Horseshoe head holder for optimal airway access in infants with macrocephaly

Sir,

Hydrocephalus in children before the closure of anterior/posterior fontanellae can result in macrocephaly. Ventriculo-peritoneal (VP) shunt surgery under general anaesthesia is frequently indicated in paediatric hydrocephalus.[1] Hydrocephalus with macrocephaly causes undue neck flexion in a supine child, compromising the access to airway and ease of endotracheal intubation.[2] Undue neck flexion compounds the airway access difficulty in the already anatomically different paediatric airway with large tongue, omega-shaped epiglottis, cephalic-located larynx, angled vocal cords and a narrow sub-glottis.[3,4] We describe here the approach we follow for optimal positioning for ease of airway access in paediatric macrocephaly.

Achieving the classic sniffing position is a standard of practice in anaesthesia, for endotracheal intubation. This position aims at obtaining a near horizontal glabella-chin (GC) plane, external auditory meatus-suprasternal notch (EO-SN) plane and an open anterior neck space.[5,6] This manoeuvre aligns the laryngeal, pharyngeal and tracheal axis in-line and improves the intubating condition. In children with macrocephaly, the GC plane and EO-SN plane are grossly misaligned with limited anterior neck space. Placing shoulder rolls and/or elevating the infant with trunk rolls or a ramp of sheets are the commonly practised techniques in infants with macrocephaly to circumvent the collapse of airway in neutral position.[2] However this technique is not without limitations such that this entails the infant’s head unstable unless a tailored head-ring support is also used. Placement of such head-ring supports can further increase neck flexion which may require further manipulations of the truncal support rolls to compensate this.

We use the adult size Mayfield® cranial stabilisation horse-shoe head holder[7] (Integra Neurosciences, New Jersey-08540) at our institution for optimal airway positioning in macrocephalic infants undergoing VP shunt for hydrocephalus [Figure 1a].

A horizontal GC plane, EO-SN plane and open anterior neck space is achieved prior to endotracheal intubation with vertical and lateral adjustments of the horse-shoe head holder [Figure 1b]. The adjustable pad base of the head holder well accommodates the infant’s macrocephalic head. After successful endotracheal intubation, VP shunt procedure can be contemplated with the horse-shoe head-holder in-situ, with added axial traction if required. Warm water-baths for truncal surface warming can be easily used with this technique. Our technique does not warrant multiple attempts at infant positioning as required if using the truncal/shoulder rolls or truncal ramp of sheets.

The Mayfield® horseshoe head holders are commonly available in every neurosurgical theatre. To our knowledge this is the first description of Mayfield® cranial stabilisation horse-shoe head holder as an airway positioning aid in neurosurgery. We present our technique as a simple yet novel method to circumvent difficult airway scenarios in infants with macrocephaly.

Declaration of patient consent
The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest
There are no conflicts of interest.
Letters to Editor

Saurabh Sharma, Bimal Kumar Sahoo,
Anurag Aggarwal1, Varun Suresh2

Department of Neuro-Anaesthesia and Neuro-Critical Care, Kalinga Institute of Medical Sciences, Bhubaneswar, Odisha, 1Department of Neuroanaesthesia and Pain Medicine, Fortis Hospital, Noida, Uttar Pradesh, 2Department of Anaesthesiology, Government Medical College, Thiruvananthapuram, Kerala, India

Address for correspondence:
Dr. Varun Suresh,
Department of Anaesthesiology, Government Medical College,
Thiruvananthapuram, Kerala, India.
E-mail: varunsureshpgi@gmail.com

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REFERENCES

1. Bober J, Rochlin J, Marneni S. Ventriculoperitoneal shunt complications in children: An evidence-based approach to emergency department management. Pediatr Emerg Med Pract 2016;13:1-23.
2. Rath GP, Dash HH. Anaesthesia for neuro surgical procedures in paediatric patients. Indian J Anaesth 2012;56:502-10.
3. Swaika S, Ghosh S, Bhattacharyya C. Airway devices in paediatric anaesthesia. Indian J Anaesth 2019;63:721-10.
4. Huang AS, Hajdu KJ, Rim C, Coffiel DS, Jagnnathan N. Focused review on management of the difficult paediatric airway. Indian J Anaesth 2019;63:428-36.
5. Fiadjoje JG, Litman RS, Serber JE, Stricker PA, Cote CJ. The use of total intravenous anaesthesia (TIVA) as an alternative to inhalational anaesthesia in patients with bronchopulmonary dysplasia (BPD). Anaesthesia for neuro surgical procedures in paediatric patients. Indian J Anaesth 2012;56:502-10.
6. Jain K, Gupta N, Yadav M, Thulkar S, Bhatnagar S. Radiological evaluation of airway—What an anaesthesiologist needs to know!. Indian J Anaesth 2019;63:257-64.
7. Available from: https://www.integralife.com/Available from: https://www.integralife.com/mayfield-headrests/product/cranial-stabilization-mayfield-standard-cranial-stabilization-system-mayfield-headrests.[Last accessed on 2020 Jul 04].

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