"I've stabbed myself!"

DALHOUSIE UNIVERSITY Inspiring Minds

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Robert's Case

A 64-year-old male arrives by ambulance after stabbing himself in the abdomen with a large butcher's knife, which is still in place (Figure 1). He arrives at the ED alert, somewhat anxious, expressing regret over his actions, but otherwise stable.

Physical exam

- BP: 130/70 mmHg
- Pulse: 84 bpm
- Respiratory rate: 20 breaths/min
- Temperature: 37°C

Figure 1. Stab wound.

Questions & Answers

1. What are the initial steps in his management?

When patients present with a knife (or any large penetrating object) still in the wound, the object may be tamponading a vascular injury, thus maintaining the stability of the patient. It is important, therefore, to move the object as little as possible. If not already stabilized, this should be done quickly using rolled towels applied to each side of the object, secured by tape.

As with any trauma, the primary survey "ABCDE" (airway, breathing, circulation, disability/neurological status, exposure/environmental control) needs to be the first priority and any abnormalities noted in this survey are treated immediately. This initial survey and treatment is completed as the history is being elicited. As the primary survey is being performed, other providers are ideally assisting by providing high flow oxygen, obtaining and securing two large bore IVs and connecting the patient to monitors for cardiac, pulse oximetry and BP. Useful history in any stab wound includes number of stabs, type and size of weapon, position of victim relative to direction of attack, time of injury and estimated blood loss at the scene.

After the primary survey, a secondary survey should be undertaken to ensure there are no other injuries present, as a knife in the abdomen can easily distract us from other injury.

Figure 2. Lateral abdominal x-ray.

2. What injuries should we suspect?

Anterior abdominal stab wounds penetrate the peritoneum in 70% of cases and inflict visceral injury in half of these. Most commonly injured in stab wounds are the liver (40%), small bowel (30%), diaphragm (20%) and colon (15%). It is important to realize that a combination of site of injury and trajectory of injury means that the chest and pelvis may also be involved. Stab wounds to the chest, especially above the clavicles or over the precordium are especially concerning and immediate surgical consultation should be considered.

3. What investigations are indicated?

Plain film radiographs may be used in patients who are hemodynamically stable in the ED. Chest x-ray in upper abdominal injury is useful to exclude associated hemothorax or pneumothorax and may document the presence of intraperitoneal air. Abdominal x-ray (Figure 2) may help to determine the track of the injury as well as identifying retroperitoneal air. Plain radiographs will also allow identification of foreign bodies such as weapon fragments. Ultrasound (Focused Assessment with Sonography for Trauma) may be used to assess pericardial and intraperitoneal spaces. CT may miss hollow viscus injuries, so is generally more appropriate in blunt than penetrating trauma.

Remember that patients who are hemodymanically unstable require immediate intervention and imaging in the ED is not the priority. Resuscitation and stabilization (which may include immediate surgery) preclude imaging studies.

4. Where should he go from here?

The clinical criteria for determining the need for laparotomy are:

- Hemodynamic compromise
- Peritoneal signs
- Evisceration
- Diaphragmatic injury
- GI hemorrhage
- Implements *in situ*
- Intraperitoneal air

In stable patients presenting with wounds where the weapon not *in situ*, time can be taken to determine whether the peritoneal cavity has been violated. Local wound exploration is generally appropriate in anterior abdominal stab wounds, however keep in mind that this may be difficult in patients who are obese or very heavily muscled, thus decreasing reliability and increasing risks. Ideally this should be performed by the surgeon who will be deciding whether to do a laparotomy or not, however, in cases where peritoneal violation seems clinically unlikely, transfer may be avoided by careful exploration followed (in "negative" cases) by an appropriate period of observation. Using local anaesthetic containing epinephrine, the wound can be extended as necessary, with each tissue layer carefully visualized. Blind probing of any kind should be avoided. If the peritoneum has been violated, or if it is uncertain whether it has or not, then further diagnostics may be employed in consultation with a surgeon. These may include serial physical exams, ultrasound, CT, diagnostic peritoneal lavage, or laparoscopy. Remember that the feared complications of penetrating trauma include intestinal perforation and spillage with resultant bacterial contamination. Peritoneal signs may not develop until some time after the injury. The incidence of intra-abdominal sepsis can be decreased by giving prophylactic antibiotics as soon as such injury is suspected, with coverage of both anaerobes and coliforms. If investigation and observation reveal there is no intra-peritoneal injury, appropriate wound care can be carried out and, if there are no other issues, the patient can be discharged.

In this case, with the knife remaining in place, the patient was taken to the OR for controlled removal of the knife, laparotomy and repair as required. Surprisingly, the surgeon found no injury to bowel, blood vessels, or other abdominal organs. Dx

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