Anesthetic management of a patient with post-thyroidectomy tracheal fistula for repair

Dear Editor,

Total thyroidectomy is widely performed for benign and malignant thyroid lesions with about a 5% incidence of procedure-related complications.[1] Common complications are vocal cord paralysis, hypoparathyroidism, hypocalcemia, hematoma, and rare complication of tracheal injury with an incidence of 0.006%.[2] In most tracheal injury cases, the initial lesion is iatrogenic due to the use of electrocautery and is identified intraoperatively and repaired.[3] If it occurs postoperatively, the patient can present with symptoms ranging from subcutaneous emphysema to pneumomediastinum.[4] Key management includes establishing a ventilation strategy without expanding the subcutaneous emphysema which can lead to airway obstruction.

A 42-year-old lady with inadvertent tracheal injury following electro-cautery use developed tracheal necrosis and subsequently tracheal fistula, 2 weeks after total thyroidectomy. She presented with swelling in the neck which increased in size during speech and on expiration. On examination, swelling increased in size during forced expiration without extension to either the chest or face and palpation revealed crepitus. The patient was hemodynamically stable and the airway examination was unremarkable. Neck radiograph showed subcutaneous emphysema and ruled out pneumothorax and pneumomediastinum. Bronchoscopy showed a fistula anteriorly in the trachea at the second to third-level ring. Under local anesthesia, the site was exposed, and a match stick head-sized fistula [Figure 1] was identified and occluded with external compression. The patient was preoxygenated, induced, and ventilated using minimal tidal volume ensuring no air leak through the fistula. After giving relaxant, nasotracheal intubation was done using a C-Mac video laryngoscope, and the endotracheal tube cuff was positioned distal to the fistula. Primary closure of the fistula was done. The patient was stable throughout the procedure. Postoperatively the patient was shifted to the postoperative ICU with an endotracheal tube *in situ* and extubated after 48 h.

The true incidence of tracheal injury is grossly underreported. Risk factors include female gender, prolonged intubation with high-pressure cuff, extensive use of diathermy, and infection.[5] Trachea may be perforated at the time of initial surgery and may undergo necrosis due to devascularization following thermal injury in the early postoperative period. Fiberoptic bronchoscopy is diagnostic. At the earliest sign, neck exploration is required. Operation theatre should be prepared for fiberoptic scope, video laryngoscope, and for emergency tracheostomy. In the current case, fistula developed later possibly due to gradual necrosis of the tracheal wall, and air leak from the fistula into the surrounding tissue was limited by a pseudo-capsule of scar tissue around the defect. Re-exploration with primary closure of the tracheal opening was preferred as the injury was towards an anterolateral aspect of the trachea making tracheostomy through the defect difficult and could cause subglottic stenosis in the future. Standard anesthetic management includes awake tracheal intubation, avoidance of muscle relaxants, and positive pressure ventilation until fistula is controlled. Fiberoptic intubation was not used as extent of necrotic tissue was unknown and inadvertent widening of fistula by endotracheal tube tip was a concern. The cornerstone in management of tracheal fistula is gaining airway control and ensuring ventilation. Management should be individualized to the patient and skilled anesthesiologist should be employed for airway management with preparedness for front of neck access.

Figure 1: The tracheal fistula

Declaration of patient consent

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

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