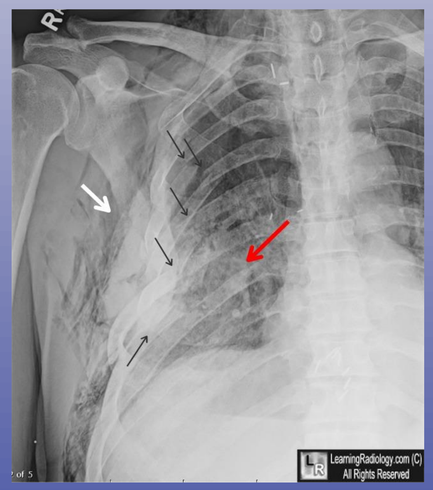

Figure 2. Radiograph shows multiple rib fractures, a pulmonary contusion, and subcutaneous emphysema.[5]

Trauma Imaging

In a trauma, there are imaging exams that must be performed right away. These exams could be a chest x-ray, pelvis x-ray, or any CT imaging that will reveal internal injuries that need to be treated immediately. There can be many reasons for a chest x-ray being performed, making it one of the most common first images a patient will have. It can diagnose a pneumothorax, divulge rib or spinal fractures, fluid in the lungs, and changes in heart size and shape which could lead to heart failure.[7] Pelvis x-rays are another common exam performed, especially if the patient undergoes a crush injury.[8] They can reveal fractures in the pelvis and superior part of the femur. Injuries to this area could possibly affect the lower extremity vasculature. CT imaging in a trauma is very revealing to any injuries a patient may have. It can show small and large fractures, organs, and some of the vasculature in an organ. It can also show signs of hemorrhage which would need to be treated right away. A radiologic technologist's role during a trauma is extremely important. They must be able to work under stressful conditions, and work quickly so that the doctors can continue to treat the patient.

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