



Case report

Rupture of the abdominal aorta artery due to self-inflicted injuries in a young man

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ABSTRACT

Introduction and importance: Intentional drug poisoning is the most common method of suicide in the population. Self-inflicted injuries are usually limited to parts of the body that are easily accessible with one's hand, such as the neck, thorax, or upper extremities. Penetrating aortic trauma has a high mortality rate, and open surgery is frequently required.

Case presentation: We report a 19-year-old man who stabbed himself in the anterior abdomen with a kitchen knife after ingesting numerous benzodiazepine tablets, resulting in a rupture of intra-abdominal viscera, including the abdominal aorta artery.

Clinical discussion: Aortic penetrating injuries have a high mortality rate. The retroperitoneal position of the abdominal aorta and the minor size of the rupture were associated with the formation of very large clots, which were essential in controlling bleeding and hemodynamic abnormalities.

Conclusion: In any patient with drug poisoning following committing suicide, in case of acute abdominal symptoms and hemodynamic disturbance, after controlling the level of consciousness, respiratory, and hemodynamic correction of the patient, immediate consultation with the surgical service should be considered.

1. Introduction

Every year, a large number of adolescents and young adults between the ages of 14 and 28 commit suicide in various ways. Penetrating aortic trauma has a high mortality rate, and open surgery is frequently required; therefore, endovascular management of severe lesions is growing in popularity [1]. Traumatic aortic penetration injuries may be associated with pseudoaneurysms, particularly in cases involving the abdominal aorta, and may necessitate open surgery or preventive exclusion via endovascular stenting, which has been done infrequently [1,2].

Despite homicides, self-stabbing is an uncommon method of suicide. Intentional drug poisoning is the most common method of suicide in the population. Self-inflicted injuries are usually limited to parts of the body

that are easily accessible with one's hand, such as the neck, thorax, or upper extremities, with the lower extremities being attempted very rarely [3,4]. The majority of patients have a psychological history, with bipolar disorder or depressive syndrome being the most frequent [5]. While suicidal behaviors and self-harming can also occur in patients with borderline personality disorder (BPD), up to 10% of BPD patients die following suicide [6].

Suicide risk is believed to be 50 times higher among individuals who self-inflict than in the general population, and 15% of people who die by suicide come to a hospital in the year leading up to their death after self-infliction [7]. Suicide prevention strategies in many countries are based on lowering the risk of suicide among those who have a history of self-harm [8]. Intentional drug overdose is the most common method of self-harm among patients who arrive at hospitals and is the most likely to be

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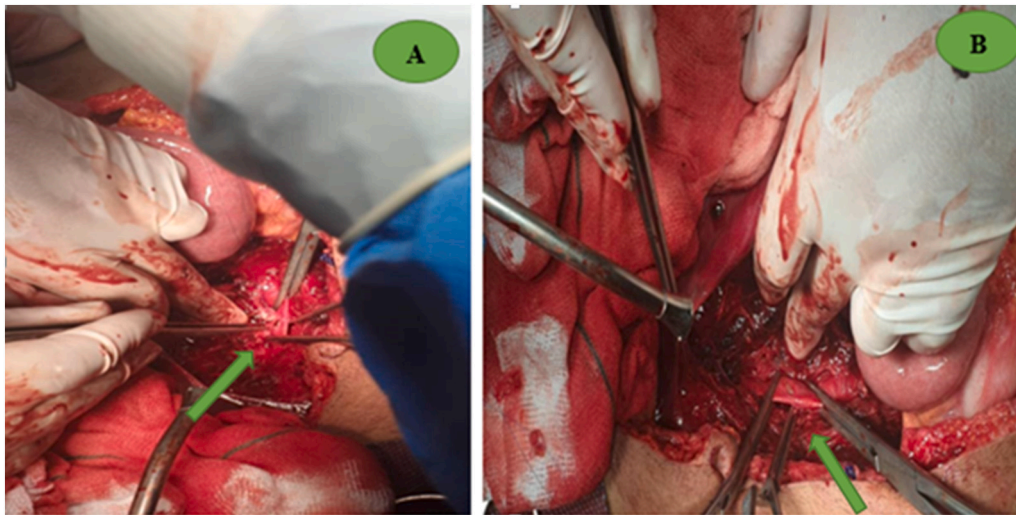


Fig. 1. A, B: Rupture of the abdominal aortic artery following self-inflicted with a knife and its repair.

referred for a psychological assessment [9].

Evidence shows that infrequent, high-lethality methods of self-injury, such as hanging, are associated with a greater risk of suicide [10,11]. Individuals with suicidal ideation can damage themselves in a variety of ways other than drug poisoning, such as stabbing and cutting, weapons and explosives, falling from a height, drowning, burning, suffocation, e.g., plastic bags, hanging and strangulation, electrocution, road and railway injuries [12].

However, severe or lethal intra-abdominal injuries can occur without producing a sign on the skin. This can happen if clothes cover the body or if you impact a large surface with blunt trauma. The liver, mesentery, or duodenum, for example, might burst without presenting any visible signs in the case of child abuse. Extensive bleeding into the peritoneal cavity is frequently due to a solid viscus rupture or mesentery hemorrhage [13]. Herein, we describe a young man with a history of addiction and suicide who attempts to self-inflict by stabbing himself in the abdomen with a kitchen knife after a conflict with his parents.

2. Case presentation

On November 21, 2021, a 19-year-old man presented to an emergency department (ED) in northern Iran with a medical history of drug addiction and suicide attempts with various drugs. Following a disagreement with his parents, he attempted to self-injure on the anterior surface of his abdomen with a sharp object (kitchen knife) following the ingestion of several clonazepam tablets. His parents brought him to the ED of a general hospital.

The patient was lethargic and restless when he arrived in the ED and rejected to cooperate. On examination, he was conscious and breathing normally, with a respiratory rate (RR) of 22 breaths/min, a blood pressure (BP) of 100/60 mmHg, and a heart rate (HR) of 100 beats/min. He had tenderness and guardedness in the palpation of the abdomen. Also, no other specific action was required in the case of a drug poisoning except for the monitoring of the patient's hemodynamics, breathing, and level of consciousness.

Due to the presence of abdominal pain and the possibility of perforation of the intra-abdominal viscera, active charcoal was not administered. After removing the patient's clothing, there was a 1.5 cm incision with an undetermined depth, about 6 cm below the xiphoid process in the middle line of the abdomen. No abnormal findings were found in other organs. A focused assessment utilizing sonography in trauma (FAST) was performed as part of the trauma workup, and it revealed moderate free fluid in the abdominal cavity.

An emergency surgical consultation was required after exploring the

wound and identifying the ruptured peritoneum. The patient was quickly prepared for a laparotomy and transferred to the operating room, where an emergency exploratory laparotomy was performed and 400 mL of blood was suctioned from the abdominal cavity. There was a laceration in the first segment of the duodenum (D1), which was repaired with the Kocher maneuver in three layers.

Then, the retroperitoneal space was explored using Cattell-Braasch maneuver, and a large clot in the anterior abdominal aorta artery (AAA) was revealed there. After removing the blood clots by suction and washing with 2L of normal saline, there was a rupture of 4 mm × 5 mm in the abdominal aorta around the lower mesenteric artery branch. The initial repair was done separately by the vascular surgeon with 5/0 prolene suture (Fig. 1A and B). The liver, spleen, pancreas, kidneys, and stomach were also checked, but no ruptures were detected. Muscles, fascia and skin were sutured. After recovering, the patient was transferred to the Intensive Care Unit (ICU).

Due to bleeding and reduction of hemoglobin to 8.4 g/dL, 3 units of fresh frozen plasma (FFP) and 4 units of packed red blood cells (PCs) were injected. Tetabulin and toxoid were also prescribed, as well as the antibiotics ceftriaxone 1 g twice daily (BID) and metronidazole 500 mg three times daily (TDS). After one week of tolerating the fluid diet, the patient was transferred to the surgical ward. Finally, the patient was discharged 10 days later in good general condition from the hospital, with no problems at the six-week follow-up. The patient was treated by a psychiatrist with a diagnosis of borderline personality disorder. Unfortunately, due to the patient not cooperating to continue the psychiatric treatment process, discharged the hospital with the consent. Written informed consent was obtained from the patient's parents for publication of this report. This study was conducted according to the Declaration of Helsinki Principles. Also, CARE guidelines and methodology were followed in this study. The work has been reported in line with the SCARE 2020 criteria [14]. The study is registered with the research registry, and the UIN is research registry 7662 <https://www.researchregistry.com/register-now#home/registrationdetails/6210a394edfc8c001e85a4c8/>.

3. Discussion

Aortic penetrating injuries have a high mortality rate [1]. In our case, the retroperitoneal position of the abdominal aorta and the small size of the rupture were associated with the formation of large clots, which helped control the patient's bleeding and hemodynamic abnormalities. Self-inflicted injuries for the purpose of making a gain are rarely fatal, unless they are accompanied by a complication [15].

Sommer et al. has reviewed the biomechanics of impact injury of the aorta. The aorta is the most fragile vessel, and it is most typically injured in deceleration trauma from both road and air accidents, as well as falls from a height, with total or partial rupture of the aorta in the descending region of its arch as a common result [16]. According to Benjamin et al., parallel intimal tears, almost always 1.5 cm distal to the ligamentum arteriosum's, often known as "ladder-rung tears," occur in deceleration trauma and can cause pseudo aneurysms. Penetrating injuries, such as stab wounds, particularly on the right side of the sternum, can often involve the main arteries (aortic arch) [17].

This case report describes a young man with suicidal ideas who was inflicted with a knife in his abdominal aorta. Our patient suffers from depression and psychiatric disorders, and he abuses a variety of substances and stimulants, which has predisposed him to commit suicide and self-injury in the past. He was stabbed in the abdomen with a kitchen knife after ingesting a large number of benzodiazepine tablets and losing his psychological stability.

Although suicide has not been associated with aortic injury, homicide and trauma are the leading causes of aortic damage [18]. According to Carroll et al., those admitted to hospitals with self-inflicted injuries to areas other than their arms and wrists (e.g., the neck or chest) had a higher risk of suicide than those hospitalized with self-poisoning [19]. A comprehensive psychosocial examination is recommended for self-injury patients in a number of clinical guidelines [20]. Those who present with self-inflicting are 56% less likely to be assessed than those who present with self-poisoning [21].

Ghazaleh et al. described a young man with a history of schizophrenia who stabbed himself 1.5 cm in the middle of his abdomen, resulting in an abdominal aortic pseudoaneurysm with no visceral injury that was successfully treated with an endovascular stent [22].

4. Conclusion

In any patient with drug poisoning following committing suicide, in case of acute abdominal symptoms and hemodynamic disturbance, after controlling the level of consciousness, respiratory, and hemodynamic correction of the patient, immediate consultation with the surgical service should be considered. Active charcoal should also be avoided if there are acute abdominal symptoms.

Declaration of competing interest

The authors confirm that this article content has no conflict of interest.

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Ethics approval

The study was approved by our local ethics committee.

Informed consent

Written informed consent was obtained from the patient's parents for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

MD and RR involved in interpretation and collecting of data, ZZ and AMT was writing and editing of the manuscript. Z.Z and MS involved in editing and preparing the final version of manuscript. All authors reviewed the paper and approved the final version of the manuscript.

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The data are available with the correspondence author and can be achieved on request.

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