

Hybrid treatment of penetrating aortic trauma

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The retained weapon injury is rare and requires complex treatment [1]. In hemodynamically stable patients with deep wounds, detailed visualization modalities should be used to apply the optimal surgical techniques [1]. Here, we describe the case of a man with a retained knife injury in the posterior thorax in which multiple surgical techniques were used to achieve the best outcome for the patient.

A hemodynamically stable 24-year-old man with no medical history was brought to the emergency department

with a retained knife injury in the left paraspinal region at the level of the sixth thoracic vertebra. The patient was sedated. Computed tomography angiography of the thorax and abdomen was performed, which showed a damaged arch, spinous process of the sixth thoracic vertebra, and a knife point in the aortic wall (Figure 1). The patient was deemed eligible for urgent surgery. The surgery was performed in three steps. First, an endovascular aortic graft was performed. The patient was stabilized in a left pos-

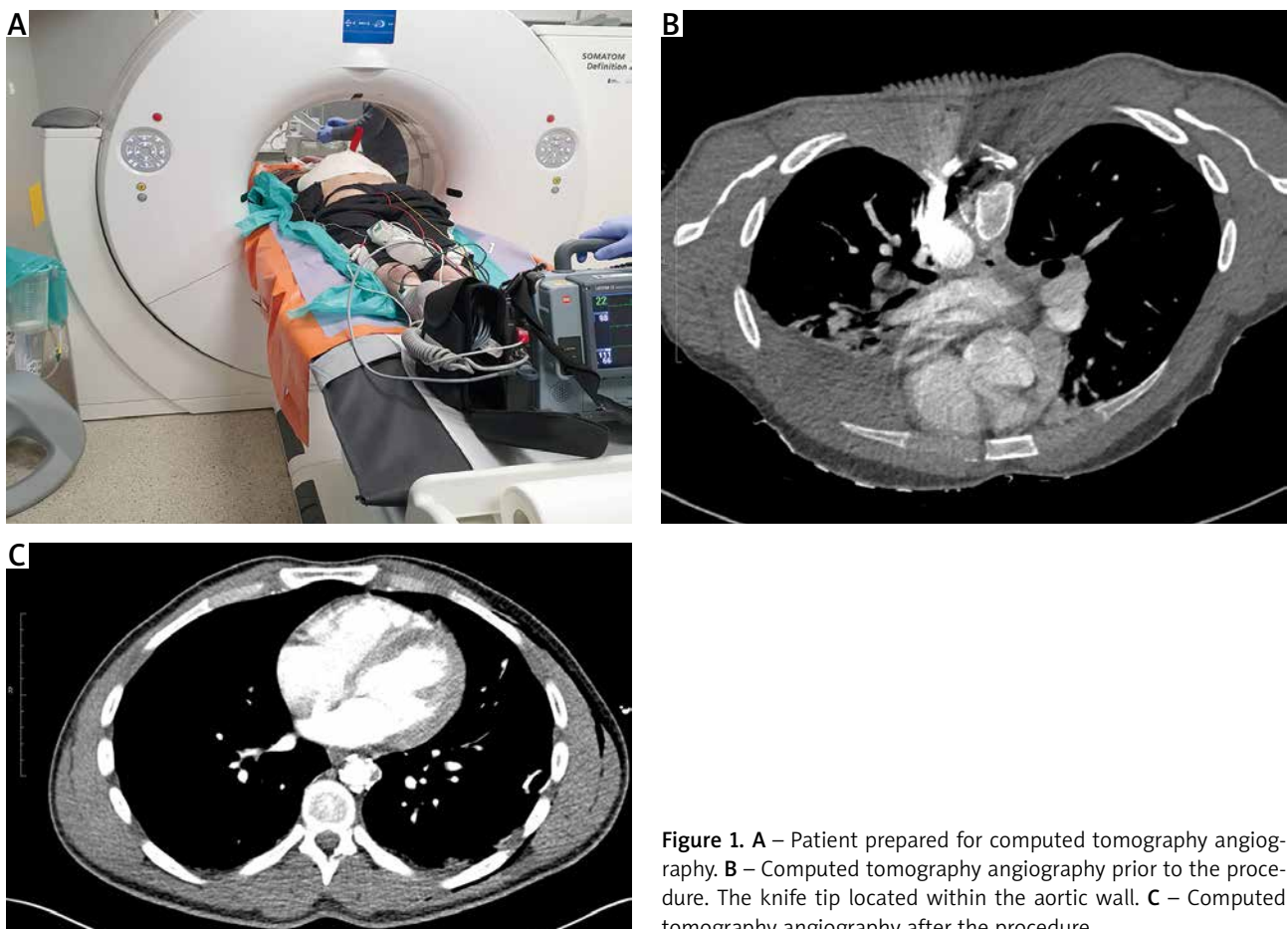


Figure 1. A – Patient prepared for computed tomography angiography. B – Computed tomography angiography prior to the procedure. The knife tip located within the aortic wall. C – Computed tomography angiography after the procedure

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Figure 2. Patient stabilized in a left posterolateral position to prevent knife contact with the angiograph and operating table

terolateral position to prevent knife contact with the angiograph and operating table (Figure 2). Five thousand units of heparin were administered, and a catheter was inserted into the right femoral artery. Angiography confirmed damage to the aortic wall. The stent graft Relay 32/155/32 (Vascutek Ltd., Renfrewshire, United Kingdom) was implanted in the 3rd landing zone of the aorta [2], with no leakage or complications observed. In the second stage, the knife was removed and the thoracic wound was closed. Finally, the patient was positioned on the right side and videothoracoscopy of the left pleural cavity was performed. Six hundred milliliters of fresh blood and clots were aspirated, and no active bleeding or air leaks were seen. A drain was placed in the left pleural cavity. Postoperative computed tomography angiography the next day revealed little fluid and air in the left pleural cavity. The patient was discharged home in good general condition. At 1-month, 6-month, and 1-year follow-up, the patient reported no complications. No abnormalities were noted at the follow-up computed tomography angiography at 6 months. The patient's informed consent for publication of this paper was obtained.

Retained knife injuries are rare. The most common site for retained weapon injuries is the thorax in 25% to 40% of cases [1, 3]. There are insufficient data to predict all-cause mortality, although single fatalities have been described [1, 3]. However, removal of the weapon outside the operating room significantly increases patient mortality [4].

Complications of retained weapon injuries are strongly associated with wound location and depth. In the case described, penetrating aortic trauma did not cause massive bleeding because the retained knife closed the resulting laceration. In traumatic rupture of the thoracic aorta, an endovascular approach has previously been reported to be associated with lower mortality compared with open surgery [5]. Because the knife remained in the wound lumen, the standard surgical technique was modified to safely implant the graft. Injuries to the paraspinal region can be associated with severe neurologic complications due to potential damage to the spinal cord [1]. However, in the case described, asymptomatic epidural edema was observed and resolved without neurosurgical intervention.

Proper preoperative planning, including imaging, resulted in successful treatment of the patient without the need for open chest surgery. Proper use of multiple surgical techniques requires great operative experience, but allows step-by-step patient management while avoiding potential fatal complications by intraoperative surgical prevention.

Disclosure

The authors report no conflict of interest.

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