Anesthetic management of a rare presentation of pediatric blunt chest trauma

Dear Editor,

Blunt chest trauma can have varied presentations in pediatric patients. Diagnosis of tracheo-esophageal injury can be delayed as symptoms and signs are often masked by or ascribed to more common blunt thoracic injuries.

A 12 kg, 2-year-old girl presented with a history of accidental fall from a height of about 1.8 m. Patient presented to our tertiary hospital after 2 days, with fever, abdominal distension, tachypnea, pallor and leucocytosis. Computerized Tomography of abdomen showed contusion in segment VII of liver with moderate ascites, while that of Thorax showed lung contusion with right hemopneumothorax [Figures 1 and 2]. An intercostal drain (ICD) was placed on the right side, which drained 150 ml hemorrhagic fluid with air.

Patient was stable on conservative management but, on day 12, she started desaturating and required ventilatory support. There was a suspicion of saliva draining into the ICD on day 14. A dye study showed dye in the stomach with no obvious leak and relatively normal chest [Figure 3]. However, on clinical suspicion of esophageal tear, patient was posted for diagnostic thoracoscopy on the same day.

Left thoracostomy showed a large esophageal tear and
gross mediastinitis. A posterolateral thoracotomy was performed, which revealed a 3 cm × 2 cm tear involving both the anterior and posterior walls of esophagus, along with air leak from a corresponding 1 cm × 0.5 cm tracheal tear, in the posterior wall of trachea. During the surgical exploration of the tear site, patient’s lungs could not be ventilated, the end tidal carbon-dioxide trace disappeared and the SpO$_2$ dropped to 50%. Lungs could be ventilated intermittently by plugging the rent with gauze pieces. The tracheal tear was repaired and cervical end-esophagostomy and gastrostomy were done.

Patient was electively ventilated post-operatively, but gastrostomy feeds started appearing in the ICD on 8th day. Patient was again re-explored to ligate the lower end of esophagus. Post-operatively, patient was electively ventilated and subsequently tracheostomized. She was gradually weaned off ventilatory support and tracheostomy tube. Patient continues to be on full gastrostomy feeds and sham feeds and is awaiting esophageal replacement.

Combined tracheo-esophageal injury due to blunt trauma of the chest is rare and potentially life threatening. The first case reported was in 1936. To date, 70 cases have been reported in adults and two in children. Patient with tracheo-esophageal injury can present with symptoms like dyspnea, dysphagia, hoarseness of voice, odynophagia, hemoptysis or hematemesis. Associated signs are subcutaneous air, crepitations felt over the neck or chest, pneumothorax or pneumomediastinum and rib fractures.

Symptoms and signs can be delayed and can present from 10 days to 2 months after the history of trauma. Patient can present at a later date, in the phase of mediastinitis with fever, dyspnea, air leak and desaturation as in our case.

We proceeded with the case suspecting an esophageal tear and peripheral airway injury. Intra-operatively on trying to remove the slough, patient could not be ventilated. There was disappearance of end-tidal carbon dioxide with desaturation during thoracotomy, which could have been addressed either using jet ventilation, or plugging of the defect, or maybe creating a bypass to such a defect. The essence of airway management in these cases is to bypass the lesion by means of endobronchial intubation with a single-lumen or double-lumen endotracheal tube or endobronchial blockers. We could not do that as the patient was in lateral decubitus, was desaturating and the tear had friable edges and there was lung contusion. Jet ventilation was considered but was not immediately available.

Although rare, delayed signs like persistent air leak, worsening oxygenation and signs of mediastinitis should raise suspicion of combined tracheo-esophageal injury in pediatric patients with blunt chest trauma. Team-work and good communication with surgeons, physicians is necessary for successful outcome of such patients who need multiple surgeries and have a prolonged stay in the intensive-care unit.

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