LETTER

Critical airway obstruction due to endotracheal tube kinking just above the vocal cords in surgical procedures with restricted access to the artificial airway

Dear Editor,

Intraoperative critical airway obstruction caused by endotracheal tube (ETT) kinking is a potentially lethal though uncommon clinical entity. Albeit, intraoperative airway compromise due to a defective tube has been previously reported[1,2], none of them involved an ETT kinking just before the entrance to the larynx in a surgical setting with restricted access to the artificial airway. We herein report three cases of critical airway obstruction caused by an unanticipated ETT kinking just above the vocal cords; one during thyroidectomy and two during elective craniotomy surgeries.

In all three cases, a gradual increase in peak inspiratory pressure (PIP) was noticed within sixty to eighty minutes after surgery commencement. Approximately one hour later PIP elevation exceeded 35 cmH_2O, with concomitant relative hypercapnia and moderate oxygen desaturation in two out of the three cases. The breathing circuit was visually inspected; no kinking, bending or another abnormality was found. In each case, manual ventilation affirmed the high airway resistance and reduced lung compliance; thus the surgical procedure was suspended, and surgical drapes were removed. Repeated failures to advance a suction catheter through ETT lumen confirmed the obstruction, roughly to its mid-length. The ETT was instantly replaced. Inspection of the removed ETT revealed a kinking just above the vocal cords, presumably caused by the accumulation of warm air/oxygen into the initially defective material of PVC-ETT, leading to gradual softening of the luminal wall at body temperature, which might have gradually changed the U-shaped bend to a sharp V-shaped kink until luminal obstruction became clinically apparent.

Thereafter, all respiratory parameters were restored, the operation was completed uneventfully, and each patient was safely extubated in the postanesthetic care unit.

The manufacturer was notified about this complication, accordingly.

It should be emphasized that all three cases took place within a 3-year time since a new type of ETT - manufactured by a company having its basis in a low-income country - was introduced into clinical practice in our department. This particular period coincided with the time when profound financial shortcuts in health care came into force, as a consequence of the economic crisis in our country.

Our reporting of these similar cases comes to highlight several important issues. Anesthesia providers should be aware of the possibility of critical airway obstruction secondary to ETT luminal kinking at the level just above the vocal cords, especially as the duration of surgery progresses. In a surgical setting with restricted access to the artificial airway, this might become even more challenging, as the rescue maneuvers can be applied with extreme difficulty under the surgical drapes and any airway manipulation engages the surgical field. Clinical awareness, vigilant monitoring, and rapid assessment are considered of utmost importance for identifying the etiologies of the airway compromise and hastening the deployment of corrective measures.

As a standard procedure for every patient undergoing planned endotracheal intubation, the artificial airway and breathing circuit must be diligently checked before use. Over and above, equipment failure could be implicated in serious adverse events, among which intraoperative ETT obstruction is considered as a life-threatening one. By all means, healthcare financial policies need to prioritize the quality of care over the pursuit of expenditures control.

Keywords: Endotracheal tube, kinking, airway obstruction

Conflicts of interest
None.

References

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