Case Report

Sedation and fiberoptic intubation of a neonate with a cystic hygroma

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The flexible bronchoscope (FB) has been used to secure the difficult airway in pediatric patients (1). Difficult intubations in patients with cystic hygromas have been performed in awake patients or after the induction of general anesthesia (2). A recent case report acknowledges the challenges of performing intubations in pediatric patients under sedation because of their inability to fully cooperate (3). The following case demonstrates the two-step-two fiberoptic bronchoscopic tracheal intubation performed using sedation and topical anesthesia in a neonate with a difficult airway.

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A 3-week-old, 4-kg neonate had a large cystic hygroma, cleft palate, and a thick cyanotic tongue protruding from his mouth (Fig. 1). The cystic hygroma covered the anterior and lateral neck and extended down to the mid-thoracic region, but without any signs of respiratory obstruction or stridor. Computerized tomography (CT) of the head and neck revealed multiple fluid-filled loculi that circled the neck with mild compression and deviation of the trachea to the right.

Because securing the airway under general anesthesia or a tracheostomy was considered to be difficult, the airway was secured before the induction of general anesthesia. Premedication consisted of atropine 0.12 mg IV. Sedation was achieved with incremental doses of IV ketamine 1.0 mg and midazolam 0.1 mg to a total dose of 3.0 and 0.2 mg, respectively, while oxygen was supplemented via a facemask. The tongue was coated with 2% viscous lidocaine before placement of a small oropharyngeal airway also coated with lidocaine. Lidocaine 2% 1 ml was sprayed over the vocal cords and inside the trachea via an epidural catheter passing through the suction channel of a 4-mm FB (Olympus LF-2, Olympus America, Melville, NY). The epidural catheter was advanced beyond the vocal cords while the tip of the fiberscope was kept just above the vocal cords. The infant coughed, although his oxygen saturation remained at 99%.

Approximately 90s after the local anesthetic was sprayed onto the larynx, a second FB with a 2.7-mm diameter (Olympus LF-P) loaded with a 3.5-mm uncuffed endotracheal tube (ETT) was advanced through the mouth alongside the oral airway into the trachea followed by smooth passage of the ETT. After ETCO₂ confirmation of tube positioning, the ETT was taped and sevoflurane was introduced. The infant remained intubated for 17 days because of swelling of the tongue and epiglottis. His hospital course was uneventful after extubation and he was discharged a month after surgery.

Fig. 1. Three-week-old neonate with a lingual hemangioma, small cleft plate, and large cystic hygroma covering the entire anterior and lateral neck.
Discussion

Cystic hygroma is a soft, benign, and painless, fluid-filled lesion typically found in the posterior triangle of the neck which may extend into the axilla or mediastinum. Feeding difficulties or repeated coughing signal potential airway encroachment. Treatment is surgical excision under general anesthesia in one or multistage resections.

We chose the oral rather than nasal approach for fiberoptic intubation to minimize the chance of bleeding, which would interfere with fiberoptic intubation. Two different FBs were used; the larger, with a working channel for the application of local anesthetic to the vocal cords and trachea, and the ultra-thin for intubation.

The ultra-thin FB has been used extensively with minimal or no sedation for bronchoscopy in neonates and infants. The most common complication was epistaxis, and the least common were transient bradycardia and laryngospasm (4). We chose ketamine because it preserves airway patency and causes bronchodilation (5). The combination of midazolam and ketamine allowed the patient to tolerate instrumentation while still breathing spontaneously. We used less than 0.5 ml 2% viscous lidocaine and 1.0 ml of 2% lidocaine solution for topical anesthesia to avoid overdosing and systemic toxicity.

Since the airway of a neonate with a large cystic hygroma may become obstructed after the induction of general anesthesia and as surgical access is difficult, we believe that fiberoptic intubation with sedation and topical anesthesia is a safe alternative method.

References


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