CASE REPORT

Misguidance of peroral rigid laryngoscopy in assessment of difficult airway: two comparable cases in microlaryngeal surgery

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SUMMARY

We describe two patients with laryngeal cyst who underwent microlaryngeal surgery. Peroral rigid laryngoscopy, as an indirect endoscopy, performed via the transoral route, was evaluated as a routine screening tool of the difficult airway in patients with laryngeal neoplasm, in our hospital preoperatively. Peroral rigid laryngoscopy had led to two different procedures: One patient was misdiagnosed as having a difficult airway by the ear, nose and throat surgeon resulting in an unnecessary awake tracheotomy. The other patient was found to be with an unanticipated difficult intubation following routine anaesthesia, successful on the third attempt. As we saw in these two cases, endoscopic examination alone was inadequate for the assessment of a difficult airway, which may also lack the predictive sensitivity or may cause a high false positive. Usage of video laryngoscopy combined with intubating stylet will improve the intubation success in patients with huge epiglottic cyst.

BACKGROUND

Vocal cord surgery is a very common procedure in the otolaryngology department. Laryngoscope image data, combining with symptoms of airway obstruction can provide reliable predictors of a difficult airway, but sometimes the image might mislead the ear, nose and throat (ENT) surgeon to overestimate a difficult airway, resulting in 'much ado about nothing' (invasive method), while at other times underestimation may result in intubation failure. Some other method should be included in assessment of airway in patients with huge laryngeal cyst. An alternative flexible endoscopy examination preoperatively may decrease the incidence of an invasive artificial airway, while a video laryngoscope combined with a stylet device may increase the success rate of tracheal intubation. Lin Na *et al* had reported using an optical stylet combined with a Macintosh laryngoscope to aid tracheal intubation in seven patients with epiglottic cyst.

CASE PRESENTATION

Case 1

An 83-year-old male patient with severe dyspnoea and dysphagia since 2 months was admitted to our hospital for microlaryngeal surgery. He could eat only liquid and pappy food, and suffered from paroxysmal nocturnal dyspnoea. Endoscopy

examination showed a huge neoplasm located among glottic portion, the right vocal cord could not be seen (figure 1). The patient was identified as an anticipated difficult airway by ENT surgeon, therefore an awake tracheotomy was performed to prevent potentially fatal complications. After establishment of invasive airway, anaesthesia was induced using fentanyl 2 µg/kg, propofol 2 mg/kg and rocuronium 0.6 mg/kg. Before the start of surgery, we used GlideScope video laryngoscope (Verathon, Bothell, Washington, USA) to re-examine the airway for supraglottic obstruction. Laryngoscopy revealed a 3 cm cyst with a stalk arising from the right side of the vallecula. After adjusting the screen position, the view of the laryngeal inlet was clear (Cormack Lehane Grade 2) (figure 2). The patient was discharged 3 days later with no complications and decannulated without sequelae. We concluded that the otolaryngologist had overestimated the results of the endoscopy, and the judgement of 'difficult airway' was a 'misdiagnosis'.

Case 2

A 61-year-old man had a symptom of foreign body sensation for half-a-year presented to our hospital for microlaryngeal surgery. Endoscopic examination showed a huge epiglottic cyst located in a lingual surface (figure 3). The case was not regarded as a difficult airway preoperatively, so the routine rapid sequence induction of general anaesthesia was performed. A bolus of fentanyl 2 µg/kg, propofol 2 mg/kg and depolarising muscle relaxant (succinylcholine) 1.5 mg/kg was injected intravenously. After facemask ventilation succeeded, tracheal intubation was performed with the GlideScope video laryngoscope (figure 4) (Verathon, Bothell, Washington, USA). But the laryngoscopy view was poor (Cormack Lehane Grade 4), the only visible anatomical change was a round cyst shaped like an egg yolk, so the tube slipped into the oesophagus (confirmed by missing of tidal CO₂ and bilateral breath sounds). A second attempt at intubation was made by the anaesthesiologist, using a Macintosh laryngoscope, also ended in failure, with some yellow liquid effusion from the cyst and suction was then administered. Then a 'call for help' programme was initiated as recommended by American Society of Anesthesiologists (ASA) guidelines for management of the unanticipated difficult intubation. After maintenance of oxygenation and facemask

To cite: Zhang X, Li W. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2012-008423

Figure 1 A huge neoplasm located among glottic portion (showed by transoral rigid laryngoscopy).

ventilation, an additional bolus of intravenous anaesthetic and muscle relaxant was provided, a third intubation was performed by the department director. Assisted with the Frova (intubating introducer bougie), a size 6 tube was successfully advanced tracheally after bypassing the shrunken cyst, and finally a definite artificial airway was established. The remainder of the surgical and anaesthetic procedure proceeded uneventfully. The cyst was removed successfully using CO₂ laser. Dexamethasone 10 mg was given to prevent oedema of the larynx, and there was no untoward event during emergency.

OUTCOME AND FOLLOW-UP

The patient in case 1 underwent a tracheotomy prior to general anaesthesia and the patient in case 2 encountered an unanticipated difficult intubation after anaesthesia which succeeded on the third attempt. Both patients had no severe adverse events during surgery.

DISCUSSION

Laryngeal cysts constitute approximately 5% of benign laryngeal lesions.¹ The majority of cysts originate from the lingual and dorsal surfaces of the epiglottis,² almost account for 52% cases.³ Most adult epiglottic cysts are detected in the sixth decade.⁴

Anaesthetic preoperative evaluation is composed of four components which include patient history, physical examination, laboratory studies and anaesthetic plan.⁵ The preoperative endoscopic airway examination (PEAE), described by Moorthy⁶ in 2005, undertaken in operation room by using topical anaesthetic lidocaine, proved to be an optional diagnostic method to evaluate the airway, providing useful information to make the anaesthesia plan, reducing unnecessary tracheotomy and the need for awake intubation.⁷ But the peroral rigid laryngoscopy,

Figure 2 The neoplasm seen on Glidescope (improving laryngeal exposure by adjustment of laryngoscopy position).

Figure 3 A huge epiglottic cyst located in a lingual surface (showed by transoral rigid laryngoscopy).

as an indirect endoscopy, performed via the transoral route, can offer only limited view of the postcricoid region, all regions of larynx can only be properly visualised by direct laryngoscopy. The direct fibre optic flexible laryngoscopy can help the ENT surgeon find neoplasm of the larynx, and facilitate the anaesthetist to accomplish intubation in patients with anticipated difficult airway.

An unknown difficult airway may pose a threat to patient's life during induction. Maintenance of oxygenation and ventilation is more meaningful than intubation itself. The Difficult Airway Society (DAS) flow chart recommended the adoption of introducer (bougie) or alternative laryngoscope if there is poor view on laryngoscopy.⁸ Cysts of the larynx and epiglottis were considered as an anticipated difficult airway and can be challenging to the anaesthesiologist.⁹ The airway may deteriorate owing to collapse of surrounding structures (laryngeal neoplasm or epiglottic cyst) after anaesthesia, especially after using of muscle relaxant. In some cases, if 'can't intubate, can't ventilate' situation exists, especially when a huge cyst obstruct the glottis inlet, aspiration of the cyst fluid to reduce the cyst size sometimes may provide crucial help and can avoid an unnecessary tracheotomy.¹⁰ Diagnosis of anticipated difficult airway in ENT patients may establish clinical symptoms relevant to airway obstruction and image of endoscopy, which provide valuable guiding information.¹¹ In these two cases, the images of endoscopy led to misleading diagnosis of difficult airway, may be due to the different focusing angles and the amplification effect of the digital camera. Unnecessary tracheotomy increases healthcare costs, meanwhile the negligent unanticipated difficult airway poses a potential hazard to the patient's life. PEAE helps to evaluate the airway controllability by anaesthesiologist preoperatively, and an awake fiberoptic intubation while maintaining spontaneous ventilation should be the primary approach in the first patient. A Shikani optical stylet may be useful to provide smooth, safe intubation,¹² and combined laryngoscope (Macintosh or video laryngoscope) with introducers (optical stylet or gum elastic bougie) may increase the success rate of intubation.¹³

Figure 4 A huge epiglottic cyst seen on Glidescope.

Learning points

- ▶ Pararol rigid laryngoscopy is a useful technique for airway evaluation, but may also lead to a misleading diagnosis of difficult airway.
- ▶ A thorough review of patient characteristics and combinations of tests (PEAE, computed tomography (CT) scans) may increase the predictive value of anticipated difficult airway.
- ▶ The airway may deteriorate because of collapsing of surrounding structures (laryngeal neoplasm or epiglottic cyst) after anaesthesia.
- ▶ Combined laryngoscope (Macintosh or Glidescope videolaryngoscope) with introducers (optical stylet⁸ or gum elastic bougie) may increase the success rate of intubation.

Contributors WL is responsible for the manuscript preparation. XZ is the first author responsible for the whole write-up.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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