

Two Cases of Postintubation Subglottic Granuloma with Dyspnea

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Anesthesiologists are frequently involved with the management of patients requiring endotracheal intubation. We have found that serious tracheal lesions such as tracheal ulcerations and tracheoepophageal fistulae are usually preventable with careful management of the upper airways and regulation of endotracheal-tube cuff pressure^{1,2}. However laryngeal lesions occur despite diligent efforts to avoid them³. These include glottic and subglottic inflammation, aritenoid and corniculate tubercle ulceration after prolonged intubation⁴. These complications usually appear within 3 weeks after extubation⁵. We have experienced two patients with dyspnea due to postintubation subglottic granuloma which occurred 3 months after extubation.

Case Report

Case 1: A 52-years-old female, height 152 cm, weight 51 kg, required emergency admission to the hospital because of severe dyspnea. Three months ear-

lier, she suffered from severe pneumonia and required intubation which was performed by unskilled internist. She was treated with mechanical ventilation for 3 days. During respiratory therapy, her blood chemistry and complete blood counts revealed anemia and low total serum protein. We examined the cause of dyspnea quickly, and a neck roentgenogram revealed a subglottic tumor. The patient was taken to the operating room, and under topical anesthesia, a tracheostomy was performed.

When tube of tracheostomy was inserted, 250 mg of thiopental was administered. Anesthesia was maintained with 1.2% isoflurane and 67% nitrous oxide. A laryngomicrosurgery was employed to visualize the vocal cords, which were found to be normal. In the immediate subglottic area, large granuloma was seen which obstructed 80% of the airway (fig. 1). The patient recovered without hoarseness and discharged from the hospital. The pathology report indicated nonspecific inflammatory granuloma.

Case 2: A 44-years-old female, height 157 cm, weight 49 kg, required urgent admission to the hospital because of severe dyspnea. She had received an operation of radical hysterectomy (for carcinoma coli) at another hospital 3 months earlier. At

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Fig. 1

surgery, she was anesthetized by a surgeon. Preoperative blood tests revealed anemia and low total serum protein. An examination of dyspnea was performed, and a lateral neck roentgenogram suggested the presence of a subglottic granuloma (fig. 2). Under topical anaesthesia, tracheostomy was performed. General anesthesia was induced by 250 mg of intravenous thiopental, and was maintained with 1.5% sevoflurane and 67% nitrous oxide. A granuloma which obstructed 70% of the airway was found in the subglottic area. After surgery, the patient had an uneventful recovery. The pathology report indicated nonspecific inflammatory granuloma.

Discussion

It was well known that laryngospasm, laryngeal inflammation and laryngeal edema may be life threatening in the hours immediately after extubation⁵. But it is not widely appreciated that postintubation granuloma may produce airway obstruction a few weeks later⁶. Granuloma formation constitutes one of the serious complication of translaryngeal intu-



Fig. 2

bation. Postintubation granuloma is usually found within few weeks after extubation⁵. The incidence of postintubation granuloma is one of thousand⁷. Postintubation granuloma first is begun as an inflammation of mucosa, resulting in epithelial disorganization, and partial or complete loss of the epithelial layer⁸. Subsequently, ulceration extends to the perichondrium and underlying cartilage⁸. The ulceration becomes covered with inflamed granulation tissue that proliferates to varying degree⁷. The pathology reports in these patients are consist with this. Postintubation granuloma is most commonly found on the posterior third of the arytenoid cartilages. Traumatic intubation causes injury of the laryngotracheal mucosa. Presumably significant pressure from a forceful intubation leads to the ischemic necrosis in the arytenoid region.

Females have a higher incidence of postintubation granuloma than males, probably due to their narrow larynx¹¹. Experimental evidence from monkeys intubated with oversize tubes indicates significant loss of epithelium within 2 hours at the site of contact¹². This suggests that large size tube will produce abrasion of the laryngeal mucosa. Manipulation of the cervical region by the surgeon, bucking on the tube, and extension of head during endotracheal

tube will contribute to the abrasive action against the laryngeal mucosa⁷.

Postintubation granuloma has been seen more frequently following poor nutrition⁷. Another etiologic factor is the patient's general condition. In patients with poor nutrition and dehydration, laryngeal mucosa is decreased, facilitating damage to the epithelium.

Intubation by an unskilled person, female and poor nutrition were risk factors for subsequent granuloma formation in our cases. Postintubation granuloma can be minimized by skilled person with sterilized endotracheal tube which is the correct size, and high-volume low-pressure cuff which is inflated only to the point of no leakage. Unnecessary movement of the head should be avoided, and good nutrition should be maintained, especially for females.

In conclusion, we managed two patients with severe dyspnea secondary to postintubation subglottic granuloma which occurred 3 months after extubation. Surgical removal of the granuloma with tracheostomy replacement was needed for these patients. Careful management of endotracheal tube is necessary for the patients with poor nutrition and females.

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