the right arm leads to the left atrium, a peripheral venous line in this area should be removed for the same reasons.

This case report emphasizes the importance of a BGA after central venous catheterization.

**Declaration of interest**

None declared.

E. Sattinger*
S. Diedrichs
J. Brickwedel
C. Detter
H. Reichenspurner
A. E. Goetz
J. Kubitz
Hamburg, Germany

*E-mail: e.sattinger@uke.de


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**Preoperative evaluation of Montgomery tube: a stitch in time saves nine**

Editor—A Montgomery tube (MT) is a silicone tube that is used to stent the airway open after laryngeal-tracheal stenosis.\(^1\) Owing to its infrequent use, working knowledge of the present-day anaesthesiologists is extremely limited. The scarcely available literature just sums up possible methods of securing airway in these patients for intraoperative positive pressure ventilation.\(^2\)\(^3\)

However, like any other airway devices [tracheal tube (TT) or tracheostomy tube], its preoperative evaluation is critical. The lack of first-hand experience and available literature often leads to underestimation of possible complications and thus preoperative planning fails to foresee associated hazards. We present a child with an MT who underwent general anaesthesia and was subject to significant preventable morbidity as a result of undiagnosed obstruction in the upper limb of the MT.

A 4-yr-old male child developed tracheal stenosis 6 months ago for which an MT was inserted to alleviate the stridor in order to stent the subglottic tracheal narrowing. Presently, bronchoscopic assessment of the upper airway was planned under general anaesthesia. During pre-anaesthesia workup, the child/parents reported no complication related to the MT or any breathing difficulty. An i.v. line was secured on the dorsum of the hand using a eutectic mixture of local anaesthetics (EMLA) in parental presence in the preoperative area. Midazolam 0.5 mg i.v. was given and the child was transferred to the operating theatre where routine monitoring was attached. A flexometallic TT was kept at hand to replace the MT after induction of anaesthesia. To pre-oxygenate, oxygen tubing from the auxiliary oxygen source from anaesthesia machine was connected to the external limb of the MT. The skin over the anterior limb was scarred and fibrosed removing the MT and inserting a tracheostomy/flexometallic TT required surgical incision on the scar tissue. The surgeon was asked to rapidly assist in emergency removal of the MT.
by incising the scar tissue. Meanwhile, considering the circum-
stantial possibility of block of the upper end of the MT, the
anaesthesia circuit (circle system) was connected to the an-
terior limb of MT using an appropriate size TT connector. This
enabled us to ventilate the child without any leak from the
upper end of the MT. The pulse oximeter saturation picked up
(on 100% oxygen) and a visible chest rise could be appreciated
(although the chest compliance seemed poor on bag ventila-
tion). After ventilation for a few minutes, the haemodynamic
became stable and ventilation was continued from the exter-
nal limb without any detectable oral leak. An endoscopic as-

sessment of the upper airway revealed mucosal overgrowth
completely obstructing the top lumen of the MT (Fig. 1). The
MT was removed and replaced with the flexometallic TT
inserted through the orifice initially accommodating the exter-
nal limb of the MT. An intraoperative fluoroscopic chest assess-
ment to evaluate the possible cause of decreased compliance
showed bilateral lung lower zone loculated pneumothorax.

The airway was finally secured using a tracheostomy tube
and on consultation with a chest physician, a computed tom-
ography (CT)-guided chest tube/pigtail catheter insertion was
planned subsequently.

The present case illustrates that an apparently normal
functioning MT after operation could lead to a potentially life-

threatening hazard. The child had no predictors suggestive of
difficult mask ventilation and had no respiratory obstruction
after operation. The possibility of occlusion of the upper end
of the MT could only be considered when bag-mask ventilation
completely failed. Such a complication with an MT has not pre-
viously been reported. As a remedy to prevent such accidents,
we suggest that during preoperative evaluation, the anterior
limb of the MT should be occluded and ensured that the child
continues to breathe normally without developing signs of re-
spiratory distress/airway obstruction. In situations like the

present case where tissue overgrows the upper end of the
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Declaration of interest
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S. Sethi1
P. M. Singh2*
A. Borle2
Chandigarh
2New Delhi, India
*E-mail: preetrajpal@gmail.com

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Virtual laryngoscopy and combined laryngoscopic–bronchoscopic approach for safe management of obstructive upper airways lesions

Editor—The airways management of patients with large ob-
structive pharyngo-laryngeal mass can be very challenging. On
such occasions, we believe that there could be three key
factors for a safe and successful approach.

A patient presented to the Ear–Nose–Throat clinic com-
plaining of oral haemorrhages and progressive shortness of
breath. A fibroscopic exam found a non-passable lesion at pha-
ryngeal level. During the pre-anaesthetic assessment, before
the surgical biopsy, the patient refused the options of awake
fibroptic intubation or awake tracheostomy, despite being
informed of the difficult airway management.

In view of such a challenge, we organized a multidisciplinary
team (MDT) meeting deciding to perform a modified (‘sniffing
position’) CT scan, and to use it for performing a 3D reconstruc-
tion (virtual laryngoscopy, VL), to stratify the airways difficulty
and to assess the involvement of vocal cords.

The CT scan showed a lesion occupying the vast majority of
the pharynx (Fig. 1A). The VL confirmed the obstruction of the
upper airways (Fig. 1b), a severely restricted subepiglottic
region (Fig. 1c) but spared vocal cords (Fig. 1d).

The obstructive lesion was considered as hindrance to
optimal laryngoscopic view, and also as an obstacle in directing
the tracheal tube. These considerations, together with the risk of
bleeding, convinced us in proceeding directly via a fibreoptic–
bronchoscopic approach. Nonetheless, in view of a challenging
passage of the bronchoscope through the stenotic and collapsing
airways after induction of anaesthesia, we decided to perform a
combined two-operator technique, using a video-laryngoscope
to facilitate the introduction of the bronchoscope. The video-
laryngoscope was used in first instance in order to prospectively
compare the real-time images with the VL findings. The real-
time view confirmed the VL images. The video-laryngoscope
only would have not been enough to perform a safe intubation
(Cormak–Lehane grade III and posterior wall bulging; Fig. 1e–g).
The fibreoptic-bronchoscope was easily introduced under video-
laryngoscope guidance (Fig. 1r), withatraumatic passage through
the stenosis and the intact vocal cords (Fig. 1i and 1j). The manouevre
was accomplished within 80 s.

On reflection, a timely organized MDT meeting allowed a
positive interaction with the radiologist. The modified CT scan
in ‘sniffing position’ with VL imaging reconstruction was
crucial by confirming the possibility to pass the tracheal tube
through the spared vocal cords, once overrun the stenosis.
We believe that this approach is helpful and easily reproducible
in any patient with a neck lesion causing airway obstruction, in-
creasing the safety of a difficult airways management.