Subcutaneous emphysema after endotracheal intubation: A case report

Sir,

Tracheal rupture which is a very grave and life-threatening condition usually occurs after trauma to the neck and chest.[1] On the other hand, tracheal injury following endotracheal intubation during surgery is a very rare condition with an approximate incidence of. 005%.[2] We report a case of a 57-year-old female presenting with surgical emphysema due to suspected tracheal injury after spinal surgery in prone position. A 57-year-old female (height 150 cm; 50 kg) presenting with radicular leg pain was posted for lumber discectomy under general endotracheal anesthesia. She was American Society of Anesthesiologists I physical status having a normal airway according to the existing standards. After induction of anesthesia with propofol and rocuronium, orotracheal intubation was performed without any difficulty (Cormack 1, 1st attempt) using a single lumen internal diameter 7.0 mm cuffed reinforced tracheal tube (Mallinckrodt Medical, Athlone, Ireland) over a bougie by an experienced anesthesiologist. Anesthesia was maintained with sevoflurane in N_2O/O_2 (FiO_2 = 0.5). Spine surgery proceeded without a specific event in the prone position. At the end of the surgery, the endotracheal tube (ETT) was removed when the patient responded to verbal commands and showed sufficient spontaneous respiration. Blood was not tinged on the extubated ETT. The duration from intubation to extubation was 75 min. She was shifted to ward with an Aldrete score of 10. Eight hours after she was shifted to general ward it was observed that she was having gradual swelling of the face, neck, and upper chest with mild respiratory distress. On palpation, crepitus was elicited over the swollen areas, and hence, a diagnosis of surgical emphysema was made. After shifting to Intensive Treatment Unit, she underwent computed tomography (CT) thorax which showed the presence of surgical emphysema, air in the superior mediastinum around the trachea without any evidence of pneumothrax [Figure 1]. Chest CT did not reveal any obvious signs of injury to the trachea [Figure 2]. She was otherwise stable and was administered oxygen only. Fortunately, her symptoms were mild enough to recover by close observation with conservative treatment over the next few days. There are multiple factors that contribute to this type of injury, which may be divided into mechanical factors that include trauma during intubation, overinflation of the cuff and vigorous coughing, etc., and anatomical factors.[3] The two most common reasons are overinflation of the cuff and sudden movement of the tube as direct tear caused by the tube itself is rare.[4] Our suspicion that the cause of tracheal injury is overinflation of the cuff is because of the following reasons. Since endotracheal intubation was not at all difficult in our case, we can safely rule out an injury of the trachea by the bougie or the ETT itself. Overinflation of an ETT cuff may be prevented by the use of a manometer to directly measure inflation pressure. Nitrous oxide was used in our case. Nitrous oxide leads to increased volume, and accidental overinflation can result from its diffusion in the cuff. Cuff pressures can be increased up to 90%, even during relatively short procedures.[5] Risk of tracheal injury increased more when overinflated cuff moved in the trachea. Our patient had spine surgery in prone position, such that abrupt head and neck movement could not be ruled out because of two positional changes from intubation to extubation. Subcutaneous emphysema being the commonest feature of this condition is also protective as its presence consequently accelerates the procedures for its definitive diagnosis and the initiation of the appropriate treatment. In our case, subcutaneous emphysema was detected after approximately 8 h. The patient improved after conservative treatment without surgical procedure. Fiberoptic bronchoscopy is believed to be the best subsequent method to confirm diagnosis and to determine the exact location and extent of the lesion. In our case, as CT thorax was negative for showing

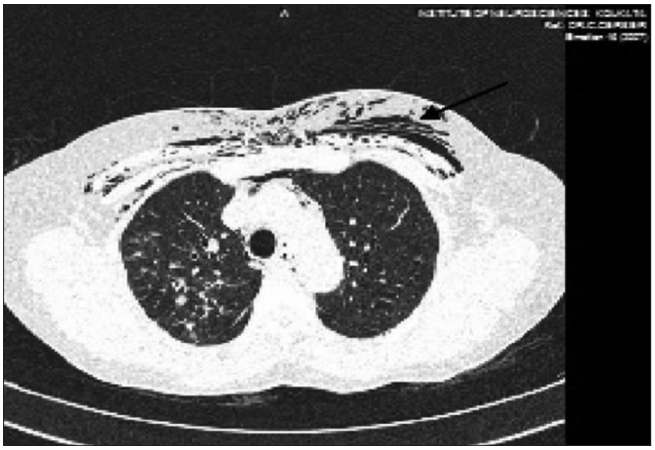

Figure 1: CT Thorax showing subcutaneous emphysema

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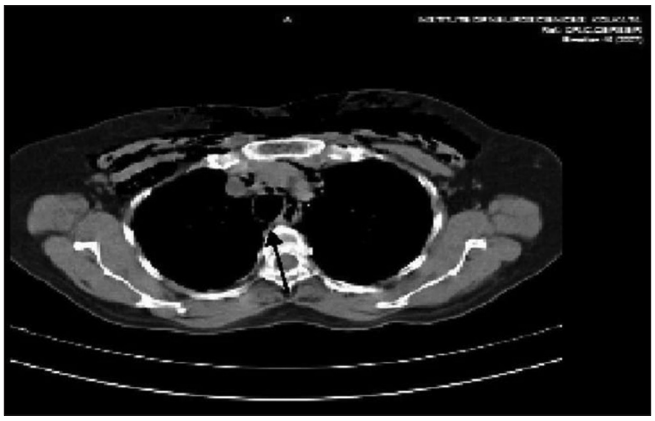

Figure 2: CT Thorax showing Intact Trachea

tracheal injury bronchoscopy could have clinched the diagnosis. However, as the lady improved with conservative treatment the relatives did not give consent for the same. Henceforth, she was discharged after complete recovery and the event was noted in her discharge certificate. In summary, we presume that the tracheal injury of our case was caused by overinflation of cuff and sudden movement of the tube by positional change. Therefore, to prevent overinflation, subtle management of cuff pressure by a manometer and minimized movement of the tube at positional change are necessary.

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Conflicts of interest
There are no conflicts of interest.

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