

Mechanism of stylet-facilitated nasotracheal intubation

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To the Editor,

We were interested in reading the recent article by Sugiyama *et al.* regarding the use of a styletted endotracheal tube (ETT) to reduce epistaxis during nasotracheal intubation,¹ and we have a few points to make regarding their report.

The authors clearly explained their maneuver of manipulating a styletted ETT in a caudal direction to enable passage through the lower nasal pathways along the nasal floor underneath the inferior turbinate. As described by Ahmed-Nusrath *et al.*,² this maneuver can help avoid trauma during nasotracheal intubation and ease navigability. This likely explains the lower incidence of nasal trauma and epistaxis in their patients.

The authors also described that a curved stylet was used only to flex the distal tip of the tube anteriorly, and it was removed immediately after the tip was successfully inserted into the nasal cavity. They further add that “*anterior flexion of the tube tip using a stylet [with stylet inside the tracheal tube] is associated with considerably smoother insertion through the nasopharynx and reduced bleeding from the nasal cavity. When the styletted tube tip approached the curve of the nasopharynx, we presume that it easily turned with the curve as it advanced toward the oropharynx, consequently reducing damage to the nasopharyngeal mucosa.*” We have some additional points to make regarding this description.

It is known that nasotracheal intubation can be associated with traumatic complications which are not confined to the

structures within the nose. It is not uncommon to encounter a submucosal dissection of the retropharynx or a pharyngeal laceration that can lead to severe bleeding (often misconstrued as epistaxis) and morbidity. This situation is usually indicated and preceded by unusual resistance to passage of the ETT. In such cases, it is recommended never to use excessive force when advancing the ETT. The ETT should be rotated and a further attempt then made for its smooth passage, or various maneuvers may be used for smooth advancement of the ETT.^{3,4}

In their study, the authors used a maneuver to minimize contact between the ETT and the nasopharyngeal wall, but they did not explain the move clearly. Stix and Mancini have shown very astutely that removal of a rigid stylet can help an ETT move anteriorly and negotiate beyond the subglottic shelf.⁵ In our *in vitro* observation, we have also observed that the ETT tip tends to move even more anteriorly the greater the distance and the more rapidly the stylet is withdrawn (Figure). Likely the anterior movement of the ETT tip when the ETT had traversed the nasal cavity

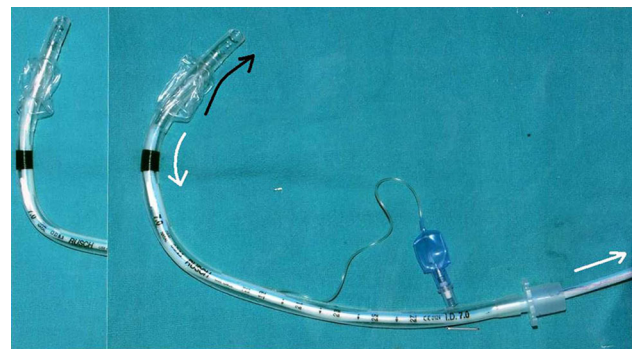


Figure As the stylet is withdrawn (indicated by the white arrows) from the endotracheal tube (TEE), the tip of the ETT demonstrates anterior movement (indicated by the black arrow)

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(and where the authors immediately removed the stylet) facilitated passage of the ETT over the nasopharyngeal mucosa while avoiding trauma and its sequelae.

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Reply

We thank Dr. Mahajan *et al.* for their interesting comments on our recent manuscript.¹ We agree that the tip of the endotracheal tube (ETT) tends to move anteriorly when the stylet is withdrawn.² In our study, the tip was guided in a caudal direction to pass through the lower pathway of the nasal cavity while the ETT was advanced through the nasal passage. When the tip, which was flexed by the stylet, easily turned with the curve of the nasopharyngeal passage, the stylet was then withdrawn. This indicates that the

flexed tip had already passed the curve of the nasopharynx and was located in the oropharynx by the time the stylet was withdrawn. Therefore, we do not consider moving the tube tip anteriorly while removing the stylet as contributing to smooth passage through the curve in the nasopharynx. In our view, anterior flexion of the tip by the stylet facilitated navigation of the curve in the nasopharynx.

In vitro, the ETT tip is able to move freely when the stylet is removed; however, *in vivo*, the tip's movement is limited by the anatomical structures of the surrounding nasal cavity. Our study did not examine whether anterior movement of the tip with removal of the stylet facilitated smooth insertion from the nasal cavity to the oral cavity. To evaluate the impact of anterior movement of the ETT tip caused by removal of the stylet, the stylet needs to be removed just before the tube tip reaches the curve of the nasopharynx.

Conflict of interest None declared.

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