
Unexpected aortic tear: Nightmare for the anesthesiologist

Dear Editor,

Conventional open esophagectomy is a complex surgery requiring meticulous monitoring due to complications like hypotension, arrhythmias, cardiac compression, and vascular injury. Incidence of intrathoracic vascular injury is around 1%, and aortic injury is infrequent. It is a life-threatening catastrophe, and the outcome entirely depends on timely control of bleeding and intraoperative resuscitation. The bleeding is usually very severe and rapid causes a substantial blood loss by the time adequate control is achieved. Significant mortality is associated with such events.^[1] We would like to present one such case of this catastrophic event, aortic tear during intrathoracic mobilization of the esophagus.

A 53-year-old man with moderately differentiated squamous cell carcinoma esophagus (middle and lower esophagus) was posted for minimally invasive esophagectomy. The patient had received three cycles of neoadjuvant

chemotherapy (carboplatin and paclitaxel) along with high-dose radiotherapy. He had a history of pulmonary tuberculosis. CT thorax showed a fibrocalcific lesion with loss of lung volume in the right upper lobe with a shift of trachea and esophagus to the right side. No other co-morbidity was present. After attaching all standard monitors in the operating room (OR), the patient was induced using the standard anesthesia technique, and all invasive lines were secured.

The surgical approach was converted from a minimally invasive thoracoscopic procedure to a conventional open esophagectomy due to multiple adhesions. The entire esophagus was mobilized except for a portion in the mid-esophagus. The surgeon's attempt to dissect the residual part of the esophagus and remove the lymph node with the help of a finger leads to a sudden, drastic fall in blood pressure. Surgeons were notified immediately, then on evaluation, the aortic tear was detected on the aortic wall.

Cardiothoracic surgeons (CTVS) were called immediately. By that time, packing was done along with compression as a desperate measure to control bleed by achieving temporary tamponade. Fluids were pushed via wide bore cannula, and noradrenaline was started at a higher dose via a central line with the addition of adrenaline and vasopressin infusion later on to maintain blood pressure. Arterial blood gas analysis (ABG) showed very high lactates and severe metabolic acidosis along with a sudden drop in hemoglobin. Massive transfusion protocol was activated. A 16-G cannula was secured in the antecubital vein, and IV fluids were infused via rapid infuser. Total 7PRBC, 7 RDP, 9FFP were transfused intraoperatively. Injection sodium bicarbonate boluses, followed by infusion was started. Injection tranexamic acid, calcium gluconate, and hydrocortisone was given to maintain cellular homeostasis during this stressful situation. CTVS surgeons did leave thoracotomy immediately to identify the source of the bleed. The exploration showed a rent in the proximal descending aorta at two sites and was repaired. The blood pressure (BP) gradually improved, and the dose of vasopressors was also reduced. The patient had one episode of ventricular fibrillation, which reverted to sinus rhythm on defibrillation. Esophagectomy was abandoned, and feeding jejunostomy was done. The adrenaline and vasopressin infusion was gradually tapered off, and the patient was shifted intubated to the intensive care unit on vasopressor (noradrenaline 0.2 mcg/kg/min) with a heart rate 89, BP- 121/52.

Aortic injury is one of the dread complications during any surgery. Though rare, it can occur during intrathoracic mobilization of the esophagus using a conventional or minimally invasive approach.^[2] Trans Hiatal esophagectomy in patients who have received neoadjuvant chemotherapy/radiotherapy is challenging. This may be due to radiation-induced fibrosis (which develops mainly if there is a time lag between administration and surgery), which also predisposes to injury to the adjacent structures. The high dose radiation and chemotherapy make the vessel wall fragile, and minor manipulation near it can lead to catastrophic bleeds, which happened in our case, where the lymph node adherent to the aortic vessel wall avulsed it on dissection.^[3]

The intraoperative aortic injury should be managed immediately with rapidly infusing intravenous fluids, vasopressors, blood products, and timely repair by an experienced CTVS surgeon. This emphasizes the need to arrange adequate cross-matched blood products before any significant surgery, especially if the dissection area is near major vessels. The patients with carcinoma esophagus are usually dysphagic, leading to decreased intake and nutritional

anemia, further reducing the intraoperative maximal allowable blood loss and, therefore, the need for more blood product transfusion. Aortic injury and sudden hemodynamic collapse can lead to a panicky environment, but teamwork and frequent drills of these critical events can smoothen out the management and avoid chaos.

Rapid volume infusers play an essential role in managing severe bleeding, allowing the immediate replacement of volume at a rate of approximately 500 to 700 ml/minute. They should be attached to a wide bore cannula, preferably 14 G or 16 G.^[4] The blood bank should be notified, massive blood transfusion should be activated immediately. The arterial blood gas analysis shows metabolic acidosis and should be promptly treated with sodium bicarbonate infusion or boluses. Injection calcium gluconate should be administered to avoid hypocalcemia in massive blood transfusion. The availability of point of care monitor, thromboelastographic (TEG), can guide further goal-directed blood transfusion. Anti-fibrinolytic drug tranexamic acid should be given as soon as possible, 1 g iv over 10 minutes.^[5] Immediate medical management of sudden intraoperative massive bleed, along with timely surgical exploration and repair of the vessel wall, is the key to manage such unexpected events.

Aortic injury is a catastrophe that causes massive hemorrhage to sudden death if not identified immediately and managed quickly, and team dynamics play an essential role in executing the same. The possibility of this critical event should be kept in mind for patients receiving chemotherapy and high dose radiotherapy with surgery in proximity to the major vessel. Frequent anesthesia drills of important events can help tackle the situation effortlessly.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the legal guardian has given his consent for images and other clinical information to be reported in the journal. The guardian understands that names and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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