

Abdominal stab wound with damage to the abdominal aorta and the left lobe of the liver - case report

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ABSTRACT

A case of a 26-year-old man with an abdominal stab wound damaging the abdominal aorta and the left lobe of the liver is presented here. The patient was diagnosed and operated on after an emergency admission. The patient was discharged from the Surgical Ward 10 days after surgery in good general condition and was referred to the out-patient clinic.

Key words: abdominal stab wounds, liver, abdominal aorta

INTRODUCTION

Two types of abdominal injuries can be distinguished: blunt and penetrating trauma. The largest number of stab and gunshot wounds to the abdomen are found in the USA, South Africa and South America. Until the end of the 20th century, most hospital admissions for abdominal trauma in Great Britain, Australia, New Zealand and the European Union, were related to blunt injuries. However, in the last decade a significant increase in abdominal stab wounds has been observed in the aforementioned countries.

The highest mortality rate among patients who survive extensive injury to the abdomen and are transported to hospital is found in two treatment stages. The first mortality peak, occurring in the Emergency Room (ER) and Operating Room, is caused by significant damage to the vascular system or due to multiorgan trauma of the abdomen. (1) The second peak consists of patients who survive the first phase of resuscitation and are susceptible to a number of life-threatening complications, such as SIRS. (1) Complications related to blood loss and massive transfusion are one of the most significant causes of death. This is a

significant factor for tissue function disorders in the course of post-traumatic stress.

CASE REPORT

A 26-year-old patient was admitted as a medical emergency to the Department of General Surgery on account of his abdominal stab wound. On admission, the patient was unconscious with a blood pressure of 90/60 mmHg, heartbeat of 120 beats per minute (BPM) and saturation of 55.1%. Complete blood count was ordered along with arterial blood gases, sodium, potassium, creatinine, coagulation factors, and a computed tomography (CT) scan.

A lower haematocrit, i.e. 27% (40-51%) and haemoglobin 8.5 g/dL (14-18 g/dL), along with a lower red blood cell count of 2.72 M/ μ L (4.2-5.4 M/ μ L), were found. Arterial blood gases revealed significant acidosis with a pH of 7.108 (7.35 - 7.45), together with PaO₂ of 42 mmHg (75 - 100 mmHg) and PaCO₂ of 51 mmHg (32 - 45 mmHg), HCO₃⁻ of 15.3 mmol/L (21 - 27 mmol/L) and ctCO₂ of 15.7 mmol/L (22 - 28 mmol/L). The concentration of lactic acid in the blood amounted to 6.2 mmol/L (0.5-1.5 mmol/L), with BE of 13.2 mEq/L (-2.3 - 2.3 mEq/L).

Multiphase and normal contrast-enhanced CT was performed. The scan revealed damage to the anterior wall of the abdominal aorta, around 3.2 cm above the origin of the celiac trunk. The wound canal was located in the lobe of the liver. Inside the lobe, a haematoma was discovered together with extensive parenchymal injury (Figure 1). The patient qualified for emergency surgery.

The operation was performed in the first hour after admission. The abdominal cavity was opened with a lengthwise incision widening the entry point of the stab wound.

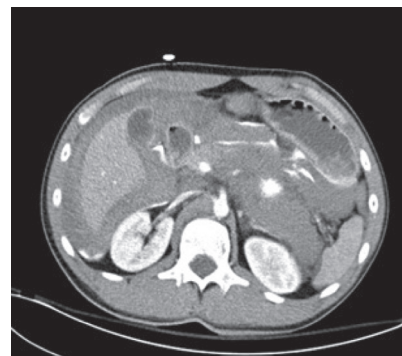


Figure 1. Selected image from computed tomography of abdomen

The peritoneal cavity was filled with fresh blood. The blood was drained and the abdominal organs were examined. The stab wound, piercing the left lobe of the liver, was revealed, along with a massive retroperitoneal haematoma. After evacuation of the haematoma, a 3-cm linear lesion was found in the anterior wall of the abdominal aorta, above the celiac trunk, with massive bleeding. The point of bleeding from the aorta was pressed and stitched with continuous vascular stitches, which stopped the bleeding. The liver was stitched using a flat, hepatic, absorbable suture (Parenchyma). Due to massive blood loss at the end of the operation, bleeding from the tissue surface, characteristic of coagulation factor deficiency, was seen in spite of blood plasma transfusion. Two drains were fixed, the right one below the liver and the left one in the recto-uterine pouch. The abdominal wall was stitched with two-layer stitches. Due to the seriousness of the condition, the patient was transferred to the Intensive Care Unit for further observation. Augmentin and Metronidazole were administered intravenously for prophylaxis. Dur-

ing the course of hospitalization, 18 units of packed blood cells and 12 units of blood plasma were transfused. The patient's condition stabilized as a result of treatment in the Intensive Care Unit. After 10 days, the patient was discharged from the Department of General Surgery and referred for ambulatory treatment.

DISCUSSION

Around 5% of cases of abdominal stab and blunt trauma include injuries to the liver (2). This is related to perioperative mortality, rate ranging from 67% to 80% in grade V liver trauma injuries. (3) The liver injury in our described case was classified as grade III, according to the liver trauma injury grading, which significantly increased the patient's survival chance. Damage to the aorta due to a stab wound or blunt abdominal trauma, is responsible for only 5 % of all aorta injuries, (4-6) which is related to the retroperitoneal location of the aorta. In 98% of cases, the injury involves

the sub-renal part of the aorta. (4) Therefore, the described case of injury to the ad-renal abdominal aorta is a rare finding in abdominal trauma surgery.

There are many surgical methods to stop bleeding from the liver. If damage involves only the hepatic parenchyma, coagulation, ligation of smaller vessels and perihepatic packing are the only methods to prevent bleeding in the long run. When larger vessels such as the portal vein, common hepatic artery or proper hepatic artery are damaged, application of endovascular techniques should be considered (e.g. stent implantation). The injury of the abdominal aorta can be managed with an open operation or endovascular technique using a stent graft. The treatment choice depends on the patient's general condition and available facilities.

In this case, the decision to perform open surgery was based on CT scans and the risk of damage to other abdominal tissues, invisible on imaging. Based on the CT scan, it was not possible to evaluate damage to the hepatic parenchyma of the left lobe

and its vessels, which resulted in massive bleeding from the abdominal aorta and blood vessels of the liver. Endovascular treatment of the abdominal aorta was also relatively unsafe due to the location of the lesion below the celiac trunk.

CONCLUSION

Every case of abdominal stab wound injury, admitted to hospital as an emergency, should be evaluated individually by doctors specialized in various fields. Guidelines regarding diagnostics and radical surgery depend on the wound size, location, and depth of the wound, along with the patient's general condition.

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