Letter to the Editor

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An innovative method of pilot balloon capping for submental intubation

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Dear Editor,

Panfacial fractures pose a challenge for anesthesiologists performing airway management. Submental intubation (SMI) has emerged as an alternative to tracheostomy, particularly for oromaxillofacial surgeries, in which there is a shared airway between the surgeon and anesthesiologist [1]. Here, we report a novel method to address the problems encountered during SMI.

A 27-year-old male patient (weight, 63 kg; height, 171 cm) involved in a road traffic accident was referred to our hospital following initial care at another institution. He sustained panfacial fractures and was scheduled for intermaxillary fixation. Our plan for anesthesia was general endotracheal anesthesia with SMI, which aimed to provide a clear and unobstructed operative field for the surgeons. Nasotracheal intubation was contraindicated in this patient because of fractures of the nasal bones and base of the skull.

During pre-anesthetic assessment, airway examination revealed Mallampati grade 2 with a mouth opening of three fingers. Standard anesthesia monitors were attached in the operating theatre. Anesthesia was induced by administration of intravenous midazolam 1 mg, fentanyl 150 μg, propofol 100 mg, and vecuronium bromide 7 mg, after which the trachea was intubated with standard orotracheal intubation with a 7-mm internal diameter reinforced endotracheal tube (ETT). A small incision was made in the submental region, and hemostatic forceps were passed through the mylohyoid muscle following blunt dissection. Another small incision was made parallel to the gingival margin inside the oral cavity to facilitate the entry of the hemostatic forceps. Initially, we extracted the deflated pilot balloon tube extraorally with the help of hemostatic forceps, and found that the one-way valve at the tip of the pilot balloon was obstructed by blood and tissue debris (Fig. 1A, 1B). The balloon could not be reinflated because of the high resistance of the one-way valve. The blockage was removed through the use of a 24 gauze needle and forceful installation of saline. A similar method of exteriorization was later used for the ETT, and the proper position of the ETT was confirmed by a capnography trace and bilateral symmetrical air entry on chest auscultation. The perioperative course was uneventful, and the patient was

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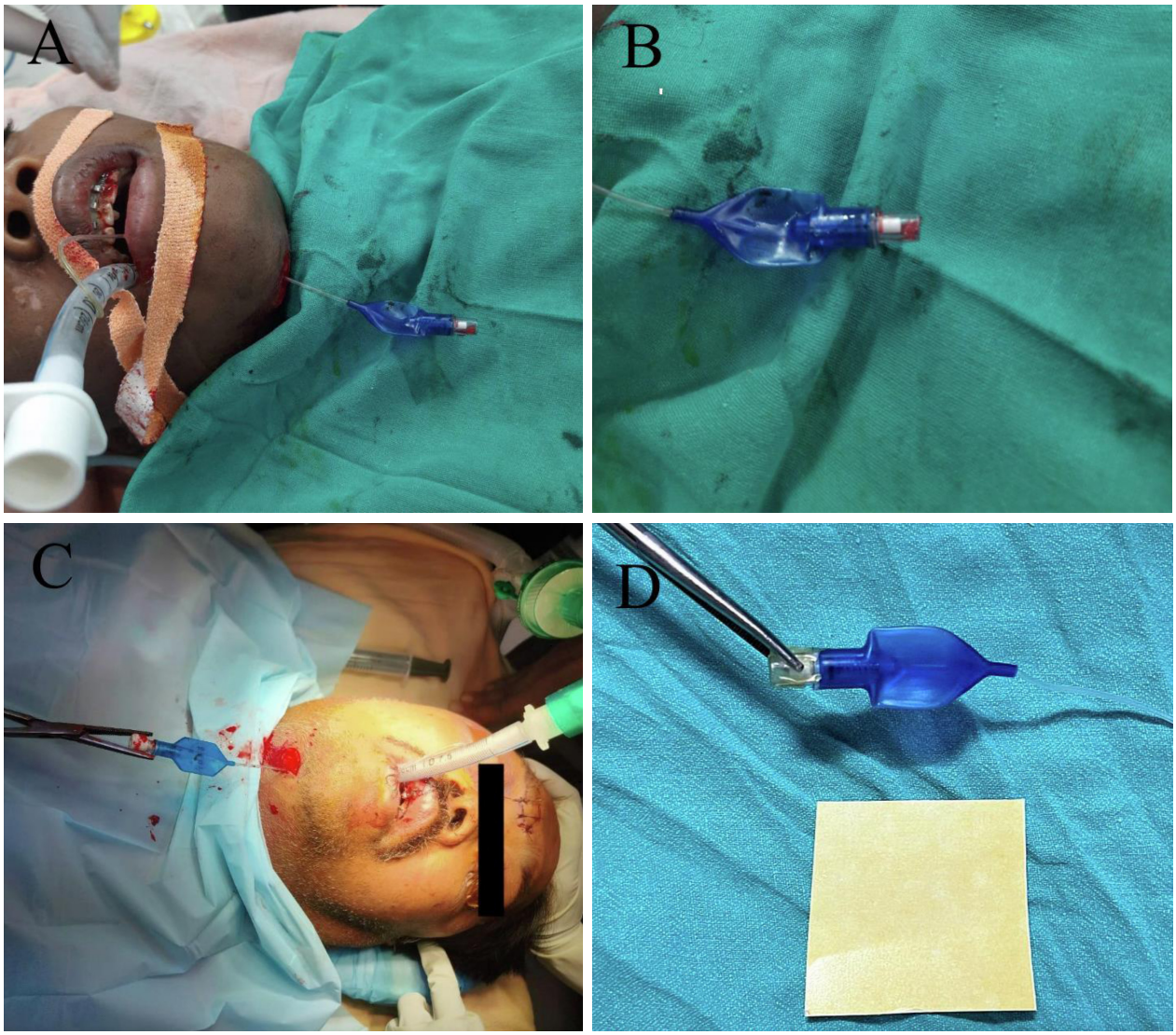

Fig. 1. (A) The patient with the exteriorized pilot balloon following submental incision, (B) Blockage of the pilot balloon one-way valve with blood and tissue debris, (C) The pilot balloon was extracted through submental incision after its tip was capped with universal intravenous cannula cap, (D) The pilot balloon tip covered with sterile adhesive plaster.

discharged on postoperative day four.

Following management of a similar case in our operating theatre, we developed this innovative method to prevent this complication. Once the hemostatic forceps reached the oral cavity, the tip of the deflated pilot balloon was occluded using a universal intravenous cannula cap. This system was then held with forceps to externally pull it out through the orocutaneous fistula (Fig. 1C), thus preventing the entry of blood or tissue debris into the pilot balloon tip, which blocks the one-way valve. The intravenous cap was removed and the ETT cuff was inflated without difficulty. The same benefit was achieved by covering the pilot balloon tip with a sterile adhesive plaster before exteriorizing the pilot balloon (Fig. 1D).

We were unable to find any information regarding pilot balloon blockage during SMI in a literature search. However, several studies and case reports have previously proposed modifications to facilitate SMI and submandibular intubation without blood or soft tissue entering the ETT. These include use of a blue cap on the end of the thoracic catheter, a surgical glove finger,

a tracheostomy dilator of the percutaneous tracheostomy set, a laparoscopic trocar, a Nelaton catheter, a suction connector, a dental needle cap, a nasal speculum, a camera cable drape, etc. [2-7].

We believe that our innovative method of pilot balloon capping using either an intravenous cannula cap or adhesive plaster before exteriorizing the pilot balloon will certainly help anesthesiologists prevent this complication during SMI.

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