RESEARCH PAPER | Medical Science | Volume : 5 | Issue : 11 | November 2015 | ISSN - 2249-555X

Airway Management in Patient For Montogomery T-Tube Insertion

KEYWORDS: T-tube insertion, airway management, LMA as airway rescue

Sanjay Johar	* Kiranpreet Kaur	Mamta Bhardwaj
Associate Professor, Department of Anaesthesiology and Critical Care, Pt. B.D. SHARMA PGIMS, ROHTAK -124001, HARYANA, INDIA	Assistant Professor, Department of Anaesthesiology and Critical Care, Pt. B.D. SHARMA PGIMS, ROHTAK -124001, HARYANA, INDIA. * Corresponding Author	Assistant Professor, Department of Anaesthesiology and Critical Care, Pt. B.D. SHARMA PGIMS, ROHTAK -124001, HARYANA, INDIA

ABSTRACT *Numerous T-tube insertion techniques have been used with good success to overcome all these problems. We successfully managed the patient of subglottic stenosis using laryngeal mask airway. Thirty years old female who was tracheosmised for subglottic stenosis following accidental ingestion of poisonous liquid reported for Montgomery T tube insertion. A size 3 LMA was inserted, cuff inflated with air and it's open end was blocked by the plastic cap of vial to prevent the leakage and dilution of anaesthetic gases.*

The Montgomery T tube is a device which serves the purpose of tracheal stent and tracheostomy tube to prevent post-operative tracheal stenosis. It was introduced in 1964. This device is an uncuffed silicone T tube. The t-tube has a vertical long limb called intraluminal or intratracheal limb that is inserted into the trachea and a horizontal extraluminal end which protrudes through the tracheostomy stoma. The proximal and distal end of the intraluminal limb is tapered to prevent mucosal abrasions. It is available in sizes ranging from 4.5 to 16 mm external diameter. [1,2, 3]

The management of patients with t-tube poses difficulty in controlled ventilation as t-tubes do not possess any standard connectors to fit with anesthesia breathing circuits and the proximal upper open end causes loss of inspired gases. Anaesthetists may experience problems like air dilution, hypoventilation and patient awareness during anaesthesia for T tube insertion.[1,3] [3]Numerous techniques have been used with good success to overcome all these problems related to ventilation through T-tube insertion. We herein describe the case of successful management of the patient for anaesthetic management for insertion of t-tube using laryngeal mask airway to overcome the problem of hypoventilation and air dilution successfully managed the patient of subglottic stenosis using laryngeal mask airway.

Thirty years old female weighing 60 kg was tracheosmised for subglottic stenosis following accidental ingestion of poisonous liquid was posted for Montgomery T tube insertion. Direct laryngoscopic finding showed stenosis below the vocal cord up to 1.5 cm caudally in the upper airway. Vocal cords were mobile and chink was adequate. Diagnosis was confirmed by CT scan.

On the patient's arrival in the operating room an intravenous line was maintained with 18 gauze cannula. All the monitoring devices were placed, including continuous electrocardiography, O_2 saturation of arterial blood and non-invasive blood pressure cuff. Baseline arterial pressure, heart rate, respiratory rate and room air O_2 saturation were 110/60 mm Hg, 98 beats/min, 18/min and 97%, respectively. Intravenous glycopyrrolate was administered. Patient was induced with injection propofol 120 mg, injection fentanyl (100 microgram) and injection Atracurium was used as muscle relaxant. Anaesthesia was maintained subsequently with N_2O-oxygen-sevoflurane and incremental doses of injection atracurium. Intermittent positive pressure was commenced by connecting the anaesthesia circuit to tracheostomy tube. A size 3 LMA was simultaneously inserted, cuff inflated with air and it's open end was blocked by the plastic cap of vial (fig 1) to prevent the leakage and dilution of anaesthetic gases.

After an anterior collar incision, stenosed segment of trachea was exposed and granulation tissue around the tracheostomy stoma was shaved off to remove the tracheostomy tube and finally space was generated for placement of Montogomery T-tube. The perpendicular limb of the T tube was connected using a no. 7 universal adaptor. Ventilation was continued via the perpendicular limb till wound closure & return of spontaneous respiration.

The difficulty that is encountered with T-tube is in maintaining controlled ventilation as the two limbs of the T tube are open. The loss of air flow and inhalant anesthetics through the open upper intraluminal limb of the T-tube after its insertion has been an important problem.[4, 5] Positive pressure ventilation & delivery of anaesthetic gases after placement of the T tube is impossible unless the upper limb or the perpendicular limb is occluded. Further, unlike standard tracheostomy tubes, the Montgomery T-tube has the disadvantage of not taking standard catheter mount connectors. [6, 7]Therefore the anaesthetist must devise ways of delivering volatile agents and carrier gases for maintenance of general anaesthesia during such critical periods.[6] To circumvent this, a short laryngeal portion or extratracheal segment must be occluded for ventilation. [7]

An LMA can be used as a pathway of ventilation by occluding the extratracheal lumen of T-tube with the spigot [6] or employed as a means of upper airway occlusion while ventilation continues via the extratracheal portion.[7] Uchiyama and Yoshino occluded the top end of the LMA, continued ventilation via the extratracheal portion of the T tube.[8] With use of this technique we can ventilate the patient through LMA whenever required by occluding

Volume : 5 | Issue : 11 | November 2015 | ISSN - 2249-555X

the other end of T-tube. [6,8] We also used LMA which was occluded at the top with the help of cap of vial, for preventing the leakage and ventilation was done successfully through extratracheal limb by connecting it with 7mm tube connector.

Various methods have been documented in literature for effective ventilation and prevention of leakage. Leakage can also be prevented by tightly packing the pharynx with ribbon gauze. This formed a supra glottis air tight seal. [7] Montgomery also suggested passing a Fogarty embolectomy catheter through the extratracheal lumen up to the upper stem of the T-tube and occluding the open upper end by inflating the balloon of the catheter. The airway can be maintained by inserting the endotracheal tube through the extratracheal portion.[7] Jet ventilation can be an alternative mode of ventilation. Airway can also managed spontaneously under deep anaesthesia as managed by Gupta et al.[9] The use of Bain's breathing system, in which a Y-connector is connected at the end of the circuit, and fresh gas flow is delivered to the extratracheal part of the T-tube and the face mask can be another alternative. [7]

In conclusion, an anesthesiologist may not be familiar with anaesthetic airway control via a Montgomery T-tube. Therefore, prior to its use, the anesthesiologist must understand the structure and characteristics of the Montgomery T-tube, and must have various options available for use before initiating anesthesia.

Legends for figure:
Fig 1: showing sealed upper part of LMA

REFERENCE

1. Premalatha S, Rangarajan R, Radhika K. Airway management during Montgomery T– tube insertion– A case report. International Journal of Research in Health Sciences. Oct–Dec 2013 Volume-1, Issue-3. | 2. Saroa R, Palta S. Another method to maintain positive-pressure ventilation | through the Montgomery® T tube. South Afr J Anaesth Analg 2013;19(5):274-276. | 3. Kerai S, Gupta R, Wadhawan S, Bhadoria P. Anesthetic management of a patient with Montgomery t-tube in-situ for direct laryngoscopy. J Anaesthesiol Clin Pharmacol 2013 ;29:105-7. | 4. Choi BR, Chung JY, Yi JW, Lee BJ, Kim DO, and Kang JM. The use of the Montgomery T-tube in post-procedural subglottic stenosis repair. Korean J Anesthesiol 2009 Apr; 56(4): 446-8. | 5. Touma O, Venugopal N, Allen G and Hinds J. Emergency airway management in a patient with a Montgomery T-tube in situ .Br. J. Anaesth 2011; 107 (1): 107-108. | 6. Mohanty S, Deviprada S. Anaesthetic Management for Montogomery T-Tube insertion in a patient with tracheal stenosis. Journal of evolution of medical and dental Sciences/ Volume 2/ Issue 43/ October 28, 2013. | 7. Park JS, Kwon YS, Lee S, Yon JH, and Kim DW. Airway management using laryngeal mask airway in insertion of the Montgomery tracheal tube for subglottic stenosis -A case report- Korean J Anesthesiol. 2010 December; 59(Suppl): S33–S36. | 8. Uchiyama M, Yoshino A. Insertion of the Montgomery T-tube. | Anaesthesia 1995; 50: 476-7. | 9. Gupta P, Malhotra N. Montogomery T tube insertion in a spontaneously breathing patient. IJA 2006: 51(1) 57. |