Case Report

Unrecognised Aspiration Pneumonitis during Enteroscopy: Two Cases Report

Manee Raksakietisak MD, FRCA*

** Department of Anesthesiology, Siriraj Hospital, Mahidol University, Bangkok, Thailand*

Two patients (one underwent balloon enteroscopy and the other had endoscopic retrograde cholangiopancreatoscopy, ERCP) developed desaturation in the post anesthetic care unit (PACU) despite high oxygen supplement. Aspiration pneumonitis was suspected. The chest x-rays taken in PACU showed lung infiltration in both cases and arterial blood gases revealed hypoxemia. During anesthesia, there were brief episodes of choking, regurgitation, and desaturation, which were improved by giving high FiO_2 and positive pressure ventilation. The diagnosis and management of aspiration pneumonitis was discussed.

Keywords: *Aspiration, Pneumonitis, Enteroscopy, Desaturation*

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Many enteroscopies have been done under anesthesia, which varies from mild sedation to general anesthesia. Two patients underwent enteroscopy in which the diagnosis of aspiration pneumonitis was not made until completing the procedures and the patients went to the post-anesthetic care unit.

Case Report

Case 1

A 60-year-old man presented with hematochezia for 2 weeks. No active bleeding was seen by gastroscopy and colonoscopy His hematocrit dropped from 43% to 23% and had been given 2 units of PRC then his hematocrit rose to 28%. He was scheduled for single balloon endoscopy. He had no underlying disease. He had not ingested anything for 7 hours. His vital signs were stable. His chest x-ray was normal. After standard monitoring (NIBP, EKG, SpO_2), he received 10% xylocaine spray (8 puff) in the oropharynx and 1 mg of midazolam, 30 mcg of fentanyl and small doses of propofol (20 mg increment until he lost consciousness) and propofol was infused 3-4 mg/kg/hr for the maintenance. Patient's position was left lateral and oxygen canula 3 L/min was supplied. After 45 minutes of uneventful anesthesia, when the endoscope was trying to enter the ileum, the patient moved and 2 small doses of propofol (20 mg) were intravenously administered. The patient was choking and breath holding and SpO_2 decreased rapidly to 86% and BP dropped to 70/50 mmHg. An anesthetic mask with 100% oxygen was placed over the patient's airway and ephedrine 6 mg was given for treatment of hypotension. The desaturation continued, so the endoscope was removed. The tracheal intubation was performed after suxamethonium was given. During laryngoscopy, there was some secretion in the oral cavity and intubation succeeded in one attempt and SpO_2 increased to 100% ($FiO_2$1.0). No abnormal breath sounds were heard and pressure decreased again with more intravenous fluid. Anesthesia was maintained with 100% oxygen and sevoflurane 0.4-1.0% and atracurium and fentanyl. The endoscope was reinserted again and the procedure took 2 hours and 30 minutes. The endoscopy revealed small bowel lymphagiectasia, no evidence of the bleeding down to the proximal ileum. The blood pressure and oxygen saturation were stable but FiO_2 could not be decreased due to desaturation. At the end, the patient was extubated after being fully awake and sent to PACU. At the PACU, his SpO_2 was 88% despite oxygen mask 10 L/min. He shivered (his temperature was 38.8^0) and received two doses of pethidine (20 mg). He was supplied with an

Correspondence to: Raksakietisak M, Department of Anesthesiology, Siriraj Hospital, 2 Phrannok Road, Bangkok Noi 10700, Bangkok. Phone: 0-2419-7990, 08-1488-0620. E-mail: simrs@mahidol.ac.th.

oxygen mask with a bag 15 L/min and his SpO_2 increased to $SpO_2$98%. His respiratory rate was 24/min but no signs of respiratory distress. Crepitation was heard at the left lower lung field. Chest x-ray revealed reticulonodular infiltration at left lower lung and arterial blood gases showed hypoxemia (pH 7.35, $PaCO_2$ 39 mmHg, $PaO_2$79 mmHg, HCO_2 22.3 mmol/L). The amoxycillin/clavulanic acid 1.2 gram was given. He was observed in the recovery room for two hours and sent to the ICU of the hospital nearby because our ICU was fully occupied. He recovered within 24 hours and had good oxygenation with room air after 3 days.

Case 2

A 73-year-old man presented with ascending cholangitis and ileus. His vital signs were stable but the abdomen was slightly distended. His chest x-ray was normal. He was scheduled for endoscopic retrograde cholangiopancreatoscopy (ERCP). After standard monitoring, the rapid sequence induction (fentanyl 100 mcg, propofol 100 mg and suxamethonium 75 mg) and intubation succeeded in the first attempt. The anesthesia was maintained with air: oxygen = 1:1 L/min and desflurane 4%. While turning the patient to the semi prone position, the patient regurgitated with gastric content, which was suctioned from the oral cavity (about 200 ml). The trachea was also suctioned but no gastric content was found and no abnormal breath sounds heard. The ERCP was performed and finished in one hour. At PACU, he developed desaturation ($SpO_2$90%) despite an oxygen mask with a bag 6 L/min. The anesthesiologist increased oxygen to 15 L/min and his SpO_2 increased to 97%. The chest x-ray at PACU (Fig. 1) showed Rt lower lung infiltration so aspiration pneumonitis was suspected. The patient had slight dyspnea and was sent to the high dependency unit (HDU) for respiratory observation. The next day, he developed severe hypoxemia and respiratory distress, the CXR revealed bilateral lung infiltration (Fig. 2). He was transferred to the ICU and was intubated and ventilated with FiO_2 1.0, controlled mechanical ventilation (CMV), tidal volume 500 ml, respiratory rate 14/min and PEEP 5 cm H_2O and his PaO_2/FiO_2 was less than 200 mmHg. The pulmonary artery catheter was inserted via Rt internal jugular vein, the pulmonary artery occlusive pressure was low, and adult respiratory distress syndrome (ARDS) was diagnosed. He needed ventilator support for 7 days and remained in ICU for 8 days before being discharged to the ward.

Discussion

The incidence of aspiration pneumonitis was 1:2,000-4,000 in anesthetic practice[1,2]. In Thailand, from the THAI study in 2003-2004, the incidence was 1.9:10,000 anesthetics and the contributing factors

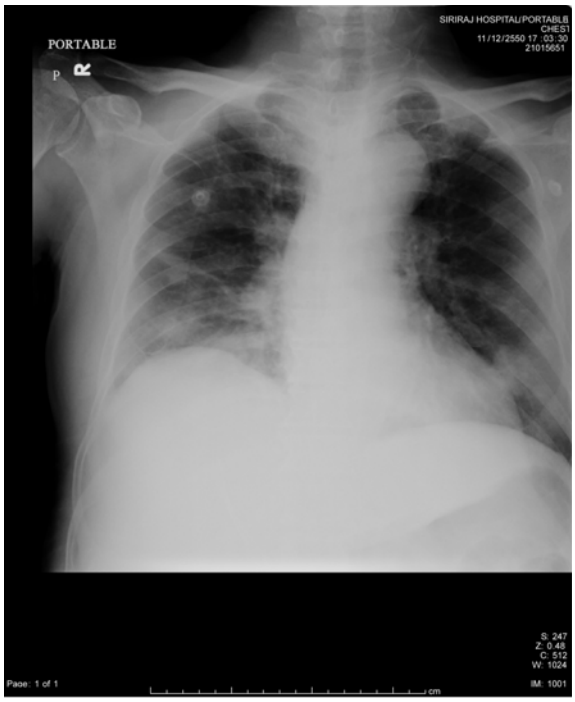

Fig. 1 Chest x-ray taken immediately post anesthesia at PACU showed right lower lung infiltration

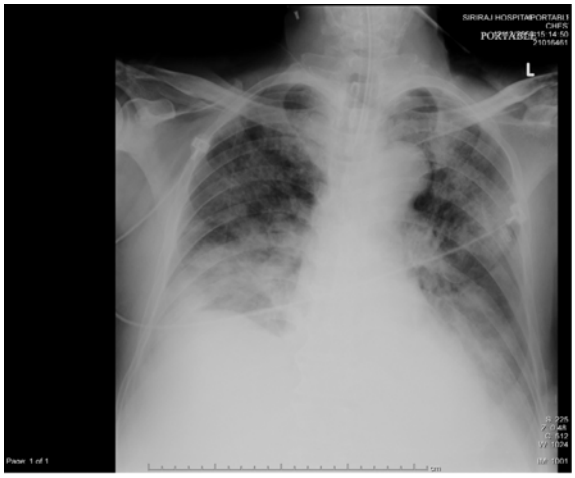

Fig. 2 Chest x-ray (24 hours after anesthesia) showed bilateral lung infiltration and the patients was already intubated

included lack of knowledge and inexperience[3]. The pulmonary aspiration is also the cause of an anesthesia related death[2-4]. The desaturation developed after choking or regurgitation. The aspiration was the major cause of desaturation in the perioperative period[5]. The aspiration pneumonitis was not earlier suspected because no content in the trachea was found and no abnormal breath sounds after intubation. Both patients received high FiO_2 during anesthesia (FiO_2 1.0 and 0.6 respectively) so the good oxygenation was maintained during both procedures. Aspiration pneumonitis proceeds into two phases, the first phase is direct toxic damage to the respiratory epithelium by the acid. The second phase about 2-3 hours later, neutrophil activation and migration into alveoli and inflammatory cytokines caused acute lung injury, which lead to V/Q mismatch, shunt, and hypoxemia[1]. The V/Q mismatch was masked by high FiO_2, which made hypoxemia unrecognized until the recovery period. At PACU, the shivering superimposed the unrecognized hypoxemia and made it recognized. Oxygen mask at least 6 L/min is always supplied to every patient after general anesthesia in Siriraj Hospital. Despite 6-10 L/min of oxygen mask, desaturation occurred so the chest x-ray and arterial blood gases were done for severity assessment. The results showed moderate hypoxemia and lung infiltration. The antibiotic was given because case 1 got new high fever and chest x-ray showed definite aspiration although the use of antibiotics is still debated [1,6]. In case 2, the antibiotic was already given because of ascending cholangitis. How can the authors prevent aspiration in our anesthetic practice? In case 1, normally the authors identify patients who have no risks (such as a recent meal, gut obstruction, pregnancy, difficult airway, obese) for aspiration before choosing TIVA as an anesthetic. Is lower GI bleeding a risk factor? The endoscopic result showed no active bleeding at that time so the authors considered this patient had an empty-stomach. TIVA is the most common anesthetic technique for gastrointestinal procedures in many hospitals[7,8]. In case 2, the cuffed endotracheal intubation could not prevent aspiration and the aspiration progressed into ARDS in the next 24 hours, which needed ventilator support for several days. Every case with a history of choking, regurgitation, unexplained hypoxemia, or need high FiO_2 during anesthesia should be suspected for aspiration pneumonitis and its severity should be assessed (by chest x-ray and arterial blood gases) immediately. Oxygen therapy or ventilator support may be needed according to the severity of hypoxemia.

In conclusion, aspiration pneumonitis during enteroscopy sometimes was undiagnosed until very late and led to severe hypoxemia, which needed ventilator support or oxygen therapy for several days.

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ปอดอักเสบจากการสูดสำลักไม่เป็นที่สังเกตระหว่างการส่องกล้องตรวจระบบทางเดินอาหาร: รายงานผู้ป่วย 2 ราย

มานี รักษาเกียรติศักดิ์

ผู้ป่วย 2 ราย (1 รายได้รับการส่องกล้องของระบบทางเดินอาหารและ อีก 1 รายได้รับการส่องกล้องระบบน้ำดีและตับอ่อน) เกิดภาวะออกซิเจนอิ่มตัวในเลือดลดต่ำลงในห้องพักฟื้นหลังการได้รับยาระงับความรู้สึก แม้ว่าจะได้รับออกซิเจนทางหน้ากาก แพทย์สงสัยว่าจะเกิดการสูดสำลักน้ำย่อยจากกระเพาะอาหารเข้าสู่ปอด ภาพรังสีเอกซเรย์ปอดแสดงให้เห็นว่ามีปอดอักเสบส่วนล่างทั้งสองราย และผลการเจาะเลือดแดงพบว่าออกซิเจนในเลือดต่ำกว่าปกติ ระหว่างการได้รับยาระงับความรู้สึก มีช่วงเวลาที่ผู้ป่วยมีอาการขย้อน และมีภาวะออกซิเจนอิ่มตัวในเลือด ลดต่ำลงชั่วขณะ ซึ่งดีขึ้นหลังจากได้รับออกซิเจนที่ความเข้มข้นสูงขึ้น และใช้เครื่องช่วยหายใจ การวินิจฉัยและแนวทาง การรักษาของภาวะปอดอักเสบจากการสูดสำลัก ได้มีการพูดถึง ในบทความนี้