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## Keyhole anesthesia in infant with subglottic stenosis: More concerns

The Editor,

We read “Keyhole anesthesia—Perioperative management of subglottic stenosis: A case report” by Zafra *et al.* with great interest.<sup>[1]</sup> We wish to highlight some further concerns regarding the case and its management.

Subglottic stenosis (SGS) is acquired in >95% cases and is attributed to a previous intubation in majority. In the present case, the SGS was more likely iatrogenic rather than congenital as claimed by the authors since the baby was preterm and had suffered difficult intubation with multiple attempts. Other risk factors like birth weight, duration of intubation and size of the endotracheal tube have not been mentioned.

Neonate with this degree of stenosis is likely to be in severe respiratory distress and in extremely poor general

condition; but surprisingly, the patient had only “noisy breathing” and no other significant abnormality has been reported. Details of flexible bronchoscopy like anesthesia technique and any other associated conditions like laryngomalacia are missing. In children, laser ablation is preferred due to its preciseness, but plasma resection was done in this case.

Managing central airway obstruction and sharing the airway with the surgeon can turn it into total airway obstruction.<sup>[2]</sup> A skilled assistance, proper supplies, and a surgeon adept with tracheostomy in a neonate should be ensured. Factors which can irritate the child, such as thirst, painful stimuli and cold environment should be minimized as crying can lead to total airway collapse due to the dynamic nature of upper airway in infants.

In the present case sevoflurane-based anesthesia was given, but in severe obstruction, induction would be unduly prolonged, and the depth of anesthesia would be poorly controlled with an open airway.<sup>[2,3]</sup> Bronchoscopic procedures require deep planes of anesthesia and the required volatile agent concentrations may precipitate severe cardiorespiratory depression. Airway topicalization using 1–2% lidocaine is an essential component of airway surgery and sedation with dexmedetomidine would have facilitated smoother induction and both would reduce the inhalational anesthetic requirements.<sup>[2]</sup> Total intravenous anesthesia (TIVA) with spontaneous respiration is being preferred for “tubeless” airway surgery.<sup>[2,3]</sup> Glycopyrrolate would be helpful to counter vagally mediated bradycardia or bronchospasm. Muscle relaxant was used in this case, but with this degree of obstruction the ability to ventilate cannot be guaranteed following use of relaxant.<sup>[3]</sup>

Neonates have a poor tolerance for apnea and even with the use of Transnasal Humidified Rapid-Insufflation Ventilatory Exchange (THRIVE) (high flows), the apnea time in infants was prolonged from 109 to 192s in a study.<sup>[4]</sup> High flows would additionally provide positive pressure and splint open the airway. The effectiveness of 3 L/min flows used in the report in prolonging the apnea times with almost 99% luminal narrowing is questionable and carbon dioxide levels could have dangerously risen.<sup>[1]</sup> It is surprising that this neonate tolerated almost 5 min procedure without the need for intermittent ventilation. Even for routine apneic oxygenation, higher flows from 5 to 15 l/min have been recommended in children.<sup>[5]</sup>

Last, edema and secretions are common following airway surgeries and can lead to significantly increase resistance. Apart from dexamethasone (100 µg/kg given in the index report while recommendation is 250–500 µg/kg with a second dose 12 h later), use of topical 1:10,000 epinephrine intraoperatively, humidified oxygen, and nebulized epinephrine should be administered postoperatively to all patients.

In conclusion, airway topicalization, sedation using dexmedetomidine, use of THRIVE, and TIVA with preserved spontaneous respiration would have been an attractive alternative to inhalational-muscle relaxant-apnea technique in the present case.

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#### Conflicts of interest

There are no conflicts of interest.

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