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Review Article

MANAGEMENT OF STAB WOUNDS

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Abstract:

Introduction: A stab wound is defined as a traumatic wound that is penetrating, which can be caused by a sharp object, such as blade, knife or broken glass. A stab as such can cause localized tissue damage along wound track, piercing patient's skin and develop entry to the body. In comparison, blunt trauma is caused by energy transfer through body tissues, which results in injury, for example, falls from heights, studded deceleration in a motor vehicle causing internal chest and abdominal injury

Aim of work: In this review, we will discuss presentation and management of stab wounds in the emergency department.

Methodology: We conducted this review using a comprehensive search of MEDLINE, PubMed, and EMBASE, January 1985, through February 2017. The following search terms were used: stab wounds, penetrating injury, airway and spine penetrating trauma, management of penetrating trauma in the emergency department

Conclusions: Patients who Sustained stab injury are difficult to assess and manage, because their wounds can be life threatening and the patient can deteriorate swiftly. Patients who present with penetrating trauma should be treated with care to ensure that they are examined fully and that any other injuries are not overlooked. To ensure that the patient receives the best possible care, a structured ABCDE approach to assessment must be adopted by all members of trauma team

Key words: penetrating wounds, stab wounds, emergency, trauma

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INTRODUCTION:

Using knives during combats or attacking are fairly common. To ensure successful outcome, patients that present to the emergency room (ER) with stab wounds require urgent assessment and stabilization, with prompt operative management, when necessary. As patients with stab wounds progress through their hospital stay, they might have different needs. A stab wound is defined as a traumatic wound that is penetrating, which can be caused by a sharp object, such as blade, knife or broken glass. A stab as such can cause localized tissue damage along wound track, piercing patient's skin and develop entry to the body. In comparison, blunt trauma is caused by energy transfer through body tissues, which results in injury, for example, falls from heights, sudden deceleration in a motor vehicle causing internal chest and abdominal injury [1].

METHODOLOGY:

• Data Sources and Search terms

We conducted this review using a comprehensive search of MEDLINE, PubMed, and EMBASE, January 1985, through February 2017. The following search terms were used: stab wounds, penetrating injury, airway and spine penetrating trauma, management of penetrating trauma in the emergency department

• Data Extraction

Two reviewers have independently reviewed the studies, abstracted data, and disagreements were resolved by consensus. Studies were evaluated for quality and a review protocol was followed throughout.

The study was approved by the ethical board of King Abdulaziz University Hospital

Trauma care

Greaves and Porter [2] stressed on the importance of considering the type of weapon used, and specifically the length of the weapon, to receive a better understanding of the main penetrating trauma as well as other different causes of injuries. A good example is a tool such as a screwdriver, where it can hide a significant damage to internal body tissue due to the small entry wound it causes. A good evidence describing the weapon used can be provided by the police or the ambulance service, who often accompany patients to the ER. Where possible, handling of any weapons should be left to the police, and nurses should be familiar with forensic issues about handling the evidence. Physicians should

carefully examine single stab wounds to exclude any other injuries. Back, buttocks, axilla, groin and perineum are well known sites for missed wounds. Patients presented with other trauma or conditions must be considered for examination of stab wounds. Presenting patients with severe head injuries can also have small axillary stab wound that could be missed while the actual injury is treated, this is one common example of presentation. Additionally, unconscious patients should be considered to have stab wounds. A great number of injuries caused by stabbings are the outcomes of criminal violence [3]. Nurses should consider their safety against violence acts, and not only patient's safety. In some cases, some perpetrator can try to attack the victim yet again, in the hospital setting. It is recommended to ensure that hospital security staff and/or the police are available in such instances. It is important in some circumstances to treat patients in an area where access can be controlled easily.

Assessment of penetrating trauma

A multidisciplinary trauma team must be present to manage patients with trauma injuries. At least three doctors, three nurses and a radiographer should be included in a trauma team. Preparation, and adequate time to assemble for patients before their arrival, should be given adequately to the trauma team. When patients are being brought with an ambulance to the hospital, the staff from the ambulance and paramedics, should inform the hospital of the approximate time of their arrival and the condition of the patient. However, in some instances, patients can be self-presented to the ER, this will not be possible and early resuscitation may need to be started as the trauma team prepare to assemble. To be able to identify and treat any life-threatening conditions promptly and properly, primary survey should be undertaken immediately once patient arrive at the hospital and involve a structured approach [4]. ABCDE approach to care is included in the systemic assessment.

Airway with cervical spine control

Two important considerations are the assessment of the patient's airway and potential damage to the cervical spine. **Driscoll and Skinner [4]** advise when there is evidence of injuries above the clavicle, or a dangerous mechanism of injury that a semi-rigid collar and secured head blocks should be used. To assess responsiveness and possible airway obstruction, any of the medical staff closest to a patient's head should attempt to talk to him/her. Signs of airway being clear, and brain being adequately perfused with oxygen, is the patient's

ability to respond coherently to simple questions.

Airway should be checked promptly, if patient fails to respond. When a case is suspected with cervical spine injury, minimizing neck movement is recommended and a jaw-thrust maneuver should be used to open the mouth to enable examination of the airway. What is required from the maneuver is the movement of patient's tongue forward at this point, fluid suction should be maintained gently as required, and any solid objects or foreign body should be removed. When injury to the cervical spine is suspected, the patient's head should not be tilted to any of the sides while suctioning takes place as injury can occur [4].

In patient who are maintaining their own gag reflex, the use of a nasopharyngeal airway can be helpful however, require help to maintain their airway. The recommendation use of endotracheal tube is advised for patients who cannot control their own airway and have no gag reflex. One known risk factor for vomiting is the use of excessive ventilation with a bag-valve mask. In some cases, due to the nature of patient's injuries or their airway anatomy, it can prove impossible to pass an endotracheal tube successfully. In order to establish a surgical airway, it might be necessary for nurses to prepare for an emergency needle cricothyroidotomy (a cannula placed into the larynx) to establish a temporary airway. Nursing staff are not required to perform these highly invasive procedures, yet must often help anesthetic staff, and information of how the procedure is carried out and what equipment is needed can be helpful [5].

Breathing and ventilation

High flow oxygen applied through a mask with an attachment of a reservoir bag is necessary in all trauma patients [6]. Breathing of patient must be checked. In order to be able to see patient's chest movement, some cloths might be needed to be removed. Tracheal shift from the midline, use of accessory muscles of respiration, rate and depth of breathing are included in observation. To provide an indication of hemoglobin saturation and oxygen, pulse oximetry in breathing assessment can be used. One important complication which can arise if not recognized and treated quickly is injuries to the thorax. These injuries include [7]:

☒ Obstruction of the airway.

☒ Tension pneumothorax – where air accumulates in the pleural space under pressure. A one-way valve is generated letting air enter the pleural space and

preventing air from leaving naturally.

☒ Open pneumothorax – communication between the outside air and pneumothorax via a hole in the chest wall.

☒ Hemothorax – existence of blood in the pleural space.

☒ Flail chest – a condition where a segment of the chest moves independently with an existence of multiple fractures in adjacent ribs.

☒ Cardiac tamponade – fluid accumulation in the layer that covers the heart (pericardium).

Any wound which is caused by penetration of the thorax will lead to hemothorax or pneumothorax. To be able to identify the existence of either, an early assessment process should ensue by the physician through auscultating the patient's chest. Treatment of pneumothorax or hemothorax should include, chest drain to allow air and fluid to be drained from the chest, however, IV catheter should be preceding this process to allow replacement of blood when needed in order to detect few of these complications, early use of x-ray in thoracic stab wounds can prove useful [4].

Circulation and hemorrhage control

One of the highest mortalities in the emergency departments, are patients with hemorrhagic shock that resulted from traumatic injury [8]. One necessary process when patients arrive to the ER, is rapid assessment of circulation status. This include monitoring blood pressure and pulse through an electronic monitoring device. Due to the fact that electronic monitoring is automated and can be unreliable, staff should not stop manual observations on patients, specifically in the case of hypotensive or combative patients. It is essential to continue to assess patient's blood pressure and pulse throughout resuscitation as it will provide important information in regard to the success or failure of interventions and patient deterioration. When IV fluids or blood are needed to be administered, access must be obtained at this stage. Ideally, two wide-bore (14-16G) intravenous cannulae must be given in the patient's arms, and blood should be taken for blood group and cross-matching in the laboratory. In some cases, obtaining IV access can be hard, due to the fact of experiencing shock or excessive blood loss from the wound. More experienced colleague should be sought when unable staff is unable to site an IV catheter adequately. To ensure adequate blood and fluid replacement, there are number of different options available when the normal IV route is unobtainable.

If peripheral route is inaccessible, central venous route should be done. **Dawes M [9]** recommends that an experienced physician should perform the procedure. When peripheral route is difficult, it might be worth considering the intraosseous route, where access is gained directly into the patient's bone.

Abdominal stab wounds

Soon after arrival in the emergency department, patient's abdomen must be assessed specifically if there is evidence of any injury. Often, large quantity of blood can gather inside the abdomen after injury, usually not detectable and may have significant effect on patient's ability to maintain end-organ perfusion. Any stab wound to the abdominal area can become life threatening, due to the large surface area of the abdomen and large number of organs within. Once the surface skin of the abdomen is penetrated there is but little resistance, that is due to absence of protective bone structure surrounding the abdomen unlike the thoracic cavity. Serious tissue injury underneath the surface of the abdomen can be hidden, despite the surface appearance. During exploration in theatre, one third of patients who have serious tissue damage display minimal pre-operative physical signs. Senior surgical doctor must be available early on assessment when young patients present, due to the fact they are able to compensate well for fluid loss and commonly only display sudden deterioration [10].

Conservative management or taking patient to the theatre for a laparotomy are two main open options a surgeon has after looking at a patient with an abdominal stab wound. local anesthesia can be used during exploration by the surgeon in the emergency room. Approximately 25% of patients are discharged as estimated after a short period of observation using this method. Other patients who exhibit hemodynamical instability or present with signs of peritonitis must not have their wounds explored and should be taken for immediate laparotomy [11]. Ultrasound scan can be used in few patients, however, in the majority of emergency rooms this will be a portable Focused Assessment with Sonography for Trauma (FAST) scan. Although FAST scan does not rule out the presence of blood in the abdominal cavity and has poor sensitivity, it is non-invasive and can be repeated as often as needed. Abdominal CT scan can also be taken. However, it is only possible if the CVS is stable enough for him/her to be taken to the radiology department [12]. Completion of any necessary pre-theatre check lists and informing the next of kin are necessary preparations that must be done by nurses who are taking the patient to the theatre. It is important to note

down that delaying transfer of patients to the theatre for emergency operation should not happen under any circumstances.

CONCLUSION:

Patients who Sustained stab injury are difficult to assess and manage, because their wounds can be life threatening and the patient can deteriorate swiftly. Patients who present with penetrating trauma should be treated with care to ensure that they are examined fully and that any other injuries are not overlooked. To ensure that the patient receives the best possible care, a structured ABCDE approach to assessment must be adopted by all members of trauma team.

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