

Airway management during the laryngoscopic surgery for the benign laryngeal obstructive disease

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The airway management and anesthesia maintenance during the laryngoscopic surgery is essential for a safe operation. For the benign laryngeal obstructive disease such as a large mass or a foreign body of the upper airway, it is difficult to secure the airway. Sometimes they might be hazardous and potentially lethal.

We present two cases of a large laryngeal polyp and a laryngeal foreign body of press-through-package (PTP). They were successfully operated on with laryngomicrosurgery under neuroleptanalgesia (NLA) without intubation. The choice of the operation and airway management were discussed.

Key words : foreign body, laryngeal polyp, neuroleptanalgesia

INTRODUCTION

The airway management and anesthesia maintenance during the laryngoscopic surgery is essential for a safe operation. An oral endotracheal intubation is chosen in general. However, for the benign laryngeal obstructive disease such as a large mass or a foreign body of the upper airway, it is difficult to secure the airway during the operation. The airway management in such cases is of discussion, because they might be hazardous and potentially lethal [1, 2].

We present here two cases with benign laryngeal obstructive disease which were successfully operated on with laryngomicrosurgery under neuroleptanalgesia (NLA). One case was a large vocal cord polyp and the other is a press through package (PTP) impaction in the larynx. We discussed the choice of the operation and airway management.

CASE REPORTS

Case 1. A 58 year-old female presented with hoarseness for one month. She suddenly felt dyspnea on the day of the visit to our hospital. She had no episode of severe cough or high fever. On the fiberoptic examination a large dark purple round mass was seen on the left vocal cord (Fig. 1). The surface of the mass seemed smooth. It was originated from the left vocal cord and moved up and down through vocal folds on the respiration. The pre-operative diagnosis was the large laryngeal polyp with submucosal hemorrhage with unknown cause.

We called anesthesiologists and examined the larynx with a video fiberscope together. How to manage the airway during the laryngeal operation was discussed with anesthesiologists. Because of the passage of an endotracheal tube is impossible or dangerous to tear off the polyp, three optional treatment methods were discussed. 1) Resection of the polyp under a direct laryngoscope

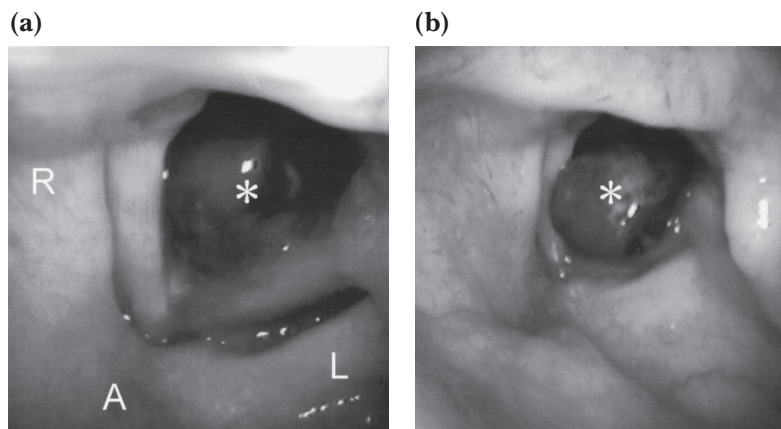


Fig. 1 Preoperative fiberoptic findings of case 1. A large pedunculated polyp (*) from the left vocal cord was seen moving up and down with the inspiration (a) and expiration (b). R: right side of the larynx. L: left side of the larynx. A: anterior side.

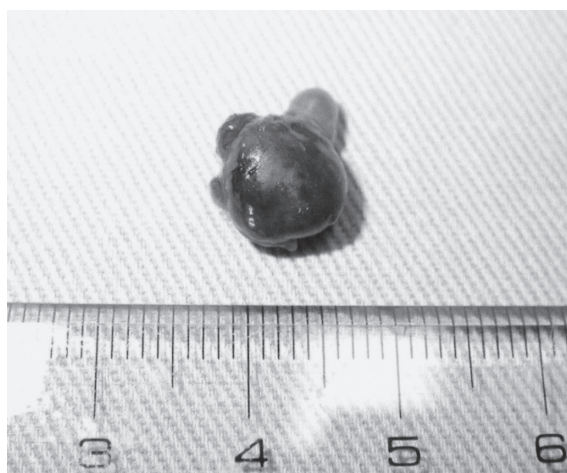


Fig. 2 A macroscopic view of the resected polyp.

after a tracheostomy, which was the safest way to secure the airway. 2) Removal using curved forceps under indirect mirror view or fiberoptic view. This was hazardous if the polyp was slipped off into the trachea or hemorrhage occurred after the resection. 3) Direct laryngoscopic surgery under NLA without intubation, which was less invasive and safer. The third option was chosen. In case of the emergent airway obstruction, equipment for emergent tracheostomy was also prepared.

The patient was transferred to the operating room. Midazolam, droperidol, and fentanyl were administered intravenously. The general anesthesia was maintained with

fentanyl. Pharynx and larynx were anesthetized with topical lidocaine spray. The laryngoscope was inserted to open the larynx. Under the microscope the large polyp was grasped with forceps and resected by cutting the pedicle with scissors. After the most part of the large mass was resected, the patient was oro-tracheally intubated. The root of the polyp on the left vocal cord was trimmed under microscope. It took 40 minutes from the anesthesia induction to the end of the operation. The size of the polyp was 12×10 mm (Fig. 2). Histopathologically the content of the polyp was a submucosal hemorrhage. Two days after the operation, she was discharged without any post-operative event.

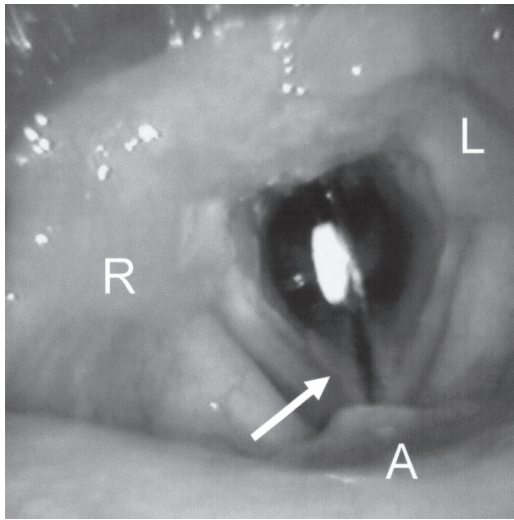


Fig. 3 A fiberscopic finding of the PTP (arrow) impacted between the vocal folds. R: right side of the larynx. L: left side of the larynx. A: anterior side.

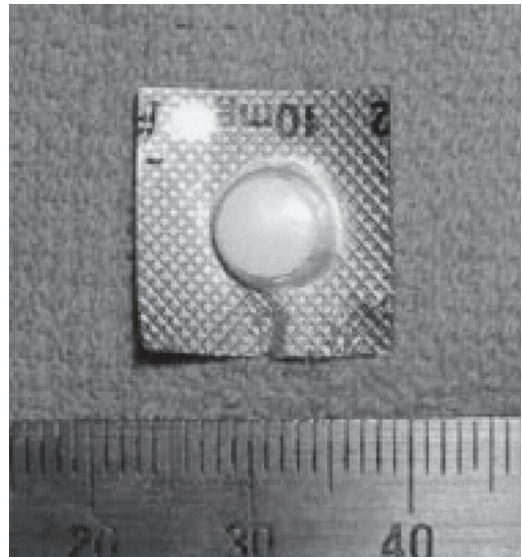


Fig. 4 A photograph of PTP removed from the larynx.

Case 2. A 58 year-old female visited a local doctor with a complaint of foreign body sensation of the throat and cough. She took tablets one day before the visit and she had not noticed swallowing any foreign body. By laryngeal fiberscopic examination, a PTP was found in the larynx. She was referred to our hospital for further examination and treatment.

Under a video fiberscope, a PTP containing a tablet was impacted to the larynx sagittally between vocal folds (Fig. 3). Because of the passage of an endotracheal tube was impossible, a constant danger of airway obstruction existed. In the same manner as the case 1, general anesthesia without intubation was planned. Under the laryngomicroscope the edge of the PTP was grasped by forceps. To prevent the injury of the laryngeal mucosa the sharp edge of the package was bent with two forceps. The PTP was carefully removed with two forceps (Fig. 4). The size of the foreign body was $16 \times 16 \times 3$ mm. It took 25 minutes from the anesthesia induction to the end of the operation. On the next day of the operation, she was discharged.

DISCUSSION

In case of the benign laryngeal obstructive disease such as a large mass or a foreign body of the larynx, the airway management

is very important for a safe operation. The options we considered for the safe induction and maintenance of anesthesia were as follows [3]. 1. A direct laryngoscope after a tracheostomy. 2. Removal using curved forceps under indirect mirror view or fiberscopic view under local anesthesia. 3. A direct laryngoscopic surgery under NLA without intubation. Although option 1 was invasive, it was the safest way to secure the airway. In option 2 a suffocation might occur if the object was slipped off or hemorrhage occurred after the removal. We chose option 3 which was less invasive and safer.

NLA is a form of pain relief achieved by the administration of the tranquilizer, droperidol, and the potent narcotic, fentanyl, in combination. Anxiety, physical movement, and sensitivity to pain are reduced. The patient is quiet and indifferent to the environment and surroundings. In our cases the patients were operated on without any cough and gag reflex. NLA requires skilled and experienced anesthesiologist to maintain an adequate anesthetic level, because NLA makes blood pressure unstable and inhibits respiration.

Most laryngeal polyps are small and attached to the free margin of the vocal cords. A large pedunculated laryngeal polyp as case 1 is rare. Their unusual presenting symp-

toms are stridor and dyspnea. Sometimes they might cause a life-threatening suffocation [1, 4, 5]. Especially in the case of large pedunculated polyp subglottic stenosis easily occurs [1]. In the literature orotracheal intubation, tracheostomy or cricothyroidotomy had been chosen for the airway management during the operation for the gigantic laryngeal polyps [1, 4-6]. Care must be taken with endotracheal intubation not to tear off the polyp into the trachea.

Aspiration of foreign bodies in the upper airway is a common emergency in childhood and old people. They are usually impacted in bronchial trees. Laryngeal foreign body is less common and potentially more hazardous, which often occurs in children [2, 7]. One lethal case has been reported [2]. The foreign bodies included toys, egg-shell, screw, and pin [2, 7]. For removal of the foreign bodies rigid laryngoscope or bronchoscope are used after tracheostomy.

PTPs are commonly used in Japan as a package for tablets and capsules. PTP foreign bodies in the esophagus are common. On the other hand PTPs in the upper airway are rare. Fourteen cases including our case have been reported in Japan [8, 9]. As an endotracheal intubation is impossible in these cases, the foreign bodies are removed under direct laryngoscope or by flexible fiberscope. We used microscopic direct laryngoscope under NLA anesthesia. We thought this is most reliable, safe and less invasive method. Because PTP impacted between vocal folds bi-manual usage of forceps is important to prevent the mucosal injury.

CONCLUSION

The management of laryngotracheal obstructive disease is a team effort which involves experienced otolaryngologists and anesthesiologists. The whole procedure should be well planned, with careful monitoring of the patient's vital signs [7]. In our experience preoperative conference and fiberoptic examination with the anesthesiologists were very important for the patient's management.

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