



# Surgical and Anaesthetic Challenges Faced During Successful Management of a Complex Tracheal Injury Using Montgomery T Tube in a Zonal Hospital

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Received: 21 February 2022 / Accepted: 25 April 2022  
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Although the treatment of routine penetrating wounds of the neck is well established, few guidelines are available to direct the management of tracheoesophageal injuries [1]. The Montgomery T-tube was first invented in 1962 by William Montgomery (Fig. 1), a physician at Harvard Medical School and the Department of Otorhinolaryngology of Massachusetts General Hospital. The T-tube was first applied to prevent tracheal stenosis after tracheal surgery [2]. We present a case of penetrating injury to neck which was managed successfully at a zonal hospital.

A 43-year-old male known case of hypothyroidism, diabetes mellitus type 2, and COVID 19 recovered presented with alleged history of penetrating injury to the left side of the neck. On examination, Pulse: 140/min, BP: 70/40

mmHg, Spo<sub>2</sub>: 50–60% room air, Glasgow comma scale (GCS) E2V2M2 with cold and clammy peripheries. Local examination of neck revealed 7 × 2 cm diffusely bleeding lacerated elliptical wound over the left side of the neck extending from cricoid to medial border of the left clavicle. Emergency exploration of the neck was done under general anaesthesia in operating room. Intraoperatively, there was L-shaped tear extending from the first to the fifth tracheal ring. There was loss of complete left anterolateral wall of trachea with intact cricoid cartilage and large haematoma with active bleeding posterior to tracheal injury with partial tear of isthmus of thyroid present (Fig. 2a). Underwent haemostasis, conversion to orotracheal endotracheal tube (ETT), primary repair of tracheal injury in two layers with 3-0 prolene sutures, buttressing of tracheal anastomosis with pre-tracheal fascia and closure of wound over 14 F suction drain. The patient had a stormy post-operative period with ongoing sepsis, hypoalbuminemia, uncontrolled diabetes mellitus type 2, Syndrome of inappropriate anti diuretic hormone secretion (SIADH) and partial Diabetes Insipidus (DI) likely secondary to hypoxic brain injury. The patient developed anastomotic dehiscence of tracheal wound along with partial necrosis of strap muscles on POD 09. In view of the anastomotic dehiscence and more than 2 weeks of mechanical ventilation, it was decided to bridge the anastomosis using Montgomery silicon T tube (Fig. 1). Underwent wound exploration on POD 13, take down of sloughed

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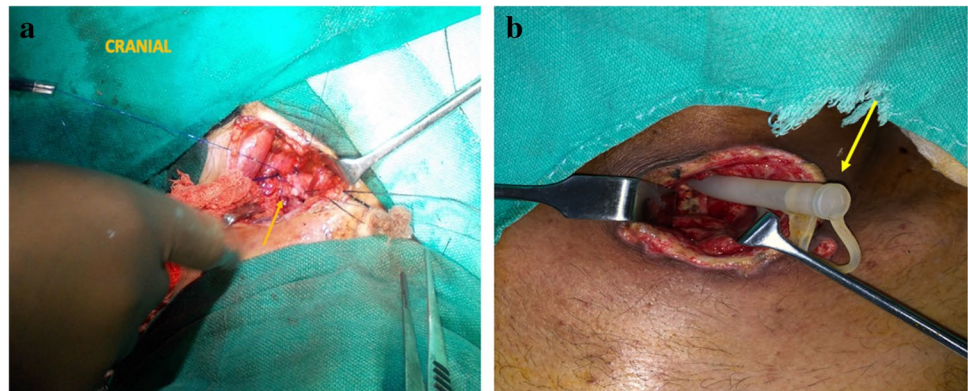
**Fig. 1** Standard Montgomery T tube

and dehiscent tracheal cartilages followed by insertion of 14 F Montgomery T tube with Fibreoptic bronchoscopy

(FOB) guidance with proximal end below glottis and distal end beyond apex of anastomosis and placement of 6.5 F ETT through T tube with reinforcement of T tube with 3-0 prolene interrupted sutures (Fig. 2b). Subsequently, the patient was kept on supportive treatment. Presently, tracheal stent is in situ with patient improving clinically and planned for tracheal stent removal at a later date at higher tertiary care centre.

For a successful repair, emphasis should be on clinical rather than endoscopic recognition of injury, minimal peritracheal dissection, repair with absorbable sutures, limited use of protective tracheostomies and use of muscle buttresses to cover tracheal repairs, especially in patients with combined injuries [3]. Montgomery T tube was initially used to prevent tracheal stenosis [4]. Unlike standard ET and TT, the t-tube does not have standard connectors. The anaesthetic management of a patient with t-tube in situ is complicated by sharing of surgical field with the airway [5]. There have been few case reports in literature for the anaesthetic management for insertion of t-tube [6] and for operative procedures in patients with T tube in situ [7]. This case shows successful use of T tube in acute tracheal injury which is rare and can be implemented for the same in the future.

**Fig. 2** Intraoperative image showing primary closure of tracheal defect using prolene 3-0 interrupted sutures followed by buttressing with pre-tracheal fascia (yellow arrow) (a). Delayed bridging of tracheal defect with Montgomery T tube stent (b)



**Data Availability** NA.

**Code Availability** NA

## Declarations

**Ethics Approval and Consent to Participate** Informed consent was obtained prior to performing the procedure, including permission for publication of all photographs and images included herein.

**Conflict of Interest** The authors declare no competing interests.

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