

Pulmonary aspiration during induction of general anesthesia in a postesophagectomy patient

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To the editor:

Although a large number of studies on pulmonary aspiration have been reported [1,2] and precautions are being taken to prevent this complication [3], all of these studies and precautions involve patients with a normal upper gastrointestinal (GI) tract. As far as we know, there is currently no documentation in the literature, including major textbooks, of studies investigating whether standard precautions are sufficient to prevent pulmonary aspiration in patients with a history of esophageal or gastric surgery. Here we would like to report a case of pulmonary aspiration in a postesophagectomy patient during induction of anesthesia, because this case is valuable to clarify the risks of aspiration in patients who have undergone upper GI tract surgery.

Case report

A 68 year-old man, 164 cm tall and weighing 72 kg, was scheduled for hepatectomy due to hepatocellular carcinoma. He had been operated on for esophageal carcinoma 3 years before, when his esophagus had been resected and reconstructed by esophagogastric anastomosis using his gastric fundus to anastomose with the cervical esophagus.

In accordance with our institute's standard preoperative procedure, the patient fasted overnight, and

was premedicated with oral diazepam 5 mg and 0.5 mg atropine sulfate i.m. 60 and 30 min before induction of anesthesia, respectively. After application of routine monitoring, anesthesia was induced by 10 mg diazepam, 0.15 mg fentanyl, 300 mg thiopental, and 8 mg pancuronium bromide. The lungs were ventilated with a face mask and no signs of airway difficulty were noted until adequate muscle relaxation was achieved. When the mouth was opened for tracheal intubation, we found that the oropharynx was filled with fluid. The fluid was immediately aspirated and the trachea was intubated with an endotracheal tube. The airway was further examined by suction through the tube, and a slightly yellowish-brown, clear fluid was aspirated. Because the pH value of the fluid was 7.184, which was far above the risk factor value ($\text{pH} < 2.5$) [3], and since minimal pulmonary injury was anticipated with clear fluid with this pH [3], we proceeded with the operation. Anesthesia was maintained with 1.0%–1.5% isoflurane in 50% N_2O and 50% O_2 . Arterial blood gas analysis at this point revealed an arterial oxygen pressure (Pao_2) of 135.8 mmHg and an arterial carbon dioxide pressure (Paco_2) of 44.0 mmHg. The fluid in the tracheal bronchi was aspirated several times using a fiberoptic bronchoscope. The mucous membrane of the bronchi looked slightly reddish, but no signs of edema or erosion of the trachea or bronchi were recognized. A chest X-ray film taken immediately after the operation showed no abnormal opacity or consolidation. The patient was transferred to the intensive care unit and kept under controlled ventilation overnight. On the following day, because the patient's condition was stable and the chest X-ray film showed no signs of pneumonia, the patient was extubated. The subsequent postoperative course was uneventful.

When a risk of aspiration is anticipated, for reasons such as full stomach or GI obstruction, several procedures have been recommended to avoid complications, including rapid-sequence induction, cricoid pressure,

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and awake endotracheal intubation [3]. The present patient had fasted overnight and there was no obstruction of the GI tract. Therefore, this case clearly demonstrates the increased risk of pulmonary aspiration in patients with a history of esophagogastric anastomosis.

There have been several reports of pneumonia due to aspiration of gastric contents after surgery for esophageal cancer [4,5]. According to these authors, the possible causes of aspiration pneumonia after esophagogastric anastomosis are as follows: (1) absence of gastroesophageal sphincter mechanism, (2) retention of gastric contents due to postvagotomy pylorospasm and gastric hypomotility, and (3) that most of the acid-producing portion of the stomach remains.

Furthermore, Marumo et al. [6] recently reported that more than 30% of patients who had undergone total gastrectomy suffered from recurrent or sporadic respiratory tract inflammation induced by pulmonary aspiration. They argue that the absence of a gastroesophageal sphincter mechanism causes esophageal reflux. Taken together, in a patient with a history of esophagectomy or gastrectomy, the risk of aspiration may increase due to malfunction of the upper GI tract.

Because of improvements in surgical procedures, more and more patients are undergoing general anes-

thesia after having had upper GI tract surgery. Thus, anesthesiologists may encounter a growing number of cases in which they should consider an increased risk of pulmonary aspiration due to malfunction of the repaired upper GI tract.

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