

Unexpected difficult intubation owing to a tracheal web in a patient with past history of a Fontan procedure

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To the Editor:

Acquired tracheal web is a rare late complication of tracheal intubation and is formed during the development of a laryngeal granuloma [1]. We report an unexpected case of tracheal web encountered after induction of general anesthesia.

A 24-year-old male patient (height 168 cm, body weight 52 kg) with acute cholecystitis was scheduled to undergo laparoscopic cholecystectomy. His medical history included transposition of the great arteries, modified Fontan surgery at 6 years of age, and Fontan surgery at 23 years of age, in which he had had postoperative intubation with an 8.5-mm internal diameter (ID) tube for less than 24 h. He had no respiratory symptoms. His physical status was American Society of Anesthesiologists (ASA) performance status (PS) III.

After anesthesia was induced and muscle relaxation was achieved, tracheal intubation was attempted. The Cormack grade of the glottic view was I and a subglottic tracheal web was observed (Fig. 1a). Because tracheal intubation with 8.0-, 7.5-, and 7.0-mm ID tubes was impossible owing to resistance, the cholecystectomy was cancelled. The tracheal intubation was needed for transesophageal echocardiography (TEE) monitoring, in the event of acute heart

failure caused by pneumoperitoneum—a risk for patients with a history of Fontan procedure. Otolaryngologists examined the larynx using a flexible fiberscope, and laryngomicrosurgery was planned for the following day.

Under anesthesia, tracheal intubation was performed with a 6.0-mm ID tube inserted above the web, using a tracheal tube introducer (15 Fr, Portex, Kent, UK). The tracheal web was visualized using a direct laryngoscope (Fig. 1b) and was removed using microscissors. Postoperatively, beclomethasone inhalation was administered and no glottal swelling was found. Fibrotic tissue was found on pathological examination.

The cholecystectomy was performed 6 days after the laryngomicrosurgery. Under anesthesia, an 8.0-mm ID tube was inserted without resistance. A FloTrac sensor and PreSep central venous catheter (Edwards Lifesciences, Irvine, CA, USA) were used for circulatory management in the event of acute heart failure and TEE was used for cardiac monitoring. Instead of laparoscopic surgery, open surgery was performed, owing to adhesions. Vital signs remained stable during the operation and postoperative tracheal tube extubation was uneventful.

Tracheal webs are late and rare sequelae of tracheal intubation and tracheotomy. Neck extension, and the prone and lateral positions, a larger tracheal tube, and a prolonged intubation period tend to increase the incidence of tracheal webs [1]. The mean duration of tracheal intubation was 5.2 days in patients with a laryngeal granuloma at the cuff site [1], and there is one report of a tracheal web in a patient under mechanical ventilation for a month [2].

While many patients with tracheal web have asthma or chronic obstructive pulmonary disease [3] others have no respiratory symptoms [2]. According to the algorithm for management, the first choice for patients without respiratory symptoms is conservative treatment, and for patients

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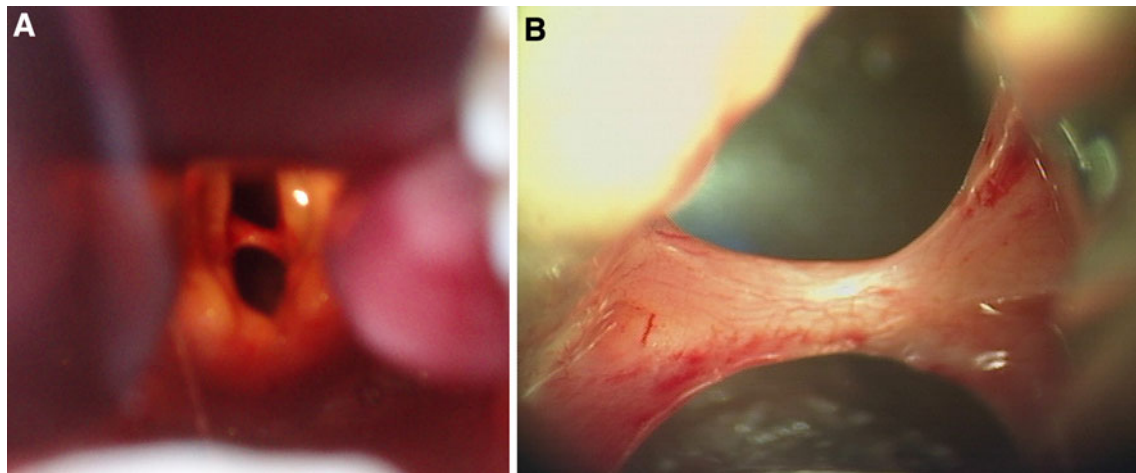


Fig. 1 **a** Findings during laryngeal exposure: a tracheal web exists in the center of the space. **b** Findings during laryngeal exposure with a direct laryngoscope: there is a tracheal web across the subglottic space

with respiratory symptoms it is endoscopic resection with an Nd: YAG laser [4]. Conservative treatment may be selected for patients with no obstructive respiratory symptoms when tracheal intubation is possible [5], and resection is often required when tracheal intubation is impossible [2]. Although surgery could have been performed immediately after the web resection [2] in our patient, given the possibility of post-resection glottal edema, which may have resulted in difficult extubation and/or airway obstruction, two-stage surgery was selected, ensuring safer anesthetic management with a minimal risk for our patient.

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