# Three-combined Airway Management for Pediatric Difficult Airway

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## Case presentation

The patient is a 2-year-5-month-old boy who was delivered by a healthy mother at term with a birth body weight of 3260gm. He was suspicious of having DiGeorge syndrome (CATCH-22) because of facial features, congenital heart disease, recurrent infections and hypocalcemia. He had received the operation of ventricular septal defect repair, patent foramen ovale repair and removal of the right atrium vegetation at two months of age. The patient tolerated the operation well and received regular rehabilitation for delayed development without the need of long term medication.

This time, he presented to OR for bilateral myringotomy and right ear meatoplasty due to bilateral otitis media and right aural stenosis with hearing impairment. The boy was 86 cm in height and 10.9 kg in weight. There were hypertelorism, low-set ears, short philtrum and micrognathism in facial appearance. There was no wheezes, crackles or heart murmurs. He had trivial anemia and normal biochemistry and coagulation profiles. The initial vital signs were recorded as below: blood pressure 136/75mmHg, heart rate 110 bpm, body temperature 36.5℃ and pulse oximetry 100% spontaneously breathing room air.

General anesthesia with endotracheal tube insertion was planned. After adequate pre-oxygenation and after ease of mask ventilation confirmed, inhalation induction using sevoflurane in combination with intravenous atropine 0.1 mg and cisatracurium 1.5 mg were given. A MallinckrodtTM 4.5# cuffless oral endotracheal tube (4.5 mm I.D./ 6.2 mm O.D.) was inserted smoothly with laryngoscope. However, significant air leakage from the mouth and inadequate ventilation were noted. Several attempts were made to re-intubate with a larger endotracheal tube but failed. Finally, we could not even put the original endotracheal tube back.

As time passed by, mask ventilation became more difficult. Saturation once went below SpO2 80%. The laryngeal mask airway (LMA) (Ambu® Aura40™ Reusable Laryngeal Mask 1.5#, min I.D. 7.3 mm/ max O.D. 13 mm) [fig. 1] was used successfully to regain an 100% oxygen saturation.

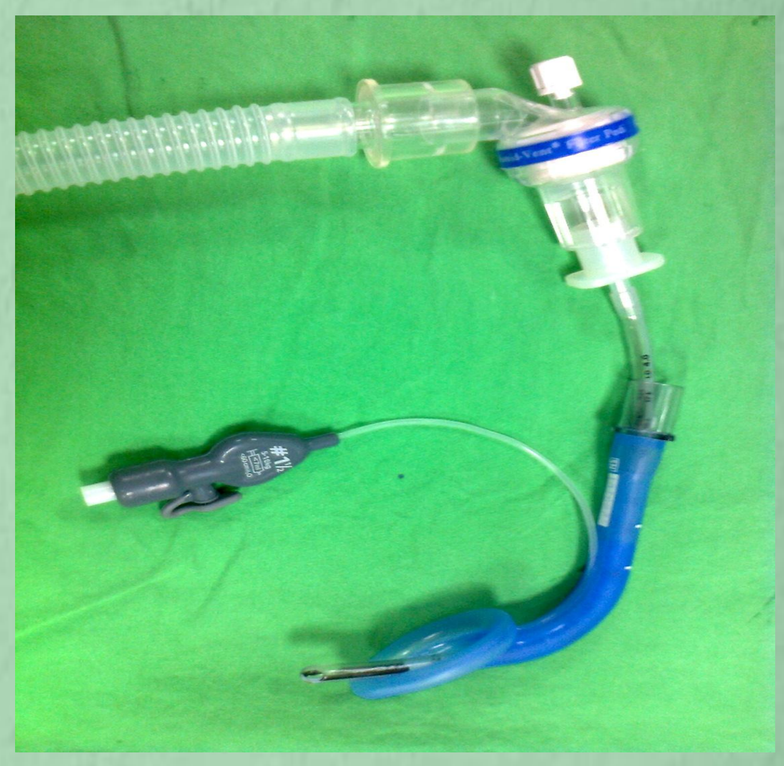
[fig. 1]

To make extra certain for the ENT surgery, we mount a MallinckrodtTM 4.0# cuffless oral endotracheal tube (4.0 mm I.D./ 5.6 mm O.D.) on a fiber bronchoscope (Olympus LF-DP, insertion tube O.D. 3.1 mm, working length 600 mm) [fig. 2] and insert the endotracheal tube through the LMA tube [fig. 3].


[fig. 2]


[fig. 3]

After successful intubation, we connected the breathing circuit to the endotracheal tube [fig. 4] and leave the LMA in place as a bite and oropharyngeal occluder. There was little air leakage afterwards, and the surgical intervention was performed smoothly.



[fig. 4]

At the conclusion of the surgery, the endotracheal tube was removed before decreasing the depth of anesthesia. The LMA was left in place for the latter emergence and was removed after a timely recovery without consequence.

## Discussion

It is well-established that LMA being incooperated into difficult airway algorithms. However, LMA is not fail-proof especially for head and neck surgeries. This three-combined management offered an idea for pediatric difficult airway management in head and neck surgeries.