Letter to the Editor

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Easy airway management using the i-gel™ supraglottic airway in a patient with Treacher Collins syndrome

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Treacher Collins syndrome (Mandibulofacial Dysostosis, TCS) is characterized by antimongoloid slanting of the palpebral fissures, coloboma of the lower lid, micrognathia and hypoplasia of the zygomatic arches, and microtia. TCS appears to be inherited in an autosomal dominant fashion or occurs sporadically, and is a congenital malformation of the 1st and 2nd branchial arches [1]. It is common for TCS to lead to difficulties in intubation [2], and many techniques for airway management have been reported, such as intubation under fiberoptic bronchoscopy, the use of a laryngeal mask airway (LMA), fiberoptic intubation through LMA, and even tracheostomy [2]. We report a case of successful airway management with the i-gel™ (Intersurgical Ltd., Wokingham, UK) after failed attempts with fiberoptic intubation and videolaryngoscope in a patient with TCS who had undergone emergency abdominal surgery.

A 25-year-old man with TCS who was 170.0 cm in height and 68.7 kg in weight was scheduled to undergo an emergency small bowel resection. His symptoms included hematochezia for 2 days and a bleeding Meckel's diverticulum diagnosed by an enterography CT scan. He was diagnosed with TCS in early childhood, and there was no family history. He also suffered from malocclusion and chronic otitis media without mental retardation or hearing impairment. He had a history of mandibular augmentation with intubation difficulty at a different hospital at age 18, and cerebral thalamic infarct without neurologic sequelae at age 22. Physical examination showed the characteristic findings of TCS. Preoperative laboratory tests were all within normal limits and no abnormal findings were shown on chest radiograph or electrocardiograph. Upon arrival in the operating room, an electrocardiogram, and automated blood pressure cuff, pulse oximetry (SpO_2), end-tidal CO_2 and Bispectral index (BIS) monitors were applied. The patient's preinduction vital sign was stable. The evaluation of his airway revealed mandibular hypoplasia, a narrow mouth opening (1.5 finger breadths), a short thyromental distance (1.5 finger breadths), and Mallampati classification grade 4. Because we anticipated difficulty intubating the patient, we planned a videolayrngoscopic approach (McGrath® MAC, Covidien, USA) and fiberoptic intubation (MAF-GM airway mobilescope, Tokyo, Olympus, Japan) under sedation with dexmedetomidine infusion. With O_2 6 L/min via a nasal prong, a loading dose of dexmedetomidine 1 μg/kg was infused over 10 min with a maintenance infusion rate of 0.5 μg/kg/hr. Prepared propofol 1–2 μg/kg/min and remifentanil 3–10 ng/kg/min were administered via target-controlled infusion (Orchestra® Base Prima, Fresenius Vial, Brezins, France). After the BIS fell below 60 while self-respiration was still maintained, we attempted videolaryngoscopy twice, but a difficult videolaryngoscope insertion due to the narrow mouth opening resulted in a failure to visualize the vocal cord. We then tried trans-nasal fiberoptic intubation with a wire endotracheal tube #6.0 twice, but failed to visualize the vocal cords due to the patient's gag reflex and small supraglottic space. Vitals were maintained in the following ranges: SpO_2 85–100%, BP 100–150/50–95 mmHg, HR 50–100 beats/min, and BIS under 60. We suspected the major barriers to successful intubation were the narrow opening of mouth and the small supraglottic area. For these reasons, we decided to use the i-gel™ #3 insertion rather than LMA for airway maintenance, and it was inserted within 30 seconds of the

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first trial. The i-gel™ insertion without leakage was confirmed by capnography and bilateral chest auscultation. Until the end of the surgery, the airway was successfully maintained with the i-gel™. After completion of the surgery, the i-gel™ was removed without any airway complications. The patient was transferred to the postanesthetic care unit and the patient's postoperative course was uneventful. He was discharged 4 days later without any other problems.

The airway management of TCS may be more challenging due to a smaller orpharynx, limited inter-incisor opening, mandible condylar hypoplasia, and a narrow space due to hypoplasia of the larynx [2]. Patients with TCS require multiple episodes of anesthesia for different and staged procedures such as orbitozygomatic surgery, otoplasty, cleft palate repair operation, etc. [2]. The difficulty in airway management increases with age and requires reevaluation of the airway before planned anesthesia due to anatomical distortions or changes from previous surgery [2]. The increase in airway difficulty with age in TCS contrasts the trend with airway management in Pierre Robin syndrome, where intubation becomes easier with increasing age [3]. Airway management for TCS consists of endotracheal intubation by direct laryngoscopy, fiberoptic, light wand, blind nasal, or oral approaches, the LMA, and videolaryngoscopy [2]. If we had tried laryngeal nerve block or lidocaine spray in the hypopharynx, the success rate for awake intubation might have increased. The analgesic effect by dexmedetomidine in our case was not enough for awake intubation, and the additive increase of a remifentanil dose induced the analgesic effect with unwanted events such as apnea and respiratory depression.

The i-gel™ is a supraglottic, latex-free airway device. It is made of a soft, gel-like, 'thermoplastic elastomer' that mirrors the perilaryngeal anatomy to create the perfect fit without the need for an inflating cuff [4]. The device has an 'epiglottis blocker' to prevent the epiglottis from down-folding or obstructing the larynx and the soft, noninflatable cuff seals anatomically against the perilaryngeal structures [4]. The i-gel™ allows direct fiberoptic intubation though the wide bore without catheter exchange, and also has a lateral 'gastric channel' for suctioning, passing of a nasogastric tube, and venting facilitation [5]. Many recent publications report that the i-gel™ has advantages over the LMA, such as ease of insertion, shorter insertion time, better fiberoptic view, better airway sealing, lower incidence of sore throat, and reduced risk of position changes.

This is a challenging area of anesthetic practice, but the use of the i-gel™ is the safest, easiest and most economic choice among many supraglottic airway devices for the administration of anesthesia to a TCS patient with a craniofacial anomaly that is associated with difficult airway management.

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